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The Impact of Differentiation Strategies on the Women Fashion-Clothing' Performance

Mehdi Rasouli Ghahroudi[1], Sepideh Sagheb[2]

[1] Assistant Professor of International Business Management, Department of Management, Institute of Management and Planning Studies (IMPS) No., 6, North of Niavaran Palace, Tehran, Iran, m.rasouli@imps.ac.ir
[2] Master of International Business Management, Islamic Azad University, Artesh Boulevard, Tehran, Iran, sepidehsagheb3@gmail.com

Abstract

Companies need innovation and initiative to win the competition, and to do this, they adopt differentiation strategies through customer satisfaction to survive in the market. The research studies the impact of differentiation strategies, including product differentiation, employee differentiation, service differentiation, distribution differentiation and image differentiation on the performance of fashion clothing companies. We examined the mediating role of customer satisfaction in the relationship between differentiation strategies and performance. Our sample includes 100 women's clothing mesons in Tehran. The results show that the distinction between product and staff and image have a positive and significate effect on the performance of fashion companies. Our finding also shows the customer satisfaction mediates the relationship between differentiation strategies and women fashion clothing performance.

Keywords: Differentiation Strategy, Customer Satisfaction, Performance, Women's Fashion Clothing

1. Introduction

The differentiation strategy seeks to provide products or services that offer benefits different from those of other competitors and are of great value to the buyers (Johnson et al., 2007). The goal of using the differentiation strategy is to achieve a competitive advantage. For example, Zara's clothing brand is creating a competitive advantage through quality products and affordable prices. The differentiation strategy should be based on two key factors: strategic customers that the companies identify their needs and whatever they value, and the main competitors that the companies are identifying to compete with (Hitt et al., 2009)

Competitive strategies are in fact a group of organizational strategies that are capable of adapting to a complex competitive environment. It is necessary that such companies achieve desirable performance in a competitive environment including maximizing profits in order to increase and improve the companies' stocks value. So, it can be concluded that performance is a very important indicator for evaluating the effectiveness of a competitive strategy (Barney, 2001)

The activities of the companies are focused on the preparation and production of a unique product or service in a differentiation strategy. In this strategy, the company tries to get a price higher than usual from the customers by providing the customers with a unique product (Porter, 1383). Organizations need continuous innovation and initiative in order to remain at the top of the competition, especially in product development. It is necessary for the companies to take a differentiation strategy in order to do a superior job, to always be in the vanguard (Ghemawat, 1986)

According to Porter, a company may compete as a low-cost producer in the industry (cost leadership strategy), or through producing unique products that differ in quality, physical characteristics, or product-related services comparing with other competitors' products (Porter, 1996).

The aim of the differentiation strategy is to provide the customers who are not very sensitive to the price with the products that are distinct from competitors' ones. In this case, the organization can be more flexible in terms of delivering products and services, also it has more potential to adapt to changing environments, and spend less on maintenance of machinery (Porter, 2008). The differentiation strategies include product, services, employees, distribution channels and image differentiation. This research aims to answer whether these differentiation strategies have a positive impact on the fashion companies' performance. Does this effect increase with customer satisfaction? This study covers the literature available in this field by showing the positive effect of customer satisfaction on the fashion companies' performance, as well as the effect of differentiation strategies on fashion companies' profitability. Finally, the result of this study has valuable consequences for women's clothing mesons.

2. Differentiation strategies and performance

In the today's changing world of business and economic environment the revenue, market share, and products adaptation to customers' needs are very important. Customers are demanding lower prices for quality services and products due to technological changes. This increase in global competition has led to a decline in the product lifecycle. Organizations tend to gain a competitive advantage or increase the organization's performance comparing to their rivals (Raduan et al., 2009). Porter's overall strategy to achieve the competitive advantage includes cost leadership and product differentiation. The company's differentiation strategy includes creating some of the unique aspects of the products and services according to the customers' needs, which satisfy the customers. The cost leadership stresses the lower costs than competitors. He argued that these two strategies are incompatible; however, recent research studies have concluded that organizations can sometimes use both strategies (Chenhall et al., 1998). However, recent research has shown that the differentiation strategy is an important and distinct tool for achieving a competitive advantage in a number of manufacturing organizations. To achieve competitive advantage, the companies seek to create the best fit between organizational capabilities and market opportunities. Organizations must continually look for opportunities to create the highest values. Organizations tend to create differentiation in manufacturing processes, product features, brand, location, and many other aspects. Differentiation is an important factor in determining the success and failure regarding the resources in competitive advantage (Porter, 1985). The product differentiation strategy is a competitive advantage tool that is used by the organization to provide the customers with satisfying products, which is used according to their needs. Customers are willing to pay more if they get the model, size, and style, which they needed. Quality of products is a major distinctive factor. Therefore, achieving competitive advantage is carried out through product differentiation (Shammot, 2011).

Since customer retention cost is much lower than new customer acquisition, customer retention is likely to increase the profitability of a company. The profit-sharing service generates relationships between profitability, customer loyalty, customer satisfaction, and employee satisfaction. Profit and growth are firstly created by customer loyalty, which is a direct result of customer satisfaction. Satisfaction is largely influenced by the service provided to customers by satisfied, loyal, and productive employees. (Heskett, 1994). The satisfied employees are likely to create satisfied customers, and satisfied customers will create happy shareholders.

Employee satisfaction plays an important role in helping with financial goals (Koys, 2003). The rationale for this argument is that if a company cares about its employees, it cares for its customers. Customers have a better shopping experience with organizations whose employees are more satisfied with their jobs. Better wages, as well as continuing training in such a way that employees feel safe, can define employee retention. (Gursoy, 2007)

The design of a strong brand has been of great importance in the commercial market. A strong brand is the most powerful asset of a company, and various companies recognize its importance. Kapferer (2004) argues that a brand is a significant factor in the society and the firm's brand can be a part of the business capital. A strong brand is a great way of identifying products and services. The brand is a combination of words, images, and sound. Creating a strong image of a brand can be a powerful strategy to reduce uncertainty in product valuation and increase purchasing decisions. A well-known brand creates a competitive advantage in relation to a positive mental image, increasing interest, attention, positive evaluation of the product, and encourage re-purchasing. Consumers are more likely to consider the familiar brands and work harder to process information about famous brands. When consumers are confronted with lack of knowledge of product features and are uncertain about a product, brands play an important role in reducing perceived risk and evaluating the quality of a feature (Markwick and Fill, 1988).

Companies can gain a competitive advantage through the distinctive design of their distribution channels. Channel differentiation is done through different means including differentiation in the distribution of the company or selling and offering products to the customers. It includes the expertise of channel managers and channel efficiency in ease of ordering, service, and employee (Kotler and Keller, 2007). Distribution channels consist of many different factors including a broad category of wholesalers, retailers, customers, and users. Each of them has certain responsibilities to others. These obligations must be in line with the correct functioning of the channel (Kali, 1996)

2.1. Product differentiation

Product differentiation refers to the unique features of a product compared to the competitors' ones. The tool derives from product differentiation, which is resulted from product's features. The product's profit can be attributed to the tangible and intangible properties of a product. Tangible benefits may also be service features, such as a place where the product is sold. Tangible benefits may be due to visual features such as validity, status, and attractiveness. The concept of product differentiation appears in apparent, services, and image features. For example, the image may be related to packaging (the physical feature) and the distribution that the sales are doing through it (services feature) (Porter, 1976). The concept of competitive advantage has been taken into consideration in recent years. One of the major challenges in discussing business strategies is how to achieve a competitive advantage. While there are several methods for brands differentiation, identifying the product differentiation plays a very important role in gaining competitive advantage (Sharp and Dawes, 2001). A differentiation is made when a company or brand introduces its products and features better than the competitors. The product differentiation strategy is a competitive advantage tool that is being used by the organization to provide customers with satisfying products, which is used according to their needs. Customers are willing to pay more if their model, size, and style are provided. Product quality is a major differentiation factor. Therefore, the competitive advantage is gained through product differentiation (Shammot, 2011).

2.2. Services differentiation

Markets have become very competitive and constantly changing (Neu and Brown, 2005). In response to changing market conditions, manufacturing companies have become more customer-oriented and innovative, and produce the products according to the to customer needs. (Deshpande et al., 2005).

The differentiation services mean different methods for achieving competitive advantage through services. It is a strategic method to attract distinct services, customer support services, business consulting, integrated services, and operational services. Business consulting, especially strategic advice, should be done by analyzing customer business and identifying problems in a customer organization based on experience (Davies, 2004)

Services lead to the creation of unique resources which are hard to imitate. (Vandermerwe, 1984). Customer services lead to more product supply and improved customer engagement quality. (Mathieu, 2001). While customer services create a final share, the products are the main sources of profit and income (Eliva, 2003). The product differentiation through customer orientation and innovation is the first priority for a product. In contrast, service providers are not limited to providing customer services. They provide a comprehensive range of services, including product installation services, design, and construction of services, valuable solutions, systems integration services, or outsourcing services (Davies, 2004).

The differentiation between products is easier than the differentiation of services because the products are more tangible, however, when the product cannot be distinctive, adding valuable services or improving their quality can be the key to competitive success. Services have a great effect on whether the customer is returning or not; therefore, the differentiation between the services is really important for all companies (Bruhn and Georgi, 2006).

2.3. Employees differentiation

Globalization and market differentiation continue to drive business change and increase global competition. Today, the return on investment to financiers and managers depends on how to deal with unexpected changes. The ability to respond quickly and appropriately (based on the time of competition) and satisfying the customer needs are of competition and success features for many companies (Gursoy and Swanger, 2007). Employees' knowledge and skills are the intangible assets of service companies. The company's future depends on the perceived quality of interactions between customers and employees (Matzler and Rernzl, 2007). Service companies need to allocate a lot of resources to maintain their employees. Studies show that maintaining the employees and keeping the customers are directly related. The employees who are happy in their work environment are more likely to stay in the company. This will result in fewer job vacancies which result in more financial performance due to the lower cost of recruiting and training new employees. Satisfied employees usually provide better services and provide a satisfying service experience for their customers. This satisfactory service experience leads to re-purchasing and customer retention.

Since satisfied employees work harder and are more motivated, the customer satisfaction is directly related to the performance of the organization, and customer satisfaction is directly related to employee satisfaction. Therefore, the employee differentiation increases profits. Today, a growing number of organizations are using the differentiation strategy to serve their customers including financial institutions, hospitals, banks, airlines, retail stores, restaurants, manufacturers, wholesalers, and restaurants. They are maintaining and supporting their customers. Having long-term relationships with customers is one of the most important strategies for having long-term relationships with customers (Rifat and Sarah, 2004).

Rifat and Sarah (2004) measure the differentiation employees through fifteen variables: knowledge for performing a specific task, skill, organizational culture, positive and friendly behavior, high understanding or knowledge, correct movements, appearance, and attitude, ability to manage time, managing customers with care and respect, notable mind, respect and honesty, consistent and accurate services, good communication skills, degree of cooperation with customer requests, willingness to solve problems, ability to recognize customer priorities.

2.4. Image differentiation

A company image can be understood as a general understanding of the company. The image can be generated by promotional activities, environmental factors, rivals' activities, or mouth-to-mouth advertisements. The image, as a result, includes all the experiences, values, and impressions that external actors possess about the company. The company has many shareholders with different backgrounds, as a result, we cannot expect that the image of all stakeholders to be the same. In other words, a company has multiple images (Markwick and Fill 1997). The product brand is one of the factors that are increasingly important in the fashion industry. A product brand can give a deeper meaning than just identifying the product and the company that produced it. The brand is usually

associated with a variety of features including monopoly, luxury, good quality, and excellent fashion (Melin, 1992).

The effective image provides three things for a product or a company. It created planned product personality, distinguishes the products from competing products, and generates the emotional power. Kotler and Keller (2007) state that when products compete alike, buyers may pick a differentiation based on the brand image. An image is a powerful tool for using differentiation.

Attention to marketing activities as a tool to penetrate in customers' mind and the creation of intellectual property as the brand is a new perspective in marketing science. Various studies have shown that there is no real value within the product or service, however, this value is in the mind of real and potential customers. It is the brand that brings real value into the minds of the customers.

A study entitled "Investigating the effect of the mental image of grocery stores, distance, and customer satisfaction" conducted by Hsu et al. (2010) in the Western U.S. university campus, shows that the mental image of the grocery store which is known through three key components of marketing features, store space and services, and marketing attractiveness. The store distance has a significant positive relationship with customer satisfaction, which retailers must seek to address the weakness of the distance.

2.5. Channel differentiation

One of the most important challenges for marketing managers and manufacturers is to transfer their manufactured goods to the target markets. Accordingly, the decision on how to transfer goods to a place of purchase or consumption is one of the important decisions that marketing director faces. The importance of the decisions made on distribution channels is due to the fact that the company has to adhere to these decisions for a long time, because, it takes several years for a distribution system to be properly deployed and it is not easy to change. The manufacturer or wholesaler should decide on how to distribute the products. Distribution should be made in such a way as to facilitate the sale and supply of the product when needed.

Companies can gain a competitive advantage through the distinctive design of their distribution channels. Channel differentiation is achieved through different methods, such as differentiating in the distribution of the company or selling and offering products to the customers. It includes the expertise of channel managers and channel efficiency in ease of ordering, services, and employee (Kotler & Keller, 2007). Distribution channels consist of many different factors. A broad category includes wholesalers, retailers, customers, and users. Each of them has certain responsibilities regarding the others. These obligations must be in order to realize the correct channel performance (McCalley, 1996).

An intermediary or a distributor's business position can be an important indicator in the choice of distributors (Braglia and Petroni, 2000). Manufacturers often want to obtain information about current and former customers of the distributors, therefore, the infrastructure of the distribution companies and their rivals are important. Knowledge and expertise of distributors are related to the amount of knowledge and expertise in that industry. The distributors who have enough expertise and knowledge about the products and services in a particular industry are more successful in providing the products and communicating with the customers (Kaleka, 2002).

The financial capability shows that the distributors with a good financial status create the ability to sell a large number of products for the producers. The financial capability represents both power and the overall performance of the company (Barli and Petro, 2004). According to Ray Doun and McCorkel (2002), the reason why a buyer often prefers to buy from a given channel instead of another channel depends on the time it takes to wait and the attempt to be made. The buyer selects this channel by comparing money, time, mental rewards, and investigating possible risks of each distribution channel.

3. Differentiation Strategies and Customer Satisfaction

According to Helir et al., customer satisfaction is the amount of overall enjoyment or customer satisfaction, and as a result the ability of the product or service to satisfy their desires, expectations, and needs. By reviewing the researchers' point of view on the definitions of satisfaction, it can be seen that there are three main factors in all definitions that the combination of these factors can provide the basis for a comprehensive definition of satisfaction. These factors include customer satisfaction, emotional (affective) response, or a state of mutual understanding and cognition.

Customer satisfaction with the store is defined as an overall customer assessment of the experience gained from the store and its mental image of the store and satisfaction resulting from the overall customer assessment of all the stimuli affecting the customer in the store. (Theodoridis, 2009)

Customer satisfaction requires planning and endeavor. Customer satisfaction is a tool and a competition. It is difficult to imitate the competitive advantage gained from customer satisfaction, and employee differentiation for competitors is very difficult, especially if the company is more dedicated to providing customer services. If the employees have empathy with each other and they have a good relationship with customers, imitating this quality is very difficult for customers (Shemwellet, 1998). Customer satisfaction is crucial for the financial performance of the organization. Providing customers with excellent services that exceed customer expectations is an opportunity for growth (Kliford and Kong, 1985). Customer satisfaction is a key factor in increasing the performance and is the key to success for any service company (Gursoy and Swange). Since satisfied employees work harder and are more motivated, customer satisfaction is directly related to the performance of the organization, and customer satisfaction has a direct relationship with employee satisfaction. As a result, employee differentiation boosts profits. Today, a growing number of organizations are using employee differentiation strategies to serve their customers, including financial institutions, hospitals, banks, airlines, retail stores, restaurants, manufacturers, wholesalers, and restaurants which are maintaining and supporting their customers. To have long-term relationships with the customers is a very important strategy to have long-term relationships with the customers (Rifat and Sarah, 2004).

In a study entitled "The characteristics of the mental image of the store and customer satisfaction among different types of customers in the supermarket sector in Greece" by Theodoridis and Chatzipanagitou in 2009, they sought to achieve two goals: the development of a functional study of the relationship between the features of the mental image of the store in the context of the Greek market and customer satisfaction, and investigation of the stability of structural relations between the features of the mental image of the store and the customer satisfaction among different groups of customers. In this study, the literature on the mental image of large stores has been systematically investigated. The features of the mental image are estimated based on factor analysis and path analysis and determining the relationship between the features of the mental image of the store and customer satisfaction. The features of the mental image in this study which includes dimensions such as marketing, products, store atmosphere, employee and price have a positive and direct effect on the customer satisfaction. Also, the effect of the features of a mental image on customer satisfaction are different among different groups of customers.

Burner et al. (2008) conducted research entitled "Satisfaction, image, and loyalty: against the experience of customers." They state that customer satisfaction and mental image are among the important factors that are being studied due to their effect on customer loyalty. The results of this study indicate that there is a difference between the new customers and the old ones. New customer satisfaction is more influenced by their mental image of the store. This research proposes an integrated model of satisfaction, mental image, shop re-purchasing, and loyalty, and analyzes these variables in the model.

Faullant et al. in a study entitled "The effect of customer satisfaction and mental image on loyalty," investigated variables such as dimensions of the mental image, satisfaction and behavioral intentions, and customer loyalty. The results show that customers with the highest degree of satisfaction and mental image are more loyal. In the first glance, overall satisfaction is more important than mental image, However, with increasing the number of

purchases, the importance of overall satisfaction in creating loyalty decreases and the importance of mental image increases relatively.

4. Customer Satisfaction and the Performance of Fashion Companies

Customer satisfaction is the desirability of the customer due to different product characteristics. Customer satisfaction leads to the loyalty of customers, and as a result of the company's reputation also increases the profitability of the company (Anderson et al., 1994).

Today, with the growing competition in the manufacturing and service sectors, the role of customer loyalty has become more prominent than the past. In today's view, marketing involves customer growth, that is, attention to satisfaction and quality from the customer's point of view, and customer loyalty and effective communication with him/her. As a result, organizations are trying to have loyal customers.

In addition to re-purchasing or using the services from his/her favorite organization, a loyal customer as an additional factor in advertising the goods and services of the organization plays an important role in promoting the profitability and improvement of the image of the organization in the minds of potential customers through advising other people. Due to several factors, such as the amount of re-purchasing, communication, and verbal recommendations, and reducing the tendency to switch or change supplier source, companies that have more shares of loyal customers increases the profitability of their organization (Reichheld, 1990).

Through the studies of the final service chain, the relationship between customer satisfaction and financial performance should be positive, however, while some studies indicate that this relationship is positive (Bernhardt et al., 2000; Nelson et al., 1992) others argue that customer services, understanding quality, and satisfaction sometimes, but not always, make a profit.

Bernhardt et al. (2000) have concluded that there is a positive and significant relationship between changes in customer satisfaction and changes in the financial performance of a company. However, in the short term, this positive and significant relationship may be hidden by many factors, however, it may be positive in the long term. Several other scholars have shown that the relationship between customer satisfaction and financial performance may be positive (Torno and Willy, 1991). However, there are some studies that are not consistent with these findings (Anderson, 1994).

In a study entitled "The characteristics of the mental image of the store and customer satisfaction among different types of customers in the supermarket sector in Greece" by Theodoridis and Chatzipanagitou in 2009, they sought to achieve two goals: the development of a functional study of the relationship between the features of the mental image of the store in the context of the Greek market and customer satisfaction, and investigation of the stability of structural relations between the features of the mental image of the store and the customer satisfaction among different groups of customers. In this study, the literature on the mental image of large stores has been systematically investigated. The features of the mental image are estimated based on factor analysis and path analysis and determining the relationship between the features of the mental image of the store and customer satisfaction. The features of the mental image in this study which includes dimensions such as marketing, products, store atmosphere, employee and price have a positive and direct effect on the customer satisfaction. Also, the effect of the features of a mental image on customer satisfaction are different among different groups of customers.

Table 1: Studies on fashion industries

Researcher	Year	Population (sample)	Main findings
Bokhari et al.	2014	Customers of 150 Bangladesh Banks	The employee differentiation leads to more satisfied customers, resulting in more profits for the company.
Dirisu, Iyiola, and Ibidunni	2013	323 company customers	There is a positive relationship between product differentiation and organizational performance.
Jahanshani	2014	234 Tata Motors customers	There is a positive and significant relationship between customer satisfaction and increase customer loyalty. The quality of customer services and the quality of products lead to customer satisfaction.
Gebauer, Gustafsson, and Witell,	2011	332 manufacturing company	The differentiation of services has a positive effect on the customer orientation of the companies which lead to more investors' benefit
Kandampully and Suhartanto	2000	237 guests from New Zealand chain hotels	The positive image of the organization and customer satisfaction have a positive effect on the organization customer loyalty.
Chi and Gursoy	2009	Staff and customers and managers of 50 hotels	Customer satisfaction has a direct effect on the financial performance of the companies. However, employee satisfaction does not directly affect the performance of the companies, and its effects are due to customer satisfaction.
Namubiru & Nabeta	2014	104 companies	The image of public companies has a direct effect on organizational performance.
Wallace, Giese, and Johnson	2004	103 retail customers	Retailer channel strategy leads to customer satisfaction by increasing the output of customer services
Chen and Kim	2013	Chinese consumers	Showing that face-saving and social connection, two important dimensions in Chinese culture, do not have a significant impact on consumer purchase intentions
Kamal and Chu	2103	American and Arab young social media users	Showing that a positive relationship exists between materialism and consumer purchase intention towards the luxury fashion products
Zhang and Kim	2013	Chinese consumers	Indicating that brand consciousness, social comparison, and fashion innovativeness all have a statistically significant impact on consumer attitude towards purchasing luxury fashion goods
Kim and Ko	2012	Consumer survey	Revealing that the effects of the constructs "entertainment, interaction, trendiness, customization, and word of mouth" on value equity, relationship equity, and brand equity are positive
Kim et al.	2012	American consumers	Proving that the factors such as the experiential need and fashion involvement

			are critical in affecting the consumers' attitude towards luxury fashion brands
Yoo and Lee	2012	Consumer survey	Revealing that an asymmetrical effect exists in which past experiences with real original luxury fashion brands are negatively correlated to consumer purchase intention of counterfeits
Jung and Shen	2011	College women from a university in China and a large public university in the USA	Showing the cultural differences in which the American consumers possess higher score in perceived quality, brand awareness, brand association than the Chinese counterparts

According to the literatures, we suggest the following conceptual model:
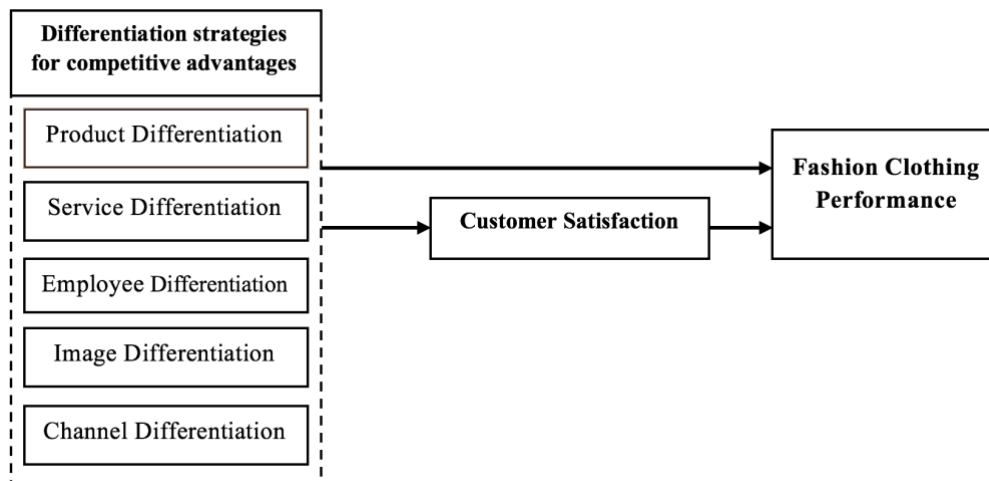
Figure 1: Conceptual framework of the research

5. Research Methodology

Considering that, its purpose is to investigate the strategies of differentiation in the fashion industry, consists of businesses in the women's clothing fashion industry and includes all women's clothing mesons in Tehran. Women's clothing mesons in Tehran have a lot of geographical dispersion, and the sampling of these mesons is very time-consuming and costly. There are licensed mesons and unlicensed (uncertified) mesons in women's clothing industry in Tehran. Considering that, licensed mesons are somehow more trusted and reliable through their permission. However, our samples only include licensed women's clothing mesons. There is a total number of 300 certified women's clothing mesons in Tehran. We have distributed questionnaires to 144 women clothing mesons, and we have received 108 questionnaires. Therefore, due to non-complete questionnaires and missing data, our final sample included 100 women clothing mesons.

Our samples include two groups of respondents. The first group are the mesons managers and the second group is fashion-clothing consumers. Considering the fact that two questionnaires were used in this research; one for the managers of the mesons and the other for the customers of the mesons, a questionnaire for the managers and two questionnaires for the customers of the mesons were distributed in each meson. Since each meson has only

one manager, the questionnaire for the managers of the mesons distributed among the managers of clothing meson.

Thus, we used 30 questionnaires as a pre-test to determine the reliability of the questionnaire. The initial reliability by Cronbach's alpha using SPSS software. At this stage, questions or items that were weak removed from the questionnaire, or revised if the wording of them was inappropriate or there was ambiguity in them, then the final questionnaire was distributed.

In order to increase the validity of the questionnaire, we have used the previous standard questionnaires prepared and used by previous studies, and the items in other questionnaires were used to design the questionnaire in this research. In addition, the viewpoint of a number of management professors, Ph.D. students, and experienced individuals and fashion experts used in the study in order to investigate the content validity of the questionnaire. However, their views were considered in the revision and completion of the questionnaire. We applied structural equations models (SEM) using Partial Least Squares (PLS) software. Since PLS has the potential to run a model with much lower sample size.

However, the research variables are as follows:

Independent variables:
Product differentiation: This is a marketing concept that was first introduced by Edward Chamberlain in 1933 in the theory of monopoly competition. Product differentiation is a process in which a product is distinct from other products of other competitors, and its creation is more attractive for a specific target market (Anderson and Palma, 1992). Product differentiation is measured using five variables: providing high-quality products, fast delivery, development and design of new products, introducing new product and providing unique product features (Chenhall and Longfield, 1998).

Service differentiation: Service differentiation plays a very important role in customer re-purchasing. It can be achieved by adding more value services including installation, repair, training, and customer consultation (Kotler, 2000). Davies and Schul (1993) have created measurement scales for brand differentiation (developing brand identification, innovation in marketing techniques, advertising and promotion), product differentiation (specially manufactured products, emphasis on high-priced products, custom design or production), and service differentiation (emphasis on customer services, fast delivery/instant response command, and focus on special needs of customer).

Employee differentiation: Companies can create competitive advantage through a trained employee. These employees must have six attributes including competency, courtesy, reliability, accountability, and proper communication (Kotler and Philip, 2000). Rifat and Sarah (2004) measure employees differentiation through 15 variables: knowledge for performing a particular task, skill, organizational culture, positive and friendly behavior, high understanding or knowledge, correct movements and good appearance and attitude, ability to manage time, managing customers with care and respect, remarkable mind, respectful and honest, consistent and accurate services, good communication skills, collaboration with customer requests, tend to solve problems, and the ability to recognize customer priorities.

Channel differentiation: Companies can achieve a competitive advantage through the proper design of their distribution channels. Channel differentiation is a way that distribution companies use to deliver their products (Kotler and Keller, 2007).

Image differentiation: Specifies that when products compete in the same way, buyers may perceive a differentiation based on the brand image. An image is a powerful tool for using differentiation. (Kotler and Armstrong, 2010). Different dimensions of the store image: the store image is composed of dimensions such as design and architecture, signs and colors, advertising and sales staff (Martinio, 1958). Lindquist (1974_1975) developed the image of the store in nine dimensions: commodity, services, customer care, physical facilities,

promotion convenience, shop atmosphere, institutionalized factors, and after-purchase satisfaction. James' et al. (1976) study which conducted in line with Lindquist's study considered these six dimensions as the main dimension: classification, staff, atmosphere, services, quality, and price. According to O'connor (1990), the elements determining the image of the store are price, variety, categories of products, quality, products and services (or lack thereof), and the location of the store. The most common dimensions of the image of the store, which are referred to in the research, include the goods, services, and customer orientation, physical facilities, promotions, convenience, and shop atmosphere, which are similar to the Lindquist's dimensions (Peter and Olson, 1990).

Mediating variable:

Customer Satisfaction: Customer satisfaction is a result of the comparison before the customer's purchase and expected performance with perceived actual performance and paid cost "(Beerli et al., 2004). Customer satisfaction measurement based on SERVQUAL model, which includes the following dimensions:

Tangibles: Includes physical features, equipment, and appearance of staff and communication devices.
Reliability: The ability to perform the committed services completely and reliably.
Responsiveness: Includes customer assistance and prompt service provision.
Guarantee: Includes knowledge and decency of employees, and the ability to build trust in the of services.
Empathy: Includes dedicated attention that the company provides for its customers.
Improvement: The ability of the organization to remedy a potential problem.
This model consists of two parts: measuring customer expectations, measuring customer reception (Kavousi, 1384).

Dependent variable:

The performance of fashion clothing mesons: Armstrong (1994) defined performance as achieving the goals whose quality and quantity are determined. The performance of one of the most important constructs in management research and is the most important measure of success in business firms. Maydeu et al. (2003) have measured organizational performance through market share, sales growth, and the rate of return on capital, whose information is obtained by the mental responsiveness of the organization's managers to questionnaires through Likert scale. For example, Paham (1997) places performance components into three categories:
- Organizational effectiveness: product quality, new product success, customer retention rates.
- Growth / Share: sales level, sales growth rate, and market share.
- Profitability: return on investment, gross profit margin.

6. Analysis and results

The results of the Shapiro-Wilk test show that the assumption of the normal distribution of a number of variables cannot be accepted (P <0.01). The significance level obtained for the four variables of image differentiation, employee differentiation, service differentiation, and product differentiation is less than 0.01. However, the significant level of three variables of customer satisfaction, the distribution channels and differentiation, and fashion company performance is more than 0.01, which indicates that the data is normal. Generally, the results indicate that the distribution of the mediator and dependent variable is normal, however, the distribution of independent variables is abnormal.

Table 2. Factor loading results of questionnaire items

	Items	Factor loading	CR	AVE
Service Differentiation	We provide our after-sales service to our customers.	0.43	0.79	0.34
	We increase the value of our goods through their diverse packaging.	0.44		
	We use celebrities (artists, actors, and athletes, etc.) to advertise.	0.76		
	We provide online sales services.	0.89		
	Our customers can find the bulk of their needed items at once.	0.44		
	The delivery of goods and services is on time and fast.	0.52		
	We are responding promptly to requests or complaints from our customers.	0.56		
	We have skilled and experienced staff.	0.60		
Product Differentiation	Models and styles of our product range are distinct from competitors.	0.73	0.87	0.35
	Our products are well positioned to be easily accessible to customers.	0.36		
	We make vigilant efforts to differentiate our products from competitors.	0.52		
	We offer limited products in comparison with competitors.	0.55		
	We continuously increase the number of new products.	0.31		
	We introduce innovative products better than our competitors do.	0.66		
	We are always ahead of competitors and the first manufacturer of new products.	0.64		
	We are investing heavily in research and development.	0.49		
	Our products and services have created a strong brand.	0.67		
	We strive to build a strong reputation in the industry.	0.46		
	We always monitor the activities of our rivals.	0.70		
	We produce our products in custom.	0.77		
	We mainly produce the products.	0.68		
Channel Differentiation	We sell our products directly (by telephone, online or mail order) to our customers.	0.68	0.86	0.41
	We sell our products through dealers, wholesalers or retailers.	0.64		
	We have stores and distributors in different parts of the city and country.	0.88		
	Our products are easily available and delivered on time.	0.76		
	We have internet and online sales on social networks (Facebook, Instagram, Telegram, etc.).	0.68		
	Our distributors and vendors have the necessary training.	0.73		
Employee Differentiation	The employees of the company have the skills to do the job	0.61	0.89	0.48
	The employees of the company are attentive and polite to deal with customers.	0.61		
	The employees of this company are well equipped.	0.64		
	The employees of this company have high communication skills and are available to customers.	0.80		
	The employees of the company have the ability to understand the needs and preferences of their customers.	0.68		
	The employees of this company are honest and intimate.	0.79		
	The company's staff collaborates with customers to respond to requests and fix their problems.	0.72		
	The staff of this company provides accurate and stable services.	0.62		
	The employees of this company have a positive and positive attitude.	0.72		
Performance	Percentage of sales of new products compared to competitors in the last three years	0.76	0.91	0.57
	The growth of market share compared to other rivals in the fashion industry in the last three years	0.74		
	Sales growth compared to other rivals in the fashion industry over the past three years	0.79		

	The rate of return on investment compared to other competitors in the fashion industry in the last three years	0.76		
Customer Satisfaction	I am very pleased with the decision to buy from this store.	0.73	0.92	0.69
	I believe that I have made the right choice.	0.83		
	I am satisfied with how the staff is treated (greetings, courtesy, accountability, etc.).	0.70		
	I am satisfied with the way of service and speed.	0.85		
	In general, I am happy with my decision to visit and buy from this store.	0.69		
Image Differentiation	I have a good idea about this store.	0.84	0.94	0.52
	This store represents a high-performance fashion vendor.	0.83		
	The profile of this store is close to my ideal store.	0.86		
	This store represents good customer service.	0.82		
	This store offers high-quality items.	0.78		
	This store has well-informed and qualified merchants.	0.75		

Table 3. Skewness and kurtosis and Shapiro-Wilk test to assess the normality of the main variables.

Variable	Shapiro-Wilk Sig.	Skewness	Kurtosis
Image differentiation	0/001>	-1.26	2.94
Employee differentiation	0/001>	-1.28	3.13
Customer satisfaction	0.011	-0.928	0.621
Service differentiation	0.001>	-0.903	1.048
Product differentiation	0.001>	-1.146	0.985
Channel differentiation	0.062	-0.107	-0.754
Fashion performance	0.016	-0.388	-0.851

Table 4. Pearson correlation matrix

		1	2	3	4	5	6	7
1	Image differentiation	-						
2	Employee differentiation	0.62**	-					
3	Customer satisfaction	0.53**	0.66**	-				
4	Service differentiation	0.02	0.04	0.36**	-			
5	Product differentiation	0.04	0.24**	0.31**	0.29**	-		
6	Channel differentiation	0.14	0.05	0.11	0.04	0.23*	-	
7	Fashion performance	0.30**	0.48**	0.57**	0.62**	0.36**	0.17	-

Note: * $p<0.05$ and ** $p<0.01$

The results of Pearson correlation test (table 4-11) showed that the performance of fashion companies has a significant relationship with all other variables, with the exception of distribution channel differentiation, ($P<0.05$). The analysis of strength or correlation intensity indicates that the performance of fashion companies has the strongest correlation with service differentiation (r = 0.62), customer satisfaction (r = 0.57), and employee differentiation (r = 0.48). There is a positive relationship between the performance of fashion companies and all other variables.

Investigation of the relationship shows that customer satisfaction has a significant correlation with all variables of the model, with the exception of distribution channel differentiation ($P<0.05$). There is a positive relationship between customer satisfaction and all variables in table 4-11. Comparison of the intensity of correlations shows that customer satisfaction has the strongest relationship with employee differentiation (r = 0.66) and the fashion

company performance (r = 0.57). The intensity of customer satisfaction correlation with product differentiation, image differentiation, and service differentiation is 0.31, 0.53, and 0.36 respectively.
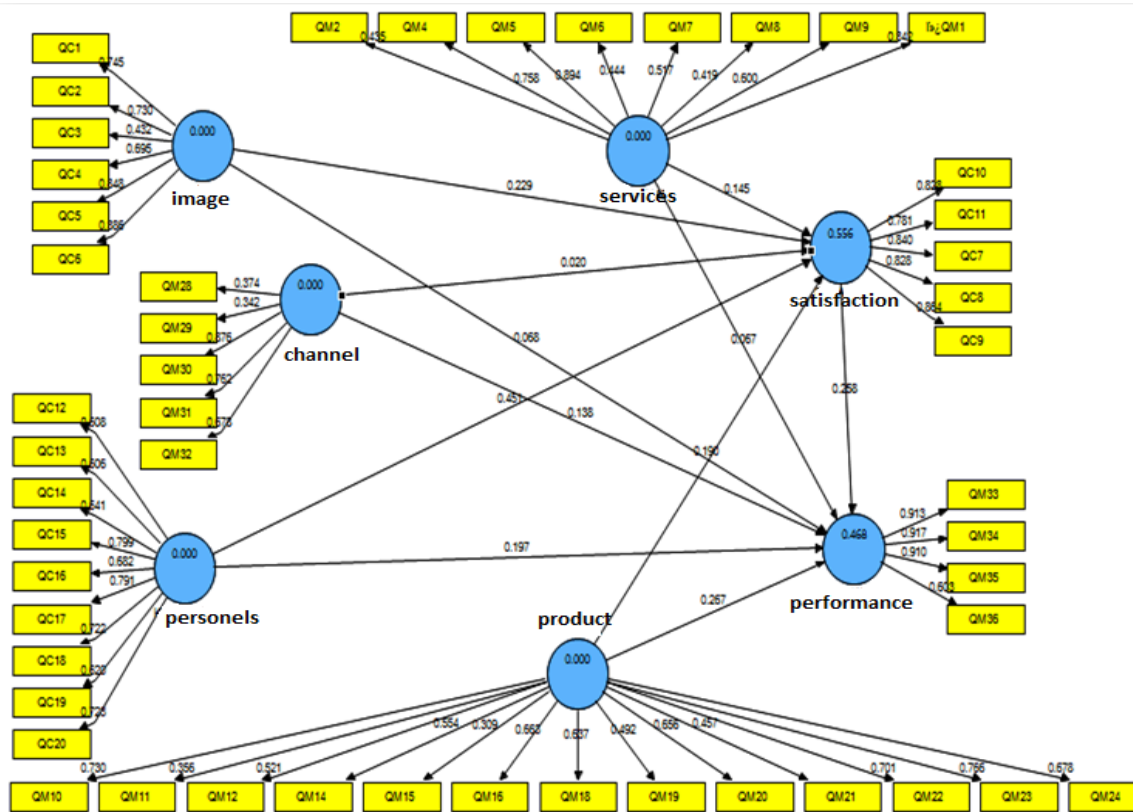
Figure 2. The result of SEM analysis of the model with Beta coefficients

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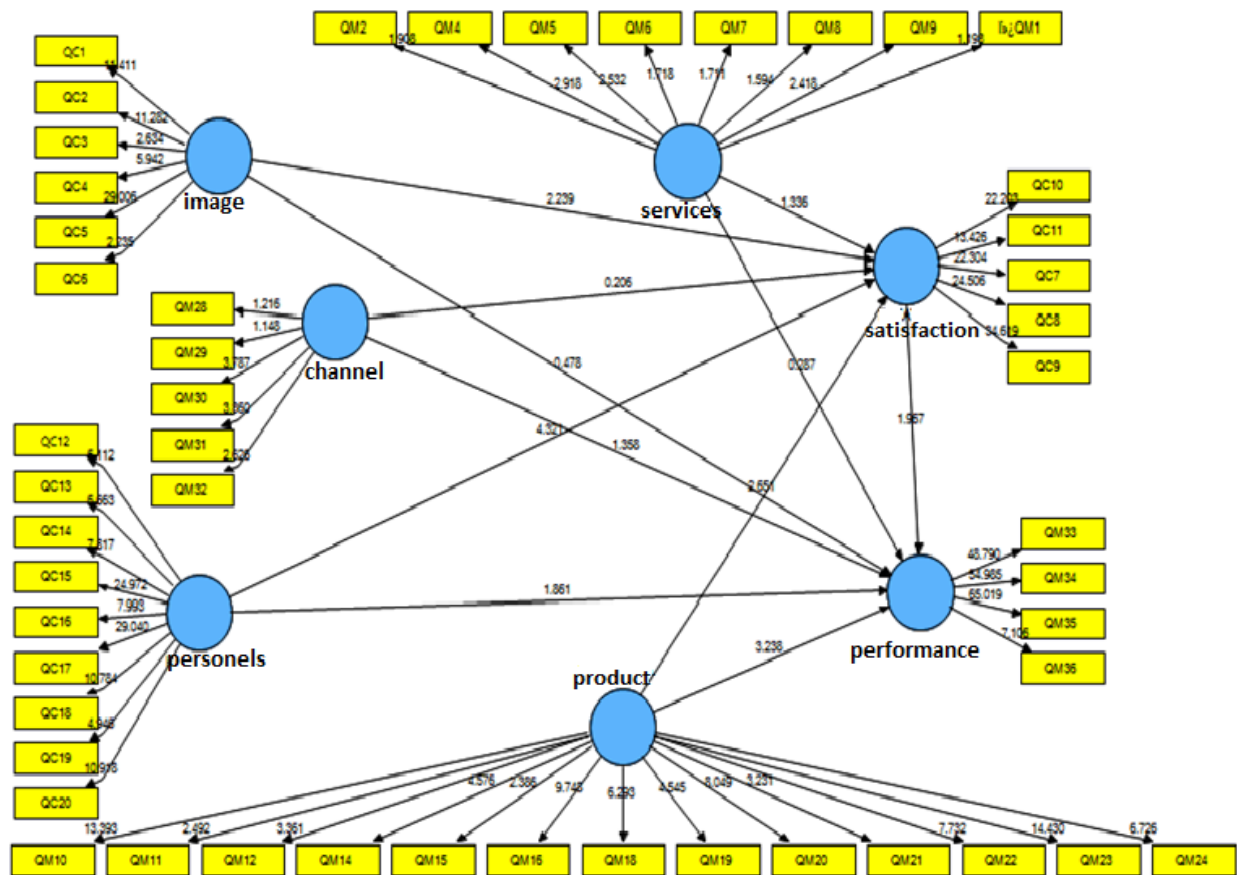
Figure 3. The result of SEM analysis of the model with t value

The results obtained from testing the structural equation model show that all the relationships of the final model are statistically significant at the 99% confidence level (P <0.01). According to the results, product differentiation is effective on customer satisfaction and for there is a positive relationship whose intensity of impact is equal to 0.227.

The results showed that employee differentiation at the 99% confidence level was effective on customer satisfaction (P <0.01), there is a positive relationship between employee differentiation and customer satisfaction whose impact intensity is equal to 0.448. According to the results of the model, image differentiation at 99% confidence level is effective on customer satisfaction (P< 0.01), there is a positive relationship between image differentiation and customer satisfaction whose impact intensity is equal to 0.246.

The results showed that the product differentiation was effective on the fashion company performance at 99% confidence level (P <0.01). The findings show that customer satisfaction is effective on the fashion company performance at 99% confidence level (P <0.01). There is a positive relationship between customer satisfaction and fashion company performance whose impact intensity is equal to 0.453.

According to the results, the coefficient of determination for the dependent variable (fashion company performance) in the initial model is equal to 0.469, and in the modified model is equal to 0.416. The coefficient of determination of the customer satisfaction variable in the initial model is equal t0 0.556, and in the modified model is equal to 0.532. Comparison of the coefficient of determination of the two models shows that the dependent variables have got higher coefficient in the initial model, however, considering that the difference in the coefficient of determination in the two models is not high on the one hand, and the two independent variables and their effects on the dependent variable is eliminated in the modified model on the other hand, it can be said that the coefficient of determination of two models shows an acceptable and appropriate value, and in both

models independent variables can determine the variables of dependent variables to an acceptable level. The value of the Q^2 index for the variable of the fashion company performance in the initial model is equal to 0.004, and in the modified model is equal to 0.149, which shows that the structural model in the modified state has a better fit than the original model.

The value of the GOF index obtained for the initial model is equal to 0.481, and in the modified model is equal to 0.523, which indicates that the modified model has a better fit than the original model.

The results of the regression test showed that the role of customer satisfaction mediation in the relationship between product differentiation and the fashion company performance is statistically confirmed ($P< 0.05$). Investigating the significant levels shows that all model relations are significant ($P< 0.05$). This indicates that the independent variable affects the dependent variable and the intermediary separately (first and second steps) and in the third stage, along with the mediator variable or customer satisfaction, has a significant effect on the fashion company performance, which is indicated by the acceptance of mediation is the customer satisfaction. Considering the significance of the effect of product differentiation on the performance of fashion, the type of mediation of customer satisfaction is of minor mediation type.

Table 5. testing the model and investigating the questioning and research relationships

Relationships	Impact factor	t value	P value	Results
Product differentiation -----> customer satisfaction	0.318	2.65	<0.01	Accepted
Service differentiation -----> customer satisfaction	0.148	1.34	>0.05	Rejected
Employee differentiation -----> customer satisfaction	0.70	4.32	<0.01	Accepted
Channel differentiation -----> customer satisfaction	0.012	0.206	>0.05	Rejected
Image Differentiation -----> customer satisfaction	0.221	2.24	<0.05	Accepted
Product differentiation -----> fashion company performance	0.773	3.24	<0.01	Accepted
Service differentiation -----> fashion company performance	0.118	0.287	>0.05	Rejected
Employee differentiation -----> fashion company performance	0.529	1.86	>0.05	Rejected
Channel differentiation -----> fashion company performance	0.148	1.36	>0.05	Rejected
Image differentiation -----> fashion company performance	0.114	0.478	>0.05	Rejected
Customer satisfaction -----> fashion company performance	0.446	1.97	<0.05	Accepted

The results obtained from the structural equation model test show that a total of 5 relationships out of 11 model relationships are confirmed ($P< 0.05$). The results showed that the effect of product differentiation on customer satisfaction, employee differentiation on customer satisfaction, image differentiation on customer satisfaction, product differentiation on fashion company performance, and the effect of customer satisfaction on fashion company performance are confirmed at 95% confidence level.

Investigating Customer Satisfaction Mediation

Table 6. Investigating the mediating effect of customer satisfaction on the relationship between the product differentiation and fashion company performance.

Relationships		B value	SD	Beta coefficient	t value	Sig. level
Phase 1	Product differentiation in fashion company performance	0.333	0.111	0.28	2.99	0.004
Phase 2	Product differentiation in customer satisfaction	0.696	0.184	0.352	3.78	P<0.001
Phase 3	Product differentiation in fashion company performance	0.390	0.166	0.199	2.34	0.021
	customer satisfaction with fashion company performance	0.747	0.124	0.512	6.01	P<0.001

Table 7. Investigating the mediating effect of customer satisfaction on the relationship between the service differentiation and fashion company performance.

Relationships		b value	SD	Beta coefficient	t value	Sig. level
Phase 1	Service differentiation in fashion company performance	0.687	0.111	0.529	6.18	<0.001
Phase 2	Service differentiation in customer satisfaction	0.428	0.130	0.331	3.30	<0.001
Phase 3	Service differentiation in fashion company performance	0.144	0.142	0.085	1.02	0.312
	Customer satisfaction on fashion company performance	0.852	0.122	0.583	6.99	<0.001

Table 8. Investigating the mediating effect of customer satisfaction on the relationship between employee differentiation and fashion company performance

Relationships		b value	SD	Beta coefficient	t value	Sig. level
Phase 1	Service differentiation in fashion company performance	0.832	0.124	0.559	6.71	<0.001
Phase 2	Service differentiation in customer satisfaction	0.849	0.112	0.588	7.94	<0.001
Phase 3	Service differentiation on fashion company performance	0.338	0.200	0.186	1.69	0.094
	Customer satisfaction with fashion company performance	0.656	0.160	0.450	4.10	<0.001

Table 9. Investigating the mediating effect of customer satisfaction in the relationship between the distribution channel differentiation and fashion company performance

Relationships		b value	SD	Beta coefficient	t value	Sig. level
Phase 1	distribution channel differentiation on fashion company performance	0.176	0.105	0.163	1.67	0.098
Phase 2	distribution channel differentiation on customer satisfaction	0.082	0.088	0.094	0.927	0.356
Phase 3	distribution channel differentiation on fashion company performance	0.227	0.171	0.110	1.33	0.188
	customer satisfaction on fashion company performance	0.819	0.121	0.561	6.76	<0.001

Table 10. Investigating the mediating effect of customer satisfaction in the relationship between image differentiation and fashion company performance

Relationships		b value	SD	Beta coefficient	t value	Sig. level
Phase 1	Image differentiation on fashion company performance	0.410	0.129	0.318	3.19	0.002
Phase 2	Image differentiation and customer satisfaction	0.449	0.133	0.340	3.38	<0.001
Phase 3	Image differentiation on fashion company performance	0.531	0.171	0.280	3.10	0.003

Customer satisfaction with fashion company performance	0.672	0.177	0.344	3.80	<0.001

Discussion and conclusion

The research model was tested using the Partial Least Squares technique. In this model, all the relationships were analyzed simultaneously. The initial model test showed that the results obtained from the structural equation model test show that a total of 5 relationships out of 11 model relationships were confirmed (P< 0.05). The results showed that the effect of product differentiation on customer satisfaction, employee differentiation on customer satisfaction, image differentiation on customer satisfaction, product differentiation on fashion company performance, and the effect of customer satisfaction on the fashion company performance are confirmed at 95% confidence level.

The results of customer satisfaction mediating role test showed that the mediating role of customer satisfaction in the relationship between product differentiation and the fashion company performance is statistically confirmed (P< 0.05). Considering the significance of the effect of product differentiation on the fashion company performance, the type of mediation of customer satisfaction is of minor mediation type. The results of the regression test showed that the mediating role of customer satisfaction in the relationship between service differentiation and fashion company performance is statistically confirmed (P< 0.05). Considering the lack of significance of the effect of service differentiation on the fashion company performance, the type of mediation of customer satisfaction is of complete mediation type. The results of the regression test showed that the mediating role of customer satisfaction in the relationship between employee differentiation and the fashion company performance is statistically confirmed (P< 0.05). Considering the lack of the significance of the effect of employee differentiation on the fashion company performance, the type of mediation of customer satisfaction is of complete mediation type. The results of the regression test showed that the mediating role of customer satisfaction in the relationship between the distribution channel differentiation and fashion company performance is statistically rejected. The results of the regression test showed that the mediating role of customer satisfaction in the relationship between image differentiation and fashion company performance is statistically confirmed (P< 0.05).

The results showed that employee differentiation has a direct effect on customer satisfaction, which is consistent with the Bokhari's et al. (2014) study. The positive relationship between product differentiation and organizational performance is consistent with the results of Dirisu's et al. (2013) study. Results of Chi et al. regarding the direct effect of customer satisfaction on the company performance is consistent with the results, however, the effect of employee satisfaction on the company performance is due to customer satisfaction. Dirisu et al. showed that product differentiation is directly related to the fashion company performance. Demovits et al. also proved that product differentiation has a direct effect on corporate profits because the vendors increase the price by cutting costs after finding the first of buyers. Product differentiation affects profitability. Li and Huang in their research also proved that the employee differentiation increases customer satisfaction and this customer satisfaction leads to gaining competitive advantage, and finally, competitive advantage can boost profits and growth. Burner et al. in their research concluded that the satisfaction of new customers is influenced by their mental effect from the store, which is in line with the results of this research. Anderson et al. in their research also proved that customer satisfaction leads to the loyalty of customers and thereby enhancing the company's reputation, as well as increasing the company's future profitability of which are an indicator of the direct effect of the fashion company performance on customer satisfaction. The following suggestions are recommended based on research findings:

Customers of these types of stores are demanding goods that are distinct from ordinary stores in the city. If the differentiation is not obvious between the products of the other stores and the mesons, the customers will not have any reason to buy from the mason. This differentiation can be seen in prices, being up-to-date, specific models, or anything else. Creativity in this business will have an extraordinary effect on the success process

(product differentiation). Since the meson is less visible than ordinary stores and does not have non-permanent customers, they should spend more on advertising. The company needs to make a differentiation in advertising for the success in this business.

The results indicate that product differentiation has a great effect on customer satisfaction, therefore, the meson managers should be more focused on distinct their products among other competitors. It is advisable for the meson managers to do their best in training the employees on how to interact with their customers because the appropriate treatment by the employees leads to more customer satisfaction and re-purchasing. Employees should have a good appearance and have a response to customers quickly. With all the efforts made to comply with the principles of sampling, only the available mesons in Tehran have been investigated, and shortages and obstacles have prevented the implementation of research on a wider scale. The inaccuracy of respondents in providing information, despite the information provided on the confidentiality of the responses. The lack of suitable conditions and place for respondents in such a way that they can respond to the questionnaire in a quiet environment, making respondents not focusing adequately in many cases. Distribution of mesons across Tehran and limitation of access to mesons and it is time-consuming. Another research problem was the resource constraint on the subject under study. Other information collecting methods such as interviews should be used in order to enhance the accuracy of measuring relationships.

With regard to the limitations of the present research, the following suggestions for future research seem to be necessary: The sample group of this research is exclusively selected from mesons in Tehran. Considering this fact, data can be collected based on samples with larger samples including other mesons all over the country in order to overcome this defect. In order to increase the accuracy of the measurement of the relationships under study, it is necessary to use other methods of collecting information, including interviews. Given the importance of the differentiation strategy and its effect on the fashion company performance, it is necessary to investigate their effectiveness regarding other variables such as price and quality. Also, the prerequisites and factors affecting the profitability of the mesons should be taken into account more than ever.

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Institutional Creativity and Entrepreneurship in Institutes of Higher Education: Opportunities and Challenges

Tawfeeq Mohammed Alanazi[1], Hanan Usama Hassan Mahmoud[2]

[1] University of Tabuk. Tabuk. Saudi Arabia, +966504231825, tawfeeqmq@hotmail.com
[2] University of Tabuk. Tabuk, Saudi Arabia, +966530950327, hananosama92@yahoo.com

Abstract

The purpose of this research is to find an appropriate framework in establishing a creativity and entrepreneurship institute based on previous experience and current opportunities and capabilities in Tabuk Province. In addition, this study aims to determine some challenges that affect the growth of ventures & entrepreneurs and to determine the opportunities & challenges that might affect the establishment of institutional creativity and entrepreneurship centres at the University of Tabuk. The exploratory research methodology was employed along with a qualitative approach. Data was collected through four sets of focus groups that were designed to gather certain people (government officials from different sectors, business owners, young entrepreneurs, and students) who are involved and might benefit from institutional entrepreneurship. The findings of this research are emphasised in four aspects. First, the culture of entrepreneurship and institutional entrepreneurship awareness levels are low among local communities. Second, the research finds several opportunities at Tabuk area, which could be beneficial in creating an entrepreneurship centre. Third, there are several challenges that might obstruct the process of creating an entrepreneurship centre. Finally, the role of government and private sectors were determined. The research was conducted in a certain area of Saudi Arabia, which is Tabuk Province. This might limit generalisation of the research's results.

Keywords: Creativity, Entrepreneurship, Higher Education, Incubators, Accelerators

1. Introduction

Entrepreneurship as a concept has become a controversial subject for over a few decades ago. Wennekers & Thurik (1999) consider entrepreneurship as a potential opportunity to create new business and take difficult decisions based on current resources. While Sethi (2011) presents entrepreneurship concept as an integrated component of venture capital, technology, and human resource. However, the opportunity is the main part of entrepreneurship and "without opportunities, there is no entrepreneurship" (Short & et al., 2010, p. 40). In order to find an opportunity for a potential business, there is a need to create new ideas or new methods that provide real value to customers. Many of those ideas and methods require long and complicated processes & development, even among higher education institutes or among the various sectors. Despite critical roles played by the government, there is a need to establish a creativity and entrepreneurship institute in universities where research & development, counselling, and training are available. The number of creativity and entrepreneurship

centres in the universities are growing rapidly due to important roles played by the universities) Office of Innovation and Entrepreneurship, 2013), which takes them further to becoming an entrepreneurial university. Entrepreneurship as a concept is not new. Several years ago when farmers' produce are above the market demand, they devise new methods to keep their harvest such that the crops last until next season and that enable them to supply market for the whole year. Entrepreneurship has similar meaning with that, in addition to strategic planning and sophisticated processes. Innovation, proactiveness and taking possible risks are the main components of entrepreneurial orientation. Thus, an entrepreneurial business consists of these aspects along with unique opportunities that differentiate it from others. Stevenson & Jarillo (1990) intensify on opportunities, seeing it as a key factor in creating potential successful businesses.

In a country with a growing economy like Saudi Arabia, there is a crucial need to create and support the ecosystem of entrepreneurship. The university is part of this system, and the ministry of education has a long-term vision and enthusiasm to create an integrated environment that supports entrepreneurship system among universities through polarising and attract professionals to transfer the global experiences of entrepreneurship they have acquired (Abu-Baker, 2014). Still, these efforts are not effective due to different capabilities, prospects, and resources in each region of Saudi Arabia. Therefore, it is crucial to discover opportunities, challenges, resources and capabilities in certain regions, which can help in creating institutional entrepreneurship. Previously, successful entrepreneurship institutes depended on several aspects, but funds and relationships between these institutes and entrepreneurs are the most important aspects (Bowers & et al., 2006). Well-established research centres in conjunction with other universities supervising students' research are also important factors (Menzies, 2000). During the early stages of a business start-up, many new ventures might fold up and disappear. Entrepreneurship has a similar situation where a low level of funds and weak capacity of technical supports might accelerate failure at the early stage of institutional entrepreneurship (Dalmarco & et al., 2018).

2. **Background**

2.1. Higher Education Institute and Entrepreneurship Culture

Many years ago, Schumpeter (1947) defined an entrepreneur as a person who is working on something new or working on something already existing but in a different way. Drucker (1985, p. 21) also emphasizes that an entrepreneur be a person who "shifts economic resources out of an area of lower productivity into an area of higher productivity and greater yield." Besides that, Stevenson & Jarillo (1990, p. 23) define entrepreneurship as "a process by which individuals - either on their own or in conjunction with an organisation - pursue opportunities not minding the resources they currently control." However, this definition ignores personal skills and capabilities, which is necessary for real business (Mason, 2000). On the other hand, Davidsson (2003) revises most of the entrepreneurship definitions and found three disciplines linked these definitions together: entrepreneur's skills employed processes of entrepreneurship and exploited opportunities as a result of entrepreneurship. Therefore, the definition of entrepreneurship is still open for argument and debate.

Mainly, entrepreneurship as a process is related to societal culture, and the concept of entrepreneurial culture has become a trendy term when studying entrepreneurship. Culture is transmitted from one generation to another over time, and that transmission involves teaching, imitation, knowledge, and values (Boyd & Richerson, 1985) where the culture of entrepreneurship is a mix of these components. Berger (1991) studies entrepreneurship culture in different countries and found that they all referred to the paradigm shift of the economy, which differed from region to another. Faltin (2001, p. 138) however, highlights several factors that can shape the culture of innovation entrepreneurship as "the significance of the entrepreneurship idea, the findings on creativity, chance for the systematic development of ideas and adopting them to meet society's values and problems." It seems that the culture of entrepreneurship is attributed to three main factors of entrepreneurship (innovativeness, risk-taking, and proactiveness) and these factors are created, developed and transmitted (Chakraborty & et al., 2016).

Somehow, culture has a specific impact on entrepreneurs themselves or on the entrepreneurship system in general. The questions which always arise are: what can make someone an entrepreneur while another is not? What are the motivations that might enable a person to start a new business? What consequences of culture

encourage or discourage a person from being an entrepreneur? Relevantly, Weber (1976) defines entrepreneurship as motivation to the spirit of successfulness and achievement. We can understand Weber's argument when we look at immigrants entrepreneurs. They start a new business to mitigate discrimination in the new culture. However, many important values and norms enable them to start a new business (Ward, 1983; Werbner, 1994). One of the interesting researches conducted by Hayton & et al. (2002) review 21 previous researches about the consequences of culture for entrepreneurship. They found either individuals or society have cultural values that were derived from cognition, needs & motives as well as beliefs & behaviours. Continually, these factors shape the norms and values of a certain culture which influence institutional and economic context and on the overall push entrepreneurship to create a comprehensive ecosystem (Hayton & et al., 2002).

Meanwhile, the education system should support entrepreneurship framework, which by means consists of two parts: arts and science (Sexton & Kasarda, 1992; Bridge & et al., 1998). Despite management and enterprise programmes are being taught for a long time, entrepreneurship programmes need more than a scientific curriculum to introduce personal and experimental side of it (Johannisson, 1992). However, teaching entrepreneurship as a part of management knowledge is not sufficient when students should be aware of entrepreneurship with successful cases from real business (Jack & Anderson, 1999). Furthermore, Hindle (2007, p. 119) develops a framework for entrepreneurship curriculum consisting different subjects of "marketing, sales, organisational behaviour, strategy, commercial development, opportunity evaluation, accounting & finance, and creativity." All of those subjects are supposed to drive mechanism of planning and assist in business start-up. Prior to that, several concerns must be solved when planning and building an entrepreneurship education system such as gender, national bias and local culture as well (European Commission, 2006).

Globally, entrepreneurship education is rapidly growing, and it contributes to a new system of learning. Indeed, a good foundation for entrepreneurship education system boosts the functionality of managing new ventures (Hansemark, 1998). Thus, students desire to obtain the required knowledge of entrepreneurship through educational system or through practical cases, which can be gained outside the education system. Gurol & Atsan (2006) propose six personal characteristics that might have an influence on students starting or at least thinking about starting a business. These are "innovativeness, need for achievement, the locus of control, risk-taking propensity, tolerance for ambiguity and self-confidence" (Gurol & Atsan, 2006, p. 28). More or less, some factors might influence students' choice of an appropriate major of study. However, choosing to be an entrepreneur is driven by entrepreneurship intentions and those students who had taken entrepreneurship programmes to have the willingness to learn entrepreneurship more than those who do not (Wibowo, 2017). The importance of teaching Entrepreneurial courses is articulated widely, but the appropriate courses are still debatable.

2.2. Value of Institutional Creativeness and Entrepreneurship Centre

Many important studies and research have highlighted the value of establishing an institutional centre of creativity and entrepreneurship. Among higher education institutes, creativity and entrepreneurship have recently become one of the focal educational objectives. However, universities should differentiate between research centres and business incubators, where the results of research centres can be transformed to a real business which can be developed by business incubators (Stal & et al., 2016). Research centres - sometimes referred to as technological incubators - consists of faculty members and students' projects, where these researches can result in new patent or developed products. In this stage, research centres support working in parallel with entrepreneurship centres to determine the potential success of products in the market. Bowers & et al. (2006) survey the profiles of 56 entrepreneurship centres and found that successful centres depended on early secured funds and strong relationship between entrepreneurial centres & entrepreneurs themselves. Not only that but also newly emerged ventures should be separated from incubators as soon as they are established or completely or partially merged with a well-established company to avoid lean startup (Lalkaka, 2001). Furthermore, Menzies (2000) conducts a comparison study focus on successful institutional entities that were established in Canadian universities to determine opportunities and challenges. The research concluded that the best environment that might encourage a successful entrepreneurship centre should consider a bundle of activities that are related to research including scientific research publication, scholarships, agreement with other universities to enhance the system of entrepreneurship, supervise students' research and pioneer staffs (Menzies, 2000). Accordingly, many

factors can play a significant role in encouraging successful entrepreneurship centres. However, successful factors that work with a certain entrepreneurship centre might not be the same and might be inappropriate for other entrepreneurial centres. Stal & et al. (2016) determine the relationship between technological incubators and research centres at universities to accelerate inventions transforming to real businesses, which needs a successful entrepreneurship model and cases to elucidate the importance of innovation and improve private sector alliances. From another point of view, Almubairik & Aljasser (2014) explain some factors from both angles that affect entrepreneurship processes among integrated ecosystem, macro, and microenvironment. They found that the macro environment barriers are due to economic recession and social problems, whereas, microenvironment barriers involve financing and its resources, investment troubles, high and aggressive competition, data and information accessibility, marketing and administration skills problems, human resources problems and finally technical problems (Almubairik & Aljasser, 2014). Furthermore, the entrepreneurship ecosystem was elucidated fairly in Western Europe and the US. However, Abu-Baker (2014) propose several factors that could enhance the entrepreneurship ecosystem among developing countries, in particular, Saudi Arabia and the universities' roles in such a comprehensive system. These factors are linked to entrepreneurship culture, policy, and regulations, infrastructure, private sector, and finance.

Indeed, most of literature adduce that entrepreneurship education play a significant role in successful entrepreneurship eco-system. Winkel & et al. (2013) focus on educational programmes and curriculums which comprises concept of entrepreneurship and investment among the universities' students, and that leads to making a competitive investment plan. Whether it is an integrated programme or a few modules, entrepreneurship education is linked to real cases and active businesses. Almekhlafy (2014) conduct a research to determine the extent of entrepreneurship programmes pervasion among universities and their capabilities to teach entrepreneurship programmes. The reviewed study revealed several suggestions from different authors about entrepreneurship educational programmes contents among higher education institutes. One of the most important models that was suggested as a guide to integrated system and environment is the Potter's model. This model consists of four factors: environment, economy, entrepreneurs and enterprise (Almekhlafy, 2014) and these checks if a successful entrepreneurship education has been implemented properly. Malaysia has a good experience with prevalence entrepreneurship culture among higher education. According to Shamsudin & et al. (2016), about 30% of academic curriculums and 15% of experimental curriculums focus on entrepreneurship culture, whereby students are able to interact with these programs. Previously, a study in the same country proves that three key points appeared to be the main motivation for educational entrepreneurship among universities and these include inspiration of students & employees, university capability & its facility and rules & regulation, which bring about changes to the entire entrepreneurship ecosystem (Abdullah & et al., 2014). Recently, Fichter & Tiemann (2018) report that involvement of entrepreneurs in regulating and developing roles of entrepreneurship eco-system has a huge potential in creating a successful start-up business. Sheta (2012) also explores the possibility of spreading entrepreneurship culture among Egyptian's university, which might be a way of encouraging fresh graduates to start their own business and reduce unemployment rate. The research suggestion concentrated on two angles: developing specific curriculums and make them compulsory for all students and holding training courses for faculty members to develop teaching skills that are related to entrepreneurship.

After all, the start-up is the most crucial stage of any business. A study that was conducted in Brazilian universities found that the trigger to starting up a business is owner technologies development not university's innovation and when an entrepreneur gets appropriate training, he or she is able to transfer the plan of business to real business (Dalmarco & et al., 2018). Along with stage of start-up, entrepreneurial climate and student's perceptions should be taken into consideration because it encourages students to start their own business (Bergmann & et al., 2018). In terms of entrepreneurial university, Jansen & et al. (2015) deeply investigate three different universities in three different countries and a model that could encourage students to be entrepreneurs through education, stimulation and incubation were developed. Each stage should consist of trainers, successful models and sufficient capabilities and facilities (Jansen & et al., 2015). However, Vilcov & Dimitrescu (2015, p. 178) conclude that "entrepreneurship education is a discipline with a strong application and involves raising the student's personality formation act." Thus, a well-designed programme of entrepreneurship helps to encourage students to to start their own business but does not guarantee success.

No doubt that entrepreneurship centres all over the world are experiencing several challenges. However, each one of them operates in the uneven environment and economic system. Local regulations, workforce, financial resources, local culture, markets, government support and education system all have a certain impact on the success or failure of entrepreneurship centres (Sheta, 2012). Saudi Arabia has potential for economic growth in the meantime, where the economy shifting is concentrated on small and medium enterprises. Those enterprises are mostly started individually. They might be launched without any incubation or has been incubated in one of the entrepreneurship centres. Entrepreneurs might also receive good entrepreneurship training and education or might not. Presumably, incubated enterprises and start-up owners who received an appropriate entrepreneurship education and training are willing to succeed. Nevertheless, what are the factors that assist and support entrepreneurship centres in Saudi Arabia to succeed and perform successful business incubation and entrepreneurship education? Like any other country, entrepreneurship centres are faced with several challenges and opportunities. Thus, the aim of this research is to determine the challenges and opportunities that might discourage or encourage entrepreneurial centres to perform successfully.

3. **Methodology**

Due to less information and knowledge about entrepreneurship centres among Saudi Universities, there is a need to understand the main challenges and opportunities that those type of centres is facing. Based on previous literature, the main research methodology was determined by exploratory research along with a qualitative approach. This is the most appropriate methodology if the phenomena have not been properly articulated (Easterby-Smith & et al., 2012). According to Saunders & et al. (2012), qualitative research uses an inductive approach to enrich theoretical spectacle. This approach is used in the research to determine the kind of challenges and potential opportunities that may play significant roles within entrepreneurship centres. Thus, the focus group method was employed to collect data for this research. The reason behind using focus group in collecting data was to discuss with a certain group of people who are involved and interested in entrepreneurship. Morgan (1997, p. 12) emphasises that "the hallmark of the focus group is the explicit use of the group interaction to produce data and insights that would be less accessible without the interaction found in a group." As a result, everyone is willing to take part in the discussion and focus on answering questions (Krueger & Casey, 2009). However, the reporting focus group is subjected to the researcher's judgment. In this research, Krueger & Casey's (2001) guide on designing and conducting focus group was used and followed.

The first step is to decide who is involved in the study focus group. While researchers are trying to find out some of the challenges and opportunities that might arise to disrupt or enhance the success of entrepreneurship centres. Investors and entrepreneurs are the main target group of people for this research. The criteria to recruit interviewees was specified based on group similarities and accordingly, two groups were determined. The first group consists of investors, businessmen or owners, and related government officers. The second group consists of entrepreneurs who have a running business or students who have unique ideas for potential business. Two lists of expected participants are obtained through the University's alumni and chamber of commerce. The researchers started calling each one in the list to recruit and confirm their agreement for participation in the focus group. Based on the local culture in Saudi Arabia, the two groups were divided into four groups where females were separated from the males. A number of participants in the focus group, ranging from five to ten people, is important in enriching and controlling discussion at the same time (Krueger & Casey, 2001). Therefore, seven female & five male entrepreneurs and students were assigned to groups one, and two and seven female & nine male investors and government officers were assigned to groups three and four. Table 1 shows the focus groups participants' categories. According to the objectives of focus groups, certain open-ended questions were defined. Before participation in each focus group, a consent letter was offered to all participants to read carefully before signing. Female groups were moderated by female co-authors of this research, and the male groups were moderated by the male authors. Each group was designed to semi-structured interviews. This format can offer time, freedom and flexibility for the discussion (Patton, 2002) and the moderator was responsible for keeping the discussion in the right direction. While group discussions were conducted in Arabic, all group discussions were tape recorded, transcribed and translated into English.

In order to analyse data of focus groups, a certain procedure was followed as suggested by Krueger & Casey (2001). First, all discussions of focus groups were revised, and any unnecessary interference was deleted. Each

participant was coded based on focus group number and his or her status. Each intervention was summarised and coded. These summaries were transferred to excel where each question has a separate sheet. The next step was to assign a theme for each equation in order to allocate each intervention summary into the appropriate theme. This sequence of procedure provides accurate responses for each participant.

Table 1: Participants Categories:

Group Code	No. of Participants	Category	Range of Age	Gender
Group a	2	Students	22-25	Male
	3	Entrepreneurs	25-28	Male
Group b	4	Students	22-25	Female
	3	Entrepreneurs	24-27	Female
Group c	5	Business owners	31-65	Male
	4	Governmental officers	26-55	Male
Group d	5	Business owners	27-57	Female
	2	Governmental officers	32-40	Female

4. **Findings**

Following Krueger & Casey's (2001) guide in conducting and analysing focus groups, a brief of all responses was reviewed and categorised carefully to show interventions in a clear pattern. Broad ideas of focus group discussions were presented based on repeating a number of citations.

Mainly, the concept of entrepreneurship is still vague among students and entrepreneurs themselves. This might be related to the weakness of sparing culture of entrepreneurship. Some of those persons are considered as a real entrepreneur by venturing into a new business with high risk. However, they do not know basic emblems and skills required by entrepreneurs. Some of them thought that being an entrepreneur is similar to being a freelancer, where the latter concept is not controlled and managed.

"Entrepreneurship is when you decide to work freely without supervision and can take any idea to business stage" (a^2). "Think, plan, build and act individually if you want to be a freelancer. While an entrepreneur is supposed to be officially registered and follow certain regulations" (b^3). "It is an opportunity especially for someone who due to parental pressure studied a course that's not suitable. Entrepreneurship is an opportunity to change instant situations" (b^4).

Business owners and government officials have similar thought to students and entrepreneurs. They are completely confused about the real meaning of entrepreneurship. There is no agreement to conclude and clarify entrepreneurship concept, and each one of them has a different thought.

"Entrepreneurship is when a person works individually without any obligations and commitment to local regulations and can manage business according to his or her capabilities" (c^3). "Entrepreneurship is when a person invests his or her money to make a profit by producing certain products" (c^6). "It is any work aside those from the government sectors having special regulations enforced by the owners and in which the owners invest a certain capital in order to make profits for individuals or group of owners" (c^9). "… it is when a person can run a business individually without any further restrictions or opinion of others affecting his or her business" (d^2)

4.1. Entrepreneurship Culture

Through group discussions, it is obvious that there is a huge misunderstanding of entrepreneurship culture and entrepreneurship functions. No one reply to entrepreneurs culture questions, even when it has been repeated twice. It seems there is no any idea what entrepreneurial culture means. The focus was on entrepreneurship institute and functions and also there is also an ambiguous understanding of entrepreneurship centres in general. Some students and entrepreneurs never heard about these type of centres. Even if some people have heard once, still centres' services and supports are unknown to them.

> "Entrepreneurship centres comprise a team of workers who provide training for those unemployed for a period of time and provide funds" (a[2]). "The main objective of those centres is that anyone who has an idea might join one of these centres and they provide him or her with special training on how to think strategically" (a[4]). "These type of centres can help students enhance their talent, skills and implement their ideas" (b[6]).

Business owners and government officials have a different point of view about entrepreneurship centres. They are of the opinion that the main job of those centres is to support entrepreneurs financially. Others believe that those centres should provide business opportunities for job seekers. Sometimes, they confuse entrepreneurship concept with entrepreneurship centres activities.

> ".. It is a new activity for something fabulous to be created. These centres have the ability to incubate people with new and visible projects as well as to support them with training, funds and consultations" (c[4]). "These centres (whether private or government centres) should provide job opportunities to entrepreneurs" (d[3]). "… it is concerned with providing visibility study, strategic plan, fund and follow up projects" (d[4]).

4.2. Entrepreneurship Institution Awareness

It seems that students are not aware of entrepreneurship centres. They only named two of those well-known entrepreneurship institutions. Nevertheless, interviewees are not aware of the institutes' missions and functions neither methods of funding.

> "I do not think there is an entrepreneurship centre except for Bab Rizq Jameel and National Entrepreneurship Centre" (b[1]). "I think there are good numbers of those institutes. However, there is insufficient awareness among students and entrepreneurs to absorb and incubate students, ideas and projects" (b[3]).

Even those private business owners and interviewees from the government could not name any entrepreneurship institute. They are very confident that entrepreneurship centres have a great mission to support the growth of private sectors. In summary, business owners believe these institutes are an arm of the national economic system. However, they could not specify what they need from these institutes as outcomes.

> "Tabuk has no entrepreneurship institute. However, entrepreneurship at different entities perform these functions" (c[5]). "I had an experience with National Entrepreneurship Centre in Tabuk. It still has a limitation in its real function and responsibilities" (c[2]). "I have not heard about these type of centres in Tabuk. But some entrepreneurship functions might be observed among different entities like the Saudi Social Development Bank" (d[6]).

4.3. Entrepreneurial Opportunities

Through interviews, it appears that female students are more precise than male students in determining entrepreneurial opportunities. In general, female students and entrepreneurs are enthusiastic about starting their own business as soon as they have the opportunity to do so and that is because they know exactly what project has a potential in the market.

> "The best way to start a business these days is to establish a fashion factory where all designers can implement their own designs and ideas" (b[2]). "Here in Tabuk, there is a limited number of

professional centres for ladies like a private place that provide several services like massage, gymnasium facilities, and fashion designing" (b^4).

On the contrary, male owners have a clear vision than female owners in determining a potentially successful project in Tabuk. Mainly, we can understand the males' prediction of successful opportunities for business. Here in Saudi Arabia, most private businesses are managed and run by males. Therefore, they are close to the market and have the ability to analyse market opportunities more than the females.

"There is a huge potential for agricultural industries in Tabuk. As long as Tabuk city remains an agricultural area, there is a need to establish various kinds of factories that transfer fresh crops to long-term products" (c^1). "One of the most successful projects in Tabuk or let's say in Saudi Arabia is the medical and education sectors. However, these projects need a massive venture capital" (c^3). "Tabuk has a number of opportunities. One of those is renewable energy and tourism, especially at the coasts. Also, there are possibilities for medical tourism, marine games, countryside tourism , and national heritage" (c^4).

4.4. Entrepreneurial Challenges

There are so many challenges that entrepreneurs might face at the early stage of their own business. Most of these challenges bother around financing, legalisation, mentoring and marketing support. Entrepreneurs and students almost agreed that any new venture might face lean start-up at an early stage of business life and this is an expected issue all over the world.

"One of the main issues is financing, and I am personally afraid of being jailed. I have an idea for good and potential business. However, I have insufficient funds to finance and start a business, and I cannot take the risk of getting a loan. I am afraid of not being able to pay back the loan on time" (a^4). "We need mentoring and training institutes to guide entrepreneurs in the right path and diminish most of the challenges" (a^3). "In my opinion, the most important challenge is having the instructor or mentor that can take you up to a professional level in managing your own business. I personally developed myself through internet sources and consultant training centres" (a^2). "The first challenge was financing, and then marketing came second. In addition, family and society support are important. They might be the cause of success or failure" (b^3). "One of the most challenges faced is the consideration of the saturated society to women business" (b^4).

Owners and government officials have a different opinion. Perhaps, they think carefully and business wise about any new venture and returns on investment. Most of them agreed that venter capital is not one of their consideration at this time. Regulations and legislation also cause huge barriers to new ventures.

"Challenges can be concentrated in fund, regulation & legislation and governmental support" (c^1). "There are no reliable sources for accurate information and data that encourage and support investment decisions" (c^3). "I personally consider lack of experience and blind imitation as the main causes of failure" (c^4).

4.5. Governmental Roles

Basically, there are so many roles that government is supposed to act considerably. Most of these roles have been mentioned above by interviewees. In a developing country like Saudi Arabia, the roles of government should be higher than those in developed countries to enhance and encourage entrepreneurship as an integrated ecosystem. The question here is that, is it really the role of government to take up a new venture till advanced level? What do entrepreneurs expect from the government? Experts think it is not the role of government to create new successful ventures. However, the government should create prospects and solid ground for success.

Students and entrepreneur interviewees mostly rely on the government to support new ventures either financially or by placing a solid ground on legislation. It is normal to find this type of reliance among fresh graduates or young entrepreneurs. Responsibility is underestimated among them, and they do not want to be under pressure at the early stages of their businesses.

"At the moment, there are quite a few governmental supporting entities. If I do not pay business liabilities, I will go to jail. It has to be a governmental authority related to the beneficiary's governmental body, such as the Saudi General Authority of Civil Aviation, which can support new ideas and take full consideration of these new ideas. I mean to form a partnership with entrepreneurs" (a[4]). "The important point is that the government should create research centres in every city of Saudi Arabia to study and find out the city's needs. By so doing, these centres are responsible for regenerating and developing new ideas based on the community's needs" (a[4]). "I think the main point is to provide an authority that supports entrepreneurs, discovering those who have a new idea, guide them, train them and finance them" (b[2]). "The government should support talented people during the early stages of their education and encourage them to implement their ideas" (b[6]).

On the other hand, government officials and owners agree on government regulations flexibility and stability which might encourage entrepreneurs to boost their own business. They also agreed that it is the entrepreneur's responsibility to attain success or failure. Moreover, an entrepreneur needs to spend more time collecting information and data about potential businesses. However, they refer to time consumption which is an important factor for success.

"The government should stabilise regulations and processes, and there should be a margin of flexibility and clear steps that facilitate entrepreneurs' needs to take their own business up to a growing level" (c[3]). "Time is important. Entrepreneurs should invest in time, not too long and not too short as well. Spend enough time searching; collecting information and preparing a feasibility study and that would lead to a successful business" (c[2]). "An Entrepreneur should develop certain skills continuously and be aware of any changes that happen in the market which is related to his or her line of business" (d[3]).

4.6. Private Sector Roles

Honestly, the private sector thinks mainly about their own business. If there is a benefit of any new venture, they will invest. The research reveals a misunderstanding of venture capital among all interviewees. We can understand the private sector's situation about the business that needs venture capital to invest especially in a country like Saudi Arabia, where the majority of private sectors are driven by government support. This point of view is mentioned several times through focus group interviews.

"I can invest in any project that is within my scope of business if that project has a potential for success and I need government to facilitate regulations for the new project" (c[3]). "There are many things that entrepreneurs should provide to persuade me to invest with him or her. I need to see a good and sophisticated feasibility study, cost of financing & opportunity cost and proposed signs for success" (c[5]). "While the need to take the discussion of investing in a new venture is a clear vision of the future project, entrepreneurs should show ability and willingness to take his or her new idea to form a successful business. In addition to that, the government should participate in facilitating these type of projects" (c[6]).

Owners have mentioned several sectors that might have potential success in Tabuk City. These areas are summarised in tourism, pharmacy industry, food and fish industry, military industry and agriculture.

5. Discussion

Several points can be presented in this research. One of the main issues is related to the lack of awareness about entrepreneurship culture and entrepreneurship institution's roles. When it comes to entrepreneurship, four main principles should be involved. First, new ideas or new methods that add a new value to the market and economy. Second, these new ideas or new methods should be created or developed further; otherwise, they have no value. Third, a mix of innovation, risk-taking, and proactiveness to consider the project as an entrepreneurial business. Fourth, legal entity and formation to pursue business processes legally and as required. This research reveals a misunderstanding of entrepreneurship concept. Despite this viewpoint mentioned by Hansemark (1998) and

Chakraborty & et al. (2016), the problem still exists. Participants are of the opinion that any new business is an entrepreneurial project with no consideration to the four principles of entrepreneurship mentioned above. Even early studies of the business and preparation depend on answering several questions that are not related to the four principles. Even though imitation is normal and required at learning stages, but not at the leave of differentiating new ventures. On the other hand, owners also could not explicate entrepreneurship and its implications among their own businesses. All they believe in is that entrepreneurship as a creative model of new business is equivalent to new ventures only. This thought must be replaced with the real concept before pursuing further. Apparently, it seems there is a real problem with local culture, entrepreneurship culture and community point of view of entrepreneurs. Females are the most affected by this overview. In a limited local culture like Tabuk, a woman might establish a new business independently but extremely struggle to convince her family and community that she can run a business like the male. Local community discourage females from getting a job, let alone if she wants to start her own business? However, local culture and entrepreneurship culture should be changed to eliminate obstructions that induce youths (either male or female) to start their own business.

The main reason behind this research is to find opportunities and challenges that might affect the creation of entrepreneurship entities in higher education institutes. The research reveals a good number of barratry and challenges. Here is a summary of some of these main challenges. First, education system at both general education and higher education levels are incapable of merging entrepreneurship culture in the education system. Majority of students finish high school or graduate from the university with a great balance of knowledge, but they have less developed skills. Furthermore, the education system should encourage creative thinking. Second, financing where the majority of entrepreneurs fail to obtain the necessary fund for their new venture. Banks finance a very limited number of ventures. However, entrepreneurs cannot commit to banks' requirements. Partnership for most entrepreneurs is a good choice, and I guess if they can find one. Third, research and development as a system and institution still suffer from a lack of finance and incubation. Universities are willing to take responsibly of this part if there are enough funds and capability by professional academic staff. Fourth, there is no specific organisation or body that provides reliable data from the market. In other words, there is a need for data centres to support entrepreneurs with reliable and accurate data. Moreover, there should be two types of entrepreneurship institutes. Incubators and accelerators and each one of them have activities and processes that integrate each other.

On the other hand, there are many opportunities that can encourage the university to establish an entrepreneurship institute. Some of these opportunities are linked to the government, and some of them are linked to local markets in Tabuk. New and updated regulations and legislation that the government of Saudi Arabia has announced lately within Saudi Arabian vision of 2030 definitely will contribute to enhancing entrepreneurship as a new form of business. In addition, Tabuk has a young and growing university which allow top managers to create and develop entrepreneurship system based on the recent experiences of other universities and without any complicated bureaucracy. The university invests a huge amount of money to set up its colleges and utilities up to global standards. Furthermore, an area of Tabuk has a huge reservoir of groundwater which makes the area the best place for agriculture and food industry. In addition, Tabuk has a long and unique beach that can be exploited for many tourism activities. While conducting this research, the government of Saudi Arabia announces new mega projects in Tabuk Province - NEOM. The project planned to change the meaning of living cities in the world. In other words, a new style of future living exist on 26,500 sq km and focus on several industries such as clear energy and water, mobility, biotech, food and advanced manufacturing (NEOM, 2018).

Finally, a good number of tasks need to be activated, and each part of the entrepreneurship ecosystem should understand its roles and act accordingly. Abu-Baker (2014) has mentioned some of these roles. However, if there is no certain assembly to coordinate all of these aspects and tasks, the entire system might not work successfully. The government should take the initiative to enhance the policy of small and medium enterprises and facilitate current regulations to protect entrepreneurs from being bankrupt and face several finance penalties. That will encourage new ventures to face the challenges and sustain the market. Also, the government should support entrepreneurship institutes and entrepreneurs with at least seed funds to pursue their own business. Nevertheless, new ideas and methods should be developed further to form new values. Otherwise, there is no need to waste time on these ideas. Thus, the need for research centres is crucial. The main body responsible for founding research centres is higher education institute, which is to be supported by the government. Not only that, the

university should consider entrepreneurship training and mentoring as well. Academic staff usually provide consultation with a general view where private sectors (business owners precisely) should participate as business mentors and advisers. In that case, some new ventures might find an appropriate partnership to finance the new venture.

6. Conclusion

Entrepreneurship is a new form of business these days. There is no event or conference in the world where entrepreneurship is not mentioned. The importance of entrepreneurship reflects on the entire economic system. Successful entrepreneurial ventures create new value in the market, increase local gross domestic product, create new jobs and reduce government expenditures. All of these benefits and others made entrepreneurship an appropriate choice for new business formation. Although there are plenty of entrepreneurship entities, many authors agree that the University is the best place to establish creativeness and entrepreneurship institute where research utilities and professional scientists are available. In this research, the focus is on the possibility, opportunities, and challenges of creating a creativity and entrepreneurship centre in the University of Tabuk. Different focus groups were formed with a various group of people to determine the main framework of the centre. Findings of the research revealed a good number of opportunities that can support the creation of the centre and many challenges that should be focused on and eliminated. On the other hand, entrepreneurship culture is important among the local community to support entrepreneurs and youths to start their own business. The local community has a prevailing thought that getting a job to secure financial income at an early stage of life is much better than any risk that might occur if a person takes the initiative and create own business independently. In addition, the education system, both general and higher education should be revised to support entrepreneurship through curriculums, and awareness. Thus, it is a complete and integrated system of entrepreneurship where government, the private sector, education system authority and entrepreneurs must realise their own roles and participate accordingly in setting up a successful creativeness and entrepreneurship institute. Finally, it is good and valuable to learn from other institutions in order to create institutional entrepreneurship among Universities. However, each area or region has various prospects and resources that differ than other region and what might work here might not work in another region.

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An Evaluation of Mandatory Audit Firm Rotation in South Africa

Arnold Rademeyer[1], Danie Schutte[2]

[1,2] School of Accounting Sciences, Faculty of Economic and Management Sciences, North-West University, Potchefstroom, 2520, South Africa. Phone: +2718 299 1436, E-mail: danie.schutte@nwu.ac.za

Abstract

Following on recent corporate failures, various initiatives are introduced to restore confidence in the audit function. In this regard, the Independent Regulatory Board for Auditors of South Africa announced its plans to pursue mandatory audit firm rotation for the audits of public interest entities. The motivation for this decision was firstly due to concerns raised about independence issues as well as a lack of transformation and competition in the South African environment. This article examines the legal and practical implications of the announcement to enforce companies to appoint auditors for a limited period of time. The article contributes to the scarce literature on the audit profession and in particular issues pertaining to the independence of auditors. Against the background of the global business world and the existence of multinational companies, the results are also relevant in an international context.

Keywords: Auditor, Audit Independence, Mandatory Audit Firm Rotation

1. Introduction

The agency theory is often used to explain the rationale behind company audits (Peng, 2004). The underlying principle of the agency theory is the separation of ownership and control. In a company setup shareholders appoint directors to maximise shareholder wealth and the successful achievement of this objective secures financial rewards for directors. On occasion, directors may, however, prefer to maximize their own personal interests by presenting misleading information to the shareholders (Jerzemowska, 2006). An agency problem arises when there is a conflict of interest between the shareholders and the directors of a company. In addressing the aforementioned agency problem the main function of an audit is to provide the owners with an independent view of the companies' affairs.

The modern-day audit function was established in the UK in the 1840s. The industrial revolution demanded a large amount of capital investment in factories and machinery (Chandler, 1992). Capital markets during this period were unregulated with a relatively large number of financial failures (Porter, 2005). In order to protect the needs of investors, the Joint Stock Companies Act stipulated that the directors shall balance the books of the company and shall compile a balance sheet. In addition, companies were required to appoint auditors to check the accounts of the company.

The growth of the US economy in the 1930s likewise resulted in a substantial amount of investments in companies. Furthermore, the establishment of capital markets in the US gave rise to the formation of larger companies with an increasing number of shareholders. Due to the diverse nature of shareholders and because they are not necessarily capable of managing their own companies they often have to hire agents to perform this task. In this regard, Jerzemowska (2006) observes that shareholders are inactive participants who tend to focus more on the risk and return of their share portfolio.

In order to bridge the gap between shareholders and directors and to protect the interests of investors, the initial goal of company audits was to convince the participants in the capital markets that the company's financial statement provided a true and fair reflection of the performance of the company. The audit function continued to evolve as a result of the accelerated growth of world economies. In the present day, auditing has expanded beyond the basic financial statement attest function, and the auditing profession had to adapt to more sophisticated transactions and practices. Moreover, concerns about the role of the auditor in various accounting scandals resulted in renewed efforts to enhance auditor independence (Young, 2006). Following on the aforementioned, audit regulatory bodies introduced a number of initiatives to ensure that the audit profession regains the trust of investors. These initiatives include, amongst others, guidance about complex transactions, for instance, ISA 545 Auditing Fair Value Measurements and Disclosures; Corporate Governance Codes, guidance to Audit Committees and Mandatory Audit Firm Rotation (MAFR) (ICAEW, 2009; FRC, 2016).

The purpose of this article is to evaluate the implementation of MAFR in South Africa. The evaluation commences with a theoretical background of MAFR, an international comparison of MAFR as well as an overview of MAFR in the South African environment. This is followed by a critical evaluation of the legal and related practical considerations of implementing MAFR in South Africa. The article concludes with a summary of important considerations and recommendations about the implementation of MAFR in South Africa.

2. Mandatory audit firm rotation

2.1. Introduction

The main objective of an audit is to reduce agency cost for investors and other providers of finance (ICAEW, 2005; Watts & Zimmerman, 1983). In this regard, an external audit provides both assurances to stakeholders as well as credibility to the financial statements prepared by management (Curtis & Turley, 2007; Lee & Ali, 2005). Furthermore, the provision of assurance by an external auditor allows stakeholders to hold the entity accountable for its actions (Mzensi & Gaspar, 2015).

Since the separation of ownership and management became more evident, the concept of an audit was described as 'being accountable' (Sinclair, 1995). An independent account from an auditor was required to convince investors to continue providing capital. According to Mautz (1975) the audit function in a market economy ultimately evolved by social consent and as conditions change, society may reject the professional status of the audit profession. He, therefore, suggests that the roles of professional auditors must continually be alert to the desirability of role modification and revision.

In recent times the objective of auditing and the role of auditors were subject to various changes. The profession was influenced by contextual factors such as the collapse of large corporations and technological developments. Moreover, the development of International Financial Reporting Standards resulted in the disclosure of information that is every so often complex in nature and based on estimates and fair value assumptions. For this reason, the question is repeatedly asked whether auditors are capable of performing effective audits in the current capital market environment and therefore maintain its professional status in society.

Despite a complex audit environment, investors expect audit firms to compete on the basis of quality. For this reason, it is necessary to identify audit quality indicators to distinguish firms from each other and thereby provide for greater competition among firms (Harris, 2015). The quality of the audit function is normally evaluated in

terms of independence and measured in terms of the level of objectivity of the auditor. Simunic (1984) interpreted a decrease in audit independence as any situation that a self-interested auditor is more likely to ignore, conceal or misrepresent. Levitt (2000) advocated that an auditor's dependence on the client could undermine the independence and reduce a willingness to resist biased presentation by management.

Auditor independence is however complicated by the fact that directors exert considerable influence over auditor appointments. Directors normally identify new auditors whilst shareholders are merely required to accept the appointment or re-appointment of auditors. Incumbent auditors may also be dismissed by directors without consulting with shareholders. Over and above the fact that management nominates the auditors of a company, the auditor interacts with top management on a regular basis. The regular interaction inevitably results in a close relationship between the auditor and the directors of a company (Cohen, Pant & Sharp; 1993). If a close relationship exists between the auditor and management, the ability of the auditor to act in an independent way may be further impaired due to self-interest, familiarity, and complacency, as well as social and economic bonding (Livne, 2013).

The objective role of the auditor is further complicated by the proposition that effective audits require a degree of closeness to the business (Power, 1997). The literature suggests that audit quality is lower if auditor tenure is short and that an audit learning curve exists for most audit engagements. Most companies evaluate audit firms in terms of experience, their knowledge of professional standards, their knowledge of the industry as well as their knowledge and understanding of the company (PWC, 2002). Knapp (1991) submitted that auditors experience a significant learning curve with new clients whilst Kinney and McDaniel (1996) observed that a substantial amount of the knowledge gained in an audit relates to a specific client. According to AICPA (1992), there exists a substantial learning curve to be acquainted with a company's operating environment and risk areas. In this regard it takes and auditors approximately two to three years to fully understand the business and nuances of a complex client (Terry, 2002).

Against this background and despite the contrasting views in the aforementioned discussion renewed measures are proposed to ensure that auditors are not appointed for long periods that may impair audit objectivity and ultimately audit quality.

2.2. Audit firm rotation

Following on recent corporate failures, such as WorldCom and Enron, Healy and Kim (2003) advocated that firm rotation can help restore confidence in the audit function. It is also believed that firm rotation will ensure that audit firms compete with each other that will ultimately lead to improved audit quality (Hoyle, 1978).

On the contrary, audit failures are generally higher in the first years of the audit as the new auditor becomes familiar with the client's operations (Arel et al., 2005). It is also believed that audit costs would rise due to the additional work performed by the new audit firm. According to the Government Accountability Office companies would incur additional auditor selection costs amounting to 17% of the first year audit fees (GAO, 2003). In addition, opportunity costs would be incurred due to a mismatch between the supply and demand for audit services (Arruñada & Paz-Ares, 1997).

Mandatory rotation of auditors refers to the principle that statutory auditors of companies are in terms of legislation and professional standards enforced by a regulatory authority not to hold office in their capacity of appointed auditors for longer than a specified period after which they must be replaced by another firm of auditors. A system of MAFR would require companies to rotate their independent auditor and would prevent auditors from becoming too aligned with the directors of a company in order to preserve auditor independence. A study conducted by Ruiz-Barbadillo, Go´mez-Aguilar and Carrera, however, revealed that auditors' incentives to retain existing clients did not impact on their decisions in both the mandatory rotation and post-mandatory rotation period. Their results provided empirical support for the arguments put forward by opponents of mandatory rotation.

Furthermore, it appears as if there is no global consensus on the matter of mandatory audit firm rotation. In this regard, the two most important audit regulators in the world, namely the European Commission in Europe and the regulator in the United States of America, have taken different routes to achieve auditor independence.

The European Union, after having implemented partner (not firm) rotation in 2006, decided in 2014 to adopt MAFR at 10 to 24 intervals, depending on certain criteria. The US implemented partner rotation mandatory rotation back in 1978. They have however decided, after a long discussion which also involved academic and public hearings, not to introduce the rule at audit firm level for the time being (Harber, 2016).

The question remains whether independence will be enhanced by mandatory audit firm rotation and whether it will indeed result in an improvement in audit quality.

3. The introduction of MAFR in South Africa

On 29 August 2016 Mr. B Agulhas, the CEO of the Independent Regulatory Board for Auditors (IRBA), announced its plans to pursue mandatory audit firm rotation for the audits of public interest entities. Agulhas indicated in his announcement that the decision to pursue MAFR is aligned to IRBA's objective to enhance audit quality which ultimately contributes to public and investor protection. According to Agulhas, the decision followed a year-long process of extensive research and industry consultation on how best to enhance audit firm independence. Agulhas continued that "governments and regulators are taking steps to focus on the independence of auditors, specifically through MAFR, as critical to the credibility and transparency of audited accounts, thereby enhancing public and investor confidence in the accuracy of financial reporting."

The motivation for IRBA's decision to introduce MAFR in South Africa was firstly due to concerns about independence issues. In addition, a lack of transformation and competition was provided. In this regard out of 353 audit partners who sign off on the financial statements of all JSE listed companies only nine are black African, and over 90% of all JSE listed companies are audited by a few firms.

4. Legal considerations of MAFR in South Africa

In this section, the current statutory regulations will be investigated. In particular, the focus will be on the aspects affecting "Independence" of the auditor is one of the motivations cited by IRBA for its consideration of MAFR in South Africa.

The audit profession in South Africa is a regulated profession. Primarily the audit profession is regulated by (i) The Companies Act no. 71 of 2008 and (ii) The Auditing Profession Act no. 26 of 2005.

Auditors and audit firms are, however, not only subject to statutory regulations. Registered auditors (with IRBA) are also bound to comply with International Auditing Standards and the IRBA Code of Professional Conduct for Registered Auditors. Corporate Governance fundamentals of Companies in South Africa is also addressed by The King Code on Corporate Governance (King IV), Companies listed on the JSE are required to include in their annual report a narrative statement as to how they complied with the principles set out in the King Code. The King Code compliments the Companies Act in certain aspects of which the code and functions of the Audit Committee are, in particular, relevant to external auditors.

4.1. The Companies Act

In terms of Section 30 of the Companies Act no. 71 of 2008 companies must prepare annual financial statements within six months after the end of its financial year. The annual financial statements of all public companies must be audited as well as any other company if it is in the public interest or regarded as of economic or social significance in terms of annual turnover, size of the workforce or the nature and extent of its activities. Chapter 3,

Part C of the Companies' Act deals with auditors. Two sections in this chapter of the Companies Act is of particular relevance to the auditors' independence.

Section 90 of the Companies Act regulates the appointment of auditors. Section 90(2) requires that a person or firm to be appointed as an auditor of a company must be a registered auditor and may not be a director, prescribed officer or consultant of the company. In addition Section 90(2) determines that the appointed auditor is acceptable to the audit committee.

Section 94(2) of the Companies Act prescribes that at each annual general meeting a public company, state-owned company or other company that is required by its Memorandum of Incorporation to have an audit committee must elect an audit committee comprising at least three members. Section 94(7) of the Companies Act prescribes the duties of the audit committee. The responsibilities of the audit committee concerning the external audit function include the nomination for appointments of auditors, the determination of the audit fees, to ensure that the appointment of the auditor complies with the provisions of this Act and any other legislation relating, to determine the nature and extent of any non-audit services that the auditor may provide to the company and to report on the independence of the auditor.

Section 94(8) continues to determine the considerations of the audit committee in the determination of the external auditors' independence. In this regard, the audit committee must ascertain that the auditor does not receive any "direct or indirect remuneration or other benefits from the company" except for auditing and related services fees. The audit committee should furthermore consider whether the auditor's independence may have been prejudiced as a result from previous appointments or any consultancy, advisory or other work undertaken by the auditor for the company. In addition, the audit committee should consider compliance with other criteria relating to "independence or conflict of interest" as prescribed by the Independent Regulatory Board for Auditors established by the Auditing Profession Act.

Section 92 of the Companies Act regulates the rotation of auditors. Section 92(1) determines that "the same individual may not serve as the auditor or designated auditor of a company for more than five consecutive financial years." This section, however, deals with the rotation of the individual designated auditor and not with the rotation of audit firms. It is therefore evident that in terms of Section 92 it is permissible to appoint an audit firm indefinitely and only to rotate audit partners from the same firm every five years.

4.2. The Auditing Profession Act

The Auditing Profession Act No. 26 of 2005 (Audit Profession Act) provides for the establishment of the Independent Regulatory Board for Auditors and, amongst other matters, the regulation of the conduct of registered auditors. Of particular relevance regarding the consideration of auditors independence, which is one of the motivations cited by IRBA in considering MAFR, is section 44 of the APA.

In terms of Section 44 (2) of the APA, a registered auditor may not express an opinion in the financial statements unless the auditor of the entity is satisfied with the criteria specified in Section 44(3). Subsection 3, inter alia, states that registered auditors comply with auditing pronouncements relating to the conduct of the audit as well as all laws relating to the audit of that entity.

The reference to auditing pronouncements in subsection 3 includes International Auditing Standards (ISA) and the IRBA code of conduct. It is beyond the scope of this article to analyse all the auditing standards, but ISA 200 summarises the fundamental concept of audit independence. In the case of an audit engagement, it is in the public interest and required by the International Ethics Standards Board for Accountants (IESBA) Code, that the auditor be independent both in mind and in appearance.

The International Standard on Quality Control (ISQC 1), which has been adopted as a standard in South Africa, requires that audit firms comply with relevant ethical requirements, including those pertaining to independence. ISA 220 furthermore sets out the engagement partner's responsibilities with respect to relevant ethical

requirements. These include considering evidence of non-compliance with relevant ethical requirements by members of the engagement team. Non-compliance would also include any threat regarding independence.

The reference "all laws" relating to the audit in S44 (3) (f) of the APA includes the Companies Act and consequently compel the auditor to comply with all the independence requirements as indicated in 4.1 above.

4.3. The King IV Report

The King IV Report on Governance for South Africa (King IV) is a comprehensive document addressing Corporate Governance in South Africa. King IV is the result of fundamental changes in both business and society. Global realities are testing the leadership of organisations on a diversity of issues with financial instability being identified as one driver of the changes. The King IV report has its foundation in ethical and effective leadership which is underpinned by the principles of good governance. Internationally the principles-based approach to governance has evolved into different approaches for example "comply or explain" or "adopt or explain." The King IV Report has introduced an "apply and explain" regime to the principle-based approach adopted in King IV. In terms of the Companies Act, directors have a legal duty to act in the best interest of the company, and it is considered appropriate for directors to comply with the principles of King IV to meet the required standards of care. King IV addresses, inter alia certain fundamental concepts of corporate governance. With specific reference to the mandatory rotation of audits, King IV states that the concept has been introduced in some jurisdictions in an attempt to ensure independence. King IV leaves the consideration and decision on whether to implement the rotation of audits either to the audit committee or those charged with the governance of a company. The Code, however, makes certain practice recommendations with regard to auditor independence, amongst them that the tenure of an audit firm needs to be disclosed.

Following the UK Corporate Governance Code and the interest of more informative reporting on the auditing process, King IV recommends that the audit committee discloses significant matters from three different perspectives, namely significant assumptions in the preparation of financial statements, significant audit considerations and how they were addressed as well significant matters from the perspective of the audit committee. Moreover, King IV recommends that the audit committee should disclose their assessment of audit quality with reference to audit quality indicators.

King IV also considers auditors' independence as fundamental and leaves the option with the audit committee and the governing body to decide on MAFR.

In summary, it would appear that existing legislation, professional standards, and King IV tend to enhance and maintain auditors' independence. It acknowledges independence as a fundamental requirement for audit quality. MAFR is however not yet legislated or incorporated in any legally enforceable manner in South Africa and, in the absence of legal enforceability, the function to ensure auditors' independence is currently the responsibility of the audit committee.

5. Practical implications of MAFR in South Africa

Following on the legal considerations in the previous section, this section will consider feedback about the practical implication of MAFR in South Africa from key stakeholders. IRBA's objectives set out above do make the South African debate and considerations regarding MAFR different from the international situation which focuses predominantly on the independence considerations.

In a letter to the Chairman of IRBA, the International Federation of Accountants (IFAC) confirmed their support for initiatives aimed at enhancing audit quality. They noted that while IRBA has identified audit quality as the key objective for its MAFR proposal, other objectives, such as transformation, were also provided. According to IFAC, it is important that competing objectives do not impede the outcomes of initiatives. On audit quality, IFAC pointed out that there is no clear evidence that MAFR will enhance audit quality. In their view, there is no

academic or practical evidence to support this statement. The recent announcement by the Monetary Authority of Singapore to cease MAFR in Singapore was provided as a practical example. In this regard, the argument was raised that there is no conclusive research that provides conclusive evidence linking mandatory firm rotation with an improvement in audit quality (IFAC, 2017). Choudhury (2016) furthermore suggested that the overall objective of MAFR should be prioritised and, in particular, be clear on whether MAFR is about enhancing investor protection or economic empowerment.

In response to IRBA's Consultation Paper AICPA proposed that South Africa should reject MAFR. According to AICPA, the key responsibilities of the audit committee would be taken away if MAFR is implemented. Moreover, AICPA suggested that MAFR would have a negative impact on audit quality, it would cause a loss of institutional knowledge and experience, limit audit specialization and result in an unintended cost. It could further increase audit market concentration and limit the ability to attract and retain talent (Melancon, 2017). In summary, AICPA suggested that MAFR is not in the public interest, it would harm audit quality, it would not be cost-effective, and it would only be economically disruptive.

The CFO Forum rejected the decision of IRBA to introduce MAFR by stating that the wrong consultation process was followed and that valid concerns of various stakeholders were disregarded (Ramon, 2016). The CFO Forum declared that transformation and independence are two different issues and that both cannot be addressed by MAFR. Kathan (2017) argued that independence is already addressed via existing structures, particularly through audit committees, and that larger audit firms are in a better position to address transformation. Larger firms would require more extensive audit resources that smaller firms would not necessarily be capable of. Kathan (2017) also suggested that smaller audit firms fulfilled an important role over the years in servicing smaller clients.

According to Ramon (2016), MAFR is not an international trend. There are a number of countries that have decided not to implement MAFR, for example, the USA, Japan, Australia, Canada, and New Zealand. Countries that did implement it, but subsequently repealed it include South Korea, Singapore, Spain, Argentina and Brazil (Choudhury, 2016). Furthermore, feedback received from the stakeholders of the Monetary Authority of Singapore indicated that there were also "negative consequences associated with frequent rotation of external auditors." In addition, for those countries that did implement MAFR, there has not yet been any evidence to support the contention that it leads to greater audit quality and auditor independence (Ramon, 2016).

6. Conclusion

This study provides both legal and practical insight about the impact of MAFR in South Africa. As such, this study contributes to the expansion of the currently growing body of literature on the rotation of auditors in practice.

This article firstly considered the legal implications of the announcement by IRBA to introduce MAFR in South Africa. In this regard the relevant sections from the Companies Act no. 71 of 2008, the Auditing Profession Act no. 26 of 2005 as well as the King IV Report on Governance for South Africa (King IV) were considered with specific reference to the requirements of auditors to act in an independent manner. The legislative review acknowledged auditor independence as a fundamental concomitant of audit quality. In addition, it was found that there is currently no legal support for MAFR in South Africa and that the responsibility to ensure auditors' independence is that of the audit committee. In this regard, this study proposes that, prior to the enactment of MAFR in South Africa, careful consideration should be given to the impact on the function of the audit committee.

This article also considered feedback from key stakeholders in South Africa. Based on the feedback received from prominent governing bodies and business participants it is suggested that MAFR would not necessarily be cost-effective and that it may have a negative effect on audit expertise and specialization.

Moreover, in the context of the global business world and against the background of multinational companies operating in different jurisdictions the research revealed that there is no evidence that MAFR was successfully implemented in any particular country in the world.

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Determinants of Students' Interest in Learning Quantitative Techniques among Undergraduates in Sri Lanka

Thevaka Suntharalingam[1], Aruppillai Thayaparan[2]

[1] Vavuniya Campus, Vavuniya, Sri Lanka. Email: sthevaka@univ.jfn.ac.lk
[2] Vavuniya Campus, Vavuniya, Sri Lanka. Email: aruppillaithayaparan@yahoo.com

Abstract

This study explored the factors affecting the interest of students in learning quantitative technique subjects among the faculty of business studies third and fourth-year students in Vavuniya Campus, Vavuniya, Sri Lanka. A sample of 150 students was selected from two batches which were studied quantitative techniques subjects namely business mathematics, business statistics, computer applications in management and management science applications in their course. The student interests in learning of these subjects are associated with three explanatory variables such as contributions of learning to the major subjects, completing a research work and participating internship programs and the data related to these aspects were collected during the academic year 2016/2017. A structured questionnaire was used to collect the data on students' interests in learning quantitative subjects and the specific factors which influence it in the campus. The collected data were analyzed using Pearson correlation statistic and multiple regression analysis , and the correlation results showed that all three explanatory variables have positively correlated with the students' interest in learning and it is statistically significant at 1% of level. Results of multiple regression model revealed that all the above explanatory variables have positively affect on students' interest in learning the quantitative techniques subjects and out of them, contributions to complete their research work has more significant in determining the interest on the subjects. This finding may help to the academic staffs who teach these subjects to prepare their session plan with various structural strategies which they can use to teach the students effectively to enhance their interest of learning these subjects in the study area.

Keywords: Quantitative Techniques, Learning Interest of Students, Internship Programs, Pearson Correlation, Business Mathematics.

Introduction

The majority of students who are following business-related courses in the universities having the quantitative techniques subjects including business mathematics, business statistics, computer applications in management and management science applications are as the most important subjects in their curriculum. Quantitative techniques subjects are a science of magnitude, and that is a very useful virtually in all subject areas. Because knowledge earns from these subjects, help in many ways for the undergraduate students especially for the contributions of learning about other the major subjects, contributions to complete their project and research works and participating internship programs. The Vavuniya campus has the faculty of business studies which providing Degree in the bachelor of business management for five specializations in Business economics,

Accounting and finance, Marketing management and Human resource management and all these areas have the quantitative techniques subjects in their syllabus.

Basic quantitative skills are useful in solving business problems and in economic analysis and in addition to that those skills guide the students to complete their degree successfully. Also, these skills are essential for proceeding to further studies in the increasingly quantitatively-oriented subfields of accounting, management, and administration and based on these reasons, and it can be assumed that quantitative subjects can contribute to do a research work too. Thus, contributions given by the quantitative subjects to study about other major subjects, contributions to complete their project and research works and participating internship programs enhance their interest and awareness on learning the quantitative techniques subjects. In this background, this study aims to identify the correlation between students' interest in learning quantitative techniques subjects and its explanatory variables and examine the major factors that determine the learning interest of undergraduates for quantitative techniques subjects among them in Vavuniya campus, Sri Lanka.

Research questions

This study has the following research questions.
- Does the student's interest in learning quantitative techniques subjects have correlates with the independent variables significantly?
- What factors influence the interests of quantitative techniques subjects among undergraduate students in the field of business studies?

Review of literature

There are several researches done by many researchers on the students' interest and their attitudes towards mathematics and other quantitative related subjects over the world. However, these kinds of studies are very rare in Sri Lanka particularly in Vavuniya campus which is located in the Northern region of Sri Lanka.

Mele F. Latu (1994) has analyzed Factors affecting the learning of English as a second language macro skill among Tongan secondary students in the Kingdom of Tonga. His findings reveal that, age of the students and their perceived ability in English, frequency of use of English with non-Tongan speakers, use of English to read for enjoyment, use of English for communication at home, integrative motivation and career aspirations were significant correlations with the students' learning of English macro skills at secondary school in the country.

Noraidah Sahari Ashaari, at el(2010), has examined the Student's Attitude towards Statistics Course in Malaysia and according to that, Majority of students find the subjects difficult due to non-cognitive factors like attitude, perception, interest, expectation, and motivation. Cognitive factors also play significant roles in contributing to the capability of the students excelling the subject. Both factors could interrupt the learning process involved and hinder the students from using statistics daily in the country.

Factors influencing academic achievement in quantitative courses among business students of private higher education institutions have analyzed by Elvis Munyaradzi Ganyaupfu (2013). He has found that lecturer competence, teaching methods and quality of learning materials have a significant positive influence on undergraduate students' academic achievements in quantitative business courses, while mathematics aptitude and minimum admission criteria have no significant influence. Adeyemi D. at el (2014) evaluated the business management students' attitude and performance in statistics learning in Nigeria Metropolitan College of technology. Their results revealed that lecturer competence, teaching methods and quality of learning materials are the primary factors that significantly influence students' achievements in quantitative subjects.

Another study was done by Safiyeh Khayati, Ali Payan (2014) on effective factors increasing the students' interest in Mathematics in the opinion of Mathematics Teachers of Zahedan. Their results proved that, doing

activity in math class activity of students while teaching and previous math teachers' behaviours have had much impact on encouraging the students towards mathematics in the country.

Analysis of factors affecting the interest of students of accounting sciences in the area of accounting sciences in the area of accounting management examined by Edvalda Araújo Leal (2014) and his study found that, factors that motivate students' interest in the area of management accounting demonstrate five different characterizations such as expertise on managerial accounting, interest in a career in this field, personal interest in the area of management accounting, quality of teachers form students view of point and theory vs. practice relevance are the important in determining the interest of students in the country. Another study done by Leonard Chinaedum Anigbo (2016) examined the factors affecting students' interest in mathematics in secondary schools in Enugu State and his results revealed that teacher factor, student factor, instructional strategy, mathematics anxiety, and infrastructural problem were effective in predicting secondary school students' interest to learn mathematics in the State.

Another study was done by Zaiton Mustafa Hishamuddin Salim (2016) to identify the factors affecting students' interest in learning Islamic education in Malaysia and their study proved that, the Islamic education teacher is the key factor in affecting students' interest towards the subject in the country. Shamila Dewi Davadas, Yoon Fah Lay (2017), examined the factors affecting students' attitude toward Mathematics: A Structural Equation Modeling Approach and they found that teacher effective support and classroom instruction predict attitude towards mathematics more than parental influences in the country. Derek Cheung (2018) has examined the key factors affecting students' individual interest in school science lessons, and his results suggest that teachers should pay special attention to the association between academic self-concept and interest if they want to motivate students to learn science at a school in the study area.

Method of data collection

To examine the factors on the students' interest in learning the quantitative techniques subjects, the relevant data collection was conducted using questionnaire which was structured in two parts and the first relates to the interest of the respondents in the quantitative techniques subjects and the second part consists of questions that indicate the three independent variables such as contributes to learn more in other major subjects, guides to complete their project study and research works and help to participate to the internship programs. All these questions were measured by an ordinal five-point Likert scales, where 1 represents 'Strongly Disagree' and 5 represents 'Strongly agree' and each of them has 6 questions in the study. Students of both genders in the faculty of business studies constitute the population, and the sample of the study was 150 students were selected conveniently from third and fourth-year students in the campus.

Analytical framework

This section describes the methods analytical tools such as correlation analysis and multiple regression using ordinary least square method which were used in the study. Before to do the statistical analysis, the accuracy of the questionnaires was tested using a reliability test using Cronbach's Alpha method.

Reliability test

After completing the process of transcribing and coding the data, it is essential to ensure the reliability of the coded questionnaires. At this stage, the researcher applied reliability test to check the accuracy of each questionnaire using Cronbach's Alpha and its value is more than 0.7 represents that those questionnaires are reliable. Cronbach's Alpha method was adopted in determining the reliability coefficient for each questionnaire, and finally, all of them categorized into dependent and independent variables in the study.

Multiple Regression

To examine the relationship among the interest of students in learning quantitative techniques subjects and its determinants, Pearson correlation was used, and the determinants of students' learning interest on those subjects were identified using multiple regression model. Thus, statistical techniques such as Pearson correlation and multiple regression analysis were used as a methodology in the study. The factors that are influence the students' interest in learning quantitative techniques subjects among them who are following Bachelor degree in the campus, was identified by the following regression model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where,
Y =   Students' interest in quantitative techniques subjects
X_1 =   Contribution to learn other major subjects
X_2 =   Contribution to do the research work
X_3 =   Contribution to do the internship successfully
ε =   Error term
β_0 = Constant
$\beta_0, \beta_1, \beta_2,$ and β_3 are the coefficients of each explanatory variable respectively

Results and discussion

The reliability coefficients results of the variables were summarized in table 01 as below:

Table 01: Results of Reliability test

Variable	Cronbach's Alpha	Items
Students' interest in learning quantitative techniques subjects.	0.69	6
Contributions of learning to other major subjects.	0.68	6
Contributions to complete their project and research works.	0.75	6
Contribution to do internship successfully	0.70	6

Source: Estimated by authors, 2018.

Internal consistency of the questionnaire items was examined using the Cronbach's alpha and their results shown in table 01. According to that, all the variables have reliable, and out of four variables, a contribution to complete their project and research works has nearly 75% of accuracy than others. Thus, the above results prove that there no internal inconsistency among the questionnaires used in the study.

Significant Pearson correlations between the dependent and independent factors regarding students' learning interest are given in Table 02. In the table below shows that Students' who have an interest in learning quantitative techniques subjects are positive correlates with all other three independent variables and all of them statistically significant at 1% level. The positive correlation 0.47 was obtained for learning interest of the students on quantitative techniques subjects and its contributions to learn other major subjects reveal that, the students who earned more benefits to learning other major subjects from the specific quantitative techniques subjects, their interest on learning those subjects also will be more.

Table 02: Pearson correlations among the variables

	Items	Y	X_1	X_2	X_3
Y	Pearson Correlation	1	.470**	.547**	.530**
	Sig. (2-tailed)		.000	.000	.000
	N	150	150	150	150
X_1	Pearson Correlation	.470**	1	.533**	.546**
	Sig. (2-tailed)	.000		.000	.000
	N	150	150	150	150
X_2	Pearson Correlation	.547**	.533**	1	.578**
	Sig. (2-tailed)	.000	.000		.000
	N	150	150	150	150
X_3	Pearson Correlation	.530**	.546**	.578**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	150	150	150	150

Source: Estimated by authors, 2018.

Note: **. Correlation is significant at the 0.01 level (2-tailed).
Where,
Y = Students' interest in learning quantitative techniques subjects.
X_1 = Contributions of learning to other major subjects.
X_2 = Contributions to complete their project and research works.
X_3 = Contribution to do internship successfully.

Among the above variables mentioned in table 03, students' learning interest on the quantitative techniques subjects has nearly 54% of positive correlates with the contribution given by those subjects to learn other main subjects in the study area. The estimation of the impact of learning to other major subjects, contributions to complete their project and research works and participating internship programs on students' interest in learning quantitative techniques subjects were conducted by ordinary least squares. The estimated results were illustrated in the following table.

Table 03: Estimated results of a multiple regression model

Model	Un standardized coefficient		Standardized coefficient	t- statistic	Sig.
Adjusted R^2 = 0.37 F – value = 30.37	β	Standard error	β		
Constant	7.173	1.96		3.647	0.000
X_1	0.170	0.085	0.163	1.996	0.048
X_2	0.288	0.078	0.308	3.671	0.000
X_3	0.272	0.088	0.213	3.098	0.002

Dependent Variable: Students' learning interest in quantitative techniques subjects and the meaning of the above independent variables are similar as defined earlier.
Source: Estimated by authors, 2018.

Adjusted R^2 measures the overall goodness fit of the model which is equal to 0.372 indicated that about 37.2% variation in students' interest in learning quantitative techniques subjects was influenced by contributions to the learning to other major subjects, contributions to complete their project and research works and participating internship programs and rest of other 62.8% is explained by other factors not mentioned in the regression model

used in this study. The F-test value of the model is 30.37, and it is statistically significant at 1% level also indicated that the model is highly significant and there is significant multiple relationships exist between the independent variables and students' interest in learning the quantitative techniques subjects.

Based on the results of unstandardized coefficients, among the above independent variables, approximately 29% variation in contributions to complete their project and research works was accounted for students' interest in learning quantitative techniques subjects, and it is statistically significant at 1% level. Therefore, cannot reject the null hypothesis that contributions to complete the project and research work positively given by those subjects affect student's learning interest.

Next factor is the contributions to participate in the internship programs given by studying these subjects accounted for approximately 27% variation in student's learning interest quantitative subjects, and it is significant at 1% level. Accordingly, the null hypothesis that is a contribution to participate in the internship programs given by the quantitative subjects has a statistically significant positive influence on students' learning interest cannot be rejected. The last one is the contributions of learning to other major subjects about 17% positive influence on students' interest in learning quantitative subjects and hence participating internship programs leads to about 0.17 percent improvement in students' learning interest with 5% level of significance. Therefore, the null hypothesis contributions of learning to other major subjects have a significant positive effect on students' learning interest in quantitative subjects cannot be rejected. Concerning standardized coefficient values which represent the relative influence of the independent variables on students' quantitative techniques interest, their individual variables indicated significant results and out of three variables, complete their project and research works contributes relatively 30.8% to the students' learning interest in quantitative subjects in the faculty.

Conclusion

This research reveals that subjects related to quantitative techniques and the interest of faculty of business studies students depend on the contributions of learning to other major subjects, complete their project and research works and helps to participate their internship programs. Also, all these variables were positively impacted on the students' interest in learning the quantitative subjects, and they have statistically significant. As the students have positive attitudes on the quantitative techniques subjects related to the contributions to learning the major subjects, helps to do the research works and getting internship training programs, will enhance their interest on learning the quantitative techniques subjects among the faculty of business studies students in Vavuniya campus, Sri Lanka.

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The Food Safety Culture of a Night Market

Hans Malikh C. Catedral[1]

[1] University of San Carlos, Cebu City, Philippines, hansccatedral@gmail.com

Abstract

Night markets are a popular food destination among tourists in Southeast Asia. The off-premise nature of these destinations resulting in higher risk for food contamination has brought about the need to improve food safety culture. Previous studies have focused primarily on food sanitation practices of vendors. However, food safety culture has been found as an effective means for improving safety practices in recent years by changing behavior and placing emphasis on food safety. The study determined the food safety culture of vendors of a night market in Cebu City. Findings shall be used as the basis for recommended guidelines on food safety specifically for night markets. This descriptive research utilized a survey questionnaire to 40-night market vendors. Results showed high mean scores in the indicators of leadership and coworker support, communication, work pressure, and self-commitment while lower scores on environment support and risk judgment. An employees' workload, provision of structural facilities and employee feedback are indicators that give rise to the level of food safety culture in an organization. The study highlights the role of management as results show food safety procedures are only followed at a certain extent but time and management pressures contribute to a decrease in following safe food handling.

Keywords: Cebu City, Food Safety, Food Safety Culture, Night Market, Night Market Vendor.

1. Introduction

1.1 Rationale of the Study

Various research in food tourism has come out in recent years, particularly focused on hygiene issues and its impact on destination experience. The Skift Report (2015) postulated that cuisine has the ability to strengthen and diversify local economies by promoting local food culture and thus is a dynamic segment in the tourism sector.

As such, night markets are a popular food destination for tourists because they offer shopping alternative for cooked food, perishable items, clothing and other household necessities (Ishak, Aziz & Latif, 2012). Furthermore, they act as business incubators as aspiring entrepreneurs would only put in a small investment to start a business. It reflects a piece of unique culture for they portrayed the eating preferences, interaction patterns and some of the evening leisure activities of the various ethnic groups in the country.

Despite exemplifying historical, economic, social and financial meaning, Tsai (2013) postulates that it represents some hidden and negative societal manifestations that should be improved. Among these is the issue of food safety. The study of Huang, Wang & Huang (2012) showed that most night market vendors have minimal

educational achievements, learn from observation and during rush hours, food vendors lacked time to wash their hands and used clean napkins or tissues for cleaning. Most night markets are also located in a street or open space, and thus, the off-premise nature of the operation where products are prepared outdoors and are exposed to food contaminants increase the risk for cross-contamination and food poisoning.

In Europe, the emergence of street food is seen as an area that could pose risks to consumers' health, because of perception of insecurity, lack of manager skills in business and the lack of controls. This is even truer for developing countries, food security continues to be a problem and is not well rooted in the mentality of the populace (Bellia, Pilato & Hugues, 2016). A study in Africa showed that sanitation emerged as the major gray area of attitudes to Ghana's traditional foods with the concerns being more expressed among elderly, women, and Muslim tourists (Amuquandoh, 2013).

On the other hand, many countries in Asia have managed to develop various night markets throughout their cities and are a popular spot among tourists such as Shihlin Night Market in Taiwan, Rot Fai Market in Bangkok and Bugis Street in Singapore. As more night food markets open in the Philippines, the challenge of ensuring food safety is an issue as the country has constantly dealt with many food poisoning incidents due to poor food safety standards and lack of government enforcement.

Many studies continue to show food safety as an important indicator of destination competitiveness. The Travel and Tourism Competitive Report (World Economic Forum, 2015) suggests that hygiene in terms of access to drinking water and sanitation are important for the comfort and health of travelers. The Association of Southeast Asian Nations (2012) notes that member states vary in levels of development that affect levels of tourist experiences. One of its biggest gaps is that of safety and security. As such, the trends show a shift from common tourist visit motivators of "sea, sun, and sand" to "safety, security, and sanitation" as essential elements of the tourism experience. Williams (2014) suggests that sanitation should be given importance if the country (Philippines) aims to be world-class. This is done by incorporating sanitation to the very fabric of Filipino culture and lifestyle.

For countries like Taiwan, street food and night markets are almost entirely unregulated (Ferry, 2015). The lack of monitoring may result in higher risks of food-borne illnesses and other health risks. In Malaysia, night market vendors admit that they cook and use oil repeatedly, making it unfit for food consumption (Azman et al., 2012).

Food safety culture, in recent years, has been found as an effective means of improving food safety in the workplace. Griffith, Livesey, and Clayton (2010) suggested that food safety performance is affected by six culture factors: leadership, food safety management systems, and style, commitment to food safety, food safety environment, risk perception and communication. It was further explored in the study of Ungku Fatimah et al. (2014) in measuring food safety culture of onsite foodservice operations. The study presented a model for determining the food safety culture. The following factors came out as components of food safety culture: leadership, communication, self-commitment, management system and style, environment support, teamwork, accountability, work pressure, and risk perception. However, in factor analysis, these nine components were compressed into a six-factor structure of food safety culture.

Chapman and Powell (2011) stressed that a good food safety culture is one where individuals know the risks associated with the foods they handle and how those should be managed, dedicate resources to evaluate supplier practices, stay up-to-date with emerging food issues, foster a value system within the organization that focuses on avoiding illnesses, communicate compelling and relevant messages regarding risk-reduction activities and empower others to put them into practice, promote effective food safety systems before an incident occurs and one that does not blame customers when illnesses are linked to their products.

Many researchers throughout the years have studied various dimensions of safety culture. In the study of Flin (2007), he identifies 1) management 2) system 3) risk and 4) work pressure as factors that affect employee behavior towards safety. The concept of management refers to how employees see management's commitment towards safety, supervision, and training. System, on the other hand, refers to safety standards, regulations, and maintenance.

Furthermore, Clayton, Griffith, Price & Peters (2002) studied 137 food handlers to understand their food safety practices in Wales. Results showed that lack of time, staff and resources were found to be barriers in safe food

handling. The study also showed that more staffing, lesser workload, and better workspaces were key for better safe food handling practices.

Food safety culture should involve communication with management to help understand employee commitment to food safety (Nayak & Waterson, 2017). Clayton et al. (2015) investigated food workers' perception of factors that impact food safety practice and identified work pressure to prioritize other food service tasks (e.g., "getting the food from the fryer to the table") over proper food safety procedures as a barrier to food safety.

There have been some local studies on food safety particularly on street vending. Despite being a good source of livelihood, Buted and Ylagan (2014) noted that many street vendors neglect the significance of food safety which then increases the risk of foodborne diseases. Studies also suggested that mere food safety knowledge does not essentially equate to observance or compliance to the requirements. This means that vendors have to understand its importance and advocate for it (Rustia, Azanza & Gascon, 2017).

1.2 Theoretical Framework

The study is anchored on the study of Ungku Fatimah (2013) in measuring food safety culture of onsite foodservice operations. The study presented a model for determining the food safety culture in an onsite foodservice operation. The six food safety culture factors were identified using a mixed methods approach and were analyzed through factor analysis. The six factors are 1) Management and co-worker support 2) Communication – evaluates employee perception towards the transfer of information and knowledge within management, supervisory staff, and food handlers. 3) Self- Commitment 4) Environment Support 5) Work Pressure and 6) Risk Judgment. This study uses the principles of both Good Manufacturing Practices (GMPs) regulations and the Codex Alimentarius Recommended International Code of Practice – General Principles of Food Hygiene. Both quality assurance systems lay the foundation in food production by creating an environment conducive for making food that is safe for consumption. The study is also anchored on Schein's model of organizational culture. This is constantly used as a way to properly understand the culture within an organization. This research is anchored on Schein's Organizational Culture Model. He divides culture into three levels: artifacts, values, and basic assumptions. The study focuses on basic assumptions. It forms the most comprehensive level of organizational culture. They form a basis that establishes how organizational members perceive their environment and determines their course of action in specific situations.

1.3 Objectives of the study

The purpose of the study is to determine the food safety culture of the night market vendors at a night market in Cebu City. Specifically, the study sought to 1) assess night market vendors' food safety culture in the areas of 1.1 Management and Coworkers Support; 1.2 Communication; 1.3 Self-commitment; 1.4 Environment support; 1.5 Work Pressure and 1.6 Risk Judgment; and 2) develop recommendations based on the findings as basis for the formulation of food safety management policies for the night market.

2. Materials and Methods

2.1 Research Design

This study used the descriptive research design utilizing the survey method to collect the relevant data for the study. A survey questionnaire was deployed 40 nonsupervisory night market vendors. Interviews with the night market organizers were conducted to validate and further expound the data gathered. This method is preferred for this kind of research because the expected responses and results are best presented by descriptions.

2.2 Research Site

For the purpose of anonymity, the research environment shall be named Cebu Night Market located in Cebu City. On an average, Cebu Night Market has around 35 to 45 vendors at a time, is open from Thursday to Sunday weekly. All vendors offer food and beverages. It is a year-round open-air food and lifestyle market in

Cebu aimed at boosting the campaign to patronize regional, local products and attract people to travel to the region.

The Cebu Night Market is one of the biggest food markets in Cebu City that aims to showcase Cebuano products in the local food industry. It also features crafts, clothing and beauty and wellness products from locals. The food market usually opens from 5:00PM-1: 00 AM, around 1,900 square meters in size and is recognized by the Department of Trade and Industry and the Department of Tourism as an official food market bazaar.

2.3 Participants

The respondents of the study are nonsupervisory food handlers of the night market to assess food safety culture in each of their food stalls. In order to determine the sample size, the researcher used Slovin's formula which resulted in 40-night market food handlers.

2.4 Instruments

The researcher used survey questionnaires as the main data gathering tool in the study which was handed out to night market food handlers. This is based on the work of Ungku Fatimah, Strohbehn, & Arendt (2014) where they created a compressed six-factor structure of food safety culture. However, some modifications were incorporated to fit the questionnaire into the night market setting. The scope of the instrument is on 1) Management and co-worker support (10 items) – refers to management roles in encouraging safe food handling practices and teamwork among coworkers; 2) Communication (6 items) – evaluates employee perception towards transfer of information and knowledge within management, supervisory staff and food handlers; 3) Self-Commitment (5 items) - evaluates employee perception towards employees values and beliefs on food safety in line with their team/ organization. 4) Environment Support (4 items) – represents measures on adequacy and quality of infrastructures that support safe food handling practices; 5) Work Pressure (3 items) - evaluates employee perception towards pressure in preparing food that may affect safe food handling and, 6) Risk Judgment (3 items) - evaluates employee perception associated with organization risk-taking decisions when implementing and complying with food safety rules and regulations.

To ensure internal consistency, the researcher used Cronbach's alpha to evaluate the reliability of the research instrument. The instrument administered to the night market vendors resulted in the internal-consistency coefficient value of 0.916.

2.5 Data Collection and Analysis

In the gathering, the data, the researcher initially requested permission from the night market organizing body to conduct the study. The survey questionnaires were distributed personally.   It was forwarded with a cover letter describing the study and indicating the confidentiality of the information that may be given out by the respondents. Mean, and standard deviation was used to analyze the questionnaire administered to night market vendors.

3. Results and Discussion

3.1.1 Night Market Vendor Perception on Management and Coworkers Support

Table 1. Night Market Vendor Perception on Management and Coworkers Support

Management and coworker support	Mean	Std. Deviation	Interpretation
Leaders inspire me to follow safe food handling practices	4.88	1.40	Somewhat involved
My leader is actively involved in making sure safe	4.88	1.70	Somewhat

food handling is practiced			involved
There is good cooperation among team members to ensure that customers receive safely prepared food	4.88	1.57	Somewhat involved
New and experienced team members work together to ensure food safety practices are in place	4.75	1.63	Somewhat involved
Leaders enforce food safety rules consistently with all team members	4.73	1.57	Somewhat involved
When lots of work needs to be done quickly, employees work together as a team to get the tasks completed safely	4.95	1.45	Somewhat involved
My leader always watches to see if I am practicing safe food handling	4.60	1.65	Somewhat involved
My coworkers are always supportive of each other regarding food safety	4.70	1.64	Somewhat involved
Team members remind each other about following food safety practices	4.75	1.56	Somewhat involved
Team members are disciplined or reprimanded when they fail to follow food safety practices	4.73	1.63	Somewhat involved
Overall Mean	**4.79**	**1.36**	**Somewhat involved**

General Interpretation Guide:

6.01 – 7.00 Very Involved

5.01 – 6.00 Involved

4.01 – 5.00 Somewhat Involved

3.01 – 4.00 Somewhat uninvolved

2.01 – 3.00 Uninvolved

1.00 – 2.00 Very Uninvolved

Source: Vogt (1999)

As reflected in the table, the overall mean for this indicator was 4.79 (SD=1.36). In addition, the values of the means of each of the items under this indicator range between 4.73 and 4.95, which can be described as "Somewhat involved." The highest mean rating was on employees working together to get tasks done (4.95). This means that leaders are somewhat involved in inspiring employees and are actively involved in the practice of safe food handling. Furthermore, findings reveal that leaders are somewhat involved in enforcing food safety rules among all team members. The importance of leadership in the practice of food safety culture was posited by Yiannas (2009) where leaders of the organization should choose to have strong food safety culture as they influence attitude towards food safety, a willingness in discussing concerns and place emphasis on its importance. Improving management guidance will ensure employee compliance in the practice of food safety.

Moreover, the results show that team members are somewhat involved in encouraging of each other, reminding one another and disciplining each other in the practice of food safety. At the same time, new and experienced team members work together to ensure safe food handling is practiced and cooperate among one another to prepare food safely. It can be deduced that members of the team need to support each other more to prepare safe food properly.

Among the various indicators, the lowest mean was on leaders somewhat involved in watching team members see if they are practicing safe food handling (4.60). Adesokan et al. (2015) also stressed that management support in providing regular refresher training for food handlers further assist in the adoption of safe food handling behaviors.

3.1.2 Night Market Vendor Perception on Communication

Table 2. Night Market Vendor Perception on Communication

Communication	Mean	Std. Deviation	Interpretation
I can freely speak up if I see something that may affect food safety	4.73	1.63	Quite well-conveyed
My leader generally gives appropriate instructions on safe food handling	4.93	1.44	Quite well-conveyed
I am encouraged to provide suggestions for improving food safety practices	4.95	1.38	Quite well-conveyed
All managers give consistent information about food safety	4.88	1.51	Quite well-conveyed
All of the necessary information for handling food safely is readily available to my area.	4.70	1.56	Quite well-conveyed
Leaders provide adequate and timely information about current food safety rules and regulations	4.60	1.47	Quite well-conveyed
Overall Mean	**4.80**	**1.30**	**Quite well-conveyed**

General Interpretation Guide:

6.01 – 7.00 Perfectly Conveyed

5.01 – 6.00 Fairly Conveyed

4.01 – 5.00 Quite Well conveyed

3.01 – 4.00 Fairly well-conveyed

2.01 – 3.00 Very little conveyed

1.00 – 2.00 Not at all conveyed

Source: Vogt (1999)

The table above showed the means and standard deviation of the perception of night market vendors on communication within each team. This factor is aimed at evaluating employee perception towards the transfer of information and knowledge within management, supervisory staff and food handlers in the organization.

Referring to the overall result, the overall mean for this indicator was 4.80 (SD=1.30), which is described as "Quite Well-Conveyed." Additionally, the table also revealed that the mean values of the items under this indicator ranged between 4.70 and 4.95, which are all interpreted as "Quite Well-Conveyed." The results reveal that communication in terms of employees providing suggestions for improving food safety was quite well-conveyed and resulted in the highest mean rating (4.95). This suggests that employees value engagement particularly in voicing out food safety issues present in the workplace and proposing action plans to resolve it.

It is generally interpreted that communication in terms of provision of information on food safety issues, adequacy and timeliness of food safety rules and regulations, and its availability for use is quite well-conveyed among respondents. Communication with management is considered significantly important to improve employee commitment and develop a positive food safety culture in the organization (Nayak &Waterson, 2017). However, among all items, leaders providing adequate and timely communication resulted in the lowest mean (4.60). This means that management is inconsistent in providing updates and communicating food safety information. It can be remembered that the General Principles of Food Hygiene (FAO, 2012) entails ensuring products have adequate, accessible information available and food handlers ensuring vendors have adequate information about the product such as ingredients, possible allergens, expiration and proper storage in cases where consumers may need it.

3.1.3 Night Market Vendor Perception on Self-Commitment

Table 3. Night Market Vendor Perception on Self-Commitment

Self-Commitment	Mean	Std. Deviation	Interpretation
I follow food safety rules because it is my responsibility to do so	5.03	1.58	Engaged
I follow food safety rules because I think they are important	5.00	1.52	Somewhat engaged
I am committed to following all food safety rules	4.98	1.49	Somewhat engaged
I keep my work area clean because I do not like clutter	5.13	1.52	Engaged
Food Safety is a high priority for me	4.85	1.85	Engaged
Overall Mean	**5.00**	**1.48**	**Engaged**

General Interpretation Guide:

6.01 – 7.00 Very engaged

5.01 – 6.00 Engaged

4.01 – 5.00 Somewhat engaged

3.01 – 4.00 Somewhat unengaged

2.01 – 3.00 Unengaged

1.00 – 2.00 Very Unengaged

Source: Vogt (1999)

The table above presents the means and standard deviation of the perception of night market vendors on self-commitment. This factor evaluates employee perception towards employees' values and beliefs on food safety in line with their organization. Data revealed that the night market vendors have a high self-commitment towards practicing food safety, as indicated by a grand mean response rating of 5.00. This result can be explained by the vendors' general engagement in following food safety rules because it is important (5.00) and because it is their responsibility to do so (5.03). The highest mean showed that employees keep their area clean due to a general dislike to clutter (5.13). It is suggested that a strong commitment to food safety from all levels of management is needed to ensure a responsive approach to keeping food safe. The need to reevaluate engagement on food safety practices and consistency in communicating food safety information was stressed by Reynolds (2016).

Employees were also found to be somewhat engaged to follow all safety rules (4.98). The lowest employee engagement was found on making food safety a high priority (4.85). Rustia, Azanza & Gascon (2017) posited the importance of self-commitment by both management and front-line workers. The authors believed that food safety knowledge does not essentially equate to observance or compliance with the requirements. This means that vendors have to understand its importance and advocate for it.

Among all indicators, leaders providing adequate and timely communication resulted in the lowest mean (4.60). This means that management is inconsistent in providing updates and communicating food safety information. The General Principles of Food Hygiene (FAO, 2012) entails ensuring products have adequate, accessible information available and food handlers need to ensure they have adequate information about the product such as ingredients, expiration and proper storage in cases where consumers may need it.

3.1.4 Night Market Vendor Perception on Environment Support

Table 4. Night Market Vendor Perception on Environment Support

Environment Support	Mean	Std. Deviation	Interpretation
Equipment items needed to prepare food safely are readily available and accessible.	4.73	1.54	Somewhat Sufficient
Adequate supplies are readily available to perform safe food handling practices	4.43	1.75	Somewhat sufficient
Facilities are of acceptable quality to follow safe food handling practices	3.98	1.97	Somewhat insufficient
It easy for me to follow safe food handling practices	3.98	1.87	Somewhat insufficient
Overall Mean	**4.28**	**1.39**	**Somewhat sufficient**

General Interpretation Guide:

6.01 – 7.00 Extremely sufficient

5.01 – 6.00 Mostly sufficient

4.01 – 5.00 Somewhat sufficient

3.01 – 4.00 Somewhat insufficient

2.01 – 3.00 Mostly insufficient

1.00 – 2.00 Extremely insufficient

Source: Vogt (1999)

Table 4 showed the means and standard deviation of the perception of night market vendors on environment support. Referring to the overall result, the overall mean for this indicator was 4.28 (SD=1.40), which is described as somewhat sufficient. The table revealed that vendors feel somewhat sufficient in terms of the equipment needed in order to prepare food which shows the highest mean (4.73). This is followed by the availability of adequate supplies needed to prepare safe food (4.43). This suggests that due to the nature of the business, employees at a certain extent may not always have all the equipment needed to perform their jobs and may have to improvise with supplies and equipment available at times.

Lack of facilities and equipment has been identified by Ball, B., Wilcock, A., & Aung, M. (2010) and Macheka, L., Manditsera, F., Ngadze, R, Mubaiwa, J, & Ny, L. (2013) as a barrier towards practicing food safety and the implementation food safety management systems. The General Principles of Food Hygiene (FAO, 2012) also notes proper sanitation and maintenance of premises were recorded as important to permit continuous and effective control of food hazards and agents likely to contaminate food.

3.1.5 Night Market Vendor Perception on Work Pressure

Table 5. Night Market Vendor Perception on Work Pressure

Work Pressure	Mean	Std. Deviation	Interpretation
My work load does not interfere with my ability to follow safe food handling practices	3.98	1.94	Somewhat unmanageable

I always have enough time to follow safe food handling procedures, even during rush hours	4.28	1.75	Somewhat manageable
The number of staff scheduled at each shift is adequate for me to get my work done and handle food safely	4.48	1.71	Somewhat manageable
Overall Mean	**4.24**	**1.57**	**Somewhat manageable**

General Interpretation Guide:

6.01 – 7.00 Very manageable

5.01 – 6.00 Manageable

4.01 – 5.00 Somewhat manageable

3.01 – 4.00 Somewhat unmanageable

2.01 – 3.00 Unmanageable

1.00 – 2.00 Very unmanageable

Source: Vogt (1999)

Table 5 showed the means and standard deviation of the perception of night market vendors on work pressure. Referring to the overall result, the overall mean for this indicator was 4.24 (SD=1.57), which is described as slightly agree. Among the three items, the number of staff scheduled per day were found to be adequate and thus, work pressure in this indicator was considered somewhat manageable. This resulted in the highest mean rating of 4.48. Vendors showed that at a certain extent, time to produce food was still somewhat manageable while following safe food handling procedures at the same time even during rush hours, having a mean of 4.28. However, the workload was found to be somewhat unmanageable and interferes an employee's ability to carry out food safety procedures.

Overall slight agreement on these items means that at some point, they are poised to produce what the customers demand at a shorter time, compromising some food safety measures without having to inform or manifest them outright to them. The results agree with the study of Clayton et al. (2015) that participants identified pressure to prioritize other food service tasks such getting the food from the fryer to the table over proper food safety procedures as a barrier to food safety.

3.1.6 Night Market Vendor Perception on Risk Judgment

Table 6. Night Market Vendor Perception on Risk Judgment

Risk Judgment	Mean	Std. Deviation	Interpretation
I believe that written food safety policies and procedures are nothing more than a cover-up in case of a law suit.	4.23	1.83	Somewhat Risky
I am sometimes asked to cut corners with food safety so we can save on costs when preparing food	4.20	1.81	Somewhat Risky
When there is pressure to finish production, team leaders sometimes tell us to work faster by taking shortcuts with food safety	4.15	1.88	Somewhat Risky
Overall Mean	**4.19**	**1.60**	**Somewhat Risky**

General Interpretation Guide:

6.01 – 7.00 Exceptionally Risky

5.01 – 6.00 Risky

4.01 – 5.00 Somewhat Risky

3.01 – 4.00 Somewhat Non-risky

2.01 – 3.00 Non-risky

1.00 – 2.00 Exceptionally Non-risky

Source: Vogt (1999)

The table above presents the means and standard deviation of the perception of night market vendors on risk judgment. This indicator evaluates employee perception associated with organization risk-taking decisions when implementing and complying with food safety rules and regulations. Referring to the overall result, the overall mean for this indicator was 4.19 (SD=1.60), which is described as somewhat risky. In addition, the mean of the three items range from 4.15 to 4.23, and all are described to be somewhat risky.

The results suggest a certain extent of perceived risk as employees feel that written food safety policies and procedures are nothing more than a cover-up in case of a law suit (4.23) such that it reached to a point when they are asked to cut corners with food safety so we can save on costs when preparing food, and being told to work faster by taking shortcuts with food safety. The results may be attributed to employees feeling that documents on food safety and permits are available, yet are not practiced in the food service setting. This is somewhat risky as negligence of food safety procedures may then increase the likelihood of shortcomings in the food preparation process.

The results support the study of Sun, Wang & Huang (2012) that even though vendors are aware of proper hygiene knowledge, they rarely put it into practice because of time-constraints in their business. Green and Selman (2005) also pointed out that time pressures to perform a job including equipment and resources are recognized factors that affect food preparation practices.

The overall mean for this indicator was 4.19 (SD=1.60), which is described as slightly agree. In addition, the mean of the three items range from 4.15 to 4.23, and all are described to be slightly agree. This means that at some point, employees feel that that written food safety policies and procedures are nothing more than a cover-up in case of a law suit (4.23) such that it reached to a point when they are asked to cut corners with food safety so we can save on costs when preparing food, and being told to work faster by taking shortcuts with food safety. This can be attributed to employees feeling that documents on food safety and permits are available, yet are not practiced in the food service setting.

The results support the study of Sun, Wang & Huang (2012) that even though vendors are aware of proper hygiene knowledge, they rarely put it into practice because of time-constraints in their business. Green and Selman (2005) also pointed out that time pressures to perform a job including equipment and resources are recognized factors that affect food preparation practices.

4 Conclusions

Night market vendors exhibit good safety culture in the factors of self-commitment, communication and management, and coworkers support. An employees' workload, provision, and sanitation of proper equipment and timely feedback were found to be indicators that give rise to the level of food safety culture in an organization. The influence of management was highlighted to affect the level of food safety practices and that organizations can improve food safety culture by managing work pressure, adherence to proper sanitation procedures and by fulfilling structural requirements in accordance to the provisions of the Sanitation Code. At a certain extent, vendors follow food safety rules but time and management pressures become contributory factors to a decrease in following food safety procedures.

5   Recommendations

The results highlight some recommendations for improvement: in terms of management, increased visibility of leadership will ensure consistent enforcement of food safety policies at all levels in the organization. There is also a need for effective and relevant hygiene training enforced by management commitment to food safety.

Operationally, proper provision of tools and equipment should be provided to food handlers in the process of preparing food. This will help ease staff workload and ensure the safe production of food. The distribution of a personal food hygiene checklist may be used to improve personal hygiene. This will ensure that staff adherence to good personal hygiene and personal protective equipment. Food displayed should be properly packaged and covered to minimize contamination.

The findings and recommendations of the research may be used as the basis for destination management guidelines or policies particularly in a night market or off-premise food production setting by both night market organizers and government regulatory bodies concerned on food safety. The research also highlights the importance of management support and influence which encompasses all factors of food safety culture.

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Impact of Intercultural Awareness on Innovation Capability in Multinational Organizations: Mediating Roles of Knowledge Sharing Motivations

Alisardar Mammadov[1], Ran An[2]

[1] School of Business Administration, South China University of Technology, Guangzhou, P.R. China, 510641.
Email: alisardarm@hotmail.com
[2] School of International Education, South China University of Technology, Guangzhou, P.R. China, 510006.
Email: sieanran@scut.edu.cn

Corresponding Author: Ran An, Email: sieanran@scut.edu.cn

Abstract

The purpose of this paper is to investigate the impact of intercultural awareness on knowledge sharing motivations and the mediation effects of knowledge sharing motivations between intercultural awareness and innovation capability. The results empirically proved that intercultural awareness has a significant positive influence on both trust and reciprocity-based knowledge sharing motivations. Results also showed that both trust-based and reciprocity-based knowledge sharing has a significant positive influence on innovation capability. The further analysis revealed that the relationship between intercultural awareness and innovation capability is mediated by the trust-based knowledge sharing motivation. However empirical evidence about the mediating role of reciprocity-based knowledge sharing between the intercultural awareness and innovation capability was not found. Overall, representing the first attempt, this paper contributes to the literature by discovering relationships among intercultural awareness, knowledge sharing, and innovation capability, as well as it may assist organizations to design more effective expatriate training programs.

Keywords: knowledge sharing, multinational organizations, intercultural awareness, innovation capability

1.Introduction

Globalization is one of the main trends characterizing the development of world economy while multinational companies are one of the most complex forms of international business organizations. Hiring culturally-diverse employees bring a number of advantages in the forms of new creative ideas, innovations to multinational organizations. Today's challenging business environment has made organizational knowledge a critical factor of sustainable competitive advantage and multinational organizations play important roles in knowledge sharing (Dobrai et al., 2012).

On the other hand, knowledge sharing as a kind of communication often exposed to challenges due to cultural differences, communication competence of interactants' that constitute a strong barrier for people in sharing their knowledge in multicultural environments. As mentioned by Podsiadlowski and Ward (2010), reaping the benefits of the culturally diverse workforce is one the effective ways to fulfill the demands of an increasingly diverse business environment. According to the authors, to get better outcomes from multicultural teams, cultural awareness training might help to increase mutual contact and familiarity that can destroy negative stereotypes as well as barriers to communication. Carr (2010) also highlighted the benefits of cultural training in closing any gaps in mutual misunderstandings among culturally-diverse employees, which might lead to mistrust, frustration (Zimmerman,2010). Without trust, the usefulness of the knowledge (Sondegaard, Kerr and Clegg, 2007) and in the absence of reciprocity or continuity of exchange relationship (Battistella and Nonnino, 2012) will be doubtful. On the other hand, from the studies of Drucker (1998), Storey and Kelly (2002) these characteristics of knowledge sharing constitute a base for the development of innovation.

To analyze different dimensions of globalization and multinational companies, several studies have been conducted to find out the motivational factors of employees' knowledge sharing, such as career commitment, job satisfaction, involvement with the organization, wages, etc. A number of studies shows that cultural differences act as an inhibitor for the knowledge sharing in the multinational organizations. However, to the best of our knowledge, none of the previous studies investigated any kind of influence of intercultural communication dimensions on knowledge sharing and innovation capability. Based on the literature review and to the best of our knowledge it will be the first study that investigates the relationship among intercultural awareness and knowledge sharing motivations that foster the innovation capability in their turn. Therefore, the goal of the current paper is to fill a gap in the literature and answer the following research questions:

1. How does the intercultural awareness affect the knowledge sharing motivations of culturally-diverse employees?
2. Does the intercultural awareness affect innovation capability through the knowledge sharing motivations of culturally-diverse employees?

The paper had been organized as follows: we started with an introduction in Section 1 and presented a general panorama of available literature in Section 2. Next, the hypotheses are developed in Section 3. The research methodology and data analyses are presented in Section 4 and 5 respectively. Finally, discussion and suggestions for further research are presented in Section 6.

2.Theoretical background and literature review

2.1 Knowledge sharing

Given the importance of knowledge sharing attracted researchers to study the factors that contribute to the development of a knowledge sharing process within the organization. Knowledge sharing is vital to the development of competitive advantages of organizations (Le and Lei, 2018), however, organizations often face with difficulties to facilitate effective knowledge sharing practices among employees due to a number of factors (Wang and Hou, 2015).

Within the discussion of influential factors to sharing knowledge, Riege (2005) divided them into three main groups: individual, organizational and technological. Studying the influence of organizational factors, Suppiah and Sandhu (2011) claimed that organizational culture might have a different influence on sharing behaviors of different type of knowledge. According to Wang and Noe (2010), organizational attitudes have a significant influence on knowledge sharing, and previous research found that organizational attitudes including job satisfaction and organizational commitment also have a positive impact on knowledge sharing. Hislop (2003) found that the level of organizational commitment shapes employees' motivation to share knowledge, and a

higher level of organizational commitment increases the probability that employees will provide extra discretionary effort and share their knowledge within the organization (Pee and Lee, 2015).
Liu and Liu's study (2011) focused on the effects of individual factors on knowledge sharing and showed that self-efficacy significantly and positively affects knowledge sharing. Previous studies demonstrated that individual factors: enjoyment in helping others and knowledge self-efficacy (Lin, 2007), altruism (Ma and Chan, 2014), trust (Chow and Chan, 2008; Razmerita et al.,2016) significantly and positively affect knowledge sharing.

Alavi and Leidner (2001), Argote et al. (2003) studied the influence of technological factors on knowledge sharing process (Wang and Noe, 2010). In her study, Lin (2007) found that ICT use positively influences knowledge collecting, however it does not influence the knowledge donating process. Hong, Suh, and Ko (2011) stated that although knowledge sharing knowledge sharing occurs within a social context, however, knowledge management systems have become easier to use due to the support of technology. Being agree with the fact that technology cannot replace human social interaction, which is necessary for knowledge, Chua, (2004) claimed that technology is able to overcome the barriers of time and space in knowledge management activities.

In the context of cultural diversity, Lin (2006) investigated the impact of culture on inter-unit knowledge flows in multinational organizations located in Taiwan. The author concluded her study that culture and characteristics of knowledge significantly influence the inter-unit knowledge transfer processes within multinational organizations while accepting the fact that there could be other factors also can have an impact on inter-unit knowledge transfer in multinational organizations. Lauring (2009) investigated the cultural diversity and the knowledge sharing process in multicultural organizations. Through the case study and analyze of different theories, the author came to the conclusion that little interaction among the employees from diverse cultural background constitutes as one of the main barriers in using each other's knowledge. In order to investigate the barriers for knowledge sharing in the intercultural environment, Kaps (2011) conducted research at an international engineering project team. Communication style, power- hierarchies, language, trust identified as the main challenges for knowledge sharing in intercultural environments. According to the author, to switch from passive knowledge capturing to active knowledge sharing, it is necessary to focus on increasing trust within a company and to design an incentive reward system for employees.

Jiacheng et al. (2010) conducted a survey in China and the USA and came to a conclusion that individuals from different nations had different sensitivities to each type of knowledge sharing motivation and suggested that management should use different incentive mechanism based on the embedded national culture. The authors found that others' appreciation is important for Chinese; compliments and appraisals to the Chinese employees who actively engage in KS would increase their attitudes toward knowledge sharing. In contrary, Americans will follow more individualistic behaviors; unlike the Chinese, they will not share knowledge with the purpose of achieving harmonious relationships. Furthermore, the effects of rewards and punishments also were examined: it was observed that unlike the Americans, to avoid punishment Chinese would support knowledge sharing. And the rewards would develop a positive attitude toward knowledge sharing.

The influence of culture on the knowledge sharing behavior of individuals was also studied by Zhang et al. (2014), who conducted research to investigate the impact of national cultural values on explicit and implicit knowledge sharing in a multi-national virtual class. Cultural dimensions of Hofstede were analyzed, and the results demonstrated that collectivism directly affects knowledge sharing, however, power distance, uncertainty avoidance, and Confucian dynamism have mediated effects on knowledge sharing motivations. It was also found that cultural values, such as concern for face, also affect knowledge sharing.

2.2 Intercultural awareness

Intercultural communication competence refers to the ability to execute effective and appropriate communication behaviors to achieve communication goals in a culturally diverse environment. It comprises three irrelated dimensions: the cognitive dimension (intercultural awareness); the affective dimension (intercultural sensitivity); the behavioral dimension (intercultural adroitness) (Chen and Starosta,1996). The cognitive aspect of

intercultural communication competence, also referred to as intercultural awareness, focuses on changes in individuals' thought process about their environment by understanding both others', as well as their own, cultures (Chen and Starosta, 1996). "The core of intercultural awareness is learning to separate observation from interpretation" (Hofstede, Pedersen and Hofstede, 2002, p.17). Other words, intercultural awareness could be defined as the learning process of values, beliefs, a way of thinking of people from different cultures (Chen and Starosta, 1998)

To the best of authors' knowledge, very few publications can be found in the literature that discusses the relationship between intercultural communication competence and knowledge sharing. Hsu (2012) stated that that knowledge sharing highly depends on interpersonal sensitivity or awareness to cultural differences of expatriates. Furthermore, it was already theoretically and empirically proved by Gong (2003), Colakoglu and Caligiuri (2008), Ravu and Parker (2015) that in multinational organizations sharing and transferring of knowledge often faces with challenges as the cultural distance increases among employees. Presbitero and Attar (2018) empirically showed the impact of intercultural communication effectiveness on knowledge sharing, where the authors found that intercultural communication effectiveness mediates the relationship between anxiety/uncertainty and knowledge sharing.

2.3 Innovation capability

According to Wallin et al., (2011) innovation capability is the ability to achieve innovative outcomes. Laforet (2011) claimed that innovation could only occur if a firm has the capability to innovate. Saunila and Ukko (2013) defined innovation capability as the main determinant influencing an organization's capability to manage innovation. The importance of knowledge sharing for the innovation capability has been theoretically and empirically examined in many studies (Ullah et al.,2017). Zhao et al. (2005), Hogan et. Al (2011) defined innovation capability as the organization's knowledge creation ability and successful execution of those knowledge and creative ideas to gain market value. Al-Sa'di et al. (2017) 's research showed that ability to generate new knowledge from existing knowledge by having a systematic approach to collect employee suggestions and ideas, accompanied with flexible procedures to share and apply new knowledge, will boost innovation capability in both products and processes.

Despite the importance of knowledge sharing for innovation, Storey and Kelly (2002) claimed that inefficient knowledge is the main obstacle to innovation in the service organization.Hart (1995) argued that competitive advantage could be sustained only if the organization's resources are not easily duplicated by its competitors. On the other hand, Lawson and Samson, (2001) linked innovation capability with knowledge due to continuous conversion of new knowledge into products and services.

Summing up the results of literature review, it can be concluded that a knowledge-sharing environment may affect organizational innovativeness, which is indeed an important source for competitive advantage, is an unarguable condition for survival and success in the modern highly challenging business environment. Acknowledging this fact, a number of studies addressed to study the influence of knowledge sharing to the innovation capability and several empirical studies showed a strong positive relationship between them. Several studies have been conducted to find out the determinant factors of employees' knowledge sharing motivations, but little or nothing has been done on the intercultural communication competence dimensions and their effect on knowledge sharing motivations.

The results of the current paper, where the influence of intercultural awareness on knowledge sharing motivations had been proved strengthen the previous studies that knowledge sharing might be influenced not only by technological, individual organizational factors but also by Zhang et al., (2014), Lauring, (2009), etc. Concretely, this paper first provided empirical evidence for the influence of intercultural awareness on knowledge sharing motivations. Second, it is also noteworthy that any kind of effect, direct or indirect influence of intercultural awareness on innovation capability also have not been investigated in the literature. As mentioned by Heizman et al. (2018), despite the recognition of the importance of knowledge sharing for the

success of multinational organizations, existing literature neglects relational and communicative aspects of the knowledge sharing process. Therefore, being the first research that studied the relationship between the cognitive dimension of intercultural communication competence-intercultural awareness and innovation capability will increase the significance of this paper. Furthermore, besides closing the gap in the current literature, this paper offers a new motivating factor for knowledge sharing, as well as provides novel implications for the managers of multinational organizations by highlighting how the intercultural awareness of culturally-diverse employees could influence motivations for knowledge sharing in multicultural environments, which is crucial for innovation capability.

3. Hypotheses development

The relationship between the knowledge contributor and receiver had been defined as one of the crucial factors that influence the motivation to share knowledge (Minu, 2003). According to Huemer et.all. (1998) decisions to exchange knowledge under certain conditions are based on trust Andrews, and Delahaye's (2000) study revealed that without trust formal knowledge-sharing mechanisms were not enough to encourage individuals to share their knowledge with others within the same work environment.

The difference in cultural backgrounds, ways of thinking, norms of behaviors and customs create many difficulties and obstacles for people in understanding and communicating with one another (Zhang, 2015). According to Chen (2010), intercultural awareness is the cognitive aspect of intercultural communication competence that refers to the understanding of cultural conventions that affect how we think and behave. Unawareness about each other's culture leads individuals to uncertainty and the feeling of anxiety (Berger and Calabresem,1975) that causes misunderstandings, which might lead to mistrust, frustration (Zimmerman,2010). Based on the discussion above, it is suggested that the intercultural awareness increases the trust-based knowledge sharing motivation which leads to the following hypothesis:

H1. Intercultural awareness has a positive effect on individuals' trust-based knowledge sharing motivation (in multicultural organizations).

Knowledge sharing is one of the important factors for innovation capability (Nonaka and Takeuchi, 1995, Shih et al., 2006, Chang, 2012). To achieve innovation, firms' employees must share their expertise, knowledge skills, and abilities (Lin, 2007, Camelo-Ordaz et al., 2011).

Despite the importance of knowledge sharing for innovation, Storey and Kelly (2002) claimed that the flow of inefficient knowledge is one of the main obstacles to innovation in service organizations. Trust is one of the key factors that enhances knowledge sharing activities (Hsu et al., 2007, Holste and Fields, 2010). Cummings (2003) related the efficiency shared knowledge with the relationship between contributors and receivers of knowledge. Since individuals might hesitate to share their valuable knowledge due to the fear that the other party will act exploitatively or opportunistically. In this manner, trust mitigates this kind of hesitations (Bijlsma and Koopman, 2003; Madjar and Ortiz-Walters, 2009).

Tufail et al.'s (2016) study showed that a trustworthy environment at workplace motivates employees to share their knowledge. In the early study of Zand (1972) it was stated that when trust exists, people will be more willing to give useful knowledge. Further, Sondegaard, Kerr, and Clegg (2007) claimed that without the trust the usefulness of the knowledge would be doubtful, and this situation will lead to misapplication or misuse of shared knowledge. And in this case, successful execution of those knowledge and creative ideas to gain market value, which defined as an innovation capability by Zhao et al. (2005) will not be possible. Thus, afore-given references motivate us to assume that nourishment of knowledge by the trust will maintain its usefulness to achieve innovation capability. Hence.

H2a. Trust-based knowledge sharing positively affects innovation capability.

H2b. Trust-based knowledge sharing positively mediates the relationship between intercultural awareness and innovation capability.

Many studies have carried out detailed analyses of reciprocity and found that it can be beneficial to knowledge contributors because they anticipate future help from other people. As mentioned by Sun et al. (2009), the existence of a strong norm of reciprocity in the collective, makes individuals trust that their contribution efforts will be reciprocated. Based on the approach presented by Hung et al. (2011), in a knowledge-sharing context a belief that their contribution is worth the effort will lead individuals to contribute knowledge. Since, as explained by Davenport and Prusak (1998), people's time, energy and knowledge are limited. Therefore, without the trust to their counterpart other words, except it is profitable, people are usually unwilling to share these scarce resources with others in the modern highly competitive environment.

On the other hand, Berger and Calabrese (1975) claimed that the lack of enough information about their counterparts during interactions creates uncertainty or ambiguity, which in turn triggers the feelings of anxiety or apprehension of interactants. According to Gudykunst (1995), the level of this uncertainty is particularly high in intercultural communication since the novelty and unfamiliarity induced by the cultural differences are high (Chen, 2010). In this manner, intercultural awareness helps to learn to separate observation from interpretation (Hofstede, Pedersen and Hofstede, 2002), and being aware of cultural differences helps to avoid misunderstandings, which might lead to mistrust (Zimmerman, 2010) among culturally-diverse coworkers. Hence, based on above-given arguments we can predict and suggest that the following hypothesis:

H3. Intercultural awareness positively influences the reciprocity-based knowledge sharing motivation *(in multicultural organizations)*.

Discontinuity in knowledge flow is one of the main obstacles to achieve innovation. Levy (2011) stated that knowledge continuity constitutes a significant advantage for organizations: it enhances creativity, innovation. On the other hand, reciprocity represents a continuous and durable exchange relationship (Battistella and Nonnino, 2012). In the knowledge-sharing context, as mentioned by Shaqrah et al. (2013) by motivating individuals to believe that their efforts will be recompensed reciprocity ensures ongoing knowledge contributions. Therefore, this study proposes the next hypothesis as following:

H4a. Reciprocity-based knowledge sharing motivation positively influences the innovation capability.

H4b. Reciprocity-based knowledge sharing positively mediates the relationship between intercultural awareness and innovation capability.

4. Method

4.1 Research model

Fig.1 illustrates the research model of the current paper. This study predicts that individuals' trust-based and reciprocity-based knowledge sharing motivations are influenced directly by their intercultural awareness. Next, it is proposed that both trust-based and reciprocity-based knowledge sharing motivation positively affects innovation capability. Finally, the hypotheses about the mediation effects of trust-based and reciprocity-based knowledge sharing between the intercultural awareness and innovation capability had been proposed. Data analysis was conducted using SPSS 19 and AMOS version 17.
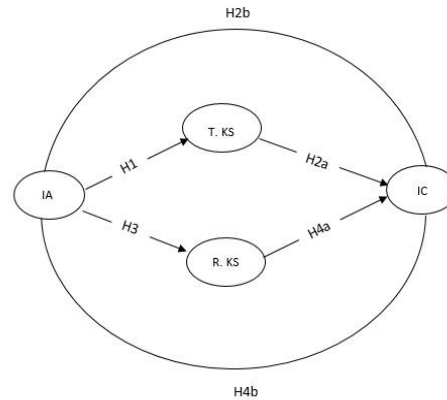
Figure. 1. Research model

4.2. Measurement

The measurement scale for intercultural awareness developed by Kim (2004), coincide with Chen and Starosta's (1996). Trust-based knowledge sharing scale drawn from Shaqrah, Hasheem and Alquirem (2013) and Tsui et al. (2007). Reciprocity-based knowledge sharing was measured with a scale from Kankanhalli et al. (2005) and Hashim et al. (2012). A measurement scale for innovation capability had been developed based on OECD (2005) and Calik (2016).

4.3. Data collection

Table 1. shows the demographic information of the respondents who participated in this study. 380 potential respondents were initially identified, at the end of 3 months, data collection period total of 290 employees of a multinational company participated in the study, from which excluded 28 questionnaires due to their incompleteness. Finally, 262 respondents' questionnaires considered usable, among them 67.2% were males, and 32.8% were females. Most of the respondents (52.3%) have a master's degree, 37 % have a bachelor's degree, 6.1 % have a Ph.D. degree, and 4.6% have a high school education. Regarding the overseas work experience, 18.7 % of respondents had more than 10-years, 37.4 % had 5-10, 27.3 % 3-5, 16.4% had 1-3 years overseas working experience.

Table 1. Demographic statistics.

Demographics	Frequency (N=262)	Percentage (%)
Gender		
Male	176	67.2
Female	86	32.8
Age		
20-29 years old	69	26.3
30-39 years old	145	55.3
40-49 years old	48	18.3
Education		
High school	12	4.6
Bachelor	97	37
Master's degree	137	52.3
PhD	16	6.1
Overseas work experience		

1-3 years	43	16.4
3-5 years	72	27.5
5-10 years	98	37.4
More than 10 years	49	18.7

4.4. Psychometric properties

The model fit indices are X^2 = 452.2, df =253, CMIN/DF = 2.228, IFI= 0.932, CFI= 0.931, TLI =0.922, RESEA=0.069, which confirms that the measurement model is acceptable (Hu et al., 1992). Cronbach's alpha values were higher than 0.70, suggesting acceptable model reliability. The average variance extracted (AVE) values of all constructs were higher than 0.50, and composite reliabilities were over 0.7 that reliability and convergent validity of all measurement indicators had been confirmed (Table 2).

Table 2. Construct reliability and validity.

	Cronbach's alpha	CR	AVE
I.A	0.833	0.84	0.56
TB	0.873	0.88	0.58
RKS	0.837	0.84	0.56
IC	0.940	0.94	0.64

Discriminant validity had been assessed in two ways. First, (Table 3) we checked whether a certain construct's square root of AVE is greater than its correlation with other constructs that indicates a satisfactory level of discriminant validity (Fornell and Larcker,1981).

Table 3. Discriminant validity test 1

	IA	TB	RKS	IC
I.A	**0.750**			
T. KS	0.567	**0.762**		
RKS	0.327	0.281	**0.75**	
IC	0.535	0.738	0.17	**0.80**

Second, we checked whether items load highly on their respective construct and not high on other constructs. The results showed that loadings of items on their respective construct were higher than they cross-loaded on other constructs (Table 4).

Table 4. Discriminant validity test 2 (Cross-loadings)

	Component			
	1	2	3	4
I.A_1	.173	.078	.761	.149
I.A_2	.141	.276	.771	.083
I.A_3	.298	.106	.754	.040
I.A_4	.193	.207	.786	.157
T. KS_1	.281	.718	.137	-.005

T. KS_2	.299	.739	.147	.184
T. KS_3	.333	.757	.112	.014
T. KS_4	.279	.765	.261	.121
T. KS_5	.343	.643	.161	.155
R.K.S_1	-.011	.040	.086	.816
R.K.S_2	.051	.133	.054	.775
R.K.S_3	.024	.152	.150	.815
R.K.S._4	.103	-.026	.085	.825
IC_1	.751	.172	.132	-.037
IC_2	.740	.274	.138	.113
IC_3	.716	.276	.165	.025
IC_4	.800	.318	.146	.090
IC_5	.721	.367	.169	-.001
IC_6	.819	.297	.165	-.003
IC_7	.798	.304	.175	.024
IC_8	.743	.308	.216	.111
IC_9	.801	.003	.135	.080

Note: IA=intercultural awareness; T. KS=trust-based knowledge sharing; R.K. S= reciprocity-based knowledge sharing; IC= innovation capability. The bold numbers in the diagonal row are item loadings on their own construct.

5. Research findings

Regression analysis had been conducted, statistical results reveal that intercultural awareness significantly positively affects both trust-based and reciprocity-based knowledge sharing motivations, which supported **H1, H3** (respectively, $\beta = 0.479$, t=8.8, p<0.001; $\beta = 0.264$, t = 4.4, p<0.001) and answered the first research question of current study. Results also showed that both trust-based and reciprocity-based knowledge sharing motivations has a positive effect on innovation capability **H2a**, **H4a** (respectively, $\beta = 0.669$, t=14.5, p<0.001; $\beta = 0.150$, t = 2.45, p<0.005).

To test for mediating effects, this study followed the steps proposed by Baron and Kenny (1986). In this method mediation tested through following regressions:
1. Independent variable must significantly influence the dependent variable.
2. Independent variable must significantly influence the mediator.
3. Mediator must significantly influence the dependent variable.
4. Independent variable and mediator significantly influence the dependent variable, where the effect of the independent variable on the dependent variable reduced upon the addition of the mediator to the model.

Following this method research results confirmed the significant positive effect of intercultural awareness on innovation capability ($\beta = 0.483$, t = 8.8, p<0.001). (for IA $\beta = 0.211$, t = 4.31, p<0.001 and for TB $\beta = 0.568$, t = 11.1, p<0.001). As it might be seen, the effect of intercultural awareness (IA) on innovation capability (IC) still exists, but in a smaller magnitude, since 0.483> 0.211. Thus, **H2b** had been supported other words, the effect of IA on IC is significantly reduced when the mediator (TK) is added to the model, which confirms the partial mediation effect of T. KS between the IA and IC. Hypothesis **H4b** involved testing the mediation effect of RKS between the IA and IC, however, achieved results did not provide statistical to support this hypothesis.

Table 5. Results of testing

	Hypothesis statement	Result
H1	The positive influence of IA to T. KS	Supported
H2a	The positive influence of T. KS to IC	Supported
H2b	Mediation effect of T. KS between IA and IC	Supported
H3	The positive influence of IA to RKS	Supported
H4a	The positive influence of RKS to IC	Supported
H4b	Mediation effect of RKS between IA and IC	Not supported

6. Discussion and suggestions for further research

The results demonstrated that intercultural awareness has a significant positive influence on both trust and reciprocity-based knowledge sharing motivation. Consistent with the previous study of Zimmerman (2010), this result could be interpreted as: being aware of values, beliefs, a way of thinking of their culturally-diverse coworkers will decrease the probabilities of misunderstandings, which might lead to distrust. Other words, reducing misunderstandings intercultural awareness will positively affect the trust-based knowledge sharing motivation. Besides, reducing an uncertainty or ambiguity that comes from the unawareness about their culturally-diverse coworkers, intercultural awareness will foster the individuals' reciprocity-based knowledge sharing motivation. That's, being aware of values, beliefs, a way of thinking of their culturally-diverse coworkers make individuals trust that their contribution efforts will be reciprocated, this belief in its turn will lead individuals to contribute knowledge.

Results also illustrated that both trust-based and reciprocity-based knowledge sharing has a significant positive influence on innovation capability. Achieved results are consistent with previous studies conducted by Zand (1972), Sondegaard, Kerr, and Clegg (2007) Levy (2011). The results could be interpreted as: motivation that trust and reciprocity give for knowledge sharing will increase the usefulness and continuity of shared knowledge, which in turn are important for innovation capability.

The hypothesis about the mediation effect of trust-based knowledge sharing between the intercultural awareness and innovation capability also supported. Decreasing the misunderstandings and mistrust among culturally-diverse employees (Zimmerman, 2010) intercultural awareness increases the trust-based knowledge sharing motivation, which in turn ensures the usefulness of shared knowledge (Zand, 1972; Sondegaard, Kerr and Clegg, 2007) that has a positive contribution on innovation capability.

Surprisingly, the positive influence of reciprocity-based knowledge on innovation capability could not be statistically proved. A possible explanation to this result could be given based on previous studies by Wasko and Faraj (2000), Hung et al. (2011) who claimed that reciprocity is a long-term influence, thus, over time reciprocity-based knowledge sharing motivation may have a mediator role between intercultural awareness and innovation capability.

The results that obtained through the findings of this study aims to contribute practical and theoretical suggestions to the field of management and to propose new solution methods to overcome knowledge sharing challenges for managers, and organizations. This research work proposed totally new enabler for knowledge sharing and empirically proved the importance of intercultural communication competence to foster knowledge sharing among the culturally diverse employees of multinational organizations. Thus, one of the main implications of the current study for managers of overseas-operated multinational companies is that targeting successful international assignment, they should focus on the holistic expatriate training plan. A successful

training plan should not only intend to overcome language barriers, but also should provide a platform where employees can increase their intercultural awareness and other necessary dimensions of intercultural communication competence. Intercultural awareness in its turn increases the knowledge sharing motivations that are vital for innovation capability of organizations. Besides, the current study also gives an opportunity to compare mediatory roles of knowledge sharing motivations that based on different sources (trust and reciprocity) between intercultural awareness and innovation capability.

This paper has some limitations. First, the current paper only focused on the influence of intercultural awareness on two kinds of knowledge sharing motivations. Therefore, future research might study the impacts of other intercultural communication dimensions on different knowledge sharing motivations. Another limitation of this study is that data were collected in a single round. Taking into consideration the long-term effects of reciprocity-based knowledge sharing, future research might be a longitudinal study that will allow having a clearer idea about the possible mediating role of reciprocity-based knowledge sharing between intercultural awareness and innovation capability.

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How Different Styles of Conflict Management Determine Creativity? Exploring Petrochemical Companies in Oman

Omar Durrah[1], Kamaal Allil[2], Moaz Gharib[3], Abdulkarim Alhamoud[4]

[1] Assistant professor, Department of Management, College of Commerce and Business Administration, Dhofar University, Salalah, Oman, odurrah@du.edu.om
[2] Assistant professor, Department of Marketing and Entrepreneurship, College of Commerce and Business Administration, Dhofar University, Salalah, Oman,kallil@du.edu.om
[3] Assistant professor, Department of Management, College of Commerce and Business Administration, Dhofar University, Salalah, Oman,mnagib@du.edu.om
[4] Assistant Professor, Department of Management, Faculty of Economic and Administrative Sciences, Mustafa Kemal University, Turkey,karimhamoud15@gmail.com

Abstract

Can conflict be turned into creativity if managed in a certain style? This study aims to explore the impact of conflict management styles (Collaboration, Avoidance, and Accommodation) on the creativity in the Petrochemical companies in Oman. Using a questionnaire, data have been collected, applying simple random method, from employees working in two petrochemical organizations. A final 147 questionnaires were valid for statistical analysis. Multiple regression analysis was utilized to investigate the impact of the styles of conflict management on creativity. The results show that only two styles of conflict management, namely (Collaboration and Accommodation) have an effect on creativity, while Avoidance style found to have no significant effect. The implications of this study are discussed.

Keywords: Styles of Conflict Management, Creativity, Collaboration, Avoidance, Accommodation, Petrochemical Companies, Oman

I.   INTRODUCTION

The conflict has been found since the existence of humanity on earth; the first human conflict was between Cain and Abel, Adam's sons. It is considered an inevitable part of dynamic growth or decline (Bercovitch, 1983). In addition, several types or levels of conflict exist, such as conflict that occurs within an individual (intra-personal), conflict between individuals (inter-personal), conflict within a group (intra-group), conflict between groups (inter-group), and conflict within organizations (intra-organizational) (Bercovitch, 1983; Madalina, 2016). Previous research noted that conflict comprises several benefits such as motivating individuals, satisfying certain psychological needs, providing creative and innovative ideas, adding variety to one's organizational life,

and facilitating an understanding of the problems (Omisore and Abiodun, 2014). Thus, the conflict within an organization is not always negative.

On the other hand, new ideas are essential to the survival and success of an organization, and their lacking put the organization at risk of losing excellence and leadership in the market. Heffernan (2015) mentioned that to get true innovation and good ideas, human conflict, interaction, debate, and argument are needed. Chen et al. (2012) also asserted that if the conflict is managed properly, it can increase creative problem-solving, improve interpersonal relationship satisfaction, and lead to better profitability, creativity, and efficiency. Therefore, conflict can be seen as vital and useful to organizations where it can increase productivity and innovativeness, stimulate creative solutions if the right style of conflict management is utilized (Gonçalves et al., 2016; Owens and Valesky, 2007). However, it still remains unclear which style of conflict management is more constructive from the perspective of creativity. Hence, this study came to clarify the effect of the different styles of conflict management on creativity.

II.   LITERATURE REVIEW

Conflict Management Styles
Conflict management implicates planning effective strategies to reduce the abnormality of conflict and to boost the constructive functionality of conflict in order to enhance organizational effectiveness (Rahim, 2002). It also involves taking rapid and effective measures defined to avoid nonproductive conflict when possible (Shahhosseinia and Taghizadeh, 2016; Madalina, 2016). Conflicts have a significant effect on the outcomes of an organization, and to attain the optimal outcome, conflicts must be appropriately resolved (Wang et al., 2016). In addition, conflict management indicates not only conflict resolution but conflict stimulation, too. There is a desired level of conflict that maximizes organizational performance (Verma, 1998). Another point of view is that managers are eager to know how to stimulate a conflict at optimal levels to boost risk-taking, creativity and long-term performance (Rahim, 2001).

Conflict management styles can be defined as the behaviors people enact during conflicts. In the Dual-Concern Model (Pruitt and Carnevale, 1993; Pruitt and Rubin, 1986; Rahim, 1983) conflict management styles can be situated along two dimensions, namely 1) concern for the own outcomes (won interests) and 2) concern for others' outcomes (relational interests) that lead to four basic styles of conflict: accommodation, avoidance, collaboration and Forcing.

In *accommodation* style, low care for one party's own goal combined with high attention to the benefits of or the relationship with the other party. So, here the accommodating party agrees with the wishes, needs, and ideas of the other party. Therefore, the more constructive opinion may not be utilized due to this style. In addition, inappropriate use of this style may lead to loss of relation that they wish to maintain (Huan &Yazdanifard, 2012). Another term has been used for accommodation in the literature is yielding and Obliging(Oetzel et al., 2001)

In *avoidance* style, conflict issue receives little attention because the problem is trivial or minor and avoiding parry wish to stay away of any confrontation with the other party (Van Erp et al., 2011). This style is real in collectivistic cultures, mainly in Asian societies (Oetzel et al., 2001). People in this style always stay away from conflict, they pretend that everything is okay. People who favor the avoidance style tend to ignore conflict (Rahim, Antonioni, and Psenicka, 2001). They usually use this style to maintain a harmonious situation (Huang, 1999). The benefit of avoidance style is that it can maintain the relationship between employees and managers in the organization, while the weakness of this style that it does not resolve the conflict. In fact, avoiding the problem does not make it go away, but make it worse (Montoya-Weiss, Massey and Song,2001). In addition, tt is inappropriate style when the immediate act is needed or when the two parties can not postpone(Rahim, 2002).
In *collaboration* style, high attention to one's own goals combined at the same time with high attention to the interests of the other party. So, here one party agree with the wishes and ideas of another party. It is a win-win

style that search for creative and optimal solutions that meet both parties' interests. Another term has been used for accommodation in the literature is cooperation, problem-solving, or integrating (Leung et al., 1990). In this style, people clear away the conflict with a solution acceptable to all parties to make all parties satisfied with the final resolution (Montoya-Weiss et al., 2001). People follow this style attend and communicate the conflict openly and neutrality with the other parties (Flanagan & Runde, 2008).

In *forcing* style, one party imposes a solution on the other party with care for one's own goal combined with little attention to the interests of or the relationship with the other party. Different terms have been used for forcing in the literature such as contending, dominating, or adversarial style (Baillien et al., 2014). Persons who use this behavior to solve the conflict may force other persons in order to achieve their objectives. They use threats, intimidate and authorities styles to force the parties to agree with it (Lussier, 2010). Therefore, this style is considered a negative conflict management style that may decrease group performance, and it creates anger and aggression toward its users (Huan &Yazdanifard, 2012). However, one advantage of the forcing style is enhancing the organizational decisions if the force is correct.

However, in the current study, only three styles of conflict management from the Dual-Concern Model will be addressed, namely accommodation, avoidance, and collaboration. Forcing style was excluded from this study due to the collective culture of Oman. Several researchers noted that people in collective culture tend to prefer harmony-enhancing styles of conflict management (Barnlund, 1989; Leung et al., 1990). In addition, forcing style tend to extremely harm the relationship and lead to bullying in the organizations (Baillien et al., 2014).

Creativity

Creativity is defined as new and useful ideas, rules and procedures that restrict improvisation and experimentation (Sarooghi et al., 2015). It also refers to transforming the existing products into unique products and offering a unique product. According to Robbins and Judge (2013), creativity means combining ideas in unique ways or create continuity between the ideas. Creativity, therefore, is considered a key input for recognizing business ideas (Smith et al., 2016). Creativity is seen as a behavior that generates useful ideas for the development of the organization, and leaders play a vital role in promoting creativity by promoting openness and applying non-traditional and imaginative thinking while solving the problem (Ellen Mathisen et al., 2012).
Organizations will never be able to continue their lives without creativity and innovation (Holagh et al., 2014; Durrah et al., 2017). To have a creative and innovative idea, it is necessary to have the following three attributes: (Subjectivity, Novelty, and Effectivity). Shahhosseinia and Taghizadeh (2016) noted that knowledge and information are the basis for creativity. The culture of creativity depends on many factors such as structural characteristics and management practices (Yılmaz, 2010). The difference in personality traits can affect creativity styles (Ee et al., 2007).

The general atmosphere leads to cooperation and creativity, and it is a proven fact that the perception of the relationship between the person and the environment and creativity is conditioned by the personality traits and the different perceptions of the surrounding world (Durrah, et al., 2015; Sokol et al., 2015).

Conflict Management and Creativity

For true innovation and good ideas, human conflict, argument, and debate are needed (Heffernan, 2015). Adamas (2006) also noted that encouraging diversity among team members is essential. Thus, the key to creativity lies in encouraging interaction and conflict among employees. Successful organizations require their employees to think creatively and to integrate conflicting demands (Miron-Spektor et al., 2011). Conflicts generate creative decisions, but the conflict, argument, and debate of tasks are detrimental to their implementation because of disagreements and a reduced willingness to work together in the future as a group (Jehn and Bendersky, 2003). Task conflict can be useful for creativity because it increases the tendency of group members and scrutinizes their task issues (Bai et al., 2016). So, the conflict has to be stimulated, as it has a positive influence on the innovation and creativity of employees.

There are a number of outcomes of resolving the conflict in an appropriate and effective manner such as maximum efficiency, talent, and creativity (Shahhosseinia and Taghizadeh, 2016). Creativity helps problem-solving, yet our understanding of it is still forming. In addition, it seems problem formulation and problem-solving concern different domains of creativity (Schmidt, 2016).

Working environments with conflict at undesirable levels are less likely to maintain creativity (Morris, 2004). The optimal level of conflict can stimulate creativity when resolving and handling issues. Therefore, conflict is considered positive in organizational environments (Omisore and Abiodun, 2014).

Thus, some conflict is important to make the relationship more reliable and interesting, and even conflict is essential to group innovation and creativity (Johnsen and Lacoste, 2016). Hence, conflict can be constructive in work settings. However, conflict at an undesired level can be harmful for the organization (Omisore and Abiodun, 2014). In other words, the relationship between conflict in the organization and creativity takes a positive direction to a certain extent and then can turn into a negative trend. Thus, from the above-mentioned literature, this study is trying to examine the following Hypotheses:

H_1: *Collaboration* style has a positive impact on creativity.
H_2: *Avoidance* style has a positive impact on creativity.
H_3: *Accommodation* style has a positive impact on creativity.

III.   RESEARCH METHODOLOGY

Research Measures
This study contains two main variables; the conflict management styles represent the independent variables of this research. The scale has been adopted based on Rahim Organizational conflict inventory II ROCI-II (Rahim, 1983; Rahim and Magner, 1995) measured by 19 items (Collaboration (7 items), Avoidance (6 items), and Accommodation (6 items). The dependent variable of this research was the creativity, and its 13-item scale has been adapted from Zhou and George (2001). A Likert scale has been adopted that includes five grades from strongly disagree to agree strongly.

Research Sample
The research was applied on two petrochemical companies, namely: 1) The Oman Liquefied Natural Gas LLC (Oman LNG) and 2) The Oman India Fertiliser Company (OMIFCO) located in the South East Governorate of Oman. Using a questionnaire, data were collected via random sample method from employees in administrative, technical, and production departments. (147) out of (200) questionnaires distributed (87%) were suitable for statistical analysis (99 from Oman LNG and 48 from OMIFCO)
The sample comprised (72.79%) males and (27.21%) females, due to the industrial nature of the company. The participants' age percentage was (61.22%) for ages less than 35, (34.02%) ranged from 35 to less than 45 years and (4.76%) aged 45 and older. As for the education of the participants, high secondary school or less (9.53%), diploma (38.77%), bachelor degree (42.17%), higher Studies (9.53%). Regarding years of experience, (21.1%) have service less than 5 years, (40.13%) for 5 to less than 10 years and (38.77%) for 10 years of service and more. As to functional position, (30.61%) of administrators, (8.16%) financier, (6.12%) marketers, (36.74%) technicians, and (18.37%) from other departments.

IV.   RESULTS AND DISCUSSIONS

Reliability
Cronbach's alpha used to measure reliability. Table 1 displays the results of reliability analysis for conflict management styles and creativity. The coefficient values of all research variables were above (0.7) indicating that all variables are reliable.

Table 1: Reliability Coefficient Analysis

	Cronbach's Alpha	No. of items
Collaboration	.822	7
Avoidance	.919	6
Accommodation	.748	6
Creativity	.876	13

Validity
Both Content and Face validities were examined in this study. During the development stage of a questionnaire, Crano and Brewer (2014) emphasized that a safe and sound means to assure content validity is through consulting a panel of expert. Thus, in the current study, content validity was evaluated by consulting five professors specialized in HRM and management at Dhofar University.
After the measure has been developed, Face validity was also determined (Nunnally and Bernstein, 2010). A group of 16 people working in the two companies was requested to review and evaluate the questionnaire. According to their recommendations, changes were implied in the measurement instrument.

Mean and standard deviation of variables
Table 2 illustrates the descriptive statistics (arithmetic mean, standard deviation) of job conflict management styles and creativity. The comparison among conflict management styles displays that the most effective style used by employees to manage conflict is the Collaboration, followed by the Accommodation and lastly Avoidance.

Table 2 shows that the collaboration style has a very high value and play the main role in managing conflict, and shows that it is essential for employees to integrate the wants of conflicted ones into a suitable solution maximizing the benefits for both parties. In addition, the mean value of accommodation style, as shown in Table 3, is high. This implies that employees are usually sacrificing their own aims to satisfy the needs of others. However, the conflict style has a medium-level value that is slightly higher than the hypothetical mean (3) and indicates that employees will sometimes allow conflicts to go unresolved. This information can be considered useful for managers when solving employees' conflict matters. Moreover, table 3 shows that the level of creativity in the organization is high.

Table 2: Means and Std. Deviations of Conflict Management Styles and Creativity

	Mean	Std. Deviation
Collaboration	4.3033	.47392
Avoidance	3.1971	.91371
Accommodation	3.8074	.57181
Creativity	4.1222	.45829

n = 147

Correlations among Variables
Table 3 shows the correlation coefficients among the research variables. As it is clear from this table, different styles of conflict management had a different relationship with creativity. The result shows that there is a moderate and positive correlation (.524) between collaboration and creativity. This relationship was highly significant (p=0.000). This result reveals that the higher the collaboration style level, the stronger will be the creativity. However, the correlation coefficient for avoidance and creativity was a negligible positive correlation (.166), and it was significant (.045). Finally, the result for accommodation style and creativity was highly

significant (p=0.000) with low positive correlation (.428). This result indicates that employees who practice the accommodation style, have a higher possibility for creativity in an organization.

Moreover, the results show that there is no significant correlation between collaboration and avoidance styles that imply that those employees who practice the collaboration style are less likely to follow the avoidance style. However, there was a positive correlation (.406) with high significance (.000) between avoidance and accommodation styles and imply those employees who practice avoidance my practice accommodation style, too.

Table 3: Correlation Coefficients

	1	2	3	4
1. Collaboration	1			
2. Avoidance	.149	1		
3. Accommodation	.406**	.456**	1	
4. Creativity	.524**	.166*	.428**	1

** Correlation is significant at the 0.01 level;

 * Correlation is significant at the 0.05 level

Multiple Regression Analysis

To test the hypothesis, multiple regression analysis was used as depicted in Table 4. Both collaboration and accommodation styles appear to have an effect on creativity with a significant value of $\beta = 0.419$ and 0.265 (p = .000 and .002), respectively. These results show that both H1 and H3 are not rejected, while the result showed that avoidance style has no influence on creativity $\beta = -.017$ (p = .823), so H2 was rejected.

Table 4: Multiple Regression Analyses

Independent Variables	ß	T	R	R^2	F
Collaboration	.419***	5.568***			
Avoidance	-.017	-.224			
Accommodation	.265**	3 .174			
			.575	.330	23.325***

*p< 0.05, **p< 0.01, ***p< 0.001, n=147

V.   Discussion and Implications

As stated earlier, the aim of the current research is to examine the effect of conflict management styles on creativity. Both collaboration and accommodation styles were found to have a significant and positive impact on creativity; whereas the results revealed that avoidance style had no influence on creativity. This positive influence of collaboration style on creativity reveals the strong relationship between the two variables and also reflects to the features added by collaboration to the creativity values such as problem-solving, changeability, and the spirit of taking risks and this evidence provide managers an idea on how to trigger creativity by focusing on collaboration style of conflict management. On the other hand, the results show that avoidance style has no effect on creativity in the petrochemical industry, and these results reveal that there is no role of avoidance style to affect creativity, and these results require the HR managers to give training for their employees to avoid practicing avoidance style while managing conflict. Also, the study indicated that the accommodation style has a

significant effect on creativity. There was a scarce in the literature regarding the studies that address the direct effect of conflict styles and creativity.

VI. Practical Implications

Based upon the above mentioned, it can be argued that the conflict management collaboration and accommodation styles influence creativity positively. Therefore, Petrochemical Companies in Oman should pay more attention to styles of conflict management practices by employees to build creativity and which in turn leads to better solve problem abilities, changeability, and spirit of innovative working. In addition, HR managers need to support the collaboration style by enhancing trust among employees. Trust provides employees the confidence to be open and encourage them to exchange of information to reach to the optimal solutions (Bacon and Blyton, 2007). However, employees will be reluctant to share problems and areas of mutual concern knowing that the information will be used against them (Zaheer and Zaheer, 2006). Moreover, managers need to develop and implement cooperative problem-solving processes by spreading the spirit of open-minded discussion of conflicting perspectives through listening and understanding each other's opinion and concerns. These recommendations are not easy to implement in a short span of time; however, when done, they can boost business creativity successfully and effectively.

VII. Limitation and Future Research

This study provides help policymakers of companies to employ a suitable style of conflict management as it is found to be one of the main drivers of creativity in an organization. On the other hand, this study has several limitations: the results cannot be generalized, due to small sample size, also, the study focused on the petrochemical industry. So, future researchers can examine other industries with larger sample size.

VIII. Conclusions

This study has investigated the effect of three styles of conflict management on creativity in the Omani context with reference to the petrochemical sector. The findings offer an understanding of employee behavior in the petrochemical organizations in Oman and thus provided managers an insight to understand how to use different styles of conflict management in enhancing the creativity of employees. So, the current study confirms that the concepts of conflict management are without a doubt are essential and critical factors for the petrochemical companies in particular and for other sectors in general.

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Study on the Influence of Error Management Culture on Star Hotel Employee Turnover Intention – Taking Food and Beverage Department Employee for Example*

Hengfa Zhang[1], Peng Li[2], Yiqing Lv[3]

[1] Shenzhen Tourism College of Jinan University, Shenzhen, China
[2] Shenzhen Tourism College of Jinan University, Shenzhen, China
[3] Shenzhen Tourism College of Jinan University, Shenzhen, China

Corresponding Author: Yiqing Lv, Shenzen Tourism College of Jinan University, Shenzhen, China. Email: lv_yq@sz.jnu.edu.cn

Abstract

Taking error management theory as the entry point, the paper probes into the determinants of star hotel employee turnover intention through the study on the correlation among star hotel organization error management culture, employee job satisfaction and turnover intention. The mediating effects of employee job satisfaction on error management culture and turnover intention verify the influence of corporate management culture on employee job-hunting intention. The empirical results show that there exists a positive correlation between error management culture and employee job satisfaction. Employee job intention would reduce individual turnover intention, and job satisfaction exerts certain mediating effects in this process; positive error management culture as an important variable could effectively manage employee turnover intention. Companies should realize the importance of building a system which could give timely response and communication to any erroneous actions of employees in accordance with error management theory and prevent the re-occurrence of the same error by sharing experience and knowledge so as to incorporate "erroneous system management" into corporate culture as an indispensable component.

Keywords: Error Management Culture, Job satisfaction, Turnover Intention, Hotel Employee, Star Hotel

1. Introduction

Along with the advent of consumption individualization era, primitive star hotel hardware facilities could no longer satisfy the increasingly mature consumption demands. Nowadays, competition among star hotels mainly focuses on centralized in the soft power under identical hardware conditions. On account of an identical hardware level, one of the important indicators for consumers to choose hotels is service quality. High-quality

service is able to improve consumers' satisfaction and loyalty, thereby attracting new consumers, retaining old consumers and ensuring the stable development of the hotel. As a result, hotel pertains to the service industry and employee constitutes one of the foremost competitive forces, the competition among hotels is the competition of employee quality in nature.

For seeking sustained development, the hotel must build an excellent and stable employees team. Extraordinary corporate management culture could more highlight corporate core competitiveness and create more powerful market competitive advantages and higher market shares for companies. However, human resources in the Chinese hotel industry confront not only external short supply crisis, but also internal management problems such as low job satisfaction, high employee turnover rate and low corporate organization efficiency. Employee turnover will result in the instability of hotel service quality and even consumer loss, which in turn weakens the competitiveness of the hotel. As indicated by the investigation results of American Marriott Hotel, if employee turnover rate reduces by 10%, the corresponding consumer loss rate will reduce by 1%-3%, and business turnover will increase by 5%-15%. Under such circumstances, sparing expenses nearly exceed gross profits and hotel service quality also obtains assurance. Whereas, most hotel companies in China ignore the influence of corporate culture on operation and management and overlook personnel management fundamentally. This is the reason why employee turnover rate in the hotel industry always remains at a high level.

Employee turnover intention is subject to multiple factors. Most scholars consider that the variable of job satisfaction would produce a negative influence on employee turnover intention and they tend to view organization efficiency as the second foremost influential factor in job satisfaction. However, organization efficiency is actually up to corporate managers' management and culture. Scholars also fully agree with the connection between management culture and turnover intention. In recent years, the research topic on management scope has aroused more and more attention from numerous scholars, in particular, error management culture. The hotel industry is the representative of the service industry, and hotel service reflects more personalized demands. Therefore, it is extremely difficult to proceed systematic quantitative control of this research topic. Error management is an important means to ensure quality control and improve service quality (Guchait, 2012). In the hotel industry, production and consumption take place concurrently. The inevitable occurrence of errors during the service process emphasizes the necessity to conduct error management culture study on the hotel industry. Hotel industry quality control provides effective referential standards and improves employee work attitudes. As pointed out by Dyck et al. (2005), error management culture not only helped the company obtain positive employee response (such as higher productivity, more complete service and stronger adaptability) and consolidate employment relationship but also created certain culture and environment which could give timely early warning and take actions for errors. Guchait et al. (2014) held the opinion that in the service environment, error management culture was able to shape more effective error response-ability. Under error management culture atmosphere, the support from managers and colleagues reassured the mindset of employees and allowed the company to more efficiently deal with accidents and quickly recover service quality even in case of any errors.

Therefore, this paper takes error management culture as the entry point and lists star hotels in Shenzhen City as the research object to discuss the correlation among corporate error management culture, employee job satisfaction and turnover intention and provides a new research orientation and perspective for high-end hotel human resource management.

2. Literature Review

2.1 Error Management Culture

2.1.1 Concept of Error Management Culture
In 1994, Klein proposed that error management culture would be more efficient at the organization layer than the individual layer. Van Dyck et al (2005) defined error management culture as a kind of culture where organization members mutually communicated, shared and corrected errors and then analyzed and processed

errors with formal organization procedures and practice. Xie Yangqun started from the perspective of erroneous information to explore error management culture and considered error management culture indicative of organization attitudes towards work as one of the key components in organization culture. Organizations could efficiently prevent the re-occurrence of errors as long as they encouraged error report actions institutionally. As pointed out by Bakker et al (2004), error management culture provided "work support" for organization members so that organization members were able to freely consult or help each other. On the contrary, under the management environment against errors, errors were taken as negative examples that should be avoided and prohibited from sharing. According to their opinions, once employees acutely perceived organization support, they were unlikely to leave office because they believed that the organization authentically cared about their welfare. The research showed that error management culture often brought about work incentive and psychological security to organization members. As a special form of error culture, error management culture contributed to the improvement of organization performance and organization security. The low flow of employee on this basis made for the long-run development of organizations.

The error management culture has two distinctive characteristics based on previous studies: (1)Mitigating aftermath by controlling errors; (2) Learning from errors. In error management culture, negative effects of errors could be decreased by controlling the aftermath and organizations could augment the positive effects of errors by learning, boosting initiative and drawing experience to enact more sound error response strategies. As a result, prominent control and learning characteristics in error management culture enable errors to be efficiently processed and coordinated and in the meantime make higher product quality and service quality possible (Van Dyck, 2005).

As mentioned above, it is the best way to share rules, experience, values and practice strategies inside an organization by incorporating error management into organization culture. Error management culture refers to the sum of a series of behavioral activities and attitudes in which the organization manager aims to make full use of positive error utility and internal adjustment to lower the negative influence of errors. Under error management culture, resources including error communication, error analysis, error learning, and error ability (effective error handling strategy) help employees boost work performance, efficiently handle problems, and give necessary help to organization members if required.

2.1.2 Dimension and Measurement of Error Management Culture

In 2000, VanDyck classified the dimension of error management culture for the first time and grouped the basic contents of error management culture into four dimensions to fabricate an error management culture scale. In particular, the dimension of error mastery, error communication, and error risk-taking belonged to positive error management culture, while the dimension of error antipathy belonged to negative error management culture. In 2005, VanDyck further refined the measurement scale based on previous research findings to design the new error management culture scale, including 17 items in the dimension of error learning, error ability, error thinking, and error communication. Especially, error learning was the method by which organization members summarized experience and lessons and actively learned problem-solving measures from errors; error ability was the ability of organization members to actively undertake risks and dispose of errors; error thinking was the measure taken by organization members to actively analyze the causes of errors and reflect over possible solutions; error communication was about whether organization members could have open communication and exchange existing errors and find the most effective problem-solving way via sharing and communication. This scale used for measuring the positive error management culture inside the organization had been universally acknowledged and widely applied by the academic community.

In combination with the research orientation of the paper, compilation of error management culture scale should refer to the error management culture theory supplemented by VanDyck in 2005 and the adapted scale concurrently so as to give a more efficient and comprehensive assessment on employees' attitudes towards the error management culture shaped by organization work environment.

2.2 Job Satisfaction

2.2.1 Concept of Job Satisfaction
Job satisfaction refers to employees' virtuous feelings and psychological state about their work and relevant matters (work environment, state, manner, pressures, challenges, interpersonal relationship, etc.) in the organization. Job satisfaction plays a vital role in organization management behaviors because of its impacts on member value judgment and psychological health. Additionally, employees who have higher job satisfaction also leave positive impacts on surrounding colleagues and work atmosphere (Dawal, 2006). The concept of "job satisfaction" was coined by Hoppock in his masterpiece *Job Satisfaction* issued in 1935 which defined job satisfaction as employees' subjective perception and reaction towards environment factors in psychology and physiology. Under the strenuous exploration, study and analysis made by numerous scholars for job satisfaction, definitions of job satisfaction could be generally classified into three categories although no consensus has been derived yet - namely, comprehensive definition, expected gap definition and expected gap definition (Xu Shijun, 1997). (1) The alleged job satisfaction gap definition means employees' total and general attitudes towards work and work environment. This definition views job satisfaction as a single concept, excluding any consideration about the dimension, formation causes and process of job satisfaction. (2) Job satisfaction expected gap definition reveals the gap between employees' perceived personal rewards and due rewards. In reality, it is the gap between "the acquired" and "the expected." When the perceived gap narrows, employees would have higher job satisfaction and vice versa. Expected gap definition is also known as "need deficiency definition." (3) The job satisfaction reference framework definition is the result obtained by employees after explaining the properties of work as per specific reference framework, and also the perception of employees towards every aspect and level of work.

2.2.2 Dimension and Measurement of Job Satisfaction
The dimension of job satisfaction is actually the influential factor of job satisfaction. In earlier research stage, the research of Hoppock et al. on the influential factors of job satisfaction mostly started from the material level. Together with the progress of the society, people start to concentrate on different things, and scholars start to consider the psychology and spirits of employees. Locke (1969) presented that the dimension of job satisfaction could be grouped to work-related factors and actor-related factors. In particular, the former included work, work rewards, work environment, and the latter included actor, internal and external organization members. The study on job satisfaction in China began in the 80s and then developed in combination with overseas research findings and practical conditions of Chinese companies. Yuan Shengli (2002) carried out a classified study on the influential factors of job satisfaction from the perspective of the individual. Work and companies were covering individual factors, including age and years of working, while work factors included work post, employee work, and learning opportunity, work challenges, colleague relation, leadership style, etc. Liu Yun (2005) conducted the research on job satisfaction from the perspective of work returns (salary welfare, promotion training, individual growth, work conditions) and psychological comfort (leadership management ability, interpersonal relation, work challenge). Kuang Jiaqing (2014) theoretically defines the job satisfaction of hotel employees and constructs a hotel employee satisfaction evaluation model based on the concept of employee satisfaction. It is evaluated in five aspects: job content satisfaction, job environment satisfaction, job return satisfaction, management status satisfaction, and career development satisfaction. Tang Jianxiong et al. (2013) studied the influence of leadership social responsibility orientation on hotel employee satisfaction. JDI (Job Description Index) was used to simplify the scale. Empirical research was conducted to measure employee satisfaction. Empirical research showed that the most important factors affecting employee satisfaction were job reward and employee social responsibility to leaders. Perceived orientation, working environment, and working relationship. Wang Xing et al. (2017) based on the moderating effect of inter-generational differences, made an empirical study on Hotel employees' job values and job satisfaction. The study shows that inter-generational differences have moderating effects on job engagement and job satisfaction. In summary, the paper will refer to Yuan Shengli's empirical theory in job satisfaction dimension measurement. While designing the questionnaire in accordance with the influential factors of job satisfaction, the paper emphasizes the influence of leadership level, learning opportunity and colleague relation on hotel employee job satisfaction.

2.3 Employee Turnover Intention

2.3.1 Concept of Turnover Intention
Overseas economists and business scholars already cast their eyes to the study on turnover intention. Hulin and Miller (1979) expressed that turnover intention was turnover thought and job-hunting attitude or general presentation, and an important variable used to predict turnover behaviors. Brown and Peterson (1993) mentioned in their research report that turnover intention was a key factor useful in the prediction of employees' variation actions and in general, it was defined as the behavioral indicator of employees' actual turnover intention. Tett and Meyer (1993) regarded turnover intention as the "purposeful intention to leave the organization." Mobley (1997) defined turnover intention as the intention for employees to leave the organization upon thoughtful considerations after working for a certain period. In other words, the turnover intention could best predict the possibility of turnover behavior since it was in the last stage when employees really planned to resign the office and sought another job. In summary, this research will refer to the argument of Mobley (1997) to give a definition for turnover intention.

2.3.2 Model and Measurement of Turnover Intention
How to measure turnover has always been the core question in turnover research. With the deepening of relevant discussion and study on turnover intention, scholars and scientific institutions across different countries successively develop multiple turnover intention models. The model developed by Mobley (1997) brings forward the sequence problem of mediating variables concerning job satisfaction and turnover for the first time, finding that employees' satisfaction or dissatisfaction about work assessment results would produce an influence on their turnover intention. The model summarizes that the three main influential factors of employee turnover intention are job satisfaction, work expectation, and appeal of other possible job opportunities. On account of previous models, Price and Mueller (1981) started from multiple perspectives (psychology and economics) to observe the influential factors of turnover intention. In line with the research needs of the paper, turnover intention measurement and model citation will consult the research scale of Mobley (1997) which contains the alteration of employees' impressions on the company, generation of turnover intention, job-hunting behaviors, the possibility of finding a new job and other variable factors.

2.4 Relation Model of Error Management Culture, Job Satisfaction, and Turnover Intention

2.4.1 Relation between Error Management Culture and Job Satisfaction
As it is, rare studies pay attention to the correlation between error management culture and employee job satisfaction. Lee (2011) clearly showed the significant role of error management culture in the improvement of employee job satisfaction and social integration. Hartnell et al. (2011) proved in the empirical research that when organization culture provided a supportive environment for employees (such as higher participation degree, sharing degree and communication degree), employees' attitudes (satisfaction and integration degree) would be positively affected. Lee (2011) added that the organization might reinforce employee job satisfaction by systematically managing culture and disposing errors and beyond this point, faster error response speed would result in higher job satisfaction. Guchait et al. (2016) observed the close intimacy between error management culture values and job satisfaction. In comparison, those employees who had higher job satisfaction would have stronger ability to dispose things and recover services in case of any errors. O'Reilly Chatman and Caldwell(1991) insisted that organization stability had a close connection with values and error handling means. Likewise, another research also demonstrated the positive influence of stability on employee job satisfaction and accordingly verified the major relation between error management and job satisfaction (Nasab & Shahrakipour, 2015). To sum up, as per previous research and theoretical evidence, the research assumes that error management culture will produce a positive influence on employee job satisfaction.

2.4.2 Relation between Job Satisfaction and Turnover Intention
Based on the "attitude-intention-behavior" model raised by scholar Fishbein and Ajzen (1975), job satisfaction possibly affects employee turnover intention and behaviors. In 2001, Lambert et al. clarified in empirical research on job satisfaction and turnover intention that the influence of job satisfaction on turnover intention was

natural and job satisfaction was a decisive antecedent in job turnover intention. Chen (2006) put forward that the connection between job satisfaction and employee turnover intention was much closer than that between job satisfaction and employee detention intention. Singh and Loncar (2010) perceived that the two influential variables of employee job satisfaction and salary satisfaction, the former obviously exerted more influence on turnover intention. Tnay (2013) stated in the report that job dissatisfaction was the main cause of employee turnover behavior. Javed (2014) noticed that when employees felt satisfied with their own work, their turnover rate would decrease and additionally, employee job satisfaction generated more influence on turnover rate than work performance. While Saeed et al. (2014) suggested in empirical research that employee job satisfaction had a greater influence on turnover intention than work participation, work performance and change of unit. They stressed that employee job satisfaction would produce a maximum influence on work transfer decisions. In conclusion, the connection between job satisfaction and turnover intention is very intimate. To be more specific, relatively higher job satisfaction would give rise to relatively lower turnover intention, and relatively lower job satisfaction would give rise to a relatively higher turnover intention.

2.4.3 Job Satisfaction as a Mediating Variable in Error Management Culture and Turnover Intention
Since there still lacks any direct study on error management culture and employee turnover intention, this research aims to verify the negative influence of error management culture on employee turnover intention under the mediating effects of job satisfaction. Egan et al. (2004)listed the similarities between organization learning culture and error management culture because they sought continuous improvement means of the organization through the regulation of job satisfaction in turnover intention. Aarons and Sawitzky (2006) alluded in the report that the influence of constructive and participatory management culture on employee turnover intention was totally mediated by work attitude (satisfaction, participation), which implied that employees might decrease their job satisfaction and even make job transfer or turnover decisions because of improper organization culture. Park and Kim (2009) ascribed the influence of organization culture on turnover intention to job satisfaction. Biswas(2010) found the mediating role of job satisfaction, concluding that organization culture generated a negative influence on turnover intention through manipulating job satisfaction. Maclntosh and Doherty (2010)[29] also proved the finding in their research. They thought that the influence of organizational culture on employee turnover intention was completely regulated by job satisfaction and although organization culture did not directly result in a job transfer, it still affected employee turnover intention by affecting employees' job satisfaction. Moreover, as announced by Lobburi (2012) organization support or culture dimension related to job satisfaction (such as justice of rewards, access to the decision-making process, possibility to obtain support and help) would produce an influence on employee turnover intention. Emerson (2013) claimed that the care and respect for employee culture would not directly affect employee turnover intention, but indeed exerted indirect influence via job satisfaction. He emphasized that job satisfaction played complete mediating effects between organization culture and employee mobility intention. Goi (2013) agreed with the mediating effects of job satisfaction, revealing that job satisfaction varied with organization management culture and accordingly affected employee turnover intention. Pattanayak (2014) believed that employees never made turnover decisions because of organizational culture or organization atmosphere, but the two factors indeed lowered employee job satisfaction and triggered turnover intention. In another word, job satisfaction had complete mediating effects on turnover intention while job satisfaction as the mediator tended to reinforce the positive relation, such as the relation between error management culture and low turnover propensity. Accordingly, this research concludes that error management culture indirectly affects turnover intention by virtue of job satisfaction but does not exert any direct influence on it.

3. Research Method

3.1 Variable Setting

（1）Error Management Culture
Error management culture refers to the sum of a series of behavioral activities and attitudes in which the hotel organization manager aims to make full use of positive error utility and internal adjustment to lower the negative influence of errors. Positive error management culture is characterized by two features: (1) reducing aftermath

by controlling errors; (2) learning from errors. Error management culture in this paper consists of error learning, error ability, error thinking, and error communication.

（2）Job Satisfaction

Job satisfaction refers to hotel employees' perception and response to their work and other aspects and levels related to work. This definition refers to the reference framework definition given by Smith et al. (1969). Job satisfaction is defined as a single dimension in this paper. In accordance with the job satisfaction scale proposed by Spector (1985), the paper altogether selects six relevant measurement items in combination with the research subject to have deep insights into hotel employee job satisfaction from leadership, learning opportunity, colleague relation, etc.

（3）Employee Turnover Intention

Turnover intention refers to the intention for employees to leave the hotel organization upon thoughtful considerations after working for a certain period. This definition cites the opinion and measurement model of Mobley (1997). The turnover intention in the paper is a single dimension too.

3.2 Research Hypotheses

This paper primarily investigates the influence of hotel error management culture on employee turnover intention and discusses the utility of job satisfaction in error management culture and turnover intention. Pursuant to numerous scholars' explanation for relevant theories, the paper puts forward the following hypotheses regarding the correlation among error management culture dimension, job satisfaction, and turnover intention and research subject based on previous research results.

H1: Error management culture has a positive correlation with job satisfaction.
H1a: Error learning has a positive correlation with job satisfaction.
H1b: Error thinking has a positive correlation with job satisfaction.
H1c: Error ability has a positive correlation with job satisfaction.
H1d: Error communication has a positive correlation with job satisfaction.

H2: Job satisfaction has a correlation with turnover intention.
H3: Job satisfaction totally mediates the relation between error management culture and turnover intention.

3.3 Theoretical Model Construction

In line with the relation study and theoretical hypotheses concerning the three factors, the paper follows "environment-perception-behavior" logic thread to construct the theoretical model of the research in view of the influence of hotel error management culture (environment) on employee job satisfaction (perception) and employee turnover intention (behavior).

Fig.3-1 Theoretical Model Construction

3.4 Scale Design and Data Collection

（1）Questionnaire

The questionnaire is the prime data collection method employed in the empirical analysis of this research. This research scale is made up of four parts, namely demographics, error management culture, job satisfaction, and post. The first part questionnaire demographics scale includes five demographic problems - age, gender, education, years of working and post. The second part error management culture scale consults the scale adapted by VanDyck (2005) and the research method adopted by Cigularov (2010) to merely select positive management scale. Therefore, error management culture in this paper actually indicates positive (active) error management culture which covers 16 measurement questions in the dimension of error learning, error ability, error thinking, and error communication. Nowadays, this scale has been widely applied in the academic research field and proved to possess favorable reliability and validity. Lickert five-point scale is used for scoring, in which five points (very agree) - 1 point (very disagree) respectively manifest hotel employees' perception about the influence of error management culture and higher points mean higher perception. The third part job satisfaction scale adheres to the job satisfaction scale proposed by Spector (1985) and makes adjustment and compilation as per real conditions in the hotel. Six items in the seven dimensions will be illustrated to measure job satisfaction. The corresponding scoring also follows Lickert five-point scale from five points (very agree) to 1 point (very disagree), in which higher points mean higher job satisfaction degree. The fourth part employee turnover intention scale consults the influential factors developed by Cammann (1982) et al. to measure employee turnover intention. The corresponding scoring also follows Lickert five-point scale from five points (very agree) to 1 point (very disagree), in which higher points mean higher employee turnover intention.

（2）Data Collection

The paper initiated online and comprehensive offline survey on employees from the Food and Beverage Department of Shenzhen high star hotels (three five-star hotels and two four-star hotels) as of December 2017. Based on previous research results, the author increases and decreases corresponding measurement items as per the research subject and research orientation of the paper. Additionally, the author discerns and corrects ambiguous expressions. Throughout the communication with the principals of human resources in the five hotels, the author explains research contents and cooperation intention so as to ensure the success of follow-up online (phone questionnaire) and offline (questionnaire envelope) survey. Since the questionnaire involves the sensitive topic about turnover, employees fill in the questionnaire anonymously. The author altogether distributed 160 questionnaires on March 2018 and recollected offline questionnaires one week later. After screening and removing invalid questionnaires from altogether 123 collected questionnaires, there were 109 valid questionnaires.

4. The Analysis of Results

4.1 Statistical Description of Questionnaire

4.1.1 Questionnaire Data Distribution

Demographics variables involved in the investigation include gender, age, diploma, years of working and post in the Food and Beverage Department. Table 4-1 lists the distribution characteristics.

Table 4-1 Sample Individual Attribute Distribution

demographics variable		number of sample	proportion（%）
gender	male	51	46.8
	female	58	53.2

age	25 and below	51	46.8
	25-30	36	33.0
	31-40	19	17.4
	41 and above	3	2.8
diploma	senior high school, technical secondary school and below	33	30.3
	Junior college	35	32.1
	undergraduate	37	33.9
	undergraduate and above	4	3.7
years of working	1year and below	29	26.6
	1-2 year(s)	30	27.5
	2-3 years	26	23.9
	3years and above	24	22.0
post (Food and Beverage Department)	a front-line employee of the hotel（FOH）	61	56.0
	back-line employee of the hotel（BOH）	48	44.0

4.1.2 Test of Scale Reliability and Validity

Reliability of all measurement indicators is analyzed with Cronbach internal consistency coefficient (α coefficient). On the suggestions of Nunnally, indicators with low Cronbach's α reliability below 0.7 should not be used. The α coefficient of this research scale as 0.751 proves the high consistency and reliability of the scale. The α coefficient of error management, job satisfaction, and turnover intention respectively as 0.860, 0.920 and 0.920 above 0.7 prove the high reliability of the research. Likewise, the KMO value of all measurement indicators in error management scale as 0.827 above 0.7 also prove the high correlation among all variables in the measurement dimension. In addition, Barlett test of sphericity X2 statistics significance probability as 0.000 below 0.01 refuses the spherical hypopaper, which also proves that the correlation among variables is suitable for factor analysis.

4.2 Statistical Analysis

Descriptive statistical analysis on all measurement items of the scale derives the maximum, minimum, mean and standard deviation of each item. As shown in the following table 4-2, interviewees' opinion about all indicators in error management does not vary a lot. In particular, the item of error communication has maximum approval degree while the item of error ability has relatively low approval degree. In terms of job satisfaction, the mean of approval is 3.74, which suggests that interviewees basically feel satisfied with present work performance. The mean of turnover intention as 2.67 below the average mean 3 signals that most interviewees now do not have intense turnover intention.

Table 4-2. Descriptive Statistical Analysis

	N	minimum	maximum	mean	standard deviation
error learning	109	2.00	5.00	4.07	.574
error thinking	109	2.20	5.00	4.07	.570
error ability	109	2.33	5.00	3.99	.692
error communication	109	2.50	5.00	4.16	.564
error management	109	2.79	5.00	4.07	.434

job satisfaction	109	1.33	5.00	3.74	.713
turnover intention	109	1.00	5.00	2.67	1.015

4.2.1 Correlation Analysis

The paper conducts a correlation analysis on error management, job satisfaction, and turnover intention and presents the significance of Pearson correlation and two-tailed test in Table 4-3.

Table 4-3 Correlation Test on Error Management Culture, Job Satisfaction and Turnover Intention

		error management	job satisfaction	turnover intention
error management	Pearson correlation	1	.629**	-.555**
	Significance(two-tailed)		.000	.000
	N	109	109	109
job satisfaction	Pearson correlation	.629**	1	-.607**
	Significance(two-tailed)	.000		.000
	N	109	109	109
turnover intention	Pearson correlation	-.555**	-.607**	1
	Significance(two-tailed)	.000	.000	
	N	109	109	109

**. Significant at 0.1 level (two-tailed)

As shown in the above table, the correlation between error management and job satisfaction is 0.629, and corresponding significance is above 0.01, which suggests the significant positive correlation between them. While the correlation coefficient between error management and turnover intention as -0.555 below 0.01 suggests the significant negative correlation between them. Similarly, the correlation between job satisfaction and turnover intention as -0.607 below 0.01 also suggests the significant negative correlation between them.

4.2.2 Regression Analysis

On the basis of correlation analysis results, the paper further explores the influence of error management on turnover intention by the correlation analysis and examines whether job satisfaction has any mediating effects on error management and turnover intention.

The regression analysis takes job satisfaction as the dependent variable and error management as the independent variable. Table 4-4 presents the regression results. Adjusted R square of the equation is 0.390, and corresponding P value is below 0.01, which suggests the statistical significance of the established regression model. In the regression equation (P<0.01), independent variable error management standard regression coefficient is 0.629, which suggests the significant positive influence of error management on job satisfaction. In brief, the higher error management degree indicates higher employee job satisfaction.

Table 4-4 Regression Analysis of Job Satisfaction

model	nonstandard coefficient		standard coefficient	t	Sig.
	B	standard error	trial version		
1 (constant)	-.462	.505		-.914	.363
error management	1.032	.123	.629	8.365	.000

R =0.629 adjusted R square=0.390 P=0.000

The test results of mediating effects are as shown in Table 4-4. In regression model 1, adjusted R square is 0.301 and P=0.000, which proves the statistical meaning of established regression model. In the equation, error management standard regression coefficient is -0.555. This implies that higher error management degree results in lower employee turnover intention.

In regression model 2, adjusted R square is 0.407 and P=0.000. In the regression equation, the standard regression coefficient of error management and job satisfaction (P<0.01) is respectively -0.287 and -0.427. Thus it can be seen that the standard regression coefficient of error management in model 1 is far above that in model 2, which reflects the partial mediating effects of job satisfaction on the influence of error management on employee turnover intention. In another word, error management affects turnover intention by affecting employee job satisfaction. For this reason, hotels need to improve error management culture and employee job satisfaction so as to lower employee turnover intention.

Table 4-4 Test on Job Satisfaction Mediating Effects

model		nonstandard coefficient		standard coefficient	t	Sig.
		B	standard error	trial version		
1	(constant)	7.952	.770		10.329	.000
	error management	-1.297	.188	-.555	-6.900	.000
2	(constant)	7.671	.712		10.773	.000
	error management	-.670	.223	-.287	-3.008	.003
	job satisfaction	-.608	.136	-.427	-4.477	.000

R=0.555 adjusted R square=0.301 P=0.000
R=0.647 adjusted R square =0.407 P=0.000

5. Discussion and Policy Suggestions

5.1 Research Results

This research aims to explore how should corporate managers utilize the error instrument to improve service quality and management level. In consequence, taking the "influence of error management culture on star hotel employee turnover intention" as the research topic and employees in star hotel Food and Beverage Department as the research object, the research comes up with theoretical model and key research hypotheses based on previous relevant studies and sets forth the correlation among error management culture, job satisfaction and turnover intention, including the influence of error management culture and all dimensions on employee job satisfaction, the influence of employee job satisfaction on turnover intention, as well as the mediating role of employee job satisfaction on error management culture dimensions and employee turnover intention. Following conclusions are drawn from above empirical analysis and research.

(1) Error management culture has a positive influence on employee job satisfaction
Research hypopaper and empirical analysis results conform to the findings derived by Lee (2011) and Frese (2015) in a study about the influence of error management culture on job satisfaction. Error learning, error thinking, error ability, and error communication all have a positive influence on employee job satisfaction, namely positive error management culture has a positive correlation with job satisfaction. Positive error

management culture could be taken as a measurement means which achieves ideal results through regulating employee job satisfaction.

（2）Job satisfaction has a negative influence on employee turnover intention

In earlier empirical research and research report, Mbah and Ikemefuna et al. (2012) already made clear the great influence of job satisfaction on turnover rate and employee job satisfaction would lower turnover intention. Empirical analysis of this research also manifests the negative correlation between job satisfaction and employee turnover intention. Employees who have higher job satisfaction tend to have the lower turnover intention and vice versa.

（3）Error management culture has an indirect influence on employee turnover intention

One major finding of the research is the mediating effects of job satisfaction on error management culture and turnover intention. As demonstrated by the research results, although error management culture is a factor which could improve job satisfaction, it does not have any direct influence on turnover intention. However, if hotel organizations adopt error management culture to create higher job satisfaction, employee turnover intention would be lowered, and hotel employees would never generate turnover intention because of organization error management culture. However, the turnover intention would produce corresponding negative influence once employee job satisfaction is affected. From this point of view, hotel industry managers ought to realize the contribution of error management culture to the reduction of employee turnover intention as an important institutional factor in improving job satisfaction. Positive (active) error management culture might be a major variable that is able to effectively manage replacement intention (one of the employees' representative negative behaviors). Although many previous studies have discussed and tested the application and influence of error management culture, rare of them start from the perspective of employee work attitudes to determine reliable variables concerning employee loss reduction. Considering the importance of human resource as a major component of hotel service, this research presents a new concept that influences employee work attitudes. As found by the research, hotels are supposed to constantly improve their culture management culture so as to enhance employee job satisfaction and lower employee turnover intention.

5.2 Management Suggestions

（1）To face up to the naturalness of errors and create favorable error management culture

Organizations should make it clear that errors could not be completely prevented or avoided and acutely realize and envisage the importance of this problem in hotel industry management. In order to effectively implement hotel error management, the first thing is to review the organization culture perspective. Human service is the main source of market competition, while the hotel is also the industry that takes service as the core competitiveness. Because hotel employees confront different consumer groups and different consumption demands every day, they must provide humanistic and invisible personal service. At the same time, because of their high autonomy at work, employees have a high possibility to make errors. When there are errors in the work environment, many organizations fail to timely offer any effective guidelines. Consequently, the way to overcome such limitation is to integrate error management into organization culture and it is essential for employees to treat errors as a natural phenomenon and for managers to tolerate errors with open attitudes. Admittedly, it does not mean that such error-tolerance environment should blindly ignore and indulge overall procedural errors. Instead, it needs to rationally deal with the errors unconsciously made by employees so that they are capable of trying to correct errors and quickly learn in such environment and perceive organization support and tolerance, therefore indirectly altering employee turnover intention.

（2）To establish a top-down error management system and cultivate error response ability

Rochlin (1999) clearly stated that the establishment of error management organization culture requested the action of a team with high cultural homogeneity degree. Hence, the hotel industry made up of teams more easily introduces error management into organization culture owing to its unique responsibility structure. In the long run, it is necessary to found a system where employees could obtain timely response and communication when they make errors. By sharing experience and knowledge, they can prevent the re-occurrence of the same error

and learn to seek solutions and countermeasures. It is noteworthy that the top-down error management system first requires the manager to learn the importance of constructing a favorable error management atmosphere, then makes improvement and restructuring on defective hotel organization structure to better propel the operation of error management system with advantageous responsibility structure, and finally establishes a sound error communication, exchange and transmission platform to ensure the accurate, fast delivery and solution of erroneous information in the organization and generate positive influence on organization innovation and development.

（3）To fully utilize positive error management culture and boost competitiveness

Although there is no direct causality between error management culture and turnover intention, the indirect influence regulated by job satisfaction indeed exists. Up to now, available studies on error management culture remain at the organization level. Whereas, even under the same organization culture, individual employees also have diverse opinions. The importance of employee opinions about organization error management culture is rather self-evident. This research confirms that error management culture could be viewed as a kind of organizational culture which helps shape common rules and values inside the organization and further affects employee job satisfaction and turnover intention. Nowadays, the competition in the hotel industry is actually the competition of talent. Hotels with service-core competitiveness could only preserve advantages and reinforce competitiveness by constantly seeking human resource support. Therefore, hotel managers should keenly realize the role of error management culture in hotels.

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The Intrinsic Attribute of Digital Currency

Chen Zhu[1], Liping Chen[2]

[1] School of Finance, Nanjing University of Finance and Economics, Nanjing, Jiangsu, China, 210023.
Cellphone: +86 18013881600. Email: 4ever_cc@163.com
[2] School of Foreign Languages and Cultures, Nanjing Normal University, 122 Ninghai Road, Nanjing Normal University, Nanjing, Jiangsu, China, 210097. Cellphone: +86 13951832256. Email: chenliping@njnu.edu.cn

Abstract
With the advent of the fourth industrial revolution, the sharing economy based on Internet, big data analysis, artificial intelligence, and cloud computing came into being. Similarly, Subversive changes in interactive information processing, network e-commerce, government services have occurred. The new industrial revolution needs new financial forms to support. As an innovative financial model, the financial technology relies on technological innovation to reduce service costs, and provides fast and accurate cloud services, becoming the trend of modern financial industry development. The development of financial technology also needs innovative currency forms to support it. Therefore, accelerating the development of legal digital currency is of great significance in boosting the development of financial technology.

Keywords: Digital Currency, Intrinsic Property, Financial Technology

1. Introduction

At present, the blockchain-based digital bill trading platform promoted by the central bank in China has been tested successfully. The legal digital currency issued by the central bank has been commissioned on the platform. At the same time, the digital currency research institute under the central bank has been officially listed. At the second annual meeting of the Digital Finance Research Center of Peking University on November 4, 2017, Yao Qian, director of the Digital Money Research Institute of the People's Bank of China, said that the development of legal digital currency would help improve the quality and efficiency of financial technology.

However, the essence of legal digital currency is still digital currency, which has similar currency attributes as Bitcoin, Litecoin, etc., which we are familiar with. Bitcoin has various financial risks such as payment, technology, money laundering, and cash withdrawal. Similarly, there are similar risks in legal digital currency. Therefore, this paper will start with the origin of currency and analyze the current digital currency problems and development trends so as to give the central bank some suggestions to develop the legal digital currency.

2. Currency origin and form

Marx believed that money is the inevitable outcome of exchange development and the accompanying development of value form. The process of exchange development can be condensed into the evolution process of value form. The value-form has experienced from "simple value form" to "expanded value form." , to the "general form of value" and then to the "currency form." Therefore, the currency is produced along with the emergence and development of the exchange of goods and commodities. It is the product of the spontaneous development of the commodity economy and the result of the development of the contradiction between social labor and private labor.

So far, money has gone through several stages, such as physical currency, metal currency, credit currency, and virtual currency. From the trend point of view, the form of money has evolved from a low-level to a high-level with the improvement of the production and circulation of goods and social and economic development. In the time dominated by the physical currency form, shells, cloth, cattle, and sheep have all served as physical currency. However, due to the bulky currency or bulky weight, they are not portable; or the texture is uneven, difficult to divide; or it is easy to rot, difficult to store; or the size is different, difficult to compare, so with the development of commodity economy, the physical currency gradually withdraws from the currency history stage.

Since then, metal smelting technology has emerged and developed rapidly, and the metal currency has been widely used. Metallic currencies such as gold and silver are stable, easy to divide, and easy to store. Metallic currencies have been used for quite a long time.

Later, credit currency appeared, originating from the rapid circulation of metal currency. Early commercial papers, banknotes and bank notes were all credit currencies. Initially, the credit currency could be cashed into a metal currency. When the government issued too much credit currency, inflation was caused, which undermined its redemption with the metal currency. However, ceasing exchanges between credit currency and metal currency also promoted the gradual improvement of the credit currency system. After that, the metal currency was replaced by credit currency, and the metal currency gradually withdrew from the historical stage.

With the continuous development of science and technology and the credit currency system, the use of virtual currency has become more and more popular. Virtual currency refers to the exchange of a certain amount of cash or deposits from the issuer and obtaining data representing the same amount, or a fast payment service launched by banks and third parties. As a result of the rapid development of the industrial economy and the technological innovation of the financial industry, virtual currency represents the future development trend of electronic and communication technologies.

3. Principles and functions of digital currency

As Internet technology replaced traditional electronic information technology, the virtual currency also began to change and gradually evolved into digital currency. Digital currency refers to a virtual currency that does not rely on any physical object but uses only cryptographic algorithms. It involves various technologies such as distributed architecture, cryptography, security chip, mobile payment, and trusted computing. Among them, the blockchain is one of the most important implementation technologies. Whether digital currency can be promoted depends largely on the network security and business processing performance of blockchain technology. Digital currency introduces a completely different payment structure that enhances transaction transparency through decentralization. Digital currency adopts classified accounting based on blockchain technology, namely distributed recording, distributed storage, distributed communication, without central system or third-party management organization, completely dependent on asymmetric encryption mathematics and database. It is a brand new payment system. Digital currency is different from credit currency and virtual currency and is a new form of currency. The digital cryptocurrency does not rely on any physical objects, is distributed and maintained

using cryptographic techniques and verification techniques, and can be distributed by everyone. The distribution path and total amount are entirely derived from some open algorithms.

Generally speaking, money has four functions: a trading medium, value scale, payment means, and storage means. The trading media function refers to the use of money as an exchange medium for goods and services. The use of money allows goods to be purchased and sold independently of each other, thereby increasing economic efficiency. The value scale function refers to the use of money as a measure of all goods and labor values. The function of the means of payment of money means that money can be used as a means of deferred payment. The function of value storage means the function of money as a temporary residence for purchasing power. The four functions of money are not parallel but have a hierarchical structure. According to the definition of a monetary function, the digital currency has a monetary function. First of all, the digital currency has the function of trading media. At present, the number of global Bitcoin users has exceeded 100 million, and the number of people holding bitcoin is rising. The UK was the first country to develop and use digital currency and the most friendly country for the development of the bitcoin industry. According to the latest digital currency research report from Cambridge University, the total number of British Bitcoin wallets increased from 8.2 million in 2013 to nearly 35 million in 2016, an increase of more than four times. Secondly, the digital currency has the function of value scale, and payment means. Up to now, nearly 10 million retailers around the world are willing to accept bitcoin as a payment method and will continue to rise in the future. In terms of storage functions, Bitcoin prices continued to rise, and the daily currency price rose to a maximum of $8040, breaking the highest record. Up to now, the unit price of Bitcoin has reached $8,119.

According to the principle of digital currency, the path and total amount of supply are fixed, but from the perspective of monetary functions, the demand outlook is not stable. Digital currency lacks internal demand in terms of consumption and production, and there is no central institution support. The future demand for digital currency can only depend on whether digital currency can be used as a trading medium. As far as the current situation is concerned, the demand for digital currency is extremely limited. Although the non-zero price of digital currency indicates that they are valuable to many users, the exchange rate of digital currency and traditional currency fluctuates drastically. Studies have shown that the standard deviation of Bitcoin's daily exchange rate fluctuations is 17 times that of the pound, so the value storage function is also short-lived. In addition, there is currently little evidence that digital currencies have accounting unit functions. Although transactions between a small number of individuals are conducted after the negotiation of bitcoin prices, these transactions are independent and irrelevant. Retailers quoted in bitcoin often update prices to ensure price stability when converting dollars and pounds. In fact, companies that pay in bitcoin in transactions typically provide retailers with pricing for fiat money, which is used only for temporary payments.

4. Digital currency trends and issues

According to the development trend of digital currency, the author believes that digital currency has huge financial risks. First of all, digital currency is a kind of virtual currency, not a real currency. It does not have monetary attributes such as legal liability. Therefore, the digital currency has a risk of payment. Secondly, digital currency does not have an accounting book with a central storage organization. Blockchain technology is similar to distributed accounting（Sun & Yang, 2016）. One block is equivalent to a part of bearer information. The distribution, circulation and transaction records of digital currency are all stored in each node（Yao, 2018）. In order to achieve the decentralization of virtual asset settlement, the digital currency has technical and operational risks.

In addition to financial risks, digital currencies will also bring many problems to macroeconomic development（Li & Zhu, 2017; Song & Wang, 2016）. First, a fixed money supply can lead to tighter prices for goods and services. More seriously, the fact that money supply cannot change as demand changes can lead to sharp fluctuations in prices and markets. If deflation is infinite, then aggregate demand and potential output will fall, and unemployment will continue to rise（Dai & Li, 2016）.

Second, digital currency holders increase their holdings by borrowing money, and price fluctuations can also affect currency lenders（Fan, 2016）. The combination of digital currency and financial instruments creates a new mechanism whereby direct holders of digital currencies and other financial market participants will hold leveraged positions in digital currencies（Yao & Tang, 2017）. If the digital currency rises to a certain important position as a payment system, the holders may jointly control the computing power of the digital currency, create deceptive "double payment," and implement system-wide fraud, which will lead to systemic banking risk. The risk will have an impact on the entire macro economy（Zhuang & Zhao, 2017; Yao, 2017）.

5. Implications for legal digital currency

The legal digital currency issued by the central bank is a digital currency that is supported by national credit and has value anchoring and can effectively exert its monetary function. The legal digital currency has the function of credit creation and the function of stabilizing the value of money, thus having a substantial effect on the economy. Although the legal digital currency has the advantage that private digital currency cannot match, the essence of the legal digital currency is still the digital currency. It has the same principle and function as the digital currency, and it also has the same development trend, risks, and problems as the digital currency. Therefore, the central bank should pay attention to two issues when issuing legal digital currency.

First, the digital currency payment system is concentrated on a small number of people. When these people use the currency to trade as much as possible, then there will be economic fragmentation, and the central bank's control over this part of consumer demand is weakening. If everyone uses digital currency for every day's transactions, they only use traditional currency to pay taxes to the state, which may lead to the monetization of the entire economy. When all payments no longer use traditional currency, the central bank's ability to regulate economic activities and prices will be destroyed, and the stability of the currency will inevitably be severely impacted. Second, the use of digital currency will lead to a decline in cash usage, which implies a coinage tax issue. The central bank's assets and the resulting coinage tax underpin the central bank's independent operations, including the implementation of monetary policy through the provision of independent sources of income outside of the government budget. This part of the tax is used to finance the operation and reserves of the central bank, and the remaining net tax is regularly transferred to the tax administration every year. If the coinage tax fluctuates, not only will the central bank's cash liabilities change, but the interest on financial assets will also change, and it may bring huge losses to government taxation.

In response to possible problems with legal digital currencies, the author suggests that the central bank can set a rule to address price deflation and market demand volatility. Since the fluctuations in the total demand for money are seasonal, periodic, and structural, the digital money supply can be allowed to grow at a constant rate of growth per period to accommodate real-time trading volumes. Under the premise of not destroying the law of economic activity, it responds to changes in demand, so that price fluctuations are within a certain range. At the same time, a decentralized system can be developed to find matching official broad money data and adjust the current digital currency system to a fixed exchange rate.

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Influencing Purchasing Positioning – Deriving a Model Based on Internal Factors

Jens-Andreas Barth, Dipl.-Wirtsch.-Ing.[1]

[1] Faculty of Management, Comenius University, Bratislava, Slovakia, jensabarth@arcor.de

Abstract

A purchasing organization is often questioned, when performance is not provided at the expected level. On the other hand a connectivity between performance level and so called positioning of a purchasing organization seems to be obvious. Technically spoken performance level is a result of an equation with input factors. The interesting question is how the performance level (output) is generated and which aspects influence the effectiveness (input) of a purchasing organization to optimize a as weak perceived purchasing division, rather than focusing on the output itself. Purchasing performance thus can be defined as the extent to which the purchasing function is able to realize its predetermined goals at the sacrifice of a minimum of the company's resources. The aim of this paper is to examine, which factors drive the individual set up of a purchasing organization to manage its performance level. The methodical approach is an executed internet and literature research of typical factors and review of a selected consultancy analysis approach. Based on the research and subsequently logical reasoning, partly supported by empirically executed programs 5 internal factors are deduced to establish a 5-axis model. Findings are that purchasing can manage internal factors to improve its performance level to a certain extent. These factors influence each other in a way, that a significant performance level improvement consists of all factors under consideration of definite requirements. The outcome of this paper will help decision makers in a structured way to draw attention to influencing input factors.

Key Words: Effectiveness, Efficiency, Internal Factor, Positioning Purchasing Performance Level,

JEL Classification: L22, L62

1. Introduction

Aim of the paper and hypothesis

In modern organisations corporate objectives are broken down to each division following a balanced scorecard principle. To that effect purchasing has to transfer and reach its derived goals (e.g. savings, risk management, quality improvement, innovation management, etc.). Goals depend on corporate´s market and positioning along value stream and thus vary in details between organisations. According to H. Andrae (2012) objectives of a metal manufacturing organisation for instance may differ from those of a service company.

In general Schifferer (2001) points out purchasing activities can be distinguished in two fields of action: operative and strategic. Operative work mainly covers day to day business in terms of purchase order handling, whereas strategic work is long term and value contributing orientated like installation and development of a supplier structure or material cost effect planning. Though the best developed organizations have marched along a recognizable evolution path, not all have reached the final status of a value managing organization.

Figure 1: Typical evolution steps of Purchasing and corresponding competencies, source: Author
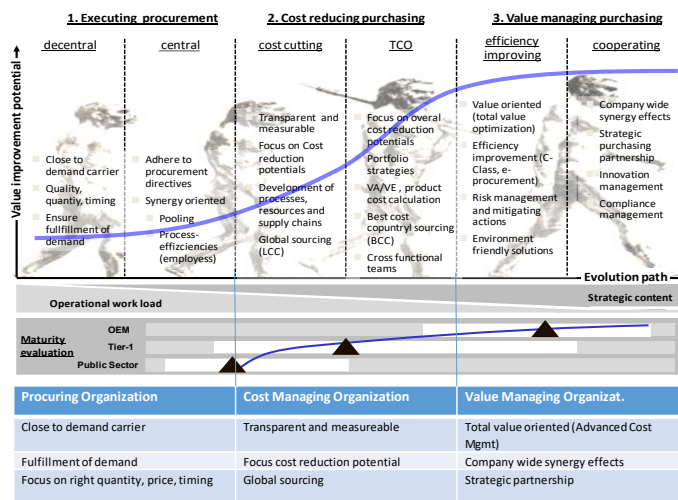
Achievement of evolution status differs between industries and automotive companies at OEM level are the most progressed. Even at this highest developed level there is still operational work but strategic work content dominates. According to Barlow R.D. (2016) modern purchasing organizations should aim for value managing approach. Value managing stands for a cooperating and an efficiency improving culture and requires clear internal (within corporation) and external (to supply base) communication and an entrepreneurial thinking about corporate business model. Thus management ability for innovation, risk, compliance and of course holistic value improvement rather than particular cost optimization is required to reach respective performance level.

In order to measure and evaluate fulfilment of performance requirements level of modern aspects of performance should be identified, which describe purchasing set up holistically and allow an evaluation.

According to Hofmann et al (2014) generally quantifiable measures e. g. savings, improved quality, reduced transportation costs or number of orders issued per period are often recommended to valuate performance level, "… as there are a number of performance measurements that businesses can use when they measure purchasing performance.", mentioned by Murray (2016).

These measures describe the performance output, the effectiveness of a purchasing organization. Technically spoken these measures represent a performance level as a result of an equation with input factors, whereas the above mentioned quantitative measures are output factors.

The interesting question is how the output is generated and which aspects determine the effectiveness level, in order to optimize a for example as weak measured output factor by corrective actions, instead of focusing on the output factor itself and manipulate performance from the output side.

Most commonly purchasing as a whole and especially internal factors face external factors which summarize environmental parameters of the entire enterprise (e.g. market, corporate organization, economy embedding) which, following a top down approach, have an impact on purchasing positioning and orientation. Elaboration of external factors is subject of another publication of Barth (2018).

The aim of this paper is to work out a set of input factors accountable for effectiveness which are eligible to influence performance level of a purchasing organization.

2. Current state of the issue under examination

Main objective of a literature research was to identify current status of research on factors, which impact level of purchasing performance. Out of numerous publications, a selection with typical predictions will be introduced. Keough (1993) reveals 5 barriers (poor information, weak administration, missing skills, lack of performance measures, purchasing low status) blocking organizations to move to strategic purchasing which leads to Carter´s et al. (1996) question:" Is purchasing really strategic?", where he carried out that strategic purchasing depends on competencies, tactics and strategy. Since purchasing organizations marched a long way and globalization

enforced revised strategic lay out of organizations, which is mostly acknowledged in industry. In a more up to date paper van Poucke (2016) verifies the direct performance implication of purchasing maturity growth for social and economic related sourcing outcomes by proofing the correlation between organizational development stage and performance level, Hughes et al. (2016) render that purchasing especially for intangible assets needs to drive values and thus has to revaluate strategies of the past towards the needs of an increasingly innovative driven and service-oriented economy. Adams (2005) examines a connectivity of purchasing performance and company size and spend volume. Further publications e.g. De Waal et al. (2015) explore high performance partnerships related to high performing organization. Handfield et al (2015) link internal stakeholders need to supplier performance agreements, Lopez (2016), worked out a lack of department aligned strategies and Sharaaz (2016) considered inflation as profit influencing.

Supply chain management related publications link improvements to selected methods and tools. For example, Burroughs (2016) recommends alternative sourcing, Chia-Min examined transaction costs to achieve goals of cost minimization. Billington (2016), and Thompson (2016) reveal in their research the necessity of supplier relationship as a value managing strategy.

Consultancies offer their capabilities on homepages, where they publish recently successfully finalized cases. The information provided adverts the achieved objectives and provide facile information about the initial approach applied. This could be due to the fact, that consultancies do not wish to publish and share details of their unique selling approach. An integral view on approaches is also not provided.

Though it is not explicitly mentioned, the essence of the introduced publications is that purchasing performance correlates with certain internal (within the purchasing organization sphere) and external (outside purchasing sphere) impact factors. Despite the need for a holistic view, the authors focus only on one or the other specific factor which proof evidence in the respective research area. Instead a set of factors, which helps to describe the positioning of a purchasing organization entirely is required to enable to select a project specific feasible cost optimization approach and is elaborated in this paper.

3. Methodology and research design

During writing this paper multiple methods were applied. The examination is based on a qualitative research of necessary information by an executed internet and literature investigation of typical internal factors from available consultancy information, journals and expert literature. The findings were mirrored with the experience and knowledge of the author. Following a review of a selected consultancy analysis approach was conducted and discussed to deduce 5 internal factors to establish a so called 5 axis model, which serves to explain influencing parameters of effectiveness of a purchasing organization.

Logical reasoning is applied to derive a hierarchy among the individual exposed factors. Subsequently each factor is discussed based on a further literature research and expert knowledge partly supported by empirically executed programs.

Finally the synthesis of knowledge, analysis and deduction helped to carry out measures which are designed to overcome factor inherent challenges and formulate conclusions.

4. Internal Factors

Aspects, which influence the output factor of purchasing performance as input factors are point of interest of this paper. These input factors account for efficiency as enabler for effectiveness, whereas last named can be measured as output in quantifiable absolute or relative so called key performance indicators (e.g. savings amount, savings ratio [= savings vs. purchasing spend]). Purchasing performance thus can be defined as the extent to which the purchasing function is able to realize its predetermined goals at the sacrifice of a minimum of the company's resources (i.e. costs, manpower, time). In this sense ratio of efficiency and effectiveness define performance and are purchasing objectives. Initially aspects for efficiency shall be discussed to define purchasing specific input factors as they are the enabler for effectiveness

E.g. PA Consulting (2007) recommends a procedure as initial analysis in their introduced QuickScan SCM approach with a focus on the aspects of strategy, resources, processes, organization and technology. The

QuickScan serves to establish a qualitative organization profile for analysis of critical points. Regrettably this proposal omits the aspect of methods and tools applied or at least does not clearly differentiate these to processes. Methods and tools should therefore be considered. The aspect technology is used in the sense of system platforms and can be replaced by the notion "systems" and should be closely linked to processes, as processes are represented by systems. Term resources should be replaced by phrase employees by meaning of attitude and competencies (see chapter attitude and competencies).

Table 1: 5 aspects of purchasing performance

Employees	Tools & Methods	Organization	Strategy	Systems & Processes
Number, Attitude, Competencies	VA / VE, Global Sourcing, Cost Analysis, Supplier Marketing	Central / Decentral, Matrix / Line, Maturity level Cross functional, Ballanced Score Card	Commodity structure, Embedding in Corporation, Sustainability	ERP, KPIs, Benchmark, Processes

Source: Author

Table 1 displays these 5 aspects by complementing typical descriptive key elements as mentioned by Barth, J.A. (2016). Strategy, Employees, Organization, Processes & Systems, Tools & Methods are enabler for purchasing effectiveness of modern purchasing and can be seen as 5 axis to help determine the positioning of purchasing. They can be estimated as internal factors, which design appearance and perception of a purchasing organization within an enterprise and which are to a great extent modifiable by purchasing itself.

These factors should not be seen isolated. In fact they interact among each other and each of them influences purchasing performance level (see figure 4, page 14), which in general is measured in quantified indicators (KPIs) in saving contribution or EBIT improvement.
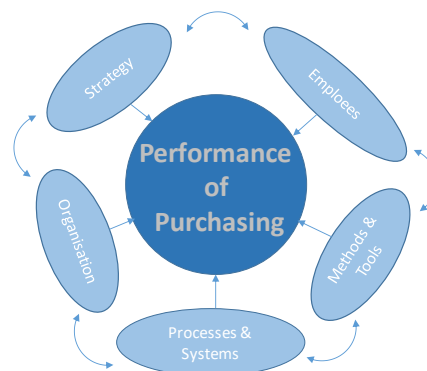
Figure 2: 5 Axis model on internal factors, source: Author

In the following chapters these factors will be introduced and further analyzed, starting with factor strategy.

4.1 Strategy

As we learned in the previous chapter, strategic work elements dominate working content at a high development stage. Thus we have to have a look into strategies.

According to Gabler Wirtschaftslexikon (2016) strategy is defined as: „… fundamental, long-term behavior (combination of measures) of the company and relevant sub-areas in relation to their environment to achieve the long-term goals." Wirtschaftslexikon24.com (2016) mentioned that in this respect besides long term short term

goals can be considered as well. The phrase derives from old Greek word art of war and meant to vanquish someone by cunning ruse.

In free market economy strategy is understood as thinking in competitive advantages. In terms of purchasing literature does not clearly assign a purchasing strategy definition, actually the notion is used in connection with sourcing and provision.

Wannenwetsch (2014) uses strategies of sourcing along supply chain pyramid (from OEM to Tier-x suppliers) which fit with the respective objectives of each pyramid level (e.g. partnership, quality, material cost). Heß (2016) uses the phrase supply strategy to stress cross functional approach of disciplines (e.g. logistic, marketing, quality, engineering) within an enterprise to ensure provision of goods and services and to manage the supply chain interface. Inverto Consultancy (2016) also does not entitle a clear definition, but describe the necessity to work out a sustainable strategy to improve enterprise value level by enhancing organization´s performance. PWC (2015-2016) widen performance range by considering questions of ethics, ecology and social integrity from shareholders point of view.

In summary mainstream definition of purchasing strategy can be understood as provision with goods and services, at which characteristics of strategy refinement depends on leveling in value chain and embedding in corporate organization, which determines level of performance.

This leads to the conclusion, that strategy refinement depends on factors, which form the living of a strategy. Typical factors are the before already introduced aspects: employees, organization, processes and systems, methods and tools.

Figure 3: Model of purchasing performance aspects of modern purchasing, source: Author

All 5 aspects together determine performance level in the sense that a high developed purchasing organization requires high developed characteristics of each aspect. Moreover all aspects are linked together and influence each other. Central turning point is strategy refinement, where all other aspects need to align with. Especially in a developing purchasing community a close dovetailing of all aspects helps to evolve purchasing further.

A modern purchasing organization should live on clearly defined and communicated strategies, which are aligned with corporate objectives.

In order to provide value to corporation at the highest level, considering objectives and strategic and operative work elements, employees gain an important role and will be discussed in next chapter.

4.2 Employees

Dachrodt (2014) mentioned that success and performance highly depend besides others on personal engagement and involvement of purchasing individuals and underline the importance of productive factor "*human being*". Thus buyer´s skills and personal characteristics are attached to high importance in order to achieve performance and a modern purchasing organization requires individuals with certain attitude and competencies.

Expert Competence	• Econimcal know how • Product-and product technically know how • Process know how • Legal know how
Methodical Competence	• Negotiation technique • Strategic planning • Price and value analysis • Demand and market analysis • Controlling methods
Personal Competence	• Leadership ability • Sense of responsilbilty • Assertiveness and salesmanship • Flexibility • Self initiative
Social Competence	• Team player • Communication skills • Networking competency • Motivation skills • Interlectual skills

Figure 4: Purchasing employee 4 competence fields, source: Autor

There is no clear definition nor clear differentiation between attitude and competencies in literature. Hirschsteiner G. and di Pesaro S.G. (2011) describe based on an analysis of job advertisements competencies and key qualifications, whereas last named is in turn influenced by personal condition. Richard J. and Sultan D. (2012) distinguish 4 competence fields (social, personal, methodical, technically, see figure 3) of which personal and social competence could be construed as attitude. Other simply formulate profile of requirements in general. Gulp (2006) requests personal abilities and technical skills.

In further examination we will focus on soft and hard skills and represented by the use of phrases attitude and competencies.

Attitude means behavior and characteristics of individuals and is also sometimes defined as soft skill. Attitude represents educated preferences or certain personality traits, which form the personality of a human being with behavioral preferences.

Competencies stand for functional or technical acquired know how and knowledge an individual has gained through education and are so called hard skills.

Soft and hard skills do not entail each other. Open personalities are not necessarily good in moderation or even leadership. In fact some behavioral pattern and attitude towards life can be trained, but personality and preferences will in generally remain preset. Attitude and individual character determine behavior and affinity towards certain fields of interest. E. g. an introvert person will rather prefer reservation than eccentric outgoing and subsequently will look for an equivalent working environment. Attitude and competencies will be regarded in this sense.

The challenge is to identify the right set of attitude and competencies for a purchasing position. On the other hand especially in a society with a small fertility rate of 1.4, according to Bundeszentrum für politische Bildung (2016), like in Germany, Scholz R. (2016) forecasted a shrinking population with an aging, where in 2035 more than a third will be older than 60 years situation will become more difficult. Situation is attended by lowest unemployment rate since German reunion of 6,4% in 2015, meaning less than 3 million people listed at the employment agency. These circumstances will influence employment market: less talents will be available and candidates with long year experience will become rare on the market.

Consequently according Gastermann M. (2011) the requirement of purchasing divisions is to communicate and advert the attractiveness of a buyer position and to win in the fight for talents.

4.2.1 Attitude

As the industrial world becomes more and more global, an international orientation is mandatory. Foreign language English at minimum is a must. Emerging markets like BRIC-states, but also global players in Asia, the USA, South America and western European countries demand further language skills. Especially in a mainly

internationally exporting country like Germany with also international supply chains global language orientation is mandatory. Besides the language also cultural know how about international conventions and habits is appreciated. Thus interracial open minding, international interest and willingness to travel are further optimal prerequisites.

In larger corporations purchasing has a lot of interfaces and contacts. Individuals should have ability to understand thinking and objectives of diverse company disciplines like finance, engineering, marketing, quality. A clear view, entrepreneurial thinking and the ability to compromise purchasing objectives help too. More over a buyer will participate and most likely lead internal and external meetings, has to convince colleagues and suppliers for his ideas. An extrovert personality with a friendly character and leading ability will surely easier convince people and achieve targets.

As a purchaser has to coordinate between suppliers and corporation he normally has a lot on his shoulders. According to this one should be able to work under partially enormous pressure and still be able to focus and concentrate and to cope with resistance. Acceptance of frequent overtime hours is beneficial.

Also intellectual curiosity and ability to get rather quickly acquainted to new subjects help to explore new markets and technologies. The ability to question actual processes and established structures suit expectations. Last but not least travelling willingness is a major requirement to purchasing candidates.

4.2.2 Competencies

Nowadays an academic degree can be seen as mandatory. Staufenbiel, Schenkelberg E. (2012) see requested fields in business administration or as simultaneous study combination of business administration and engineering in the area of mechanical or electrical engineering. Alternatively an expert specific education is required. According to BME Income survey 2016 almost 30% of purchasing employees obtained a specific education whereas the ratio of academic grades (BSc., Master, German Fachhochschule, PhD) amounted to 60%. Positioning with well educated experts seems to be close to most possible extent. Professional experience in years is required.

Know how in IT-, ERP- and PPS- systems, and MS-Office and internet application skills are also requested.

Market insights, international economic and political grasp, know how in legal contracts and trade, overview about currencies and actual incoterms are main commercial proficiencies. Hirtschsteiner G. Pisario M. (2011) emphasize business fluent English language skills are a must on an international platform, preferable is a second foreign language. Ability to get quickly familiar with foreign subjects, working in cross functional teams especially with technical departments is highly appreciated.

Further competencies are expected in leadership, moderation, presentation and negotiation. Also understanding of customer requirements and technical requirements and specifications gain importance as organizations tend to award purchasing with the creation of specifications. Know how in production and quality complement field of competencies.

Finally buyers should know and apply latest tools and methods in purchasing.

It is very important to understand, that purchasing employees have to manage various interfaces internally in corporation to affiliated departments and externally to supply base. Interface management of internal customers and external service providers and manufacturing companies composes a specific set of requirements, which depends on various parameters like:

- Market field of corporation
- Product (manufacturing or service)
- Size of corporation (T/O, number of employees)
- Positioning in value chain (OEM, Tier-x)
- Reporting line and organizational structure of purchasing organization
- Commodity
- Market power of supply base

The requirements for purchasing positions may vary depending on company and commodity and thus attitude and competencies will have different characteristics also within the same company. Regardless the characteristics above mentioned set of requirements of attitude and competencies are generally common sense in industry.

To recap the expectations against a purchaser in terms of character and skills are very high and are comparable to a managerial position. Personnel needs to identify potential candidates for purchasing which suit the global personal requirements and are eager to live a purchaser role.

In a recently executed project client´s company suffered from as poor perceived purchasing organization. Especially affiliated departments claimed missing service ability and assessed purchasing organization with bad reputation.

Table 2: Sample assessment matrix of purchasing employees, source: Author

Evaluation criteria	Employee 1	Employee 2	Employee 3	Employee 4	Employee 5
Target orientation	2	3	3	1	2
Ability for implementation	2	3	2	1	2
Cleverness	3	2	2	2	2
Strategic Thinking	2	2	3	2	2
Ability to prioritize	3	2	2	2	2
Entrepreneurship	2	2	2	1	2
Ambition	2	3	3	2	3
Open mindness	2	3	2	1	2
Proactivity	2	3	3	1	2
Teamwork	2	2	2	2	2
Leadership	3	2	3	2	3
Commitment	2	3	3	1	2
Deal of effort	2	3	2	2	2
Average Attitude	2,23	2,54	2,46	1,54	2,15
Ability of communication	2	3	2	2	2
Selfcontained work out a solution	3	2	4	2	3
Know How (Tools and methods)	3	2	2	2	2
Know How (commercial, technical, processes)	2	2	2	2	2
Power of argumentation	3	2	2	2	2
Power of persuasion	3	3	3	2	3
Average Competencies	2,67	2,33	2,50	2,00	2,33
Potential of development	2,45	2,44	2,48	1,77	2,24

1 - 5, 1 = very good, 3 = satifactory, 5 = bad

Legende		
very good - high potential		
satifactory		
bad		

An assessment matrix for purchasing internal evaluation was established with criteria to measure attitude and competencies. Most important is, that criteria selected fit to the specific requirements of respective company in the area of public power supply. The purchased commodities of the respective buyers mainly cover services. Companies of different industries will require a different set. The table displays an extract of the entire assessment. Criteria were established in a team of external experts and were selected in dependence of area of weaknesses claimed. Attitude and competencies were equally weighed.

In the end 60% of purchasing staff showed satisfactory or bad assessment results. Purchasing management used the assessment table to initiate counter measures as training on the job, job rotation and training sessions for reputational and performance improvement.

4.3 Organization

According to Arnold U. (1997) historically purchasing organizations were committed to operatively supply goods and services for the manufacturing process, which could not be produced in house, whereas strategic elements gain more significance. The VDMA-committee for business administration (2011) deduces a similar

definition but expands by considering best price procurement. Besides Holtmann J. (2016) defines main task of Purchasing organization as to become more flexible and faster, to develop purchasing towards new requirements and competencies. The bibliography of SAP defines purchasing organization as part of logistic and distinguishes three corporate hierarchies: corporate, company, and plant.

All reviewed definitions inhere in aligning the organization with corporate processes and predict an increase of strategic working content to suit the overall objective of cost optimization. Furthermore the authors accord with the fact, that different industries or branches and commodities require different organizational set up and the need for inclusion of purchasing in overall corporate objectives. In order to fulfill these objectives, direct and indirect purchasing should be divided into strategic and operative units broken down according commodities, customers or suppliers. Additional arrangements are project related (new business) or serial related (current business) purchasing organization. Separation of purchasing units depend on corporation size. A bigger company should bring efforts in establishing an organizational format on a higher detailed level, e.g. SM function of SD and SQ should be separated from line activities.

Meredith J. R., Mantel S. J. (2009) mention that in bigger purchasing organizations, most likely in an automotive environment, a matrix structure can be applied. The matrix often displays a net structure which in a vertical axis represents responsibility of commodity purchasing (e.g. components, parts) whereas the second axis structure represents cross components purchasing responsibility (e.g. carline, platform).

In automotive industry the notion commodity organization for vertical and platform organization for cross commodity responsibility have become common. Commodity managers need to focus on their commodity and typically handle commercials specifics, whereas in a matrix design a purchasing carline manager has to obtain a cross commodity holistic view.

He usually is less committed to specifics but ensures meeting of business objectives within carline and coordinates with commodity organization. In general the commercial purchasing power and typical purchasing activities are with the commodity managers.

Another organizational aspect is centralization vs. decentralization. Though advantages of purchasing power by centralization should compromise with flexibility of a decentralized organization. Especially in the automotive sector the lead buyer concept is an example of powerful centralization in serial production.

Figure 5: Typical matrix organization in automotive industry, source: Author
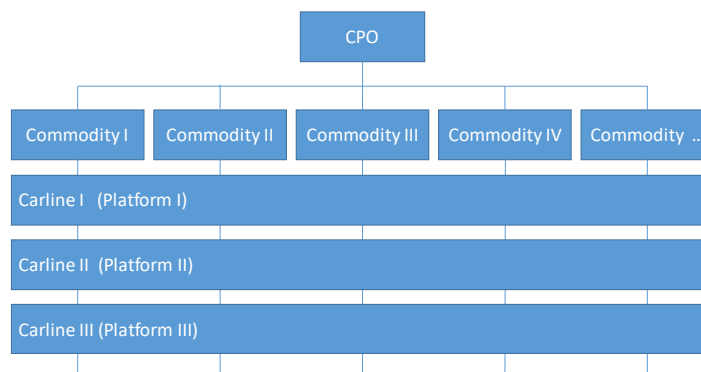
As organizational structure should represent processes, and processes are anchored cross departmental wise cross functional cooperation with affiliated departments gains major importance. Thus organizational set up should consider and enable cross functional team approach, e.g. interdepartmental projects or even in a project organization.

Next chapter will examine typical requirements of processes and systems of a purchasing organization.

4.4 Processes and Systems

In this thesis processes are estimated as procedures of provision of an industrial enterprise, whereas systems are electronic based auxiliaries to support processes.

4.4.1 Processes

According to Profirm professional, there are 4 general requirements, management processes have to fulfill: effective (cost reduction), efficient, controllable and rectifiable for people involved, adjustable to process environment.

Purchasing can be regarded from top corporation level as superordinate management process. According to the organizational requirements explained in the previous chapter, Höveler B. and Laakmann J. (2016) identified three typical core processes (strategic-, operative-, SM-processes), which shall be supported by dedicated methods.

A similiar explanation is provided by University of applied sciences Darmstadt (2009), which reduces the definition to two streams in strategic and operative purchasing processes (see figure 9, page 26) and puts focus on single procuring activities along a typical value stream. Although meaning of processes in this thesis is to focus primarily on those selected procedures and requirements, which set a frame for activities and ensure achievability of the overall purchasing objective cost optimization.

Referring to the above in this chapter mentioned 4 requirements, it can be taken as self-explanatory that successful purchasing organizations achieve higher level of effectiveness by aligning their structure with processes according to BME (2015).

Internal and external procedures should be clearly defined. Documentation, transparency, communication enable for adherence of processes and are mandatory to ensure living and efficiency of processes. E.g. incidents of maverick buy stand for disregard of procurement procedures. Dietrich J. (2012) refers to an example in industry of more than 30% maverick buy ratio and caused by 3 types of maverick buying (no or late purchasing involvement, existing contracts not utilized) and the benefits of process adherence. Very often these incidents are not transparent in companies which modern organizations avoid.

Controlling processes are vital in modern purchasing organizations. In order to measure level of efficiency and effectiveness controlling instruments should be established as kind of steering cockpit. According to Decker H. (2013) indicators should cover KPI measures in two dimensions:

1. Internal performance measures (organization)
2. External measures (Supply chain)

If connected with an ERP-system a cockpit can pull and aggregate data to provide clear overview about documents, workflow and has ability to combine processes. Comparison of indicated with corporate history data or market benchmarks allow location decision and enable for corrective action(s), most preferable in team with cross functional partners.

Corporate organization should involve purchasing at the earliest possible stage to consider cost effects earliest possible in product development process and life cycle and live processes cross department boarders.

4.4.2 Systems

Systems support enterprises to consistently live and maintain processes. Especially ERP-systems are business related software solutions to map controlling on corporate processes. They should provide functional access with clear access authorization. Systems should span across departments and allow smooth process flow on a cross functional basis.

Various systems are offered for SMEs whereas SAP is the biggest European Software producer and the largest provider of ERP-Software in the world with almost 300.000 users according to SAP homepage (2016).

Also Microsoft offers ERP-systems which covers main business processes which are tailored to SMEs. Major suppliers offer cloud solutions additionally.

Supplemental various specific systems are offered to fit additional functionalities in purchasing which are also supported by cloud solutions and focus on specific purchasing processes so called eProcurment platforms. Hochschule Darmstadt (2009) mentioned greater objective of eProcurement implementation as:

- Finance goals (reduce failure and process cost)
- Information goals (gain more transparency)
- Process goals (streamline processes)
- Market goals (achieve better prices)

Exemplary following functions shall be mentioned: Source to contract, eCommerce, eSourcing, Procure to pay, SRM, Spend and purchasing intelligence according to Synertrade which represent the majority of market available functionalities. In detail the systems contain among others purchasing processes, supplier marketing tools, auctions and inquiries, catalogue management and ordering and payment systems as mentioned by Lemme M. (2009). Stollenwerk (2012) adds electronic data exchange (EDI), market places and homepages.

According to Theisinger F. (2012) systems improve purchasing performance level once they are as well integrated in process and system landscape as accepted and consequently used by employees.

It appears extremely important to have systems in place which provide data transparency and enable analysis and strategic conclusions on an interdepartmental basis.

4.5 Methods and tools

Literature does not clearly distinguish between processes on the one side and methods on the other side nor does a clear formulation for methods and tools exist. E.g. Sarikay D. explains methods for cost reduction in a metal-working medium-sized enterprise using the phrase process. Höveler and Laakmann (2016) explain core processes based on methods and identified lack of methods leading to a poor living process culture and lower purchasing performance.

Hahn (2002) instead uses the phrase instruments and mentions various methods and tools for cost optimization as target costing, make or buy analysis, TCO, re-engineering of supply chain management. The VDMA committee of Purchasing and materials management (2011) explains the need for specific tools as so called satellite themes over the existing basic tools like commodity strategy, demand planning and supplier management, which ensure general task to procure goods in right quantity and quality, at the right time and at best price as so defined core themes. Supplier development, advanced sourcing, value engineering and price or cost driver analysis are nominated as sample satellite themes. A further important cost optimization tool is from the authors point of view early purchasing involvement. According to Stollenwerk (2012) an early involvement bears a very high potential of influencing material or engineering costs, which account for almost 90% of following spend. Lemme (2009) on the contrary speaks of concepts and activities of cost reduction. Exemplary be alluted to ABC- and XYZ-analysis, diverse cost calculation methods (prices, logistic costs, price-quantities, etc.) and sourcing techniques. At the third BME-Forum (2013) quite similar cost reduction topics were highlighted from a practical environment with the aim to develop purchasing towards value managing: Global sourcing, negotiation, process cost design.

Various consultancies specialized in purchasing optimization offer a range of proven tools and methods for cost optimization. For instance McKinzey & SMI (2004) expose best practice processes referring to tools for sourcing, total costs for all categories and negotiation. Schuh et al (2008) invented the purchasing chessboard recommending 64 levers for cost optimization based on a portfolio analysis, which are basically divided in 4 categories: Sourcing concepts, specification adaption, partnership approach and utilizing competition. Besides the above mentioned big strategic consultancy players smaller specialized in purchasing also offer quite similar

approaches and can meanwhile partly be estimated as standard. The difference is in utilization in varying industries and diverse sizes of enterprises. According to All about Sourcing (2015) most consultancies see their instruments as strategic element to reach sustainable savings and develop purchasing towards value managing department.

In the course of this thesis method and tools shall be understood as measures, which support superordinate processes and are primarily eligible or directly support cost reduction effects. In this context we will stick to the term method and tools whereas the notion tool is understood as subordinated specific activity to a certain method. In chapter 5 selected value levers will be evaluated for best cost reduction approaches whereas in this chapter methods and tools and respective expectations towards these are introduced.

Recommended methods applied should be in line with overall goal of enterprise and suit purchasing strategy. Methods are not categorized and selection and application of them depends on focal point of consultancy. As there is a plurality of methods available in the market the most recent shall be mentioned in a categorized order at this point:

Table 3: Typical cost reduction methods and tools

Method	Tools	Benefit
Cost analytic	Product costing, target costing, total cost of ownership, supplier workshop, material cost analysis, specification analysis, LPP, Regression analysis, VA/VE, standardization	Transparency in material, product and value chain costs, identification of cost drivers and saving potentials
Sourcing concept	Global sourcing, single/dual/multi sourcing, make or buy analysis, eTools (e.g. eAuctions), technical concept competition, volume bundeling, purchasing cooperation	Expanded supplier market, improved market prices
Negotiation	Contract, payment terms, duration of agreement, intellectual property, terms & conditions,	Improved market prices
Purchasing power	Early purchasing involvement, prevent Maverick buy	Cost reduction at early development stage, responsibility of spend
Working capital optimization	Inventory optimization, call off optimization, delivery time optimization,	Improved inventory cost
Supportive	ABC/XYZ-analysis, Pareto-analysis, portfolio analysis	Spend and cost transparency (suppliers, products, material, services)

Source: Author

The table divides the in forefront discussed tools and groups them according their methodical orientation. Six main methods cluster were identified and cover the typical purchasing activity range. The displayed methods focus primarily on savings contribution and, or, allow strategic planning of purchasing spend (e.g. suppliers, goods, services), if applied coherently. Especially the as supportive classified tools enable for prioritization and make a deductive conclusion even possible. Methods can be applied to goods, services and processes for improved cost efficiencies, competitive advantages or lean processes and should consider the effect of sustainability.

Methods and tools have an extraordinary importance as they stand for target oriented activities for cost reduction. Reverse if not applied properly or only to certain extent, enterprises may suffer from weak purchasing performance or even fail.

5. Result

This paper carried out 5 internal main and respective sub factors, which highly influence purchasing performance and drive the effectiveness of an organization by adjustable efficiency parameters. Based on the 5 factors a so defined 5 axis-model was composed which shows, that the introduced factors obtain an interactive effect in the sense that an isolated modification of one factor does not imply a significant performance lift. Quite the contrary a substantial performance lift is achieved by an improvement of all factors. Though all factors have an impact, the most important tends to be factor employees. Though factor strategy is the broad and other factors embracing performance factor, quality and ability of strategy execution and smart application highly depends on competence and attitude of employees (compare assessment results of empirical project). Therefore the factor employees should be of particular importance and be awarded with special attention. Factor organization should help, based on consideration of the size of the enterprise, to establish best fit set up (centralized vs. decentralized, matrix vs. project organization) to enable cross functional team approach at its best. Sub factor processes is the only by so called KPIs quantifiable actuating variable which offers corrective action if monitored and tracked for example within an ERP-system, whereas sub factor systems requires stringent application by users. Modern tools were clustered according their respective corresponding method and a table set composed, finally showing potential benefits per method and tool selected. Interestingly all internal factors can be altered and manipulated by purchasing to a certain extent, given the organization is empowered to manage their business division as possible independently of other department direction (e.g Purchasing reporting to Finance).

The carried out 5 internal factors have a significant impact to purchasing organization effectiveness and are eligible to improve performance level of purchasing. The derived recommendations per factor indicate fields of actions to help for a target oriented performance improvement.

6. Study limitation and conclusion

There are a lot of parameters which can impact a purchasing organization. The aim of this paper was to classify internal factors, which comprehensible impact the performance level (output) of a division and which seem to be eligible to help analyze purchasing positioning. Sources like consultancies generally do not provide detailed insights about approaches or do not publish in depth analysis information, due to the fact, that consultancies do not want to spread their knowledge. This attitude underlines the necessity of a sound and holistic positioning understanding. Nevertheless one approach available from author´s network was analyzed, and based on comparison to the need of modern purchasing and knowledge a 5 axis model deduced. The factors carried out serve primarily in the automotive and machinery sector, where global market conditions apply. However industries with similar market approach could benefit as well from the findings. The introduced internal factor process usually is steered by quantifiable measures (so called KPIs = key performance indicators) and deviation from objectives allow counter measures. In order to enable for holistic target oriented counter actions, qualitative characters of features should also be transferred in a manner, that quantifiable measures can be derived.

A modern established purchasing department can contribute sound benefits, e.g. savings, market insights, new technologies to an enterprise and even more manage value efficient. For that purpose a set of certain requirements needs to be fulfilled with the introduced 5-axis model of performance:

- Corporate wise aligned purchasing strategy
- Well educated and globally oriented employees
- Netted organization and reporting line to C-Level
- Corporate wide integrated systems and living processes
- Knowledge and application of modern methods and tools

If all internal factors are managed well the need for improvement or external help by consultancy is rather low. Reality often shows differently. One missing element can cause potential risk to fail or underperform and to give up market position.

In order to improve the level of performance these internal factors need to be analyzed at an early stage. In a subsequent step the internal factors should be evaluated, which forms a picture of purchasing positioning based on internal factors. A three step process should be followed:

1. Analysis of 5 internal factors (Strategy, Employees, Organization, Method and Tools, Processes and Systems)
2. Deduction of challenges and counter measures
3. Design and implementation of target oriented counter measures

By adhering to the above introduced process, an efficient cost optimization program with a minimum sacrifice of resources will be ensured.

Besides the internal factors external factors should also be considered. The examination of external factors and their contribution to purchasing positioning will be carried out in a separate paper.

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Research on the Factors Affecting the Sales of Urban Commercial Housing in China

Li Xuexin[1]

[1] School of Business, Guangdong University of Foreign Studies, Guangzhou, China. E-mail: 757556629@qq.com

Abstract

With the rapid development of the market economy after the reform and opening up, there is also rapid development in China's real estate industry. However, in recent years, high prices have been hotly debated. As a pillar industry of the national economy, the real estate industry is not only concerned with the quality of life of the residents, but also with the stable development of the national economy. Moreover, the housing prices are also affected by many complex factors. This article will start from the three perspectives of supply, demand and macro economics, and subdivide them into the four factors that affect the total population, average wages of employees, investment in real estate development, and gross domestic product. Using Equal Part Linear Regression Model to analyze the data in 2016, identify and verify the important factors that affect the sales price, and then drawing relevant conclusions through specific analysis, as well as the implications for the future development of China's housing prices.

Key Words: Housing Prices; Supply Factor; Demand Factor; Equal Part Linear Regression Model

1. Introduction

In recent years, the real estate industry has developed rapidly and has become a pillar industry in China's new development stage, playing an important role in the national economy. The basic requirements of the real estate industry meet the needs of the people's material and cultural life, as well as the driving force of economic development. However, the rising housing price started to cast a negative impact on people's lives. Thus, more and more attention is paid on the commercial housing price and the affecting factors.

With the aim of understanding the important factors affecting commercial housing prices and having implications for the future development of housing prices, this paper is an application of Equal Linear Regression Model on the affecting factors of the housing price.

Equal Part Linear Regression Model is the main model of this research. The Equal Part Linear Regression analysis method is a new linear regression analysis modeling method proposed by Pan, based on selected actual cases. This method constructs an Equal Part Linear Regression line by dividing the sampling points into equal parts and moving the aliquots from left to right (Pan, 2017). This approach allows researchers to observe the trend of each equal part and compare it to the results of a general Linear Regression Model to improve the performance of the linear regression model. When the sample data is large enough, the Linear Regression Model construction process takes a long time so the Equal Part Linear Regression Model encoded by R language will be better.

2. Literature review

Domestic research on housing prices has gradually increased in recent years, with the expansion of housing prices. In particular, it has determined that research topics are collected from databases, and linear regression analysis has drawn conclusions and quantitative research. This paper analyzes the factors affecting housing prices by four specific factors: the total population, the average wage of employees on the job, the amount of investment in real estate development, and the gross domestic product. The amount of real estate development investment and GDP are from the perspective of supply and macroeconomic factors respectively, and then the total population and the average wage of employees on the job are considered in terms of demand. S.W. Decarlo (1997) pointed out that the reasons for the fluctuation of the real estate market mainly included supply and demand changes, vacancy rate, monetary policy, employment level, population trends, regulations and policies, family size, etc. He believed that the supply and demand are the most important factors.

Residents are the main part of the demand for commercial housing, so the population directly affects the demand for housing in one area. The rapid development of the economy has promoted the development of urbanization, so the increase in the population of the city has also boosted the demand for commercial housing. Yan Lei (2011) applied the panel data from 1997 to 2008 to empirically analyze various factors affecting real estate prices. The real estate price is proportional to the total population at the end of the year and has a significant relationship, and the total population and population structure will affect housing demand.

Income is considered to be the most important determinant of consumer spending. At the same time, increase and decrease of the average wage of employees on the job and the extents of the change are closely related to the income of the residents and the disposable income of the individual. Both of them directly affect residents' spending power. Wang and Huang (2005) concluded that there was a close positive correlation between the income level of residents and housing prices through the discussion of the relationship between the income level of residents and housing prices. Meanwhile, based on the simple partial equilibrium model, Li and Meng (2005) empirically analyzed the panel data of 31 provinces and cities in China from 1999 to 2003. The per capita disposable income and investment in real estate are important factors for housing price increase.

In terms of investment in real estate development, more research has linked this aspect to interest rates and credit, etc. however, very few independent analysis of real estate development investment was put forward. For an instant, Liang and Gao (2006) found that both the growth rate of construction industry loans and the growth rate of real estate development funds in financial institutions are negatively correlated with housing prices. The increase in capital means an increase in supply. That is, the larger the credit scale, the lower the house price will be.

As a national pillar industry, the real estate industry and GDP have a correlation, and this connection is more complicated. Yang and Tan (2011), after studying the factors affecting housing prices in the Pearl River Delta, concluded that there is a two-way causal relationship between GDP and housing prices and that social output has a very large impact on housing prices. Zhao (2014) studied the impact of GDP and household income on the prices of different types of houses. It was found that the most affected by GDP fluctuations was the price of commercial housing, followed by ordinary residential, residential and high-end residential, affordable housing. Residents' income has the least impact on the price of commercial housing, which is determined by the dual nature of real estate as both consumer goods and investment products.

3. Analysis of Model Framework

3.1 Methodology

In this paper, the key study method is Equal Part Linear Regression Model，which is proposed by Professor Pan Wen-Tsao (2017). According to his theory, data can be divided into several equal divisions with Equal Linear Regression Modeling, and then each aliquot of model trends can be observed independently.

Equal Linear Regression theory assumes that y is a continuous dependent variable that depends on x. The standard linear regression model can be expressed as follows:

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i$$

Since linear regression uses Least Squares Method (LSM) to seek for the line that minimizes the sum of the squared errors (SSE). So the formula above can also be written as:

$$\min \Sigma_i [y_i - (\beta_0 + \beta_1 x_i)]^2$$

Then this formula can be expressed by:

$$\hat{\beta}_0 = \frac{\sum_{i=1}^{n}(xi - \bar{x})(yi - \bar{y})}{\sum_{i=1}^{n}(xi - \bar{x})^2}$$

$$\hat{\beta}_1 = \bar{y} - \hat{\beta}_0 \bar{x}$$

Coefficient of determination and confidence interval:

$$\hat{\beta}_1 - t_{\frac{\alpha}{2}} \times S_{\hat{\beta}_t}, \hat{\beta}_i + t_{\frac{\alpha}{2}} \times S_{\hat{\beta}_t}), i = 0,1$$

The symbol "t" means data is equally divided into t parts. Each part is analysis by linear regression model respectively.

3.2   Theoretical review

Since 2002, the problems of overheated real estate investment in various cities in China have risen, housing prices have been rising, and the growth rate is too fast. Figure 1 is the relevant statistics.

People buy houses on the one hand for a living, on the other hand for investment, so the property has the attributes of both consumer goods and investment goods. According to the microeconomics supply and demand theory, when real estate is used as a consumer product, its price is affected by supply and demand; when it is used as an investment, its price is mainly affected by income. Whether it is a consumer product or an investment product, the price will be affected by the regional macroeconomy. According to the above hypothesis, it can be inferred that supply, demand, and macroeconomics will have a certain impact on the selling price of commercial housing.
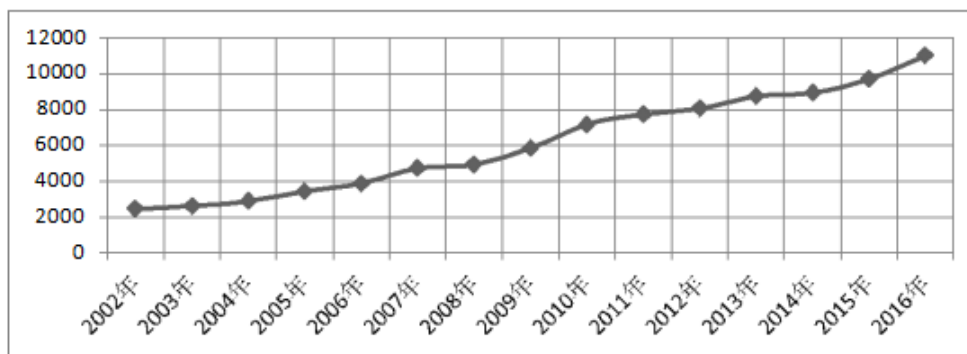
Figure 1. The average selling price of the commercial housing of major cities in China from the year 2002 to 2016（Unit：Yuan)

In summary, the factors affecting the selling price of commercial housing are multi-faceted. Due to the conditions, we use the amount of real estate development investment (indicated by X1) to represent the supply side factor and select the total population at the end of the year (in X2). The average wage of employees on the job (indicated by X3) represents the demand side factor, and the regional GDP (indicated by X4) is selected to reflect the regional macroeconomic level, while the sales price of commercial housing is used as the dependent variable (indicated by Y). The following figures are collected from the China Statistical Yearbook. This paper makes certain theoretical analysis and assumptions based on the results of data operation.

3.2.1   Supply-side factor

The amount of real estate development investment is the amount of investment in real estate commodities in the same year. The higher the investment amount is, the more the new construction area of the residential area in that year. And in the next few years, the supply of commercial housing will increase, so that the price of real estate will change. Therefore, the amount of investment in real estate development will affect the price of real estate by affecting the supply of real estate.

It can be seen from the following line chart that the average real estate investment in major cities in China has been raising since 2002. Figure 2 shows the same upward trend in the price of commercial housing as in Figure 3. From this, it is assumed that the real estate development investment (X1) is related to the commercial housing price (Y).
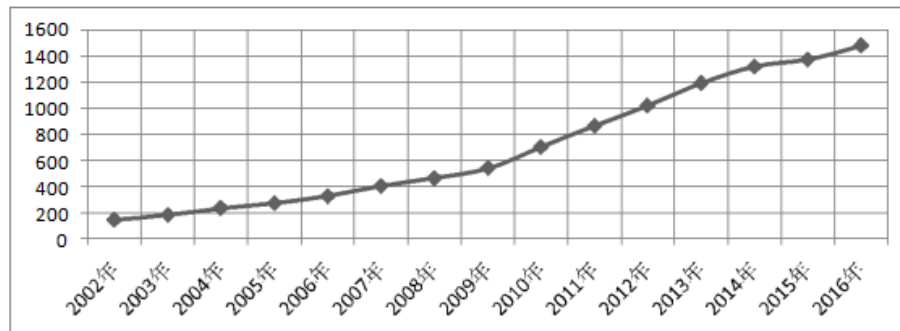
Figure 2. Average real estate investment of major cities in China from 2002 to 2016
(Unit: hundred million Yuan)

3.2.2   Demand-side factor

First of all, the main body of demand for real estate is people. Therefore, the price and the population of the local population are closely related to the population density. The higher the population density is, the greater the demand will be for commercial housing in the region. When the amount of demand is more than supply, the price of commercial housing to rise will be caused. Therefore, the total population at the end of the year is selected to reflect the impact of population size. According to Figure 3, we assume the total population at the end of the year (X2) and commercial housing.
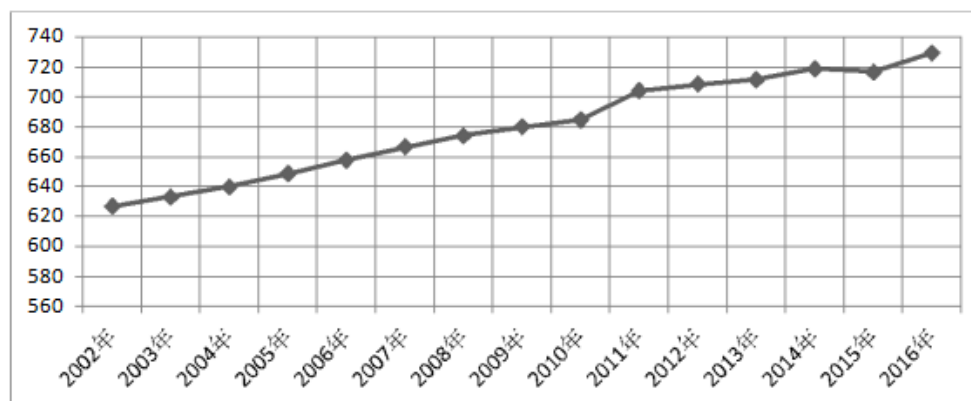
Figure 3. The average annual population of major cities in China from 2002 to 2016
(Unit: ten thousand)

Second, the income level of residents is one of the most important factors affecting the consumption structure. To a certain extent, the average wage of employees in an area represents the income level of residents in the area. When the income is low, even if the demand side subjectively has the demand for housing purchase, it will be restricted by the income level and cannot afford to buy a house. Therefore, the income level directly limits the purchasing power of the demand side. As people's disposable income increases, the Engel coefficient will

gradually decline, and the proportion of food expenditures for purchasing survivability will be lower and lower. As incomes increase, the demand for previously no purchasing power is turned into an effective demand. People's demand for commercial housing is growing. Therefore, this paper selects the average salary of employees on the job to reflect the income level of residents. According to Figure 4, we assume that the average wage (X3) of employees is positively correlated with the sale price of commercial housing (Y).
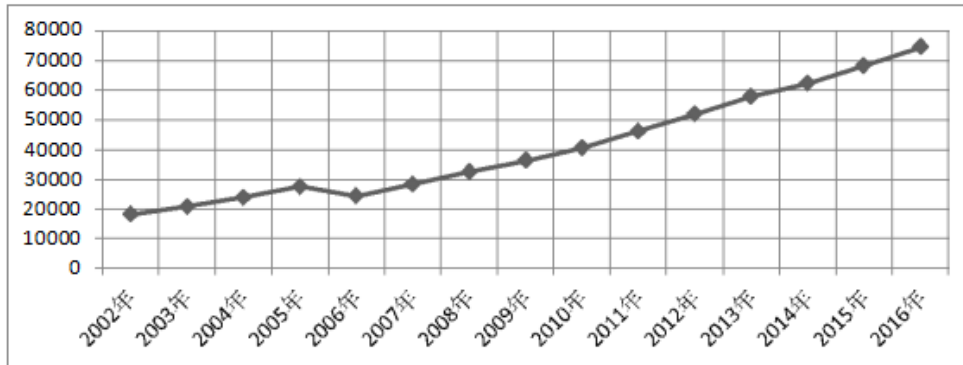
Figure 4. The average wage of employees in major cities in China from 2002 to 2016
(Unit: yuan/year)

3.2.3   Macroeconomic factors

The real estate industry is the pillar industry of the national economy and is affected by the overall level of macroeconomic development. GDP growth will drive economic development and improve people's quality of life, and national income will increase. As a result, First-time home purchase demand and improved home demand will increase, and more people will generate speculative demand. For real estate providers, the rise in GDP means that the macroeconomy is better, thus increasing the confidence of real estate developers to invest. Therefore, Investment will be increased so that housing prices will be affected. It can be seen from Figure 5, the average GDP of major cities in China has raised steadily since 2002. From this we assume that when the GPD rises, the house price will also rise, that is, the regional GDP (X4) is positively correlated with the commercial house price (Y).
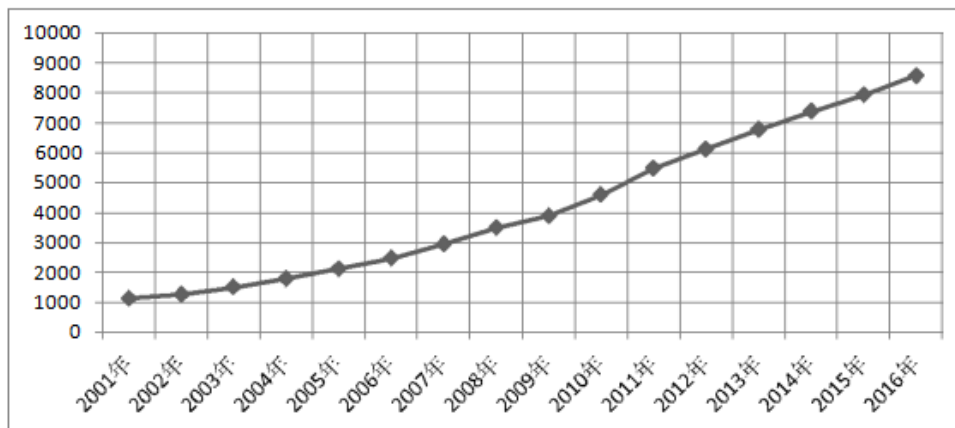
Figure 5. Average GDP of major cities in China from 2002 to 2016
(Unit: hundred million yuan)

4.   Analysis with Equal Part Linear Regression Model in R language

4.1   Process of analysis

The following steps are required:

Ⅰ. Establish a data worksheet. The investment amount of real estate development is variable X1. The total population at the end of the year is variable X2. The average salary of the on-the-job job is variable X3, the gross domestic product is X4, and the average sales price of commercial housing is Y. Name the worksheet "testdataL5" and save it in CSV format.

Ⅱ. Create a data folder on the computer C drive and place the testdataL5 worksheet in the folder.

Ⅲ. Create an Equal Part Linear Regression in R language:

Run all the functions and confirm that the required installation packages are prepared. (Relevant characters are shown in Table 1)

Table 1. The required installation packages

```
install.packages("SparseM")
install.packages("quantreg")
install.packages("boot")
install.packages("ggplot2")
install.packages("grid")
install.packages("Rmisc")
library(SparseM)
library(quantreg)
library(boot)
library(ggplot2)
library(grid)
library("Rmisc")
```

    a.   Define a function "equal_lm" to handle regression analysis and parse data. Then set five parameters: formulation, data, model name, C (confidence level) and K (the number of variables).

    b.   DF_model divides the data into equal parts and calculates the final result.

    c.   Define a function "PY_data" to split the data and calculate the model results. Then input five parameters: formulation, all data(all data), C (confidence level), K (the number of variables) and alpha (the number of mobile data samples, 5 data at a time).

    d.   Draw a function graph of the confidence interval. Set a strip chart function: "ymin" is the lower limit; "ymax" is the upper limit.

    e.   Set the variance test function of samples and F test for translation model coefficient.

    f.   After completing the above steps, the R language initial environment of the Equal Part Linear Regression is established.

Ⅳ. Perform data analysis in Equal Part linear Regression Model

    a.   Data reading (Relevant characters are showed in Table 2 &3):

Table 2. Characters Input

```
setwd("C:/data")

data=read.csv("testdataL5.csv")

data
```

Table 3. The process of data reading

```
Loading required package: plyr
> setwd("C:/data")
> data=read.csv("testdata15.csv")
> data
        Y        X1        X2       X3        X4
1  0.27497 0.0400057 0.0136286 1.22749 0.2566913
2  0.12830 0.0230001 0.0104440 0.87806 0.1788539
3  0.08281 0.0101577 0.0103800 0.61189 0.0592773
4  0.07667 0.0068013 0.0037025 0.64820 0.0295560
5  0.06425 0.0052052 0.0024097 0.56213 0.0317359
6  0.07128 0.0070967 0.0073440 0.67444 0.0546001
7  0.09354 0.0053517 0.0059563 0.73764 0.0673033
8  0.06557 0.0059665 0.0075343 0.68434 0.0591794
9  0.06680 0.0052613 0.0096205 0.62583 0.0610161
10 0.24747 0.0370903 0.0145000 1.20503 0.2817865
11 0.17754 0.0184560 0.0066279 0.90191 0.1050302
12 0.15753 0.0260663 0.0073600 0.87153 0.1131972
13 0.11228 0.0127033 0.0059096 0.83656 0.0868649
14 0.09369 0.0135259 0.0072983 0.71054 0.0627438
15 0.11089 0.0167944 0.0068706 0.67630 0.0619764
16 0.20021 0.0076580 0.0022055 0.69218 0.0378427
17 0.08218 0.0067460 0.0052279 0.65812 0.0435499
18 0.08247 0.0116414 0.0063283 0.77012 0.0653612
```

b.   Perform simple linear regression

Apply simple linear regression to all data. "c=0.90" means the confidence is 0.90, and "k=5" means a total of 5 variable (4 X variables + 1 constant term). (Relevant characters are shown in Table 4)

Table 4. Simple Linear Regression performance

```
data=read.csv("testdata.csv")

model0_result1<-equal_lm(Y~X1+X2+X3+X4,datak=data,modelname="model0",c=0.95,k=5)
model0_result1
```

c.   Perform Equal Part Regression

Divide data into 3 equal parts. "c=0.90" means the confidence is 0.90, "k=5" refers to a total of 5 variable (4 X variables + 1 constant term) and "alpha=3" represents the three equal parts. (Relevant characters are shown in Table 5)

Table 5. Equal Part Regression performance

```
model_dengfen_result<-DF_model(Y~X1+X2+X3+X4,alldata=data,c=0.90,k=5,alpha=3)
model_dengfen_result
write.csv(model_dengfen_result,"dengfeng.csv")
variable<-c("Y","X1","X2","X3","X4")
plot_conf(k=5,mn=model_dengfen_result,variable)
```

d.   Apply translation model

(Relevant characters are shown in Table 6)

Table 6. Application of translation model

```
mode_pingyi_result<-py_model(Y~X1+X2+X3+X4,data,c=0.90,k=5,alpha = nrow(data)/3)
mode_pingyi_result
write.csv(mode_pingyi_result,"pingyimodel.csv")
variable<-c("Y","X1","X2","X3","X4")
plot_conf(k=5,mn=mode_pingyi_result,variable)
```

e.   Use F Test to examine samples

(Relevant characters are shown in Table 7)

Table 7. Application of F Test on samples examination

```
variable<-c("Y","X1","X2","X3","X4")
F_test_result<-F_test(variable,data,3)
F_test_result
write.csv(F_test_result,"data_F_test.csv")
```

f.   Use F Test to test Translation Model Regression coefficient

(Relevant characters are shown in Table 8)

Table 8. Application of F Test on Tranlation Model Regression coefficient

```
mode_pingyi_result<-py_model(Y~X1+X2+X3+X4,data,c=0.95,k=5, alpha= nrow(data)/3)
mode_pingyi_result
data_beta_result<-py_xishu_f_test(mode_pingyi_result,3,c("constant","x1","x2","X3","X4"))
data_beta_result
write.csv(data_beta_result,"data_F_test.csv")
```

Ⅵ. Get the result of the operation

(Relevant images and characters are shown in Figure 6 and Table 9)
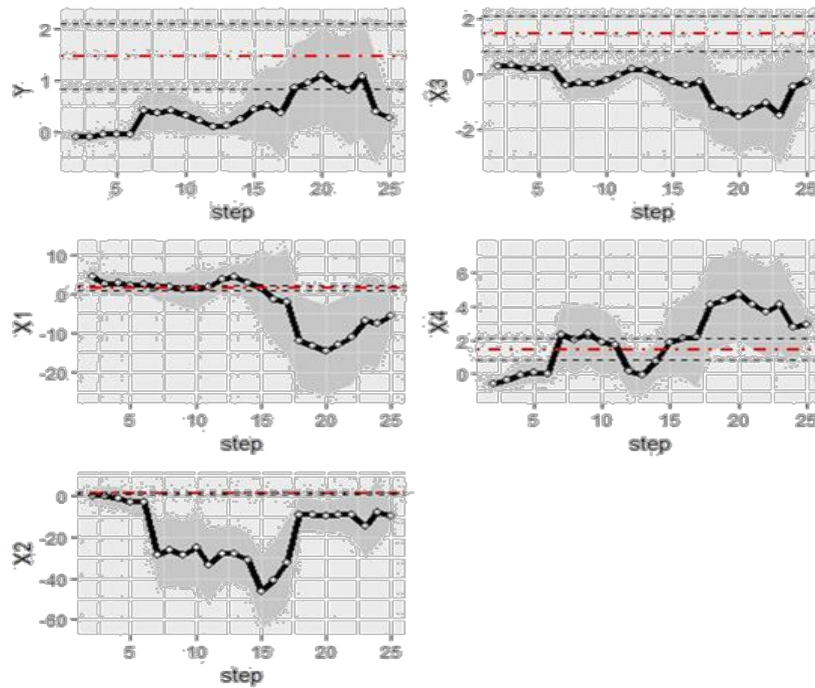
Figure 6. Images of Operation results

Table 9. Operation results

```
123 0.0185449363   -17.47860555   -2.337305641
124 0.3879613858   -1.03821495     0.466090981
125 0.0007011546    1.81938346     4.087103927
> data_beta_result<-py_xishu_f_test(mode_pingyi_result,3,c("constant","x1","$
> data_beta_result
      data_compare variavle      f_value      p_value
6              - constant  0.17603842 0.1210225057
7   model 1 and 2       x1  0.52232461 0.5447767220
8              -       x2  0.23053142 0.1842833430
9              -       X3  0.13039718 0.0737008741
10             -       X4  0.11482178 0.0592782559
11             - constant  0.09005415 0.0386954027
12  model 1 and 3       x1  0.48466705 0.5002545696
13             -       x2 19.68095770 0.0135762405
14             -       X3  0.11032882 0.0553170991
15             -       X4  0.59376189 0.6259413181
16             - constant  0.51155966 0.5321655392
17  model 2 and 3       x1  0.92790392 0.9439320042
18             -       x2 85.37212869 0.0007980661
19             -       X3  0.84609820 0.8752407067
20             -       X4  5.17116080 0.1405296858
> write.csv(data_beta_result,"data_F_test.csv")
> |
```

4.2   Analysis of the result

In Figure 7, the red dotted line is the standard linear regression line, the upper and lower horizontal dashed lines are the confidence intervals of the standard linear regression, the irregular thick lines are the Equal Part Linear regression lines, and the upper and lower gray areas are the confidence intervals of the aliquot linear regression.

4.2.1   Analysis of the X1 (Real estate development investment)
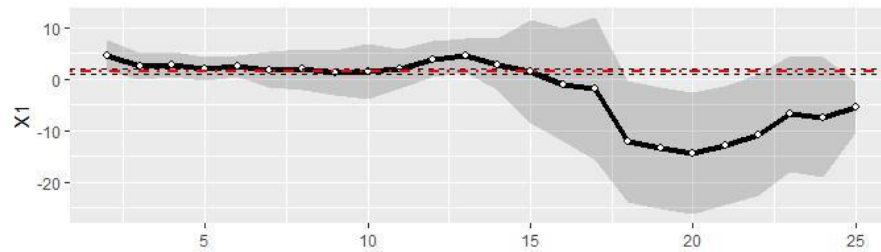
Figure 7. The trajectories of the multiple Equal Part Linear Regression's coefficients and the confident intervals (X1)

From Figure 7, it can be seen that X1 is underestimated in lower and medium divisions. This situation means that the variable X1 in the lower and middle points affects the variable Y more significantly. There is an overestimation situation in the upper division, at which point the self-variation X1 has no significant effect on the variable Y.

Why is there such a turning point? The reason for this needs to be further explored:

In the lower and middle divisions, the variable X1 affects the Y more significantly. The first reason is that in the middle and low-price level areas (such as second- and third-tier cities), housing prices have a large potential for growth, and house prices are more likely to float. Second, in low-price provinces, many properties have not yet been developed. Third, with the rise in per capita wages, people's purchasing power in housing has increased. In order to solve the problem of excessive housing prices in first-tier cities, the government has set policies to restrict the purchase of commercial housing for migrants. As a result, many people have shifted their targets to second- and third-tier cities, and housing demand in second- and third-tier cities has increased. In conclusion, when the amount of real estate development investment fluctuates, real estate prices will also fluctuate significantly.

In the upper divisions, the variable X1 has no significant effect on Y. The main reason is that in major cities, housing price is at a high level. The excessively high cost of buying a house cast a negative impact on domestic life and economy. As a result, the policy is set to limit the commercial housing price. Policies such as increasing property taxes limit capitalist investment.

4.2.2   Analysis of the X2 (Population of the area)

Figure 8. The trajectories of the multiple Equal Part Linear Regression's coefficients and the confident intervals (X2)

From Figure 8, it can be seen that whether in low or high divisions, there will be an overestimation in X2. It means that in either the low or the higher scores, X2 does not have a great effect on the variable Y. That is, the impact of the total population on the average selling price of commercial housing is not significant. That is because the data only reflect the impact of the population instead of the structure. But commercial housing is usually purchased on a household basis. The population cannot reflect the family structure directly.

4.2.3   Analysis of the X3 (Average salary of employees

Figure 9. The trajectories of the Multiple Equal Part Linear Regression's coefficients and the confident intervals (X3)

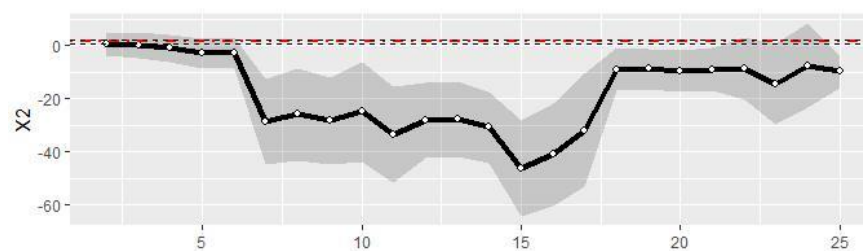From figure 9, whether in low or high divisions, X2 will have an overestimation by using Equal part Linear Regression Model. That is, whether it is in low or high points, the effect of independent variables X3 is not significant. In summary, the average salary of employees is not significant for the average selling price of commercial housing.
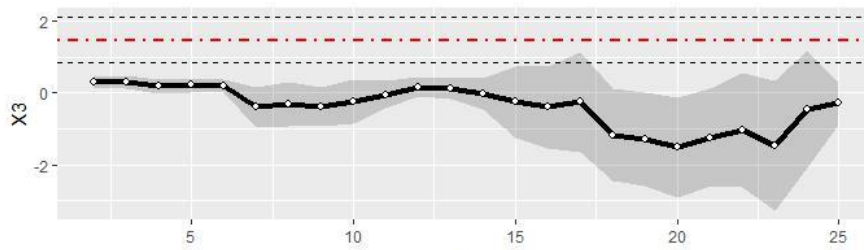
4.2.4   Analysis of the X4 (GDP)
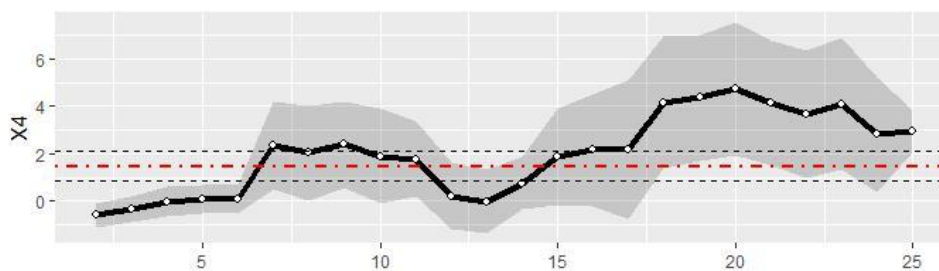
Figure 10. The trajectories of the Multiple Equal Part Linear Regression's coefficients and the confident intervals (X4)

From Figure 10, it can be seen that X4 is overestimated at low aliquots. It means that the effect of X4 on Y is not significant. However, in the medium aliquot, there are two kinds of phenomena: underestimation and overestimation. It means that X4 has both significant and insignificant situations. The reason is worth further exploration.

After searching relevant materials, the reason for the situation in the middle branch is that with the continuous improvement of the gross national product (GDP), the living standards and quality of life are constantly improving. People's willingness to purchase houses is becoming stronger because of the meaning of housing ownership. It can reflect a person's living standard and personal accomplishment. Also, it is a way to show personal achievement and social status. The boom of buying a house is a good explanation for the emergence of such phenomena. Due to the excessive demand for commercial housing, more and more investors regard buying a house as a high-profit making behavior. So the prices keep rising. This has led to a large financial bubble in the real estate industry. Once the bubble is disillusioned, a disastrous impact will occur in the national economy.

In this regard, the government departments have introduced various laws and regulations prohibiting malicious real estate speculation and implemented certain government intervention and control over the real estate industry, so there will be overestimation behind the image. In this regard, the government stated to establish various laws and regulations prohibiting malicious real estate speculation and implemented certain government intervention and control over the real estate industry, so there will be overestimation on the right side of the image.

There is an underestimation in the high aliquots, which means that the influence of the X4 is significant. In the high-altitude, the Equal Part Linear Regression line shows a positive correlation as a whole.

5. Conclusion

5.1 Summary of the influence of independent variables

There are four factors influencing the price of commercial housing considered in this paper, namely, the amount of investment in real estate development, the total number of people in the region, the average salary of working positions, and the gross domestic product. Among them, the real estate development investment and the gross domestic product have a significant impact on the price of commercial housing. The total population of the region and the average salary of the incumbent posts have no significant impact on the price movement of the commercial housing.

For the amount of real estate development investment, the impact of medium and low-level real estate development investment on the price of commercial housing is significant. This is because, in the middle and low housing prices, the real estate market is not saturated, there is still a large amount of land for real estate developers to develop, and the supply relationship of real estate is relatively balanced. So the price of commercial housing is slightly higher than the cost of real estate construction, that is, the amount of investment in real estate development. In areas with high housing prices, the amount of real estate development investment has no significant impact on real estate prices. This is because in the high-priced areas, that is, some first-tier cities, people's housing demand is high, and some investors have purchased a large number of commercial housing for speculation, resulting in a housing price bubble. Therefore, in order to control housing prices, the state and the government have adopted house price control policies and purchase restrictions, resulting in limited housing price fluctuations. In the provinces where housing prices are too high, the speculation is more obvious. The greater the supervision of the state, the greater the investment restrictions on capital plus. Therefore, in the first-tier cities, the impact of real estate development investment on commercial housing prices is not significant.

The impact of real estate development on medium and high levels of GDP on real estate prices is particularly significant. GDP is the domestic consumption index, which refers to the total price of a country's consumption in a certain period of time. In the middle and high level of GDP, people's consumption level is strong, the willingness to purchase real estate rises, the market demand is large, and the seller's supply and demand relationship is at the seller. In the market, house prices have risen. The rapid development of the national economy will promote the prosperity and development of the real estate industry. At the same time, real estate also plays an important role in the growth of the national economy. The prosperity and recession of the economy directly affect the real estate industry.

5.2 Residential price change trend forecast

In recent years, China's real estate industry has developed rapidly and has become a pillar industry of the national economy. The price of real estate sales, especially the price of commercial housing, has also risen. The high level of GDP reflects the economic growth rate and the quality of economic growth and expands the demand in the real estate market. According to the relationship between GDP and real estate prices, future economic growth will also drive up the price of housing, and this trend will spread from first-tier cities to second- and third-tier cities.

From the analysis of consumption hotspots, the consumption demand for living and shopping in the five major material consumptions of eating, wearing, using, living, and traveling has been increasing. The housing aspect is particularly prominent, and people's housing consumption demand is far from being satisfied. The development stage and development requirements of the national economy determine that China's real estate is at a high-speed development stage, and housing will become a persistent consumption hotspot. The rise of housing prices is also the inevitable result of economic development. How to control the rising housing prices within the psychological tolerance of consumers, controlling appropriate consumption is an issue that the government should pay much attention to.

5.3 Suggestion on current phenomena

High-level GDP promotes the rise of housing prices, causing a large number of property market bubbles. The increase is more than people's expectations. Consumers are unacceptable, which will lead to a decline in

consumption, a decline in GDP, and a relationship between GDP and housing prices. Only when the house price is controlled at an appropriate level can the real estate industry develop healthily, it requires the government to make reasonable adjustments to the real estate market.

5.3.1   Government functions should be transformed to improve the management level of the real estate market.

The government and its various departments must create a fair and competitive market environment for real estate development enterprises according to economic laws. Strengthen research on relevant rules and policies in real estate investment, management and service areas, improve policy transparency; strengthen real estate market statistics, provide reliable information for real estate market management; build scientific and effective on the basis of comprehensive and dynamic collection of real estate market information data Real estate market early warning and forecasting system; do a good job in real estate development planning, promote the real estate marketization process, and strive to improve the level of service to enterprises.

5.3.2   The housing security system needs to be improved.

The Housing Administration Bureau can establish different housing security systems for low-income groups. Implement low-rent housing policies for low-income groups; provide affordable housing for low-income people. The establishment of a housing security fund, in view of insufficient local funding sources, the central government should solve the problem of funding sources through transfer payments. Establish a housing archive and distribution system for low-income people and arrange housing investment and housing allocation according to actual needs, so that insurance should be guaranteed.

5.3.3   Increase the supply of commercial housing.

The government should give certain policy support to the construction of medium and low-priced, medium and small-sized ordinary houses. By means of relevant taxes reduction and exemption, real estate developers can be guided to increase the development of small and medium-sized ordinary houses.

In addition, the supply of ordinary housing could be increased according to demand. Formulate sales rules also plays a role which will give buyers preferential treatment in terms of distribution, mortgage interest rate, down payment ratio and use of provident fund loans, meet the needs of ordinary residents to purchase houses. And thus the cost and pressure of buying houses will decrease.

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Factors Affecting Intellectual Capital Disclosures: A Case of Primary Sectors in Thailand

Saarce Elsye Hatane,[1] Audrey Tania Wijaya,[2] Andy William,[3] Amanda Devi Haryanto[4]

[1,2,3,4] Accounting Department, Petra Christian University, Indonesia

Abstract

The aim of this paper is to explore the quality of Intellectual Capital Disclosure (ICD) in the modern economic era. Using the data from both agricultural sector and resources sector listed in The Stock Exchange of Thailand (SET) between 2013-2017 (15 companies each), the study finds that firm size has an influence on all aspects of ICD (Human Capital Disclosure, Internal Capital Disclosure, and External Capital Disclosure). Meanwhile, profitability affects Human Capital Disclosure and Internal Capital Disclosure. As a contribution to previous researches, the findings support the view in which information asymmetry has a positive relationship with External Capital Disclosure. Furthermore, it finds that market share has a significant influence on the quality of Human Capital Disclosure and Intellectual Capital Disclosure. Since the study applies content analysis which investigates companies' annual reports according to ICD terms used in the reports, there is a possibility that the quality of ICD will not be wholly captured. In addition, firms may use other sources of information to communicate their ICD. To sum up, this paper assists in giving some insight about the quality of ICD in Thailand, especially agricultural sector and resource sector, as well as trying to inspect other factors related to ICD that was rarely used in previous research, such as market share.

Key Words: Information Asymmetry, Intellectual Capital Disclosure, Market Share, Profitability

1. Introduction

1.1 Introduction

Intellectual Capital (IC) grows rapidly as a hidden value of a business. A firm's value does not lie only in its physical assets, but also on its database, human competence, firm performance, or any other intangible asset (Huang *et al.*, 2010). The world's economic continuous development is currently pushed by the basis of utilization of knowledge and business innovation, while also identifying needs of IC (Kianto *et al*., 2014; Tzortzaki & Mihiotis, 2014). The recognition of intangible assets such as research and development, copyright, license, trademark, patent, product portfolio, and technology, has become the basis for the emergence of IC in financial reporting disclosure as a whole (Joshi *et al*., 2018). Many of the current research frameworks have started moving towards the matter of human abilities and skills. This means there are various studies of intellectual capital, done either conceptually (Eddine *at al.*, 2015) or empirically.

Several empirical studies have tried measuring the factors that affect the creation of intellectual capital in an organization; whether in the shape of value-added capital as suggested by Pulic in 1998 (Al-Musali & Ismail, 2015; Appuhami & Bhuyan, 2015; Hatane *et al.*, 2017; Nadeem *et al.*, 2017) or as the disclosure of intellectual capital activities (Ousama *et al.*, 2012; Mondal & Ghosh, 2014; Morariu, 2014; Abhayawansah & Azim, 2014; Kamath, 2017). This has become a challenge for further researchers who want to expand on the topic of intellectual capital.

Firm's knowledge and reputation, skills, experience, loyalty, and employee's commitment are several non-financial information related to intellectual capital activities that firms must communicate to stakeholders. This may become a challenge for companies as this information have no clearly defined standard of presentation and measurement (Branco *et al.*, 2011). Meanwhile, said non-financial information are also points of consideration for stakeholders in making firm-related decisions.

Guthrie *et al.* in their study of intellectual capital disclosure (ICD) in 2012 developed the framework in order to expand ICD's components. They classify the source of intangible assets into three parts, and while they may have different terms, are generally divided into the internal structure commonly known as structural capital, the external structure called relational capital, and human resources (Edvinsson, 2013; Curado *et al.*, 2014). This study will use the same IC classification categories as the previous studies to earn a comparable empirical result. IC classification used are human capital disclosure (HCD), internal capital disclosure (InCD), and external capital disclosure (ECD).

Human Capital (HC) is a set of skill or expertise, knowledge, or other intangible assets of an individual, that may be used to create economic value an individual, employee, or community. The most important thing in human capital is education, which becomes a firm's investment. Internal Capital (InC) is the supporting infrastructure for a firm to do its operational activities. Internal Capital is also known as Structural Capital. This particular capital is firm-owned and will stay inside the firm even when employees leave it. External Capital (EC) concerns how a firm relates to its external parties, including among other things, customers, competitors, government, public, firm's reputation, and trademark (Guthrie *et al.*, 2012).

Previous studies have analyzed the determinant of IC disclosure. Generally, ICD is significantly affected by size, industry type, profitability, and leverage. This research will add market share as a relatively new variable in ICD studies. Branco *et al.* (2011) state that firm size measured with market capitalization is a significant impetus of ICD; this result supports the study of Taliyang *et al.* (2011). Inversely, Huang *et al.* (2010) find that firm size does not significantly affect ICD in several companies across Malaysia. Morariu (2014) describes that industry type is not a determinant factor of ICD in Romanian firms, while Kamath (2017) instead states that industry type is a determinant. On profitability, research by Haji & Ghazali (2013) shows that there is a correlation between profitability and ICD at a significant level of one percent. Meanwhile, Atan & Rahim (2012) do not find any significant relationship between profitability and ICD. Likewise, different results are present between the studies by Rashid *et al.* (2012), Oliveira *et al.* (2013), Haji & Ghazali (2013), and Whiting & Woodcock's research which finds that leverage is not significantly related with ICD. Other than using size, market share, profitability, and leverage as variables, this study also tries to measure the role of information asymmetry in IC disclosure, as done by Bruggen *et al.* (2009) and Orens *et al.* (2009).

The study uses data from 30 companies in agriculture and resources sectors between 2013-2017, which are listed in the Stock Exchange of Thailand (SET). This period is chosen as it is the start of ASEAN Economic Community, that is, the start of free-trade between ASEAN countries. As a leading agrarian nation in South East Asia, the agricultural sector is expected to be the main livelihood of Thais. The agricultural sector, comprised mostly of small-scale farms, contributes only 10% of GDP but employs about one-third of the labor force (Forbes, 2017). Natural resources are also a developing sector in Thailand; this includes the mining sector with lead being the main result.

This research finds that size, ROA, and information asymmetry has a positive effect on ICD, while market share negatively affects ICD. The result is different from the previous study by Bruggen *et al.* (2009) which finds that there is no relationship between information asymmetry and ICD. This study contributes to adding ICD research in various countries while also answering the question of what factors affect IC disclosure activity.

1.2 Literature Review

IC investment keeps increasing and has currently reached the highest level in the world (OECD, 2013). In this era of knowledge, IC has become the center of new economic growth as the role of intangible assets more prominent compared to fixed assets and financial assets. Even more, specialists support the notion that IC is an important element in reaching an organization's optimal performance (Sydler *et al.*, 2014). However, not all firms consistently disclose it. According to An *et al.* (2011), there are three factors that motivate a firm to disclose IC. First, it is to reduce information asymmetry between firm's management and various stakeholders in public; then

to perform accountability to stakeholders, and finally to signal the legitimacy and advantage (and superiority) of the firm to the public.

Firms who acknowledge the importance of IC tend to invest on it and report it in their annual report to increase their competitive advantage and success (An *et al.*, 2011; Nimtrakoon, 2015). IC disclosure is also seen as an effective means for firms to reduce information asymmetry and to increase their relationship with various stakeholders (Vergauwen *et al.*, 2007; Yi & Davey, 2010).

Several factors determine the quality of IC disclosure. Bruggen *et al.* (2009) in a study in Australia find that industry type significantly affects IC disclosure. Eddine *et al.* (2015) reveal that firm size, profitability, and industry type have positive relationships with ICD. In Malaysia, Ousama *et al.* (2012) show that profitability is the key factor in ICD, while Taliyang *et al.* (2011) do not find any significant relationship between profitability and ICD. On a study by Huang *et al.* (2010), firm size does not significantly affect IC disclosure. Kamardin *et al.* (2017) report that leverage is significantly related to ICD; conversely, Whiting & Woodcock (2017) and Ferreira *et al.* (2012) recognize no significant relationship between leverage and ICD. Orens *et al.* (2009) find that leverage and ICD have a significant relationship but only in the Internal Capital disclosure component. A study by Bruggen *et al.* (2009) show that information asymmetry does not significantly affect ICD; however, on a study by Orens *et al.* (2009), information asymmetry significantly affects ICD. It may be said that, although using the same variables, the determinant in IC disclosure quality differs in each research.

Similarly, Abeysekera & Guthrie (2005) find a different proportion of IC categories (human capital, internal capital, and external capital) in Sri Lanka compared to Guthrie & Petty's findings in Australia. Human capital proportion reported on firms in the Sri Lankan study (36%) is higher than that in Australia (30%). Meanwhile, internal capital proportion reported in firms in Sri Lanka (20%) is lower than Australia's (30%). In this case, the study used the same framework but earned different results. The newest research is done by Wagiciengo & Belal (2012) in South Africa. This research surveyed the nature and the rate of IC disclosure on 20 South Africa firms between 2002-2006. The findings show that there is an increasing trend for IC disclosure in South Africa, with Human Capital becoming the most reported IC category. The difference in outcomes may happen as a result of the time difference, sample size, and a nation's rules and customs. Based on the above explanation, this research examines the firm size, market share, information asymmetry, profitability, and leverage as factors affecting the quality of IC disclosure in the agriculture and resources sectors in Thailand.

Stakeholder theory may become the basis of ICD-related information disclosure of a firm. A company will voluntarily report its activities if the management thought of this as something the community expects (Deegan, 2004). According to Harrison and Wicks (2013), stakeholder theory explains that a firm does not operate for its own interest only but should also be able to provide benefits for all stakeholders (shareholders, customers, society, government, suppliers, and all other parties who contribute to the company). Stakeholders hold a right to make management utilize all potential a firm has. This potential may be human capital, structural (internal) capital, and relational (external) capital which can add value for the company as it increases financial information while also increases stakeholders' trust towards the firm (Alcaniz *et al.*, 2011).

Legitimacy theory supports ICD as it is closely related to stakeholder theory. Legitimacy theory is asserted on each organization and makes sure that they operate within boundaries and standard or other public norms where an organization is located (Deegan, 2000). Legitimacy theory helps a firm to analyze the content in IC disclosure (Kamath, 2017). By disclosing IC, a company gives out information related to its activities. Through the report, external parties or investors can assess if said company has applied norms and values that fit society's beliefs.

1.3 Hypothesis Development

1.3.1 Firm Size

Based on studies by White *et al.* (2010), Branco *et al.* (2011), and Ferreira *et al.* (2012), firm size is an important factor that affects IC disclosure. Large-scale firms naturally have bigger resources compared to smaller-scaled firms, so that big firms are capable of funding IC disclosure. Additionally, big firms are respected and monitored by society and government, leading firms to provide more information including that related to IC. Firm size becomes the most used variable, and many studies find that there is a significant positive relationship between firm size and ICD (Morariu, 2014). The following hypotheses were made:

H1a. Firm size affects the quality of human capital disclosure.

H1b. Firm size affects the quality of internal capital disclosure.

H1c. Firm size affects the quality of external capital disclosure.

1.3.2 Market Share

Market share is firm's strength in competing on any particular industry sector. Higher market share motivates firms to gain even more trust from external parties. Marisanti (2012) explains that a firm with a better reputation tend to reduce IC disclosure as they have already earned the public's trust and legitimacy. This research explores the effect of market share on IC disclosure, and the following hypotheses were made:

H2a. Market share affects the quality of human capital disclosure.

H2b. Market share affects the quality of internal capital disclosure.

H2c. Market share affects the quality of external capital disclosure.

1.3.3 Information Asymmetry

Stakeholders' trust can be increased with the presence of IC disclosure. This is in line with Martini *et al.* (2016) who state that the existence of information such as external capital can increase a firm's legitimacy for its stakeholders. The establishment of trust is most important to ensure stakeholders' commitment to the company's future. Firms with higher IC disclosure are expected to have more committed and loyal customers and employees. Logically, agency problem which enables internal parties to take advantage of the situation by sacrificing external parties may occur if the firm fails to disclose IC information (Thompson & Randall, 2000). Thus, ICD can reduce exploitation from internal parties and would finally reduce information asymmetry (Omar & Christian, 2014). The study on the relationship between information asymmetry with ICD has been done by Bruggen *et al.* (2009), who find that information asymmetry does not affect ICD, while Orens *et al.* (2009) revealed otherwise. Thus the following hypotheses were made:

H3a. Information asymmetry affects the quality of human capital disclosure.

H3b. Information asymmetry affects the quality of internal capital disclosure.

H3c. Information asymmetry affects the quality of external capital disclosure.

1.3.4 ROA (Profitability)

Signaling theory can be used in explaining the relationship between ICD and firm profitability; where the higher the profit a firm makes, the more it gives the signal that it has better performance by providing more information on its IC. This argument is supported by Ousama *et al.* (2012) who study ICD in Malaysia, and by Haji & Ghazali (2013). Another reasoning is that with a higher profit margin, managers will be more motivated to give more detailed information, as this is related to the bonus they could receive. The following hypotheses were then made:

H4a. Profitability affects the quality of human capital disclosure.

H4b. Profitability affects the quality of internal capital disclosure.

H4c. Profitability affects the quality of external capital disclosure.

1.3.5 Leverage

Higher leverage will drive external parties (e.g., creditors) to ask firms to disclose even more information, such as IC information. High debt means higher supervision, which can be done through published disclosure. Firms would want to assure external parties that firm value does not rely only on financial performance, but also other factors like intellectual capital. Rashid *et al.* (2012), Oliveira *et al.* (2013), and Kamardin *et al.* (2017) examine the relationship between leverage and ICD and find them to have a significant relationship. The following hypotheses were made:

H5a. Leverage affects the quality of human capital disclosure.

H5b. Leverage affects the quality of internal capital disclosure.

H5c. Leverage affects the quality of external capital disclosure.

2. Research Method

2.1 Samples

The study uses data from financial and annual reports between 2013-2017, from 30 companies in the agriculture and resources sector listed in Stock Exchange of Thailand (SET). The total population is 59 companies in the agricultural sector and 63 companies in the resources sector. The final sample is 15 agricultural companies and 15 resources companies. The completeness of financial reporting is also considered as part of sample selection. ICD is measured with an identifying scoring method based on each ICD classification. Finally, this study uses multiple regression panel data to examine IC disclosure.

2.2 IC Reporting Practice Measurement

Table 1. Intellectual Capital: Related Terms

Human Capital	Internal Capital	External Capital
Employee Education	Management philosophy	Brand Recognition
Division Qualification	Corporate culture	Customer
Employee Engagement	Management processes	Company name
Labor Union Activity	Achievements	Profitable contract
Appreciate Employee	Information systems	Value of the company's shares
Employee Performance	Network system	Business Collaboration
Employee training	Intellectual property	Permission Agreement
Employee development	Organizational flexibility	Franchise Agreement
Successful planning	Organizational learning	Financial Relations
Innovative capabilities	Research and development	Brand recognition
Diversity Issues	Patent	Brand development
Employee safety and health	Copyright	Goodwill
Employee know how	Trademarks	Customer appreciation
Employee competency	Leadership	Customer retention
Expert seniority	Innovation	Customer service
Performance and results	Strategy	Customer feedback system
from executives senior	Organizational & management structure	Disabled customer
Motivations	Business model	Market share
Employee expertise	Organizational & business expertise	Corporate image & reputation
Expert teams	Corporate governance	
Specialist	Technology	
Cultural diversity	Quality	
Personnel		
Human resources		
Employee satisfaction		
Employee retention		
Work experience		
Educational qualifications		
and Management team		
Working Environment		
Training & development		
Employee attitudes, commitment & satisfaction		

Source: Author's Compilation

Table 1 shows relevant terms related to IC used in this research. The following are ICD measurement components that have been identified according to the three criteria of ICD quality: human capital, internal capital, and external capital. The scoring of each criteria ranges from 0 to 3. A score of 0 represents no written disclosure of criteria in annual report, 1 means there is some disclosure on the criteria, 2 means there is some disclosure on the criteria backed with numerical data such as percentage or the amount of certain years, and 3 means there is disclosure on the criteria with nominal data in certain currency, in this case, Thai Baht (THB).

2.3 Independent Variables Measurement

- Firm Size (FSIZE) is measured with log Total Assets.
- Market Share (MSHARE) is measured by dividing the Total Firm Sales with Total Industry Sales.
- Information Asymmetry (INFASYM) is measured by the percentage of share ownership not owned by the top 10 major shareholders.
- Profitability (PROF) is measured with the Return on Assets (ROA) ratio.
- Leverage (LEV) is measured by dividing Total Debt with Total Equity.

2.4 Multiple Regression Model

The study uses multiple ordinary least square regression model (OLS), a model commonly used on ICD studies, for example by Huang *et al.* (2010). The calculation of OLS regression model is as follows:

$$ICD = \alpha + \beta 1 SIZE + \beta 2 MSHARE + \beta 3 INFASYM + \beta 4 PROF + \beta 5 LEV + e$$

(1)

3. Empirical Results and Discussions

3.1 ICD Quality

Table 2 explains firms' average ICD quality from 2013-2017, measured with 0-3 scoring. Information disclosed regarding human capital tends to be just the general, unspecific data. As seen on the table, in the 1st interval from 2013-2017, the average percentage of HCD is 55% from 30 companies. Both internal capital and external capital disclosure show similarities with human capital's, in that disclosure, is unspecific on interval 1 with an average percentage of 58% and 39%, respectively.

Table 2. Company's ICD Quality

Years	Score	Human Capital Average	Internal Capital Average	External Capital Average
	0	8.2	6.09	9.42
2013	1	15.63	16.5	10.58
	2	4.17	4.14	3.16
	3	2	3.27	6.84
	0	7.63	5.45	9.05
2014	1	16.2	17.05	10.21
	2	4.07	4.09	3.47
	3	2.1	3.41	7.26
	0	6.93	5.05	9.16
2015	1	16.6	17.05	10.16
	2	4.4	4.23	3.47
	3	2.07	3.68	7.21
2016	0	6.5	4.73	7.84
	1	16.47	17.27	11.53

	2	4.77	4.23	3.37
	3	2.27	3.77	7.26
	0	6.33	4.18	7.32
2017	1	16.47	17.41	11.68
	2	4.77	4.64	3.37
	3	2.4	3.77	7.58

Source: Author's compilation

Human capital and internal capital both have the minimum score in the 3rd interval, each 7%, and 11%, while the minimum score of external capital is in the 2nd interval with 11%. Thus it is concluded that most human capital, internal capital, and external capital disclosures by firm samples are explained in an unspecific term.

3.2 Multiple Regression Analysis

Table 3. Pooled OLS Model

	HCD	InCD	ECD
Firm Size	0.0006***	0.0007***	0.0043***
Market Share	0.0007***	0.6624	0.8525
Information Asymmetry	0.4157	0.0203**	0.3182
Profitability (ROA)	0.0878*	0.1746	0.0886*
Leverage	0.148	<0.0001***	0.9605
P-Value (F)	0.102899	6.15E-13	0.094636
Adjusted R-Square	0.000898	0.343886	0.001599
Heteroskedasticity	0.097265	0.115991	0.261745

Source: Author's compilation

Table 3 result displays the first step in the multiple regression model, continued with a panel test model. The information contained in the table shows that the HCD and ECD model could not be tested with the pooled OLS model (p-value (F) > 0.05). All three models are free from heteroskedasticity as the significant value is > 0.05. Next, from Table 4 below it may be derived that this study is also free from collinearity since the VIF score of each independent variable is less than 10.

Table 4. Collinearity Test –Variance Inflation Factor Value (VIF)

	HCD	InCD	ECD
Firm Size	2.456	2.456	2.456
Market Share	2.198	2.198	2.198
Information Asymmetry	1.008	1.008	1.008
Profitability (ROA)	1.395	1.395	1.395
Leverage	1.403	1.403	1.403

Source: Author's compilation

Table 5. Panel Test

	HCD	InCD	ECD
Fixed Estimator	3.37E-25	1.81E-33	1.08E-33
Breusch-Pagan test	2.67E-32	1.64E-25	4.66E-38
Hausman test	0.0555802	2.09E-09	0.00452431
Conclusion	Random Effect	Fixed Effect	Fixed Effect

Source: Author's compilation

Table 5 reveals the result of the data panel model test. If the p-value of the fixed estimator is < 0.05, the model is fixed, and if the p-value of Breush-Pagan test is < 0.05, then the model is random. The final determinant test is the Hausman test; p-value of < 0.05 indicates that the model is fixed, whereas a p-value of > 0.05 shows a random model.

Table 6. Panel regression on ICD

	HCD	InCD	ECD
Firm Size	0.2237***	0.5673***	0.5194***
Market Share	-1.075***	-4.777***	-0.3635
Information Asymmetry	0.0062	0.3232	0.7192**
Profitability (ROA) Lev	0.6128**	0.6796***	0.0295
Leverage	0.0327	0.0221	0.0184
Panel Model	Random effect	Fixed	Fixed effect
F-test & Asymptotic test Statistic (p value)	0.0004	7.10E-43	2.34E-35
R-Square	12.14%	39.85%	21.88%

Source: Author's compilation, *Note*. *, **, *** significant at 10, 5, and 1 percent levels, respectively

From the outcome of the regression model above it can be concluded that firm size significantly affects all indicators of ICD; thus H1a, H1b, and H1c are accepted. The bigger the company leads to higher demand for information disclosure by related external parties, e.g. investors and government. Relatively higher resources push firms to disclose IC information in a more specified manner. This result supports previous studies such as White *et al.* (2010); Branco *et al.* (2011); Taliyang *et al.* (2011); Ousama *et al.* (2012); and Ferreira *et al.* (2012).

Market share reveals a significant relationship with ICD. Market share indicates a significant negative relationship on the component of human capital and internal capital, hence only H2a and H2b are accepted. In this study, market share is calculated using the percentage of total firm sales to total industry sales in the same industry. It is determined that there exists a relation with the confidence in firm achievement. Market share also shows a dominantly negative relationship with ICD. It is assumed that the management of an industry giant would have a good reputation and trust in the general public's eyes.

The above regression model also exhibits that information asymmetry significantly affect external capital, meaning only H3c is accepted with H3a and H3b being rejected. This shows that lower information asymmetry leads to more information being kept by the firm's internal parties, causing lower disclosure level to external parties. This result is contrary to Bruggen *et al.* (2009) but supports Orens *et al.* (2009), who discover that information asymmetry affect ICD. For this research, information asymmetry is significant to external capital as it is measured from share ownership outside the top 10 major shareholders, with most information being disclosed in the 2nd interval.

The results go against the findings of Marisanti & Kiswara (2012) who find that firms with higher profitability tend to reduce IC disclosure. However, there is a possibility that firms with higher profitability would disclose more information compared to firms with lower profitability (Khlif & Souissi, 2010). Thus, higher profitability means a higher probability for firms to disclose IC. The result shows that profitability significantly affects HC and InC that only H4a and H4b are accepted. Profitability influences how employees or managers act, as it is related to the bonus they might receive.

Leverage does not significantly affect ICD as a whole. The result is in line with Ferreira *et al.* (2012), Ousama *et al.* (2012) , and Muttakin *et al.* (2015) but is conflicting with Rashid *et al.* (2012), Oliveira *et al.* (2013), and Kamardin *et al.* (2017) who find that leverage has insignificant effect of ICD. The insignificant effect of leverage on ICD may be caused by the lack of demand from creditors to disclose firm's non-financial information, especially regarding ICD; since for debitors, firm's capability to service its debts is the most important. According to Cheng (2014), the balance sheet is an important tool for creditors to evaluate the financial risk attached to a firm. This study assumes that debtors tend to pay attention only to disclosures with numerical and currency data.

As the objects of study mostly disclose IC on 49% level in the 1st interval and 23% in interval 0, this means there is basically no IC disclosure.

4. Conclusion

   The main purpose of this study is to explore the quality of ICD in the current modern economy. The study chose Thailand, the largest agricultural country in ASEAN and specifically the sectors of agriculture and resources. The findings show that firm size is the variable that consistently affects all aspects of ICD. Higher market share leads to lower HCD and InCD, while information asymmetry increases the quality of ECD. ROA as a measurement of firm profit positively affects the quality of HCD and InCD. Leverage is the only independent variable that consistently does not affect any of ICD's components. Other than leverage, all variables used in the study then significantly affect the creation of ICD value. The research aims to encourage firms' awareness of specific, numerical data-supported ICD.

 In this modern era access to an entity's information becomes incredibly easy and could become a threat if a firm does not maximize its presentation of information. The disclosure of IC has become a practice that determines a firm's maturity and the vision of the firm's management (Joshi *et al.,* 2018). These findings underline the importance of ICD as a form of the firm's responsibility to both internal and external parties. Based on Table III, the result of regression panel shows that the ability of firm size, market share, information asymmetry, profitability (ROA), and leverage in affecting each component of ICD are 12.14% for HC, 39.85% for InC, and 21.88% for EC. The three models show the capability of each independent variable in affecting the dependent variable is relatively low.

   Edvinsson (2013) asserts the role of IC on individuals, organizations, society, and globally to maximize results. Firms must note and maximize their IC in order to support the firm's objectives. Firms are expected to be able to present a specific disclosure of human capital, internal capital, and external capital in annual reporting.

 This research has limitations in data processing as it uses the scoring method, focusing on financial and annual reports taken from the companies' website and did not consider information from other forms of media. It is also limited to just the sectors of agriculture and resources in Thailand, thus making it incompatible with other sectors and nations. Further research is expected to expand this model in other sectors and other nations, with different time framing. Further research may also use different methods for measuring IC to enrich empirical result on intellectual capital disclosure.

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Notes

Note 1. Multiple regression formula.

The Impacts of Transformational Leadership on Competitive Advantage of Local Accounting Firms

Devie[1], Ivan Wendrata[2], Christian A. Hartono[3]

[1,2,3] Accounting Department, Petra Christian University, Surabaya, Indonesia

Corresponding Author: Ivan Wendrata, Accounting Department, Petra Christian University, Surabaya, Indonesia. Tel: +62-81241005324. E-mail: ivanwendrata95@gmail.com

Abstract

The emergence of the ASEAN Economic Community (AEC) had increased the competitiveness of many industries in South-East Asia. Since the accounting services have been heavily regulated by the Mutual Recognition Arrangements (MRA), the impact of AEC has led to the entrance of many foreign accounting firms in Indonesia, which may harm the local accounting firms if they do not have the competitive advantage to prosper. This research aims to find the influence of transformational leadership, organizational culture, and management control system to a competitive advantage. A set of questionnaires was assembled to measure each of the variables using the statements adapted from previous researches of the respective variables. Each statement is rated using a 5-point Likert scale and analyzed using SmartPLS. This study was conducted on 27 public accounting firms and 18 accounting service firms in Surabaya, Indonesia. The findings confirm that both transformational leadership and organizational culture have significant influence to competitive advantage, while management control system has no significant influence to competitive advantage. Moreover, the transformational leadership also shows significant influence on organizational culture and management control system and the influence of organizational culture to management control system as mediating variables also show a significant impact. Finally, this paper concludes that local accounting firms can, in the long run, improve their competitive advantage by adopting an interactive management control system and showing idealized influence characteristic as transformational leaders. Moreover, to answer the rapid changes in market demand caused by AEC, local accounting firms can also adopt market culture.

Key Words: Accounting Firm, Competitive Advantage, Management Control System, Organizational Culture, Transformational Leadership

1. Introduction

Earlier this century, the declaration of Association of Southeast Asian Nations Economic Community (AEC) has opened up new areas of opportunities, bringing forth the freedom of operating business across Southeast Asia Countries. AEC is an initiative of international economic integration of Southeast Asia countries which the main objective is to limit obstructions to Southeast Asian regional trade in goods and services as well as foreign investment (Gunadi, 2016). AEC will potentially affect roughly US$ 2.6 trillion in market values and over 622 million people (ASEAN, 2015a). AEC was created in order to improve the economic conditions in ASEAN and provides ASEAN countries the opportunity to compete against countries with superior economic power (Taty, Possumah, & Razak, 2017). However, this milestone has also increased the intensity of competitiveness and rivalry

across firms in Southeast Asia (Gunadi, 2016). To firms and countries that are unprepared, the nature of free trade brought by AEC gives birth to new threats and challenges.

In Indonesia's perspective as the most populous country in ASEAN with immeasurable but untapped potential, Indonesia's competitiveness can be considered as still below par. Based on Human Development Index 2016, out of 187 countries, Indonesia was ranked 121st which was way below its neighboring countries including Singapore (18th), Malaysia (64th), Thailand (103rd), and the Philippines (114th) (Taty et al., 2017). Furthermore, in 2016, Indonesia's gross domestic product per capita ranked 5th out of 10 ASEAN countries below Singapore, Brunei Darussalam, Malaysia, and Thailand (Statista, 2018). In short, it can be bluntly said that the potential threats and challenges brought by AEC will adversely affect Indonesia's economy.

In the turbulence of the enormous growth caused by AEC in Indonesia, the role of accounting firms cannot be overlooked. The complexity of businesses caused by AEC has changed the daily routine of an accountant into something much more complicated. The needs of the ever-changing business environment forces accounting firms to be adaptive. This was the case especially with the sign of 2009 Mutual Recognition Arrangements (MRAs) on Accounting Services. MRAs are meant to expedite the employment of professionals into any of the ASEAN countries while paying attention to the relevant domestic regulations and market demand conditions of ASEAN countries (ASEAN, 2015b). From then on, Indonesia's accounting scene is heavily dominated by foreign companies. As mentioned by Saepudin, Gunawan, Nuryanto, and Rusmanto (2017), the total earnings of Big Four (abbreviation for four biggest foreign accounting firms including Ernst & Young, KPMG, Deloitte and PricewaterhouseCoopers) accounted for over 80 percent of the total industry revenues. Furthermore, the existence of Big Four is considered to be vital in the development of the accounting and auditing industry. As a result, some local accounting firms chose to cooperate with foreign accounting firms while others maintain its own identity while at the same time develop their competitive advantage.

The role of leadership in the organization is very important in order to achieve competitive advantage (Agbor, 2008). By utilizing the resources at their disposal, leaders are able to inspire creativity to their subordinates (Khan & Anjum, 2013). The creative nature that was instilled to the employees will eventually give birth to many innovations which in turn will consolidate into a sustainable competitive advantage (Garcia-Morales, Llorens-Montes, & Verdu-Jover, 2008). However, this process is laborious and perpetual. Moreover, several direct or indirect determinants of competitive advantage cannot be ignored. These mediating variables include organizational culture and also management control systems (MCS).

According to Block (2003), many researches had been conducted attempting to examine the influence of leadership on organizational culture which implies that the leadership-culture connection affects the performance of organizations. Ali, Jangga, Ismail, Kamal, and Ali (2015) also corroborated the importance of organizational culture in achieving success while mentioning the possible effects caused by leadership style on organizational culture. In short, the influence of leaders on the creation of competitive advantage cannot be separated from the culture of the firms.

On the other hand, the role of leadership towards the organizational design of a firm vanished from the literature many years ago (Abernethy, Bouwens, & Lent, 2010). In a similar manner, the relationship between company strategy as a manifestation of competitive advantage with MCS was insufficiently explained in past researches (Pant & Yuthas, 2001). The lack of research between leadership style, MCS and competitive advantage is undesirable since the connection between leadership style, MCS and management performance, which arguably the result of competitive advantage, is proven to be positive (Abernethy et al., 2010).

In contemporary literature, one of the leadership styles that many considered to be effective and superior in influencing subordinates is transformational leadership (Ehrhardt & Klein, 2001). Transformational leadership generates advantages for organizational performance while stimulating knowledge and innovation (Howell & Avolio, 1993). Thus, in pursuit of explaining competitive advantage, it is worthwhile to investigate the nature of transformational leadership style with its positive impacts.

With the purpose of contributing to the existing studies, the objective of this study is to explore the effect of transformational leadership to the five dimensions of competitive advantage, which are pricing/cost (PC), quality (QU), dependable delivery (DD), product innovation (PI), and time-to-market (TM) (Wijetunge, 2016; Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006). Another aim is to investigate the mediation effect of organizational culture and management control systems to transformational leadership. Examining the impact of each independent

variables would allow the researchers to gain a better knowledge of the relative effects of each independent variables to the competitive advantage.

The remainder of this paper is organized as follows: first, the researchers discussed the definition of variables used in this study; second, the hypotheses of the variables were constructed; third, the methods and results of this research were presented; finally, the researchers tried to elaborate on the results of this research and its implications and presented the limitations of this research as well as recommendations for further study.

2. Conceptual Model

2.1 Theoretical Framework

2.1.1 Transformational Leadership (TL)

The definition of leadership has experienced several changes over the last 100 years (Rost, 1991). Fleishman and Peters (1962) defined leadership as acts occur when one individual attempts to influence the behavior of others towards some goals. On one hand, leadership style can be seen as a continuum, ranging from highly structured and autocratic style at one end and people-oriented, considerate style at another (Otley & Pierce, 1995). Based on this consideration, many leadership styles were investigated and theorized.

In this paper, the researchers chose to investigate transformational leadership. Transformational leadership is a leadership style in which leaders take part in their subordinates' activity and forges a relationship with the followers that boosts the level of motivation and morality of both parties (Burn, 1978). In their paper titled "Leading in the 1990s: The Four I's of Transformational Leadership", Avolio, Waldman, and Yammarino (1991) discussed thoroughly the four dimensions of transformational leadership. These four dimensions include individualized consideration, intellectual stimulation, inspirational motivation, and idealized influence.

Individualized consideration is proven to be an important leadership behavior (Sarros, Gray, & Densen, 2002). Bass and Avolio (1994) defined Individualized consideration as the behavior of paying attention to the different needs of each individual employee rather than treating all followers alike and having the same needs. By paying attention to their employees, leaders are able to develop their followers' strength in order to finish their tasks (Rowold, 2005). Leaders are considered to be a coach or mentor (Brown, 2008) and become the source of encouragement and support to their followers (Chan & Mak, 2014).

Intellectual stimulation promotes intelligence, rationality and careful problem solving (Bass & Avolio, 1994). Leaders who practice intellectual stimulation introduce employees to new perspectives on how to solve problems. By stimulating subordinates ability to solve challenges, subordinates will develop a sense of pride to follow their leaders (Avolio et al., 1991) Furthermore, intellectual stimulation encourages employees to be more committed to the organization and thus, allowing the organization to achieve its predetermined goals (Anjali & Anand, 2015).

Inspirational motivation is interpreted as leaders' ability to give attention to their subordinates which in consequence makes their followers feel respected, become self-confident and assured that their leader could overcome obstacles and introduce the organization to new challenges and opportunities (Avolio et al., 1991). Inspirational motivation often creates attractive goals and shows optimism and enthusiasm regarding those goals (Bruch & Walter, 2007). Additionally, leaders who encourage their subordinates are linked to the extra effort given by employees to finish their jobs (Densten, 2002). This extra workforce support is important when organizations need to embrace opportunities for growth and development (Gibson, Conger, & Cooper, 2001).

Idealized influence means following and acting upon the communal sense of mission and values (Rowold, 2005). Leaders who exercise idealized influence set up a personal example and high ethical standards and maintain them (Chan & Mak, 2014) and thus, respected and trusted by their subordinates (Brown, 2008). The combination of idealized influence and inspirational motivation makes leaders being seen as charismatic and inspiring (Bass, 1998). This is important in order to influence employees to achieve great accomplishments (Bass, 1990).

The effect of transformational leaders to their subordinates may manifest in their encouragement for their subordinates to realize their full potential and exceed their individual aspirations for the benefit of the organization (Berson & Avolio, 2004; Ali et al., 2015). The leaders often assign tasks to the followers in attempts of teaching the followers to be responsible and autonomous (Jain & Duggal, 2018). In their attempts to influence behavior,

transformational leaders usually emphasize on the morality enhancement and motivation of their subordinates (Bass, 1999). Thus, transformational leaders are often seen as charismatic and inspiring leaders (Nguyen, Mia, Winata, & Chong, 2016).

2.1.2 Competitive Advantage (CA)

Competitive advantage emerges when firms are able to create more economic value through implementing and exercising a strategy that is unique to other firms than their competitor in its product market (Birasnav, 2012; Sigalas, Economou & Georgopoulos, 2013). Competitive advantage comprises competitive capabilities that allow organizations to distinguish itself and is the result of critical management decisions (Li et al., 2006). When firms make full use of the available resources and further develop their strategy, firms will create a sustainable competitive advantage.

In this research, the researchers adopted the dimensions of competitive capabilities constructed by Li et al. (2006) since it is suitable for measuring the competitive advantage of the non-manufacturing business. The factors that form a competitive advantage consists of five dimensions: Pricing or Cost, Quality, Dependable Delivery, Product Innovation, and Time-to-Market (Wijetunge, 2016; Li et al., 2006).

Pricing or Cost (PC) is interpreted as financial superiority that is achieved by obtaining a better margin than the other competitors within the similar market and industry (Khan & Anjum, 2013). Competitive advantage is achieved when a company is able to manufacture a similar product or execute a similar service to its competitor with lower cost, thus able to generate margin. Ownership or possession of low-cost, valuable resource such as the privilege to acquire inputs and enter markets will create competitive advantage (Ma, 1999).

Quality (QU) is the capability of a company to create more valuable products or services to the customer than its competitors (Birasnav, 2012; Wijetunge, 2016). Through quality, a company can generate competitive advantage by creating a better product than the competitors. Quality help satisfy the customer by introducing a product that was created to perfection (Motwani, Frahm & Kathawala, 1994). In addition, quality can also be developed through adding valuable benefits to the products or services, such as reliability, durability, and perceived quality.

Dependable Delivery (DD) is the competence of a firm to fulfill the delivery requirement needed by the customer better than the competitor (Koufteros, 1997). Giunipero and Brand (1996) explained that consistent on-time and reliable delivery would enhance operational performance better than the competitor and thus, creating a competitive advantage. Competitive advantage can be realized through responsiveness, fast delivery, and variety, which allow firms to meet customers' need in a timely manner (Al Serhan, Julian & Ahmed, 2015).

Product Innovation (PI) is described as the infusion of resources and relevant knowledge to create a new product to meet a currently unmet demand (Varadarajan, 2018). Product innovation pushes firms to create new and better products more frequently than its competitor and hence, leading to competitive advantage (Liu & Huang, 2018). In the perspective of service firms like accounting firms, it can be used to further improve their competitive positions in the market by offering important new core benefits or reviving old services. In addition, alteration of the firms' service systems will also create a competitive advantage through the creation of new value streams to enhance value delivery (Anning-Dorson, 2018).

Time-to-Market (TM) is an important competitive priority in a time-based competition. It establishes a competitive advantage by being responsive and adaptive to the market. It provides a competitive advantage by changing their competitive strategies accordingly in order to be 'fast-to-market' or 'fast-to-produce.' Being aware of the importance of time-based management allows the company to have an edge in the time-sensitive market environment (Al Serhan et al., 2015).

2.1.3 Organizational Culture (OC)

A firm is the summation of diverse personalities, backgrounds, and a range of experiences that shaped each individual in it (Sadri & Lees, 2001). Culture is the core of the firm that guides how employees interact and make decisions. While it is always invisible, culture is manifested in mutual values, assumptions, beliefs, and organizational artifacts (Lee, 2011). Organizational culture is crucial to organizational success (Twati &

Gammack, 2006). Understanding the importance of organizational culture will affect the strategic development of the firm and hence, gaining competitive advantage for the firm.

In this research, we adopt the classification of organizational culture based on Cameron and Quinn's (1999) Competing Values Framework (CVF) since it has been widely used in the literature and practiced in over 10 000 organizations globally within a variety of fields (Parolini & Parolini, 2012). CVF classified cultures into four different types: Clan culture, Adhocratic culture, Hierarchical culture, and Market culture. Each culture type represents a specific way of thinking, an approach to address the challenges and adopt specific strategies that lead to the creation of values in organizations (Jaeger & Adair, 2013). The classification of these cultures is based on two sets of the continuum. The first differentiate effectiveness criteria that emphasize flexibility as opposed to stability. The second characteristic differentiates effectiveness criteria that emphasizes internal orientation as opposed to external orientation

Clan culture orientation focuses on human relations that prioritizes on internal cohesiveness and orientation, participation and loyalty, teamwork, and commitment in employee-firm connections (Morgan & Vorhies, 2018). Organizations that adopt clan culture orientation will feel like a family that is portrayed by following those in the higher position, less restriction on operational activities and tolerance for ambiguity in structure and procedures that can obscure information disclosure (Elkelish & Hasan, 2014). With such values implemented in an organization, it will create collectivism nature and high sense of loyalty and commitment. Furthermore, leaders in clan culture organization are expected to be collaborative, cohesive, participative, empowering, and communicative, so there is good moral, satisfaction, development of people, and high commitment to the organization (Parolini & Parolini, 2012).

Adhocratic culture orientation emphasizes external focus and differentiation and also flexibility and discretion. A company that adopts adhocratic culture is characterized as entrepreneurial, creative, dynamic and risk-taking that supports change, innovation, constant growth, entrepreneurship, adaptiveness to changes, and initiative (Cameron & Quinn, 1999). Furthermore, leaders of adhocratic organizations are expected to be risk-oriented, ideal, and creative (Moonen, 2017). Leaders of adhocratic organizations are also heavily involved with the market in order to maintain the position of the company as the top provider of creative products or services, which may require a low degree of risk disclosure (Morgan & Vorhies, 2018).

Hierarchy culture orientation emphasizes internal focus and integration while focusing on stability and control values (Cameron & Quinn, 1999). A hierarchical organization is established as a formal and structured working environment to manage the expanding responsibilities. It concerns maintaining stability, predictability, efficiency, and certainty (Twati & Gammack, 2006). This type of organization is based on formal rules and procedures and formalized and well-structured bureaucracy. Organizations with hierarchical culture maintain swift operations by adhering to strict and numerous procedures and policies. Within the hierarchy, there are centralized structures in place for most processes, especially communication and decision making (Parolini & Parolini, 2012). Leaders of hierarchical organizations are expected to be more risk-averse due to the emphasis on being transparent, enforcement of roles, and rules regulations under the basis of highly structured organizations (Elkelish & Hasan, 2014). By disclosing risks and information, the uncertainties are reduced and thus, increasing certainty and clarity.

Market culture emphasizes external focus and stability (Cameron & Quinn, 1999). It concentrates on productivity, market share growth, and competitive actions and outcomes (Oney-Yazici, Giritli, Oraz-Topcu, & Acar, 2007). It engages in exchanges with suppliers, customers, and vendors (Cameron & Quinn, 1999). Market culture tends to disclose information, especially with regards to customers by prioritizing on the market demand in order to achieve a higher level of customer satisfaction and hence, maintaining market leadership. Leaders of this culture are expected to be tough, demanding, and hard-driving, while focusing on productivity, market share and penetration, and profitability (Moonen, 2017).

2.1.4 Management Control System (MCS)

In order to execute corporate strategies, the management control system (MCS) can be seen as complementing mechanism (Jordao, Souza & Avelar, 2014). It is defined as a series of processes in which managers ascertain the effective and efficient use of controlled resources so that the previously set goals can be achieved (Langfield-Smith, 1997). There are two broad main objectives of MCS which are the use of information in performance

evaluation (decision-influencing role) and its use for enhancing managerial decision making (decision-making role) (Nguyen et al., 2016). In many pieces of literature, MCS is often mentioned in different terms including management accounting system, management accounting, and organizational controls.

MCS also possesses several groups of systems. One of the frequently researched groups of systems is the 'levers of control' framework that was developed by Simons (1995). This group of systems consists of belief systems, boundary systems, interactive control systems, and diagnostic control systems.

The belief system is used to enhance the core values related to business strategy and encourage the search for new opportunities (Tuomas, 2009). Belief system manifests in the forms of statements of purpose and formal mission statements of the organization (Simons, 1995). Initially, managers who utilize belief systems define and communicate the existing core values of the organization (Simons, 1994). By clearly communicating its missions and values, management can then motivate and guide its employees' desirable behavior (Marginson, 2009).

Unlike the belief system which inspire employees to behave accordingly, boundary system is used to reduce risks by setting limits to strategically undesirable behaviors (Tuomas, 2009). Boundary system manifest in the form of the code of conduct of the organization. Although categorized as a negative control by Simons (1995), boundary system are needed in order to facilitate organizations operating at "high speeds" (Tessier & Otley, 2012).

The interactive control system is defined as a formal system that can be employed to signal all organizational levels on actions to be monitored and where new ideas should be introduced and tested (Tuomas, 2009). According to Simons (2000), there are several attributes of the interactive control system. First, management is heavily engaged in the use of the control system. Second, the interactive control system is not exclusive to the higher level management, but instead, all members of the organization are participating in it. Third, the interactive control system emphasizes the importance of organizational learning. Fourth, the interactive control system deals with strategic uncertainties and thus, initiate the learning process and strategic changes.

The diagnostic control system is a system used to monitor organizational outcome through formal feedback (Tuomas, 2009). It is used by the management to communicate and monitor the critical success factors of the company (Tuomela, 2005). There are several similarities but also differences between the diagnostic control system and other control systems. Both systems can be applied to team management in all levels of organization (Matsuo & Matsuo, 2017). Moreover, the diagnostic control system is also related to the learning process of organization (Argyris, 1991). On the contrary, the diagnostic control system is categorized as a necessary negative control system which is required to set the foundation of the interactive control system (Simons, 1995).

While each lever of control have a specific purpose, the four controls need to be elaborated in order to create organizational effectiveness (Hoque & Chia, 2012). Control features offered in the levers of control are proven to be interdependent (Milgrom & Roberts, 1995). Belief and boundary systems serve a similar purpose in that they both are intended to motivate employees to be more adventurous (Simons, 1995). As for interactive and diagnostic control systems, both are demonstrated to have dynamic tension and positively affect performance (Henri, 2006).

2.2 Hypothesis Development

2.2.1 Transformational Leadership and Competitive Advantage

Birasnav (2012) explained that since transformational leadership is the core of attaining and maintaining competitive advantage, the transformation of managers into competent leaders will increase the competitiveness of the current firm over its competitors. Similarly, Devie, Semuel, and Siagian (2015) expressed that transformational leadership is the primary factor in the success of the organization. Transformational leaders that exist in the firm are able to encourage and lead the employees in achieving organizational goals in creating competitive advantage. In addition, it can also boost and develop the subordinates' competencies to further create competitive advantage by motivating and guiding the employees and seeking new opportunities and challenges (Bass, 1999).

According to Imran, Ilyas, Aslam, and Ubaid-Ur-Rahman (2016), transformational leaders will stimulate transfer of explicit and tacit knowledge in the organization that will generate sustainable competitive advantage and enhancements in organizational performance. When transformational leaders integrate persistence, creative insight, and sensitivity to their subordinates, it will motivate, inspire and create competitiveness in the firm (Avolio

et al., 1991). Furthermore, it also influences absorptive capacity which will improve individual absorption and increase human capital. Based on the arguments above, the researchers proposed:

H1.   Transformational Leadership has an influence on Competitive Advantage.

2.2.2 Organizational Culture and Competitive Advantage

Some research findings found that by understanding organizational culture, a firm can develop and intensify its corporate competitive advantage through increasing margins, efficiency, and the level of financial performance (Sadri & Lees, 2001; Barney, 1986; Flamholtz & Randle, 2012). Firms with valuable, rare, and imperfectly imitable cultures could turn their cultures to be the source of sustained competitive advantages (Barney, 1986).

A valuable culture is one that enables a firm to act in ways that lead to higher sales, lower cost, higher profits, or adding economic value to the firm. A rare and unique culture must have attributes that are uncommon to most cultures. Having unique and rare attributes will enable the firm to generate sustained competitive advantage. Finally, imperfectly imitable culture means that other firms cannot fully replicate the culture and if they do, they will be at a disadvantage (reputational, experience, etc.) compared to the firm that they are trying to imitate (Barney, 1986). Chan, Shaffer, and Snape (2004); Flamholtz and Randle (2012) stated that culture has shown to have a significant direct influence on competitive advantage-sustained financial performance. Based on the arguments above, the researchers proposed:

H2.   Organizational Culture has an influence on Competitive Advantage.

2.2.3 Management Control System and Competitive Advantage

In order to achieve a competitive advantage, an organization must be able to facilitate the mechanism of executing corporate strategies. The use of MCS in the firm will affect the innovation and business strategy, in other words, how does a company compete and differentiate itself among its competitors and hence, creating competitive advantage (Simons, 1990). MCS will further develop the way the management does the business by boosting their core values, setting limits to regulate business flows, improving and implementing new ideas, and controlling their outcomes through feedbacks.

Pant and Yuthas (2001) explained that competitive advantage could be achieved by integrating the usually separate functions of strategy and control. In other words, competitive advantage can be gained by a series of processes in MCS. Furthermore, MCS is beneficial in improving the firm's performance. MCS enhances organizational commitment and coordination towards desired outcomes, reduces the uncertainty, and leads to higher performance. In addition, MCS will also increase the efficiency of solving organizational problems and thus, increasing competitive advantage (Duréndez, Ruiz-Palomo, García-Pérez-de-Lema, & Dieguez-Soto, 2016). Moreover, through the induced increase in product innovation as one of the five dimensions of competitive advantage, MCS can be expected to affect organizational performance (Bisbe & Otley, 2004). Based on the arguments above, the researchers proposed:

H3.   Management Control System has an influence on Competitive Advantage.

2.2.4 Transformational Leadership and Organizational Culture

As previously mentioned, leaders can be defined as someone who influences others' behavior in order to achieve specific and mutual goals. This influential relationship between leaders and subordinates works within existing organizational culture, in a sense that the leaders' decision-making process and actions are based on the operating norms and procedures of their own organization (Bass & Avolio, 1993). Thus, it can be concluded, with the exception of the founders of the organization served as the leaders of the organization, that the existence of organizational culture precedes its leaders.

Leadership is the center of any change process. The actions and attitudes of the employees can be affected through the actions and attitude of those in positions of authority (Block, 2003). When it is needed and possible to do so, leaders can change the key aspects of organizational culture in accordance with new directions desired by the

leaders and members of the organization (Bass & Avolio, 1993). The changes that occur in the organizational cultures, therefore, affected by its leaders and differ according to the leadership style that leaders practice.

Transformational leaders have the ability to carry out changes to the organization's vision, strategy, attitude and culture (Turner, Muller & Dulewicz, 2009). There are distinct cultural attributes in organizations that practice transformational leadership based on Bass and Avolio (1993). In transformational culture, every member of the organization shares a sense of purpose and belonging. Commitments are long-term with leaders and subordinates share the same interests and interdependent. On the other hand, transformational culture does not prevent individuals from pursuing their own goals. Based on the arguments above, the researchers proposed:

> *H4.*   Transformational Leadership has an influence on Organizational Culture.

2.2.5 Transformational Leadership and Management Control System

The four dimensions of transformational leadership correlate differently to MCS. Each of the four correlations was further explained by Nguyen et al. (2016). First, the inspirational motivation and idealized influence of transformational leadership suggest that leaders can further develop MCS that rewards their subordinates for their attainments. Second, individualized consideration can further develop a control system that contributes to the decision-making role of the managers. Third, intellectual stimulation can further develop a control system that acknowledges creativity and innovations by having performance measures and reward systems.

On the contrary, instead of explicit and direct influence, Rochdianingrum and Samuel (2017) suggested that there should be other variables that mediate transformational leadership and MCS. Transformational leadership cannot directly influence the MCS, instead, it needs to be mediated by information technology and organizational culture. They further explained that this phenomenon happened as the result of three factors: using information technology as communication media and as a control to day-to-day operation; the repetitive characteristic of the industry used as the object of research, and the existence of the third party as representative of the leaders of the organization.

Regardless of the direct or indirect nature of the influence of transformational leadership on MCS, the influence of transformational leadership to MCS need to be considered. By understanding the influence of transformational leadership to MCS, people who are responsible for setting and developing the upper-level management can benefit from it in addition to giving notice of the sometimes-ignored factor of control choices (Abernethy et al., 2010). Based on the arguments above, the researchers proposed:

> *H5.*   Transformational Leadership has an influence on the Management Control System.

2.2.6 Organizational Culture and Management Control System

Organizational culture was defined by Schein (1985) as a custom of shared assumptions, developed, invented or discovered by the firm as it tries to overcome the problems of external adaptation and internal integration that has to succeed to be deemed valid. Hence, organizational culture is passed to new members of the firm as the right way to think, feel, and perceive in relation to solving their problems. In facing external challenges and maintaining the internal environment of the business, organizational culture, therefore, may alter the implementation of MCS (Reginato & Guerreiro, 2013). The research was done by Jordao et al. (2014), for example, explained that changes in the MCS of the company acquired in acquisition process happened due to the new results-oriented culture introduced by the acquirer.

Furthermore, the presence of MCS is also affected by the culture of the organization. In the research by Duréndez, Madrid-Guijarro, and García-Pérez-de-Lema (2011), they did not explicitly establish the influence of organizational culture to MCS, but their choice to include MCS as their research variable was based on the use of organizational control system to transmit and support the culture of the firm (Flamholtz, 1983) and the previously researched reciprocal relationship between organizational control system and culture (Herath, Herath, & Abdul Azeez, 2006). Based on the arguments above, the researchers proposed:

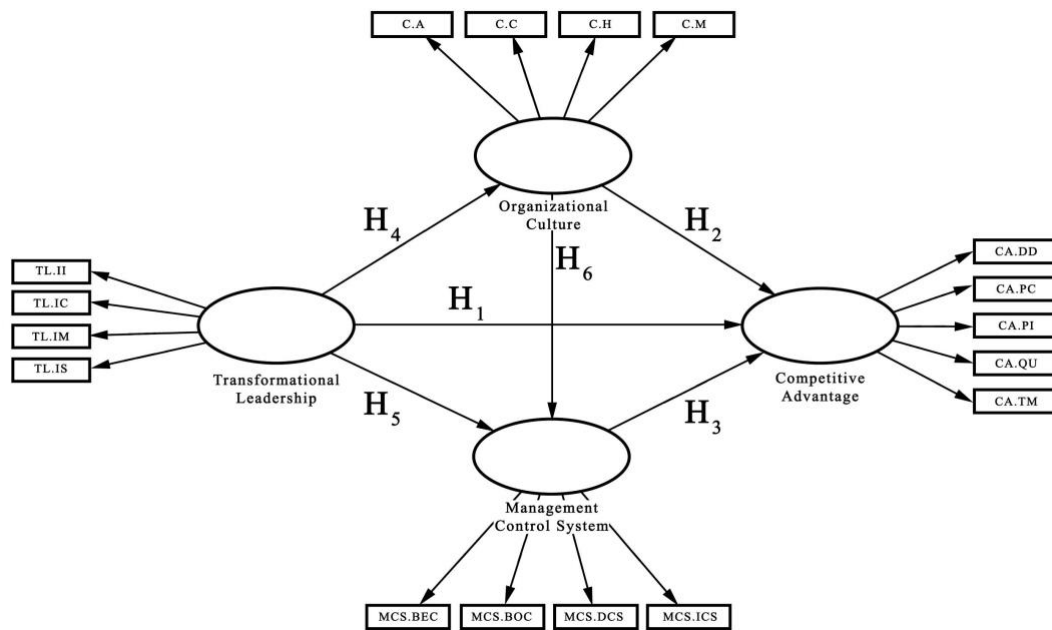> *H6.*   Organizational Culture has an influence on the Management Control System.

Figure 1. Research Model Design

3. Methods

3.1 Participants and Data Collection

The participants in our study were public accounting firms and accounting service firms that are located in Surabaya. To select the participants, the researchers first obtained the information of accounting firms from the Directory of Public Accounting Firms 2018 edition, and the Directory of Accounting Service Firms 2017 edition, provided by IAPI (*Institut Akuntan Publik Indonesia)* and IAI (*Institut Akuntan Indonesia)* respectively. Second, the researchers selected accounting firms using purposive sampling. Since the main concern of this research is the phenomenon of AEC and its effect towards the domination of foreign or foreign-affiliated public accounting firms and accounting service firms, this research investigated specifically on public accounting firms and accounting service firms that are free from foreign influence. More importantly, to assure the availability of the respondents, the firms that were used as respondents should still be operating when this research was being held. In short, the criteria used in purposive sampling are as follow 1. accounting firms that do not have any relation with foreign affiliations; 2. accounting firms that are still operating in the duration of this research.

The researchers gathered a total population of 62 accounting firms, consisting of 41 public accounting firms and 21 accounting service firms. The sample was then reduced to 45 accounting firms, consisting of 27 public accounting firms and 18 accounting service firms. 14 public accounting firms were not included because they have **an** affiliation with foreign companies, while 3 accounting service firms had been discontinued.

The researchers invited each of the chosen accounting firms to participate by sending a permission letter that was sent directly to their addresses, along with an e-mail containing the link of a web-based questionnaire, and conventional paper-based questionnaire. Out of 45 accounting firms, 8 public accounting firms and 4 accounting service firms refused to participate. Ultimately, 33 out of 45 samples of accounting firms completed the questionnaire.

3.2 Variable Measurement

To reassure the reliability and validity of this research, the entire variables were measured by questionnaires that have been employed before. The researchers adopted and modified the questionnaire for Transformational Leadership from Avolio, Bass, and Jung (1999), Organizational Culture from Duréndez et al. (2011), Management Control System from Widener (2007), and Competitive Advantage from Li et al. (2006). Each question is further modified to fit accounting firms' characteristics and scored using the 5-Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

4. Results

4.1 Descriptive Statistics

The descriptive statistics for sample demographics are presented in **Table 1.**

Age	Male	Female	Total	Work Year	Male	Female	Total
20-29	32(28.83%)	36(32.43%)	68(61.26%)	0-2	31(27.93%)	23(22.52%)	56(50.45%)
30-39	19(17.12%)	6 (5.41%)	25(22.52%)	3-4	14(17.12%)	8 (7.21%)	22(22.52%)
40-49	6 (5.41%)	6 (5.41%)	12(10.81%)	5-6	11(9.91%)	7 (6.31%)	18(16.22%)
50+	6 (5.41%)	0 (0.00%)	6 (5.41%)	7+	7 (3.60%)	8 (0.90%)	15(4.50%)
Total	63(56.76%)	48(43.24%)	111(100.00%)	Total	63(56.76%)	48(43.24%)	111(100.00%)

Table 1. Sample Characteristics

A total of 111 questionnaires were submitted by the respondents. Respondents' data were stratified according to age, gender, and year of experience. Respondents had an average of 4.2-years experience, ranging from 2 months to 20 years of experience. The majority of the respondents are male, with a percentage of 56.76%, whereas female had a percentage of 43.24%. The respondents were aged from 20 to 65 years old with the majority belonging to the 20-29 year old age group with a percentage of 61.26%. Respondents held various positions such as Junior Auditor, Senior Auditor, Tax Accountant, Supervisor, Manager, and others, depending on each firm's hierarchical structure.

4.2 Measurement Model

This research was conducted using SmartPLS 3.0 with partial least squares (PLS) approach. The statistics from the PLS measurement model was used to test the measurement properties of the variables. Furthermore, this research categorized Transformational Leadership, Management Control System, Organizational Culture and Competitive Advantage as reflective variables.

In order to check the convergent validity of the reflective variables, the researchers used Factor Loading and Average Variance Extracted (AVE), while Cross Loading was used to check the discriminant validity. Additionally, Cronbach's Alpha and Composite Reliability were tested so that the reflective data processed in the research are free from error (Reliable).
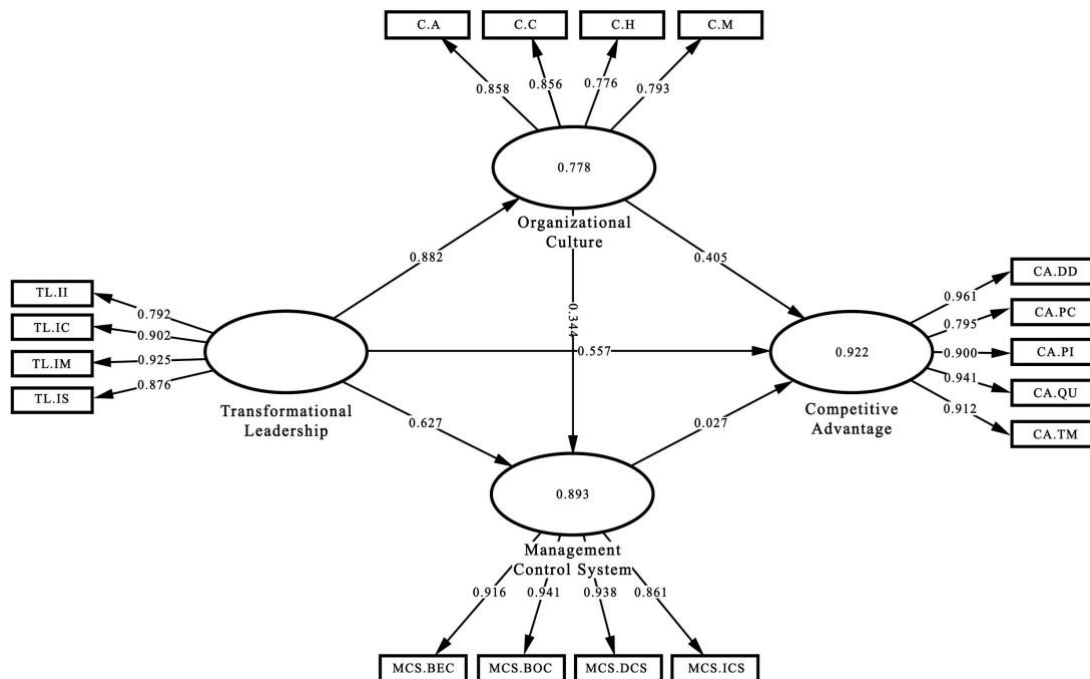

Figure 2. Path Coefficient of the Structural Model

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
CA	0.943	0.957	0.816
MCS	0.934	0.953	0.836
OC	0.839	0.892	0.675
TL	0.897	0.929	0.766

Table 2. PLS Results for Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE)

Both the AVE and the Factor Loading for each scale should score above or equal to 0.500. **Table 2** and **Figure 2** illustrate that the AVE for Competitive Advantage (CA) is 0.816 with factor loading of 0.961 (for Dependable Delivery), 0.795 (for Price/Cost), 0.900 (for Product Innovation), 0.941 (for Quality) and 0.912 (for Time-to-Market). The AVE for Management Control System (MCS) is 0.836 with factor loading of 0.916 (for Belief Control), 0.941 (for Boundary Control), 0.938 (for Diagnostic Control System) and 0.861 (for Interactive Control System). Finally, the AVE for Organizational Culture (OC) is 0.675 with a loading factor of 0.858 (for Adhocratic Culture), 0.856 (for Clan Culture), 0.776 (for Hierarchical Culture), and 0.793 (for Market Culture). Finally, The AVE for Transformational Leadership is 0.766 with factor loading of 0.792 (for Individualized Consideration), 0.902 (for Idealized Influence), 0.925 (for Inspiring Motivation), and 0.876 (for Intellectual Stimulation).

	CA	MCS	OC	TL
OC.A	0.757	0.821	**0.858**	0.770
OC.C	0.802	0.769	**0.856**	0.739
OC.H	0.722	0.643	**0.776**	0.720
OC.M	0.747	0.708	**0.793**	0.672
MCS.BEC	0.812	**0.916**	0.844	0.849
MCS.BOC	0.850	**0.941**	0.785	0.892
MCS.DCS	0.895	**0.938**	0.909	0.888
MCS.ICS	0.765	**0.861**	0.736	0.771
CA.DD	**0.961**	0.846	0.884	0.886
CA.PC	**0.795**	0.777	0.786	0.761
CA.PI	**0.900**	0.831	0.834	0.823
CA.QU	**0.941**	0.903	0.851	0.910
CA.TM	**0.912**	0.748	0.803	0.857
TL.IC	0.747	0.739	0.724	**0.792**
TL.II	0.832	0.858	0.807	**0.902**
TL.IM	0.855	0.887	0.777	**0.925**
TL.IS	0.852	0.767	0.778	**0.876**

Table 3. PLS Result for Cross Loadings

In checking the discriminant validity, the loading for each indicator to the latent variable should be higher compared to the cross loading to the other variables. **Table 3** illustrates that all the reflective variables passed this criterion. Thus, it can be said that the reflective data used in this research are valid. In checking the reliability of the reflective variables, both the Cronbach's Alpha and the Composite Reliability for each variable must be greater than or equal to 0.700. **Table 2** demonstrates that the Competitive Advantage variable has Cronbach's Alpha of 0.943 with Composite Reliability of 0.957, Management Control System has Cronbach's Alpha of 0.934 with Composite Reliability of 0.953, whereas Organizational Culture has Cronbach's Alpha of 0.839 with Composite Reliability of 0.892, and Transformational Leadership has Cronbach's Alpha of 0.897 with Composite Reliability of 0.929. Hence, it can be concluded that the reflective data acquired for this research is reliable.

4.3 Structural Model

The structural model was examined using SmartPLS Bootstrapping. It was conducted to first test the inner model of the research by looking at the R-Square value for each variable and then to test the significance for each correlation of the variables. R-Square is used to test how well do the independent variables explain the dependent variables. The closer R-Square is to 1.000, and the more information the independent variables are able to give

regarding the dependent variables. **Table 4** depicts that Competitive Advantage scores the highest R-Square with 0.922 followed by Management Control System (0.893) and Organizational Culture (0.778).

	R-Square	R-Square Adjusted
CA	0.922	0.914
MCS	0.893	0.886
OC	0.778	0.770

Table 4. PLS Result for R-Square and R-Square Adjusted

After analyzing the inner model, the hypothesis for each variable was then tested. Since the hypotheses are two-tailed, the significance of each hypothesis is demonstrated with T-Statistics higher than 1.960 and P-values less than 0.050. The results demonstrated in **Table 5**, and **Figure 2** illustrates that there is a statistically significant and positive influence between the following variables:

	T-Statistics	P-Value
MCS->CA	0.161	0.872
OC->CA	2.766	0.006
OC->MCS	2.644	0.008
TL->CA	3.313	0.001
TL->MCS	5.135	0.000
TL->OC	19.555	0.000

Table 5. PLS Results for T-Statistics and P-Value

(a) Organizational Culture with Competitive Advantage (with original sample of 0.405, T-Statistics 2.766 of and P-Values of 0.006), (b) Organizational Culture with Management Control System (with original sample of 0.344, T-Statistics of 2.644 and P-Values of 0.008), (c) Transformational Leadership with Competitive Advantage (with original sample of 0.557, T-Statistics of 3.313 and P-Values of 0.001), (d) Transformational Leadership with Management Control System (with original sample of 0.627, T-Statistics of 5.135 and P-Values of 0.000) and (e) Transformational Leadership with Organizational Culture (with original sample of 0.882, T-Statistics of 19.555 and P-Values of 0.000). These results support H1, H2, H4, H5, and H6. Furthermore, **Table 5** and **Figure 2** also show that the influence of Management Control System to Competitive Advantage is insignificant with the original sample of 0.034, T-Statistics of 0.195 and P-Value of 0.845, thus rejecting H3.

Besides the nature of the relationship of each latent variables, **Figure 2** portrays how each latent variables reflects each dimension. Transformational Leadership is dominated by inspiring motivation with Factor Loading of 0.925. This shows that leaders in local accounting firms are perceived as motivators and inspiration to their followers. Organizational Culture is dominated by Adhocratic Culture (Factor Loading of 0.858), which explains that the culture in local accounting firms is mostly creative, unrestrictive cultures. This stimulates employees to perform their activities in different and new perspectives. Furthermore, Management Control System is dominated by Boundary Control System (Factor Loading of 0.941) that emphasizes on rules and codes of conduct. This can be explained by the nature of local accounting firms itself as conservative and risk-averse companies. Since auditing activities require risk management, it is not surprising that people in local Accounting Business tend to conduct their day-to-day business in this manner. In addition, Competitive Advantage is dominated by Dependable Delivery (Factor Loading of 0.961), that emphasizes timeliness and dependability. This result shows the nature of the accounting firm's business environment that is regulated to deliver a product with high time sensitivity, which can be seen in the financial statements and audit reports.

5. Discussion

The results showed that the transformational leadership style has a significant and positive influence on the creation of competitive advantage. This finding is in accordance with the result of the research that was conducted by Garcia-Morales et al. (2008) that implied transformational leadership has a role in boosting the company's absorptive capability, innovation, and organizational learning intensely, and thus, increasing competitive advantage. Transformational leadership helped the company shape the firm's innovative perspective by involving

the firm's members through decision-making and critical thinking that promotes successful implementation of the company's strategy. Furthermore, Devie et al. (2015) emphasized that creativity and human development can be developed through the creation of new products and new systems, which implies the positive role of transformational leadership towards innovation. In addition, Samad (2012) explained that transformational leadership plays a key role in enhancing organizational performance.

Transformational leadership may enhance competitive advantage directly, but the mediating effect of the other factors cannot be overlooked. At the beginning of this research, the researchers hypothesized that organizational culture and MCS contribute to transformational leadership-competitive advantage relationship. Later, it was proven that only organizational culture has a mediating effect to transformational leadership-competitive advantage relationship. This is shown by the significant influence of transformational leadership on organizational culture and organizational culture to competitive advantage, while the influence of MCS to competitive advantage is rather insignificant.

Organizational culture has a positive and significant influence on the creation of competitive advantage. This finding is in line with the results of Barney (1986) that valuable, rare, and imperfectly imitable culture can further become their own competitive advantage. A company can develop competitive advantage through culture in the long run since a firm's organizational culture is an attribute that can distinguish it from other firms. Klein's (2011) findings also explained how different types of cultural approaches to business strategy might lead to different competitive advantages. In addition, Flamholtz and Randle's (2012) findings also matched with the researchers' result. Organizational culture might not play a direct role in boosting financial performance, but it is one of the inimitable, imperishable strategic assets that will further boost competitive advantage.

The employees in local accounting firms are becoming more aware of the importance of high quality and reliable auditing results, which can be shown by the high number of quality in competitive advantage. Inspirational leaders and creative culture help shape the quality of services that the accounting firms provide through continuous cultivation and development. This was proven from the influence of transformational leadership that is focused by inspirational motivation and organizational culture that is dominated by Adhocratic culture towards quality as a competitive advantage. In addition, transformational leadership also positively and significantly influence organizational culture. This result is backed up by the research of Bass and Avolio (1993); Ali et al. (2015); Jati, Hassan, Harman, Jabar, and Majid (2015). Bass and Avolio (1993) explained that there are distinctive organizational culture characteristics which resulted from the implementation of transformational leadership. Transformational leaders, or leaders in general, are said to have a constant reciprocal interaction with organizational culture. They can fabricate mechanisms for cultural development and revision of accepted norms and behaviors postulated within the cultural boundaries. In addition, transformational leaders have the power to rouse subordinates to exceed the expectations of the company. Thus, in terms of creating superior work culture, transformational leadership style plays an important role according to Ali et al. (2015).

However, Adhocratic culture must be followed with the intensive use of the interactive control system. The findings have shown that the interactive control system is the least dominating dimension of MCS. In order to further enhance the influence of Adhocratic culture in accounting, a control system must develop an interactive aspect and deploy broader communication. Moreover, local accounting firms heavily rely on boundary system and diagnostic control system which are categorized and perceived as "negative" control systems (Simons, 1995). This phenomenon results in the influence of MCS to competitive advantage to be insignificant, and thus nullifies the effect of the MCS as a mediating variable.

Fascinatingly, transformational leadership still has a significant positive influence on the application of the MCS. The result is also in line with the explanation of Nguyen et al. (2016) that emphasized how transformational leaders motivate and stimulate followers to rely on information from the MCS for managerial decision-making processes, reward purposes, and performance evaluation. Leaders would interactively utilize MCS as a tool to further develop the communication between followers (Abernethy et al., 2010).

In addition, organizational culture has a positive and significant influence on the MCS. This result is consistent with the findings of Duréndez et al. (2011); Reginato and Guerreiro (2013); Lee and Widener (2013); Jordao et al. (2014). Reginato and Guerriero's (2013) research was conducted in an area proven to have specific organizational culture attributes. MCS implementation was concluded as a manifestation of the companies' need to have control over their activities. Thus, MCS changes have led to profound cultural changes. These cultural changes will, in

turn, affect the further needs of organizational control and will then generate a reciprocal relationship between organizational culture and MCS.

Understanding how competitive advantage is developed by implementing transformational leadership is beneficial to the leaders of local accounting firms. High inspirational motivation factor loading shows that leaders of local accounting firms are inclined to inspire their subordinates. This means that subordinates of local accounting firms already perceived their leaders as an exemplary. However, the factor loading of idealized influence shows that leaders are not able to project their vision to their subordinates effectively. Thus, there is still a possibility for leaders to improve their competitive advantage by enhancing their influence towards their subordinates' vision and mission.

In addition, knowing the mediating effect of organizational culture is also advantageous for leaders. Although the influence of organizational culture to competitive advantage is already significant, there is still room for improvement since the path coefficient of this relationship is the lowest compared to the other positive and significant influence. This can be explained by the weak reflection of hierarchical and market culture. By optimizing the already existing company structure and emphasizing on the importance of market demand, local accounting firms might further enhance the competitive advantage of their firm.

Moreover, stressing on market demand could also prepare local accounting firms to new challenges that are brought about by an ever-changing business environment. Gaining knowledge regarding the insignificant influence of MCS on competitive advantage also uncovers a new area of improvement. In order to harness the competitive advantage of local accounting firms, especially since local accounting firms have already adopted adhocratic culture to a great extent. Local accounting firms might as well improve the use of interactive control system as their MCS. By giving attention to the importance of the interactive control system, accounting firms could expedite their business conduct, particularly when faced with problems produced by clients' new business practices.

There is one limitation to our research. This research did not employ any control variable. Two control variables that were proven by previous research to be important are firm age and size. According to Anning-Dorson (2018), larger and older firms possess more than enough resources, capacity and prerequisite scale to spend on innovation which will, in turn, generate a competitive advantage. Thus, in order to ascertain the strength of the relationship of each variable, future research can add the size of the firm and age as its control variables.

Nevertheless, the result of this research can still be used by local accounting firms to face challenges due to the emergence of AEC. Since AEC, the business environment of accounting firms is dominated by foreign affiliates. By understanding the relationship between each variable brought upon this research, local accounting firms can then implement the results of this research by adjusting their ways to conduct their business.

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Marketing Mix Factors of Educational Services, Accreditation Status, and Image Formation as Intervening Variables on Decisions in Choosing Private University in Palembang: Bina Darma University Palembang

Yeni[1], Zakaria Wahab[2], Agustina Hanafi[3]
Magister of Management Sciences, Faculty of Economics, Sriwijaya University, Palembang. Indonesia.

[1]Postgraduate, Sriwijaya University, Palembang. Indonesia, 30139. Email: yenimirza1@gmail.com
[2]Postgraduate, Sriwijaya University, Palembang. Indonesia, 30139. Email: zkwahab@yahoo.com
[3]Postgraduate, Sriwijaya University, Palembang. Indonesia, 30139. Email: tinahanafi.@ymail.com

Corresponding Author: Yeni, Email: yenimirza1@gmail.com

Abstract
The purpose of this study was to find out and analyze (1) the marketing mix towards the decision to choose Bina Darma University (2) the accreditation status towards the decision to choose Bina Darma University (3) The marketing mix towards image (4) the accreditation status toward image formation (5) the image toward decision to choose Bina Darma University. This study was conducted using descriptive and quantitative methods. SEM analysis was used and operated through the AMOS program. There were 300 students as the samples taken by using purposive sampling method based on suitable specific characteristics with the research objectives so that they were expected to answer research problems. The results of the study showed that (1) the marketing mix had a positive and significant effect on the decision to choose Bina Darma University (2) the accreditation status had a positive and significant effect on the decision to choose Bina Darma University (3) the marketing mix had a positive and significant effect on the image formation (4) the status accreditation had a positive and significant effect on the formation of image (5) the image had a positive and significant effect on the decision to choose Bina Darma University. It can be concluded that all proposed hypotheses were accepted.

Key Words: Marketing Mix, Accreditation, Image, Choosing Decision

1. INTRODUCTION

Indonesia as one of the countries in Asia continually experiences developments and changes, including in the world of education. The existence of education reformation such as privatization, internationalization, decentralization, and changes in the structure of higher education creates a competitive environment in education (Soedijati, 2011). These changes affect how higher education institutions operate nowadays, and it is considered a driving force for the marketing orientation in higher education (Maringe, 2006).

In the Higher Education Sector, there are some competitive business phenomena in this industry. Higher education as one part of formal education sector makes the need for education services getting increase and diverse, so it becomes a strategic sector that is expected to produce the quality of human resources (Arwanda et al. 2014). In

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addition, it was revealed that only 25 percent of the total private university had more than 500 students, and the rest have fewer than 500 students. Therefore, the Private Universities are required not only to develop the right strategy in attracting the interest of prospective students, but also a strategy to keep the students from following the process of education until their graduation.

Currently, there are 3,011 higher education institutions in Indonesia based on their ownership status consisting of state-owned universities called *Perguruan Tinggi Negara* (*PTN*) and private-owned universities called *Perguruan Tinggi Swasta (PTS)* with the composition based on various forms of education consisting of universities, institutes, high schools, academies, and polytechnic (Ministry of National Education Statistics, 2015). It proves that higher education in Indonesia is experiencing very high development because in 2014 the number of higher education institutions in Indonesia total of 2,928. It can be seen in table 1:

Table 1. Higher Educational Institutions in Indonesia in 2014/2015 (in thousands)

Variables	Public		Private		Total
	No.	%	No.	%	
Institute	83	2.76	2,928	97.24	3,011
University	48	10.43	412	89.57	460
Diploma	6	11.32	47	88.68	53
High SchoolInstitution	2	0.15	1,314	99.85	1,316
Academy	0	-	1,015	100.00	1,015
Polytechnic	27	16.17	140	83.83	167

Source: Ministry of National Education statistics, 2015

The high growth of universities and higher educational institutions in Indonesia should be in accordance with the increasing of services quality because only universities or institutions that have competitive advantages are able to survive in competition.

Table 2. The Comparison Number of PTN and PTS Students in Indonesia,2012 – 2015 (in thousand and million)

University	Years			
	2012	2013	2014	2015
Public	2.243.761	2.567.879	2.373.223	2.323.924
Private	805.479	824.693	978.739	907.154

Source: Ministry of National Education Statistics, 2015

Table 2 shows that the number of PTN is higher than PTS students from year to year, even though the number of PTS was higher than PTNs in 2015. The number of *PTSs* in Indonesia total of 2,928 (97.24%) (Directorate General of Higher Education, Ministry of National Education, 2015).

According to Assauri (2007), the marketing mix is "a combination of variables or activities as the core of the marketing system, variables that can be controlled by the company to influence the reactions of buyers or consumers." When good Image has been formed, the positive impressions generated can increase the probability of the educational institution to be chosen (Kusumawati, 2013).

Accreditation is an assessment activity to determine the feasibility of a study program. Accreditation is a high education quality assurance system. Accreditation is important for private universities because the existence of accreditation status will affect the acquisition number of students and the composition of the lecturers. Accreditation is also one form of an external quality assurance system, a process used by authorized institutions to provide formal recognition to carry out certain activities.

According to Sach (2007) image is knowledge about person and attitudes toward persons who have different groups. The definition of an image as cited by Effendi in Soemirat and Ardianto (2007) that is the world around a person that looks at the person. According to Canton in Sukatendel (1990) image is the impression, feeling, the image of the public toward the company. It is the impressions that are deliberately created from an object, person

or organization (Soemirat and Ardianto, 2007). From this understanding, Sukatendel in Soemirat and Ardianto (2007) argue that the image intentionally needs to be created to be positive values.

According to Swastha (2007) define Purchasing decision is one of the main components of consumer behavior. Consumer purchasing decisions are step by step used by consumers when buying goods and services (Lamb, 2008). Purchasing decision is an approach to solve problems in human activities to buy an item or service in fulfilling their wants and needs consisting of the introduction of needs and desires, information seeking, evaluation of alternative purchases, the decision of prospective students to choose the desired place to study in *PTS*s.

In this study, the writer adapted some addition to the accreditation variable based on Verawati (2016) research, the results of her research showed that the factors influencing students' interest in continuing the Magister of Accounting included motivation, study program accreditation, educational facilities, majors concentration, tuition fees, and reputation of educators . So that it can be interpreted that the six independent variables have a significant effect on students 'interest in continuing their magister program, and the results of Bahri Kamal's research, Ghea Dwi Rahmadiane (2017) showed that students' perceptions, study program accreditation, and promotion had an influence on students' decision to choose Accounting Study Programs at Polytechnic of Harapan Bersama, and accreditation of study programs was the most influential variable on the decision of students to choose the Accounting study program at the Harapan Bersama Polytechnic.

The purposes of this study were (1) whatwere the effects of the marketing mix of educational services consisting of products, price, distribution / place, promotion, people, process, and physical evidence on the decision of students to choose Bina Darma University? (2) How did the status of accreditation influence the decision to choose Bina Darma University Palembang? (3) How did marketing mix of the product, price, distribution / place, promotion, people, process, and physical evidence of the image of Bina University Darma Palembang? (4) How did the Status of Accreditation affect the Image of Bina Darma University Palembang? (5) How did the image influence the student's decision to choose Bina Darma University?

Based on the literature that has been described and the phenomena exist, the writer was interested in conducting research on "Marketing Mix Factors of Educational Services, Accreditation Status, and Image Formation as Intervening Variables on the Decision to Choose Private Universities in Palembang: Case Study at Bina Darma University Palembang."

2. THEORETICAL REVIEW

Marketing Mix. Rambat Lupiyoadi (2013) defines the marketing mix as a device / tool for marketers that consist of various elements of a marketing program to be considered so the implementation of the marketing strategy and determining the position can be successful. Whereas, according to Gunara & Sudibyo (2007) the marketing mix is the combination of elements of goods or services, product excellence, pricing, packaging, advertising, inventory, distribution, and marketing budgets in an effort to market a product or service. Kotler and Armstrong (2012) divide the dimensions of the marketing mix as follows:

1) **Products**, in higher education, more often referred to as educational programs or services. The program is the most basic thing in higher education institutions. Products can be seen from two perspectives, as follows: if students as consumers, the product leads to services offered by the university to meet the needs of students, whereas, if the job market as a consumer, students are products of the university. Products in educational services include: educational / academic quality and concentration choices / Prospects of getting a job and career can also be considered a product the university.
2) **Price,**Price of education services is all costs incurred by students to obtain educational services offered by a college. The price of education services includes tuition fees (Educational Development Donations or SPP, construction costs, laboratory fees), scholarships and flexible payment systems. Often this price element is linear with the quality of educational products.
3) **Place or Location**, In the context of educational services, what is meant by place is the location of educational institutions. Location Higher education is an important element in influencing student preferences in making

choices. The location of colleges that are easily accessible by public transportation, the proximity of the location of universities, and the availability of tertiary educational sites are virtual locations of universities through the internet which can be an attraction because of that they get information without having to go to a physical location.

4) **Promotion**, promotion is a means to provide information and try to convince stakeholders of educational services, so that they continue to know and remember it. Promotions in higher education services can include advertising (newspaper advertisements, TV, radio, brochures), public relations activities (holding events and invitations) and direct contact with prospective students and the community.

5) **People**, all people involved in the process of delivering education services to education customers. Human resources include qualified lecturers, professors, and lecturers with other academic degrees, competent administrators / leaders (rector), and professional administrative and educational staff.

6) **Process**, the process of higher education concerning its main products, the teaching and learning process from lecturers to students including administrative services that provide accurate, responsive, care. The quality of human resources related to delivering education services.

7) **Physical evidence**, in higher education, physical evidence is an environment where students and higher education institutions can interact, in which there are tangible components or facilities that support the performance or communication of these educational services. Physical evidence of higher education includes the design / style of buildings (conformity between aesthetics and functionality), supporting infrastructure facilities (laboratories & libraries, parking, religious facilities) and the technology used. Besides that, the existence of a dormitory building is the main attraction for students. Physical evidence plays an important role and often reflects the quality of services provided by educational institutions

Accreditation. According to Sumaryanto (2008) accreditation is an educational activity carried out by an agency called the National Accreditation Agency/ *Badan Akreditasi Nasional*(BAN) to accredit or determine the feasibility of study programs and educational units. Basically, accreditation is carried out as a form of accountability objectively, fairly, transparently and comprehensively by the education unit to the public
Known by the public, accreditation is an assessment carried out by the government towards private universities to rank the government recognition of these institutions, but this policy is now being implemented towards universities as a whole, both public and private. It shows that accredited universities get a higher recognition in society compared to universities that have not been accredited (Prasetyo, 2014),

Image. According to G. Sach in Soemirat and Elvinaro Ardianto (2007) image is knowledge about people and attitudes toward people in different groups. This definition is then cited by Effendi in Soemirat and Elvinaro Ardianto (2007) that image is the world around us that looks at us. According to Bill Canton in Sukatendel (1990) image is the impression, feeling, and public image of a company. Frank Jefkins in Soemirat and Elvinaro Ardianto (2007), divided images into several types, including:

a. **The mirror image** (image reflection), which is how management (image) predicts the external public in seeing the company.

b. **The current image** (warm image) that is the image contained in the external public, which is based on experience or concerning the poor information and external public understanding. This image can be contrary to mirror image.

c. **The wish image** (desired image), is management wants certain achievements. This image is applied to something new before the external public gets complete information.

d. **The multiple image**s, namely a number of individuals, branch offices or other company representatives can form a certain image that does not necessarily correspond to the uniformity of the image in the entire organization or company

Purchasing Decision / Choosing. According to M. Iqbal Hasan (2002), a decision is the result of resolving the problem taken firmly. Decisions must be able to answer questions related to planning. Astuti et al. (2007), define purchasing decision as strong self-confidence in consumers or customers who believe that the purchasing decision for a product taken is correct. According to Kotler, et al. (2012) there are several stages in the process of consumer purchasing decisions, can be seen in the following descriptions:

1. **The Problem recognition,** marketers need to identify conditions that trigger certain needs by gathering information from a number of consumers, so they can recognize stimuli that often occur to generate interest in certain types of products / services.The problem recognition phase in the process of purchasing higher education services is from the prospective student or external such as advertising, discussion with friends, and advice from the teacher. At this stage, the purchasing process is activated by a person who has a role as an initiator. Marketers of educational services need to identify the trigger factors that stimulate interest in certain educational institutions.

2. **Information Searching**, Consumers who have certain needs, will be encouraged to seek more information. The main concern of marketers is the main sources of information that become consumers' reference and the relative influence of each source on following purchasing decisions.

3. **Alternative Evaluation**, there are several factors considered by consumers to choose from many alternatives: product characteristics / performance, brand trust, brand selection procedures, benefit functions for each feature. Evaluation often reflects beliefs and attitudes through acting and learning, people gaining confidence and attitude. Consumers finally take a position (decision, preference) on various brands through product evaluation procedures. In evaluating higher education service buyers (prospective students) do: (a) evaluate all college attributes and give relative values, they will choose universities that provide the highest scores; (b) evaluate each attribute, and eliminate those that do not fit their criteria.

4. **Purchasing Decision**, at the evaluation stage, consumers form preferences for brands that are in a collection of choices. Consumers can also form an intention to buy the most preferred brand. In purchasing decisions involving 5 (five) sub-decisions, namely: branding decision, providing a decision, numbering decisions, timing decision, and paying procedure decision. The purchasing stage decision to choose a university can be interpreted that the consumers (prospective students) register to the chosen university.

5. **Post-Purchasing Behavior**, the post-purchase behavior is the stage of the consumers' decision process where consumers take further action after the purchase based on satisfaction and dissatisfaction. Consumers' satisfaction and dissatisfaction on higher education services (students) will greatly influence the following behavior. Whether the consumers continue their study or make recommendations to others.

Framework and Hypotheses

The framework in this study is a development model from the theories and the results of previous studies. The framework is described in Figure 1 as follow:
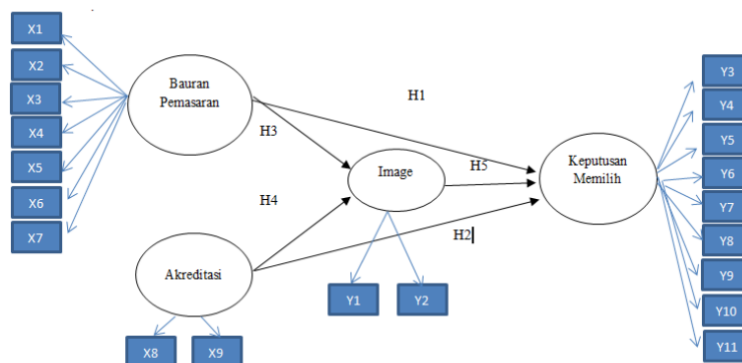

Figure 1. Framework

Research Hypotheses

According to Sugiyono (2010), the hypothesis is a temporary finding to the research problem formulation. The hypothesis is compiled and tested to show right or wrong by being free from the values and opinions of the researcher who compiled and tested it.

There were several hypotheses tested in this study, as follows:

H1: The **Marketing Mix** consisting of products, prices, places, processes, people, promotions, and physical evidence influenced the decision to choose Bina Darma University Palembang.

H2: The **Accreditation** status influenced the decision to choose Bina Darma University Palembang.

H3: The **Marketing Mix** had a positive and significant effect on the image formation of Bina Darma University Palembang

H4: The **Accreditation** status influenced Image Formation

H5: The **image** Influenced the Decision to choose Bina Darma University Palembang

3. RESEARCH METHODS

This study was quantitative research with causal research design to determine the effect of marketing mix factors on educational services,accreditation status, and image formation as an intervening variable toward the decision to choose a private university in Palembang: a case study in Bina Darma University Palembang. There were 4 (four) variables in this study, consisted marketing mix variables (X1), accreditation variables (X2) as independent or exogenous variables while mediating variable was an image (Y1) and decision variable (Y2) as dependent variable or endogenous variable . The marketing mix variables were measured using 7 (seven) dimensions: Product (X1), Price (X2), Place (X3), Promotion (X4), People (X5), Process (X6), and Physical evidence (X7). The number of indicators used in this study was 35 indicators. This study used primary data through distributing questionnaires by using ordinal scales and rating scales with 10 point measurement levels; points 1 through 10 that measured each item in the questionnaire (1 = strongly disagree to 10 = strongly agree).

Population and Samples

The population in this study was all students accepted at Bina Darma University Palembang. Purposive sampling technique was used in this study;the samples were specified based on suitable specific characteristics with the objectives of the study,which was expected to answer the research problems. There were 300 respondents taken as the samples in this study, the number of the sample met the minimum sample requirements using Structural Equation Model (SEM) analysis technique.

Analysis Methods

The analysis technique used in this study consisted of descriptive analysis by looking at the frequency table of respondents' characteristics and quantitative analysis using SEM analysis. The model development in this study used a second-order confirmatory factor (SOCF) technique, which was a two-level measurement model while the estimation method was the Maximum Likelihood (ML). In evaluating the suitability of the model (goodness of fit) was conducted using three suitability measures; (1) the suitability of the measurement model, consisting of measurements of construct validity and construct reliability. (2) the suitability of the structural model based on P-Value $<\alpha$ where $\alpha = 5\%$ and (3) the suitability of the whole model based on the index of the goodness of fit (Hair et al., 2010).

4. RESULTS AND DISCUSSION

Characteristics of Respondents

Respondents in this study, based on gender, were 57.3% females, 62.4% aged between 18 to 25 years. In evaluating the suitability, construct validity and construct reliability were calculated. In measuring construct validity, the indicators were considered significant when the probability value or p-value <0.05 and the Standardized factor loading value was valid when the standardized factor loading> 0.50. Based on Table 3, all the CR values of each variable were above 0.7, so it was reliable.

Model Test or Measurement Model

In evaluating the suitability, two measurement models were conducted; construct validity and construct reliability. In measuring construct validity, the indicators were considered significant when the probability value or p-value <0, 05 and the Standardized factor loading values were valid when> 0.05. Based on Table 1, from the two test points above, it can be concluded that all measurement models were valid. In measuring construct reliability, the

indicator was reliable when the value of construct reliability (CR)> 0.7. Based on Table 3, all CR values of each variable were above 0.7, so it can be concluded that the measurement model was reliable.

Table 3. Test Results for Validity and Construction Reliability

Variables	Dimension	Indicators	$\sum\lambda$	$\sum\varepsilon j$	Construct Reliability
Marketing Mix	Product	X1	0,781	0,390	
		X2	0,686	0,529	
		X3	0,764	0,416	
	Price	X4	0,706	0,502	
		X5	0,645	0,584	
		X6	0,686	0,529	
	Promotion	X7	0,584	0,659	
		X8	0,685	0,531	
		X9	0,725	0,474	
	People	X10	0,706	0,502	
		X11	0,746	0,443	0,961
		X12	0,644	0,585	
	Process	X13	0,806	0,350	
		X14	0,800	0,360	
		X15	0,851	0,276	
	Physical evidence	X16	0,817	0,333	
		X17	0,800	0,360	
		X18	0,776	0,398	
		X19	0,733	0,463	
		X20	0,706	0,502	
		X21	0,602	0,638	
		X22	0,725	0,474	
Acreditation		X23	0,992	0,016	0,976
		X24	0,960	0,078	
Image		Y1	0,855	0,269	0,905
		Y2	0,961	0,076	
ChosingDicission		Y3	0,810	0,344	
		Y4	0,785	0,384	
		Y5	0,687	0,528	
		Y6	0,748	0,440	0,926
		Y7	0,904	0,183	
		Y8	0,772	0,404	
		Y9	0,667	0,555	
		Y10	0,759	0,424	
		Y11	0,711	0,494	

Source: Results of AMOS Output Processing

In conducting a compatibility test, the overall model is based on the estimation of the SEM model as shown in Figure 2 below:
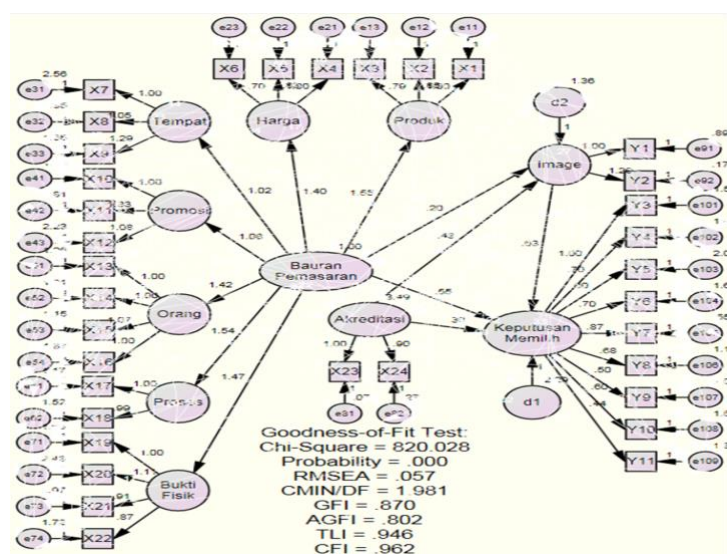

Figure 2. SEM model

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Based on Figure 2, the results of the SEM model shown in table 4 are as follows:

Table 4. Goodness of Fit Test Results

No.	Goodness of fit index	Cut off value	Values	Results
1	*Chi-Square* atau CMIN	*good fit* if CMIN <*Chi-Square* table α = 5% DF = 763, *Chi-Square* table = 462,440	820,028	*not good fit*
2	*Significance Probability of* CMIN (*p-value*)	*good fit* if *P-value* ≥ α α = 5%	0,000	*not good fit*
3	RMSEA	RMSEA < 0,08 *good fit* RMSEA < 0,05 *close fit*	0,057	*good fit*
4	CMIN/DF	*good fit* if CMIN/DF < 2,00	1,981	*good fit*
5	GFI	GFI close to 1 *good fit* Emphirical: GFI ≥ 0,90 *good fit* 0,80 ≤ GFI ≤ 0,90 *marginal fit*	0,870	*marginal fit*
7	TLI	TLI > 0,90 *good fit* 0,80 ≤ TLI ≤ 0,90 *marginal fit*	0,946	*good fit*
8	CFI	CFI > 0,90 *good fit* 0,80 ≤ CFI ≤ 0,90 h *marginal fit*	0,962	*good fit*

From testing the overall suitability of the model, showed the good model was 75%, so the SEM model was good.

Hypotheses test results. After testing the fit model as a whole, hypotheses testing was carried out to find out whether the hypotheses were rejected or accepted. A hypothesis can be accepted if the p-value is smaller than 0.05. Based on Table 3, the results of the 5 hypotheses were shown in Table 6 as follows:

Table 6. The Results of *Hypothesis Tests*

Descriptions	Parameter Estimation Values	P-Value	Results
Hypothesis 1 (H1)	0,554	< 0,001*	Hypothesis accepted
Hypothesis 2 (H2)	*0,296*	< 0,001*	Hypothesis accepted
Hypothesis 3 (H3)	*0,204*	< 0,003*	Hypothesis accepted
Hypothesis 4 (H4)	*0,428*	< 0,001*	Hypothesis accepted
Hypothesis 5 (H5)	*0,633*	< 0,001*	hypothesis accepted

Source: Amos Output

H1: The Marketing Mix affected the decision to choose
The results of the first hypothesis showed that there was a positive and significant effect of the marketing mix on the decision to choose a total of 0.554. It meant that the student's decision to choose a university was influenced by the service marketing mix which included products / study programs, prices / costs, places, processes, promotions, people, and physical evidence. The results supported the researches from Isnaeni (2002), Payne (2000) which revealed that the marketing mix of services could be used to satisfy customers. Product related to the choosing decision.

H2: Accreditation influenced the choosing decision
From the result of the second hypothesis, it was found that accreditation had a positive and significant effect on making a decision. It had a statistically acceptable value of 0.296, which meant that accreditation influence on

making the decision to choose the university. Based on these conclusions it can be said that the status of Accreditation for Higher Education institutions is a form of evaluation (assessment) of the quality and feasibility of higher education institutions or study programs. The choice was focused on the presentation of accreditation quality in education (Prasetyo, 2014). The better the accreditations rank, the higher the student's decision to choose the study program. On the contrary, the lower the accreditation ranks, the lower the student's decision to choose private institutions.

According to respondents, they chose Bina Darma University Palembang because the Information System Study Program accreditation was accredited A, and the Informatics Engineering Study Program was accredited B which had the competent quality of graduation, and the implementation of educational programs met the standards set by the National Accreditation Board of Higher Education (BAN-PT). It is in accordance with the regulation of the Minister of Education and Culture No. 87 of 2004 stating that accreditation is an assessment activity to determine the feasibility of study programs and university. The significance in this study supported the research conducted by Widi Rudini (2013) stating that there was an influence of rating accreditation on the interest in choosing study programs, with an effective contribution of 63.89%. While in this study, the effective contribution of accreditation ratings was 53%, lower than the previous study.

Research conducted by Bahri Kamal, Gea Dwi Rahmadiane (2017) state that Study Program Accreditation and student decision to choose Accounting study programs at Tegal Harapan Bersama Polytechnic and study program accreditation were the most influential variables on student decisions to choose Accounting at Polytechnic of *Harapan Bersama Tegal*. Research conducted by Verawati (2016) stated that the factors influenced students' interest in continuing the Accounting Masters included motivation, study program accreditation, educational facilities, departmental concentration, education costs, and the reputation of educators. So that it can be interpreted that the six independent variables had significant effects on students interest to continue their magister of Accounting, it was indicated by the value of each variable <0.05.

H3: Marketing Mix affected Image
The third hypothesis results found that the marketing mix had a positive and significant effect on Image of 0.204 which meant that the coefficient of 0.204 showed the marketing mix increased on one unit, the higher the image value, the lower the marketing mix value. Supported by previous research by Arwanda, Nur Oktalia Dwine; Hartoyo; Sri Hartoyo. (2014) that the image of the academy had the highest relationship to improve students' perceptions to higher education institutions.

H4: Accreditation had an effect on Image
The fourth hypothesis results showed that accreditation was a positive and significant influence on image formation with a statistically acceptable value of 0.428, which meant that accreditations affected the image of higher education institutions on the decision to be chosen. Based on these conclusions, it can be said that the status of Accreditation for Higher Education is a form of evaluation (assessment) of quality and feasibility for the image of higher education institutions or study programs. A positive image from a college will have a better chance to attract students. According to Nugroho (2013), the image is "total perception of an object, which is formed by processing information from various sources."

The image of the higher educational institution is measured through reputation or the same as the Accreditation of Higher Education. It indicates that the status and ranking of accreditation of higher education institutions greatly influences the image of a university which indicates high credibility (level of public trust). It also shows that the accreditation influences greatly in improving the image of a university.

H5: Image influenced the choosing decision
The results of the fifth hypothesis showed a positive and significant effect on the decision to choose a private university at Bina Darma University Palembang with an estimate of 0.663 indicating that the higher the value of the image, the higher the decision value, the lower the value of the image, the lower the value of the decision. The image can be interpreted as a belief in the form of a picture and general impression of a company by looking at various aspects formed by processing information from various sources.

Nugroho J Setiadi (2013), explained the relationship of brand image as follows; brand image associated with attitudes in the form of beliefs and preferences for a brand. Consumers with a positive image of a brand are more likely to make a purchase; therefore the main use of advertising is to build a positive image of the brand. The image has a very important meaning for a university where the image will shape public perceptions differently, before making a decision. Differences in perceptions of a particular object are possible because each individual has experience, understanding, and the way to capture different information.

Regarding the result of the study by Zainal Hanafi, Amri, Sulaiman (2016), the image variable had a very dominant influence on the decision of students to choose universities, and further research showed that mediation of image variables had a significant influence on the decision of students to choose Polytechnic of Aceh. It is needed to pay more attention to form an image of the university with graduation who has high market acceptance; image strengthening will have a strong impact on the decision of prospective students to choose to study at the Aceh Polytechnic.

Research conducted by Fure et al. (2015) stated that simultaneously Image had a significant effect on consumer purchasing decisions. Partially the brand image had a significant effect on consumer purchasing decisions, and the price variable had no significant effect.

5. CONCLUSIONS AND SUGGESTIONS

Conclusion
Based on the results of this study indicated that (1) the Marketing mix had a positive and significant effect on the decision to chose Bina Darma University Palembang, (2) Accreditation Status had a positive and significant effect on the decision to choose Bina Darma University Palembang (3) Marketing Mix had a positive and significant effect on image formation of Bina Darma University Palembang (4) Accreditation Status had a positive and significant effect on the Image of Bina Darma University Palembang and (5) Image had a positive and significant effect on the decision to choose Bina Darma University Palembang.

Suggestion
Based on the previous results of the study, it is suggested as follows: (1) For Bina Darma University Palembang to add / open a New Study Program (for example: Marketing Management Department), to maintain and to improve the accreditation status that has been better in each The Study Program at Bina and to enhance the image of Bina Darma University. (for example qualified graduates, work-ready graduates, etc.), to improve better services and satisfaction to students (for example academic administration processes, teaching and learning processes, facilities and infrastructure, curriculum quality, scholarships and etc.), to increase promotion continuously every year, especially when receiving prospective new students. (For example socialization to schools, holding events / stands, giving discounts to the first 50 registrants, etc.). (2)for further researches, it is necessary to add other variables, for example, cultural variables (culture, sub-culture, social class), social factors (group, family, personal factors: age / cycle, product, occupation, economic situation, personality lifestyle), psychological factors (motivation).

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Firm-specific Financial Determinants of Non-Performing Loan in the Banking Sector of Developing Countries: Evidence from the Listed Commercial Banks in Bangladesh

Arif Ahammed[1], Sabuj Saha[2]

[1] Lecturer, AUST
[2] AIS, DU

Corresponding Author: Arif Ahammed, Lecturer, SoB, Ahsanullah University of Science and Technology (AUST). Cell: 01626-565162, 01758-856275. Email: arifdu2874@gmail.com

Abstract

This article aims at finding the financial determinants of Non-performing Loans (NPL) in the banking sector of Bangladesh. It employs panel data analysis techniques to find those determinants and the extent of their impact on NPL. It collects data from 2012 to 2016(total 5 years) of 10 listed commercial banks in Bangladesh from their annual report. It finds that Capital Adequacy Ratio (CAR) and Return on Equity (ROE) are significantly negatively related to NPL where Size(S) is a significant positive determinant of NPL. It also finds that Loan growth (LG) is positive determinants of NPL where Loan to Deposit ratio (LTD) is a negative determinant of NPL, but none of these two is significant. Bank management should focus on higher CAR and efficient utilization of assets that will lessen NPL and consequently enhance the performance. Findings of this article are highly congruous with that of existing literature.

Key Words: Non-performing Loan, Capital Adequacy Ratio, Return on Equity, Loan Growth, Bangladesh.

1. Introduction:

The term non-performing loan (NPL) means the amount of loan for which the debtor has not made any scheduled payment at least for 90 days as per the rule of Bangladesh Bank. It may be a bad loan or close to a bad loan. Loan default in the Banking sectors of Bangladesh has already become a culture that is a big threat to the performance and sustenance of a bank. It is too dangerous a thing that can lead to the substantial financial crisis (Ahmad and Bashir, 2013).

One of the major concern for the banking sector is the minimization of the non-performing loan. NPL is basically dependent on many aspects, both of clients and banks. For example, the inefficiency of management in calculating the credit-worthiness of a client may be a major driver of NPL. On the other hand, an unwillingness of the client or the subsequent failure in business may lead the business borrower to default. Another important reason for the non-performing loan is the use of the fund in the sectors other than those it was collected for (Richard, 2011).

Most of the defaulters of this country are habitual defaulters who take loan and default willingly. Many of them continue taking a fresh loan in addition to the over-due amount after filing a writ petition to the court that gives them a clean slate (The Daily Star, November 2017). Again, they fail to pay back the loans. The central bank of Bangladesh has a lot to do to rein this situation. Another very crucial reason for a loan is the absence of strong

corporate governance. As this popular daily reported, many of the defaulters default due to legitimate reasons. For example, many of them defaulted due to sluggish growth of export earnings and inflow of remittance. On the other hand, many of them default due to an unfriendly business environment.

This article mainly aims at finding the firm specify financial determinants of non-performing loans in the banking sector of Bangladesh, especially in commercial banks listed on the Dhaka Stock Exchange (DSE). It uses panel data analysis techniques and financial data of five years from the annual reports of 10 listed commercial banks of the DSE. That means it considers 50-factor years of data. The independent variables selected are, Capital adequacy ratio (CAR), Loan Growth (LG), Loan to deposit ratio (LDR), Return on equity (ROE) and Size of the bank in term of total assets. Graph 1, given below, presents the historical scenario of NPL in Bangladesh as a percentage of total Loan.

Graph 1: Recent Trends in NPL in Banking Sector of Bangladesh

NPL as % of Total Laon
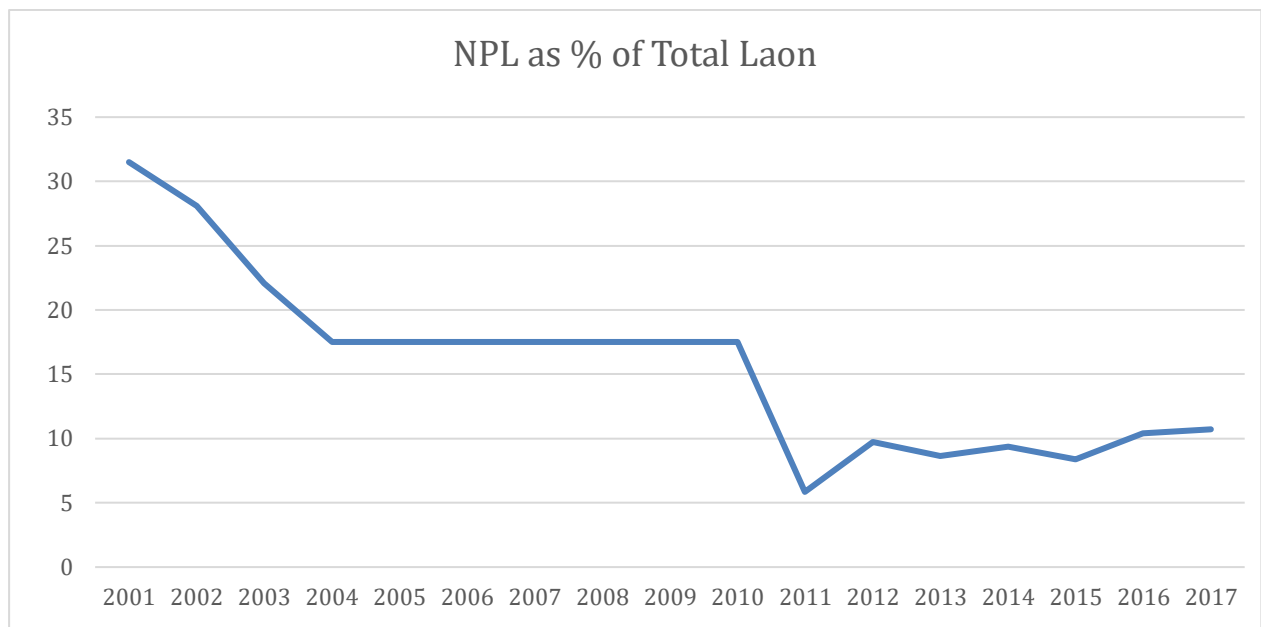
Source: CEIC

As the graph shows, NPL has fallen down as a percentage of the total loan from 2001 to 2004 significantly. From 2004 to 2010, it remained stable at almost 18%. Again it started falling and continued up to 2011 and reached a 6% mark. After 2011, with some ups and down, it kept increasing and reached a point of 11% in 2017 showing an upward trend.

In the following sections, this article focuses on research methodology, hypothesis building, model development and analysis of the result. It also provides policy guidelines to the interested parties in banking sectors throughout the analysis in thearticle.

2. Literature Review:

A very few numbers of research has been performed on NPL in the banking sector of Bangladesh. A portfolio of knowledge has been created from the literature of some native and foreign research papers as presented below.

Non-Performing Loans (NPL):
Non-Performing Loans are an acute problem of the banks of Bangladesh and more specifically of banks, located in the urban and corporate periphery, dealt with the industrial and big business loans. Credit Risk occurs when a loan becomes non-performing. A Non-performing loan is a loan that is in default or close to being in default (Bangladesh Bank). It is the most important factor behind the survival of a bank that may also indicate the failure of bank's policy resulting in a broader financial crisis (Saba et al, 2012). Adhikary(2006), finds that NPL is

alarmingly prevalent in the banking sector of Bangladesh, both in nationalized commercial banks and development financial institutions. According to him lack of enforcement of law along with poor capital adequacy ratio are the main determinants of NPL.

According to Saba et al, 2012, a non-performing loan (NPL) is defined as a sum of borrowed money upon which the debtor has not made his or her scheduled payments for at least 90 days. A nonperforming loan is either in default or close to being in default. Once a loan is nonperforming, the odds that it will be repaid in full are considered to be substantially lower. If the debtor starts making payments again on a nonperforming loan, it becomes a re-performing loan, even if the debtor has not caught up on all the missed payments. On the other hand, Mahmood (2016) Defined non-performing loan as the financial assets that generate no interest income or principal repayment to the lending party. According to BRPD Circular 14, 2012 of Bangladesh Bank, the following policies are followed to determine the extent of non-performing loan of a continuous or demand loan.

Overdue or due period	Classification
03 months or more but less than 06 months	substandard
06 months or more but less than 09months	Doubtful
09 months or beyond	Bad loan

Source: BRPD Circular 14, 2012

Capital Adequacy Ratio: As a financial institution a bank may have several sources of fund that can be broadly categorized in two groups i.e. deposit and non-deposit where capital is the non-deposit source of fund for a bank. A simple definition of capital can be the fund coming from long-term debt and equity to the bank. Capital adequacy ratio depict the internal financial strength through giving insight of financial position of a Banka (Shrivastava, 2011). Moreover, falling of this ratio below the minimum requirements results in higher regulatory cost for bank managers(Moyer, 1990). Though this ratio may seem positive for the bank succinctly, a stringent capital adequacy rule may also bring danger or increase risk for a bank as under bindings equity a unit of equity of tomorrow will be more valuable to the banks commensurately rising the risk (Blum, 1990). A higher stock of capital will result in economic fluctuation in turns and reduce bank's ability to disburse fund to lending and industry investment.(Blum and Hellwing,1995). According to Mamun, 2013, in order to calculate CAR, banks are required to calculate their Risk Weighted Assets (RWA) on the basis of credit, market, and operational risks where the total RWA will be determined by multiplying the amount of capital charge for market risk and operational risk by the reciprocal of the minimum CAR and adding the resulting figures to the sum of risk weighted assets for credit risk. The CAR is then calculated by taking eligible regulatory capital as numerator and total RWA as denominator. Minimum capital requirement in Bangladesh is 10% of total risk weighted asset or 4 billion as capital whichever is higher of which 5% should be core capital (BRPD Circular No. 10).

Return on Equity (ROE):
Return on equity is a measure of performance of a business that is derived by dividing net income attributable to the owners of a business by equity of the owners or net assets. The core decision behind any investment decision is whether it will boost up the value of equity holders, and return one equity is one of the most crucial drivers of that value to the equity holders (Arditti,1967). On the other hand, ROIS is affected by the several aspects of company performance like total equity, leverage, performance, return on assets etc. amongst which Risk and Size of the fir are the two most significant determinants(Hagerman and Ratchford,1987). ROE is also an factor of evaluating the efficiency of management (Samad and Kabir,1999).

Size (Total Assets):
Size of a bank (actually any business) is a major aspect of its performance, and this can be measured in terms of total assets, capital or sales volume. Size of bank may have diversified impact on its risk and performance. A bank with higher size enjoys a competitive advantages and lower risk where a smaller banks are bound to take higher risk due to fierce competition (Hakenes and Schnabel, 2011). On the other hand, a bank with larger capacity can serve the customers fasters, solve problems quickly, access the financial flows easily and so on so forth. But, Laeven et al. (2014)come with and opposing finding that the systematic risk of a bank increases with increase in the size of a bank.

Loan Growth (LG):
Loan growth can be defined, in simple language, as percentage increase in the total amount of loan disbursed from the previous year. With the expansion of business and increase in demand from the clients, it is necessary to increase amount of loan but an abnormal loan growth leads to lower capital ratio and increases risk for the banks resulting in lower performance and higher loan loss in turns (Foos et al. (2010), Keeton, (1999)). Loan growth is also a measure of loan quality. Though complex, there exist a relationship between loan growth and loan quality, to be more specified a higher loan leads to higher loan quality of loan, meaning increased loan loss and charge-off [clair,(1992) and Laeven and Majnoni(2003)].

Loan to Deposit Ratio (LDR):
Loan to deposit ratio is ratio between total loans and total deposit of bank. If this ratio is more than one, it implies that the bank is relying on outside borrowing that may increase the risk of performance in case of non-performance of loan where a ratio lower than one may imply the safety of performance. A sector variation regarding the LDR may have varied impact on the performance and risk of a bank. For example, a shift form business sector to personal sector increases the interest margin of banks (Allen, 1988). LDR is also a measure of the flow of the fund. A relatively inflexible RDR may lead to shortage in mortgage and hamper the cyclical flow of funds to and from the banks that in turns may haper the performance of bank (Klein, 1972).

The relationship among Non-performing Loan, Capital Adequacy, Loan Growth, Size, Loan to Deposit Ratio and Return on Equity:
Tsige(2013) in his article on Determinants of Non-performing loans in Ethiopian commercial banks found that Size has a significant positive relationship with NPL where loan growth, financial performance, operational efficiency have a negative impact on NPL of commercial banks in Ethiopia. Rahamand et al (2016) in a research on determinants of non-performing loans in Indonesia covering a sample period of 2013-2014 of 26 commercial banks found that Capital adequacy ratio(CAR)) is significantly negatively related to the amount of NPL and loan to deposit ratio was insignificantly related to NPL. Louzis et al (2012) in a study on non-performing loans of Greece studied the impact of some macroeconomic and firm-specific factors on NPL. They performed a comparative analysis and found that GDP, Unemployment rate, Interest rate, Public debt and Quality of management are the variables that can significantly describe the NPL in the banking sector of Greece. Messai and Jouini (2013) studied the impact of both microeconomic and macroeconomic factors on the NPL of Italy, Greece and Spain for a period of 2004-2008. Using panel data analysis technique in their research they found that NPL is negatively affected by GDP growth and profitability of bank where it is positively affected the real interest rate, unemployment rate and loan loss reserve ratio. Marki et al (2014) studied the determinants of non-performing loans in the Eurozone banking system using a case study approach for a periodof 2000-2008. They used both macroeconomic and microeconomic variables in their study. They found a strong correlation between NPL and firm-specific variables, namely Return on Equity (ROE), Growth of NPL and Capital adequacy ratio (CAR). Ghosh (2015) in his article sought evidence of determinants of non-performing loans from the banking industry of the USA for a study period of 1984-2013. He used both industry-specific and regional factors to find their impact on NPLs. Liquidity risk, poor credit quality, cost efficiency, and size of the bank have a significant positive impact on NL. He also found that higher profitability of bank is significantly negatively related to NPL. Ahmad and Bashir (2013) in their article titled "Explanatory Power of Bank Specific Variables as Determinants of Non-performing Loans: Evidence from Pakistan" performed a study of 6 years panel data of 30 commercial banks in Pakistan. They found that Size of a bank, Management quality, Moral hazards, Return on assets, Return on equity, Loan growth, Loan to deposit ratio are the significant determinants of non-performing loans in commercial banks of Pakistan.

This article is important in that it considers more recent data (2012-2016) and provides the investors and banking organizations with more update guidelines. On the other hand, it uses panel data analysis techniques to do the same that has not been done before in Bangladesh. Thus this article fills up the research gap and contributes to the existing body of literature.

3. Research Objectives:

The core objective of this article is to find out the determinants of Non-performing loans (NPL) andtheir impact on the same in the banking sector of Bangladesh. It also aims at providing policy guidelines to the bank management and the interested parties.

4. Sample and Data:

This article selects 10 commercial banks listed on the Dhaka Stock Exchange (DSE) randomly. These banks are Islami Bank Ltd, Dhaka Bank Ltd., Mutual Trust Bank Ld., Dutch Bangla Bank Ltd., Social Islami Bank Ltd., Prime Bank Ltd., Brac Bank Ltd., Standard Bank Ltd., Jamuna Bank Ltd., and South-East bank Ltd. It considers a sample period of total 5 years from 2012 to 2016. These 10 banks comprise 1/3 of the commercial banking companies listed in the DSE. Data has been collected from the published annual report of these banks and some magazines of this Bangladesh.

5. Methodology:

This article employs panel data analysis technique to find out the impact of independent variables on NPL. It uses Hausman test (Hausman, 1978) to select the model (Fixed or Random). It also employs Wald test, Pesaran CD test, and LM test for diagnosing the data set. It collects the required data from the annual reports of the sample banking companies.

6. Independent Variables and Model Development:

In this section, this article develops the theoretical and mathematical model of the expected relationship of independent variables with the dependent variable. At first, it develops the hypotheses, then it presents the expected theoretical relationship in table 1 and then shows the mathematical relationship in an equation.

Capital Adequacy Ratio (CAR): It is a measure of capital and measured in terms of risk-weighted assets of a bank. It is maintained to protect the depositors. The higher the amount of CAR is, the lower is the amount of NPL.
H_0: There exists no relationship between NPL and CAR.
H_1: There exists a relationship between NPL and CAR.
Loan to Deposit Ratio (LDR): Loan to Deposit ratio (LTD) means the portion of deposits from the depositor disbursed as loan to the customers. The higher will be this ratio, the higher will be the chance of NPL.
H_0: There exists no relationship between NPL and LDR.
H_1: There exists a relationship between NPL and LDR.
Loan Growth (LG): It means the amount of loan disbursed in addition to the prior one. As loan grows, a chance for default also grows. The higher is the amount of LG, the higher will be the chance of NPL.
H_0: There exists no relationship between NPL and LG.
H_1: There exists a relationship between NPL and LG.

Return on Equity (ROE): A higher amount of Non-performing loan leaves a lower amount of assets used to earn the profit. As a result, earnings fall and consequently ROE also falls. Therefore, a higher amount of NPL implies a lower amount of ROE.
H_0: There exists no relationship between NPL and ROE.
H_1: There exists a relationship between NPL and ROE.
Size (S):A bigger size of a bank in term of total assets means its higher capacity to disburse loan and adequacy of assets. As a bank gets larger, amount of distributed loans also increases. This higher amount of loans create a commensurate higher risk of NPL.
H_0: There exists no relationship between NPL and Size(S)
H_1: There exists a relationship between NPL and Size(s)

Table 1: Expected Relationship of Independent Variables with Dependent Variables.

Dependent Variable	Independent Variables	Expected Relationship	Sign of Relationship
NPL	CAR		-
NPL	LDR		+
NPL	LG		+
NPL	ROE		-
NPL	S		+

Model Development:

From the theoretical discussion and expected relationship given above, NPL is a function of CAR, LDR, LG, ROE, and S that can be presented as follows:

NPL $= f(CAR, LDR, ROE, S))$

The mathematical model can be presented as follows:

Ln NPL $= \beta_0 + \beta_1 CAR_{it} + \beta_2 LDR_{it} + \beta_3 LG_{it} - \beta_4 ROE_{it} + \beta_5 Ln\ S_{it} + \varepsilon_{it}$

Where, NPL_{it}= Non-performing loan of a bank of time t

B_0= the intercept

CAR_{it}= Capital adequacy ratio of bank i of time t

$LDR_{i\ t}$= Loab deposit ratio of bank i of time t

LG_{it}= Loan growth of bank i of time t

ROE_{it}= Returnon equity of bank i of time t

S_{it}= Size (total assets) of bank i of time t

$\varepsilon_{it=}$ error term

7.   Analysis of Results and Findings:

7.1 Correlation Analysis:

Table 1, given below, presents the value of correlation among the variables. It shows the correlation coefficient of the dependent variable (NPL) with independent variables and among the independent variables also. We find that no multicollinearity occurs among the independent variables. Correlations between LG and LDR, CAR and S, LG and ROE, and ROE and S are found to be significant at 1% level of significance. From these data, it can be concluded that the data set is free from multicollinearity.

Table 2: Pearson Test of Correlation:

	Ln NPL	CAR	LG	LDR	ROE	Ln S
Ln NPL	1	-0.159	0.014	-0.186	0.1887	-0.152
CAR		1	0.22	0.1647	0.113	-0.234***
LG			1	0.3879***	0.416***	-0.158
LDR				1	-0.0264	0.224
ROE					1	-0.41***
Ln S						1

*** means the correlation is significant at 1% level.

7.2 Diagnosis Test:

Values of three test statistics are given in table 3. Value of serial correlation test reveals that there exists serial correlation in the data set of this paper. On the other hand, the value of Pearson CD that is used to test the cross-section dependence in the data set reveals that there exists no cross section dependence in the data set. The null hypothesis of no cross-section dependence is accepted. It is also visible from the value of Wald test that their existsheteroscedasticity in the data set of this paper that is evident by the P-value of Wald test less than the 5%.

Tables 3: Diagnosis Tests

Tests	Name of test	Test Value	P Value
Serial Correlation	LM Test	75.35684	0.00031
Homoscedasticity	Wald Test	207.28	0.0000
Cross-section dependence	Pearson Cd	-0.82322	0.4104

7.3 Selection of Appropriate Model:

Appropriateness of panel data analysis is dependent on the choice of the model that gives the best estimate. As we can see that there exist heteroscedasticity and serial correlation in the data set used in this paper, use of general pooled ordinary least square (OLS) may give a biased and inappropriate result. That is why Random and Fixed effect models are estimated. Here, Hausman test is used to decide between Fixed effect and Random effect model. Value of Hausman test supports the selection of Fixed effect model as evident by the P-value less than 5%.

Table 4: Hausman Test

Test	Test Value(Chi-Square)	P value
Hausman Test	14.827825	0.0111

7.4 Analysis of Regression Result:

Table 5, given below, presents the result of Fixed effect regression model using panel data. As it is seen in the table, Capital Adequacy Ratio (CAR) is a significant negative determinant of NPL in banking sectors of Bangladesh as evident by its P value of 2.25%. Each unit increase in CAR reduces NPL by 0.039 unit. Similarly, Return on Equity (ROE) is also a significant negative determinant of NPL as evident by its P value of 0.0001 that is almost 0(zero). Each unit increase in NPL decreases REO by 0.0304unit. On the other hand, size of a bank, that means, total assets is a significant positive determinant of NPL. Each unit increase in the total asset increases NPL by 1.23 unit and vice versa. It is also seen that Loan growth (LG) positively affects the NPL where Loan to deposit ratio (LDR) affects NPL negatively. None of the LG and LDR is significantly related to NPL as evident by their corresponding P-values.

Value of R-squared is 91%. It means our model can explain the 91% of changes in the dependent variable (NPL) by the independent variables. It has a very satisfactory explanatory power. Value of F-statistics is 2831.924 and its p-value is 0.000. It means that the explanatory power of the model is statistically significant.

Table 5: Result of Fixed Effect Model:

Variables	Coefficient	Standard error	t-statistics	P value
C	-7.212181	3.937875	-1.831490	0.0756
CAR	-0.039333	0.016475	-2.387414	0.0225
LDR	-0.010052	0.00747	-1.345470	0.1871
LG	0.004857	0.00443	1.094597	0.2812
ROE	-0.030423	0.006905	-4.405785	0.0001
S	1.238979	0.170643	7.260629	0.0000
R-squared	0.910118	Adj. R-squared	0.908765	
F-value	2831.924	Prob. of F-value	0.0000	

8   Conclusion and Policy Guidelines:

The non-performing loan has become one of the major threat to the banking sector of Bangladesh. Here loan default is almost a culture and very easy to get escape. Political shelter and lack of enforcement of the law, on one side, and lack of a prudent decision by bank management, willing defaults, on the other hand, are major issues behind the scene. The government of Bangladesh has to recapitalize the state-owned banks regularly. On the other hand, opening and operating a bank in this country is becoming easier. A huge competition in this sector makes the management relaxed regarding issuing loans. They issue loans in easy conditions and without proper check-up of credit worthiness. The low-interest rate, problems of corporate governance, family control, dishonest practices, political instability etc. contribute to soaring up this situation from time to time. This kind of rampant loan default is really leading the banking sector of this country to a crisis. This situation should be checked before it becomes too late.

In this article, it is found that Capital adequacy ratio (CAR) significantly reduces the amount of NPL in Bangladesh. Bank management should focus on this aspect strongly. On the other hand, NPL reduces the performance bank significantly that may lead to long-term sustainability threats. It is also found that Size of a bank in terms of total assets significantly contributes to NPL in a positive way. It implies the mismanagement of assets by bank management.

This article considers financial aspects specific to the banking companies. In addition to these, other factors like macroeconomic ones can be used in future research to seek more answers and contribute to the development of the banking sector of Bangladesh.

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The theme of "non-performing loans" (NPLs) has attracted more attention in recent decades. Several studies examined bank failures and find that asset quality is an indicator of insolvency (Demirguc-Kunt, 1989; Barr and Siems, 1994).

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Do The Earnings Management, Governance, Media Exposure, and Ownership Structure Have Any Effect on ESG Disclosure?

Priskila Adiasih[1], Avioletta Effendy[2], Carissa Dea Yuwono[3], Nadya Octavia[4]

[1,2,3,4] Business Accounting Program, Petra Christian University, Surabaya, Indonesia

Correspondence: Priskila Adiasih, Accounting Business Program, Petra Christian University, T Building 3rd floor, Siwalankerto 121-131, Surabaya, Indonesia. Tel: +62-31-298-3232. Email: priskila@petra.ac.id

Abstract

Previous study has shown various results for the relationship between good corporate governance (GCG), and company ownership to corporate social responsibility (CSR) governance. The environmental, social and governance (ESG) is one dimension of CSR governance. Using legitimacy theory, this study conducts to answer the gap by exploring real earnings management practice towards ESG. We use financial data and CSR governance from Bloomberg ESG database. The samples are 27 companies for the period 2012-2016. The findings suggest that GCG influence positively to ESG disclosure. In addition, we find that real earnings management (represent by Abnormal Cash Flow from Operation and Abnormal Production) has a positive effect on ESG disclosure. However, no evidence yet exist that Abnormal Discretionary Expense has a significant effect on ESG disclosure. We also demonstrate how the company ownership influences the disclosure. This study contributes to the literature by focusing on real earnings management rather than abnormal discretionary accrual.

Keywords: Real Earnings Management, ESG Disclosure, Bloomberg, Corporate Governance.

1. Introduction

1.1 Introduction

Environmental, Social, and Governance (ESG) have grown to become a significant tool in business decision making, especially in the last few decades. The level of ESG disclosures can be linked to a company's level of transparency (Daub, 2007) and the quality and capability of its management in improving business profitably in the future (Eccles et al., 2011). To that end, businesses are now always striving to improve their business reporting practices as investors expect companies to disclose their environmental, social, and governance (ESG) performance in ways that can be trusted and understood.

ESG information, in particular, is a non-financial disclosure that does not pursue a standardized format as in financial disclosure; therefore, ESG disclosures tend to vary (Elzahar et al., 2015). This non-financial aspect possesses a significant impact on the financial performance of a company, i.e., in terms of access to capital; cost and operational efficiencies; risk management; sales growth and market expansion; brand value and prestige (Hoang, 2018).

According to PWC (2016), ESG is a series of corporate operating standards that are used by investors to filter their investment. ESG concept combines three main factors, which are environmental, social, and

governance, in evaluating the sustainability and ethical impacts of an investment in a company or business. Therefore, good corporate governance and financial reporting environment are stimulating the capital market performance to improve investor confidence (Mohammed, Ahmed, Ji, 2017).

ESG concept allows the environmental factor is explaining how the company runs its operations in the framework of natural environmental responsibility. The social factor reports on how a company manages its relations with the employees, suppliers, customers and the community. Meanwhile, the governance factor explains the leadership aspect in the company, executive remuneration, audit and internal control, and the shareholders' rights (PWC, 2016).

Bajic and Yurtoglu (2018) confirmed that ESG measures could capture significant impacts of ESG on a company, which would drive the relationship between social aspects of ESG and the company's value. A systematic presentation of ESG information can be utilized by professional investors as an investing analysis tool.

This study expects to find out the kind of impacts that Audit Committee Meeting, Independent Commissioner, Media Exposures, Real Earning Management, and Ownership make on ESG. The benefit from this study would be to provide information for companies on the importance of considering ESG factors if influenced by Audit Committee Meeting, Independent Commissioner, Media Exposures, Real Earning Management, and Ownership. For research purposes, major companies in Indonesia are taken as subjects of this study and expected to be able to develop further initiatives related to ESG disclosure. This study adopts the third party rating approach to calculate the extent of ESG disclosure. This study is also investigating the determining factor in an ESG disclosure and treating ESG disclosures separately (Giannarakis, Konteos, Sariannidis, 2014).

The following are several studies previously conducted on real earnings management and ESG disclosure. Research conducted by Choi and Pae (2011), Kim et al. (2012) discovered that ESG disclosure is also positively linked to the level of earnings management. In addition to real earnings management, Ownership variable also influences ESG. According to Kim et al. (2018) companies with high foreign ownership score higher company value, higher ESG disclosure value, and a higher level of asset growth. Khan et al. (2012) discover that there is a positive association between public ownership and the level of ESG disclosure. Research by Kuo et al. (2012); Tagesson, Blank, Broberg, & Collin (2009) state that there is a positive impact between government ownership and ESG disclosure. According to research by Rao and Tilt (2016b), the majority of studies have apparently confirmed that there is a positive relation between the independent commissioner and ESG. Maistriau and Bonardi (2014) recognise that media coverage has a positive effect on ESG performance. Audit committee meeting, another independent variable, also influences ESG disclosure. According to European Multi-stakeholder Forum on CSR (2004) and Tencati et al. (2004), audit committees with a high frequency of meetings can better manage their business operations, because during meetings information on ESG disclosure is given high attention, both by the internal and external stakeholders.

From those research, it can be concluded that there are inconsistent results regarding the relations between independent and dependent variables. Thus, another study is going to conduct on those research. For the purpose of this study, we will test the companies listed on Indonesia Stock Exchanges that also possess ESG scores.

1.2 Literature Review

Real earnings management has been proven to become an alternative to accrual management (Cohen et al., 2008; Zang, 2012). Prior et al. (2008) use a sample of 593 companies from 26 countries and show the positive impact earnings management has on ESG disclosure. They find a positive relation between earnings management and ESG disclosure in regulated firms; however, the results are not significant statistically for unregulated firms. Findings from research conducted by Choi and Pae (2011), Kim et al. (2012) discover a positive relation between ESG and earnings management. Yet, Chih et al. (2008) discover that the evidences found are not consistent, in relation with earnings management of ESG companies.

Ownership is divided into 3, i.e., the government, public and foreign entity, whose numbers are taken from the annual reports of 27 companies. According to Kim et al. (2018), an increase in foreign ownership could drive managers to work actively in their company's ESG activities. This study result shows that companies with higher foreign ownership have higher company value, higher ESG disclosures, and a higher level of asset growths. Other studies discover that there is a positive impact between foreign ownership and ESG (Guoyou, Saixing,

Chiming, Haitao, & Hailiang, 2013; Oh, Chang, & Martynov, 2011). Foreign companies tend to use their company websites to disseminate their ESG information in order to reduce conflicts between managers and the foreign owners, as well as to provide access to information for their foreign stakeholders (Firth et al., 2007; Wang et al., 2008). When ownership diffusion widens, expectation and demands from the shareholders will also become extensive (Keim, 1978). Companies that are publicly-listed can widen their ownership diffusion and the number of shareholders. For that reason, entities with public ownership face higher pressures that they are encouraged to disclose additional information on their activities due to visibility and accountability (Choi, 1999; Cormier and Gordon, 2001). Khan et al. (2012) discover that there is a positive association between public ownership and the level of ESG disclosure. In addition, companies that are listed in the stock market tend to comply with the requirements specified by the authorities (Monteiro and Aibar-Guzmán, 2010). For that reason, companies that are listed in the stock market and establish ownership diffusion are considered significant determiner in voluntary ESG disclosures. Studies by Kuo et al. (2012), Tagesson, Blank, Broberg, & Collin (2009) state that there is a positive impact between government ownership and ESG disclosure. According to those studies, companies that are operated by the government have more commitment to disclosing their environmental information compared to other companies. According to Said et al. (2009), a government mandate can cause companies to reveal their ESG information as the government is a publicly-trusted body. There are a few other studies that offer varying results, for example, Suwaidan dkk. (2004), Mohd Ghazali (2007), and Lim et al. (2008) that discover significant positive relations between government ownership and ESG. Other researchers, Alotaibi and Hussainey (2016) find a significant negative relation between government ownership and ESG. On the other side, few other researchers find that there is positive and insignificant relation between government ownership and ESG (Haji, 2013, Lu and Abeysekera, 2014, Naser et al., 2006, Khasharmeh and Suwaidan, 2010).

Independent commissioners do not only strive to implement sustainable initiatives but also positively and significantly in relation with the extent of voluntary corporate disclosure, encouraging reporting system and transparent disclosure (Ho & Wong, 2001; Barros et al. , 2013). According to Chang et al. (2012) and Johnson and Greening (1999), the level of external representation (independent commissioner) is positively related to ESG. According to a study by Rao and Tilt (2016b), the majority of the studies seem to confirm a positive relation between the commissioner's independence and ESG. However, according to Frias-Aceituno et al. (2013), study findings cannot be concluded only by looking at the type of relations exist between ESG disclosure and independent commissioners. For example, Lim et al. (2007) and Prado-Lorenzo and Garcia-Sanchez (2010) discover a negative relation between the commissioner's independence and ESG, however; other studies find a positive relation (Chen & Jaggi, 2000) or insignificant between ESG disclosure and independent commissioner (Gallego-Álvarez et al., 2011; Rao & Tilt, 2016a). Khan et al. (2012), conduct an analysis on 116 manufacturing companies listed on the Dhaka Stock Exchange in Bangladesh from 2005 up to 2009 and discover that there is a significant positive relation between commissioner's independence and ESG disclosure. This result shows that the higher commissioner's independence, the most probable a company will emphasize on aspects of social interest and organisation's legitimacy and disclose more ESG activities.

In addition, by establishing a relation between media activities and corporate ESG disclosure efforts, this study also sees that impacts from media coverages are important. Maistriau and Bonardi (2014) recognize that media coverage has a positive impact on ESG performance. They study British companies and discover that negative news coverage would encourage managers to make additional investments on ESG. Public's awareness and interests on environmental and social issues and the increased attention in the mass media have resulted in more social disclosures by companies in the last two decades (Deegan and Gordon, 1996; Gray et al., 1995; Hooghiemstra, 2000; Kolk, 2003). However, renowned controlled media have been dominated by and for the elites, where most of their ESG activities conducted are quite positive (Zhang and Swanson 2006; Deephouse and Suchman 2008; Lyon and Montgomery 2013). For this reason, disclosures that are conducted excessively on ESG activities often fall under suspicion that they are used to serve the companies' own interests, attracting attention from critical stakeholders, and operating the risk of '' self-promoter paradox" (Lyon and Maxwell, 2011). In order for ESG communication to succeed, there needs to be supported by the public.

Allegrini & Greco (2013) argue that through audit committee meeting members can present their evaluation on the company's accounting decisions in relation to their principles, disclosures, and assumptions. Moreover, through regular meetings, members of the Audit Committee can receive information and acknowledgment on accounting and audit issues that are relevant (Allegrini & Greco, 2013). For this reason, a

more proactive Audit Committee, one that often meets during the year, can offer its members more significant opportunities to discuss and evaluate issues that present at the moment in relation with the company's financial reporting practice (Li et al., 2012). Giannarakis et al. (2014) argue that the number of board meetings is not a substantial factor in explaining the level of ESG disclosure, as the board of directors is only responsible for the ESG policies and not the implementation of ESG. According to the European Multistakeholder Forum on ESG (2004) and Tencati et al. (2004), the audit committee with a high frequency of meetings can better run its business operations, as during sessions ESG disclosure information is usually given a lot of attention, either by the internal or external stakeholders. Lipton and Lorsch (1992) contend that the frequency of audit committee meetings can encourage companies to monitor company operations superiorly and motivate companies to increase transparency.

Legitimacy theory states that in order to respect their social contracts, organisations constantly strive to ensure that stakeholders have considered their activities as legitimate (Suchman, 1995). From this point of view, social, environmental and governance disclosures become a legitimacy management tool that is used by companies to influence the perception of their stakeholders on social, environmental and governance impacts from their activities (Cho, 2009; Gray et al., 1995).

1.3 Hypothesis Development

1.3.1 Earnings Management

Based on studies by Prior et al. (2008), managers who are involved in earnings manipulation can balance out by being involved in ESG activities, considering the asymmetric information between the internal (manager and director) and the external (shareholders and stakeholders) parties. They find a positive relation between earnings management and ESG disclosure in regulated firms; however, the results are not significant statistically for unregulated firms. Yet Chih et al. (2008) on the opposite, discover that the evidences found are not consistent, in relation with earnings management of ESG companies. The following hypothesis was made:

H1. Earnings management has an impact on ESG disclosure

1.3.2 Ownership

Many recent studies show that structure or type of ownership of a company has an impact on the company's governance mechanism (Sur et al., 2013) and its performance (Thomsen and Pedersen, 2000). Kim et al. (2018) explain that an increase in foreign ownership could drive managers to work actively in their company's ESG activities. On the other hand, Khan et al. (2012) discover that there is a positive association between public ownership and the level of ESG disclosure. Other researchers such as Suwaidan dkk. (2004), Mohd Ghazali (2007), and Lim et al. (2008) discover positive significant relations between government ownership and ESG. Therefore, the following hypotheses were made:

H2. Foreign Ownership has an impact on ESG disclosure

H3. Public Ownership has an impact on ESG disclosure

H4. Government Ownership has an impact on ESG disclosure

1.3.3 Independent Commissioners

Independent commissioners are members of the board of commissioners that do not have any relation with the management, other members of the board of commissioners and the controlling shareholders, and free from business relations as well as other affiliations that can influence their ability to act independently or act solely for the company's interest. The study on the relationship between independent commissioners with ESG is supported from Rao and Tilt (2016b), which majority of their studies seem to confirm a positive relation between the commissioner's independence and ESG. Thus the following hypothesis was made:

H5. Independent Commissioner has an impact on ESG disclosure

1.3.5 Media Exposures

Media forms public opinions on events that are not directly experienced by the people. The way media describes a company can affect the extent of company's acceptance in the society (Brown and Deegan, 1998; Aerts and Cormier, 2009; Dickson and Eckman, 2008). According to the results of previous studies, they consistently support the argument that the larger the media exposure, the higher the level of ESG disclosure. This is supported

by the study from Maistriau and Bonardi (2014) who recognize that media coverage has a positive impact on ESG performance. Thus the following hypothesis was made:

H6. Media Exposure has an impact on ESG disclosure

1.3.4 Audit Committee Meeting

Allegrini & Greco (2013) argue that through the audit committee meeting, the members can present their evaluation on the company's accounting and receive information on accounting and audit issues that are relevant. This is supported by the study from Lipton and Lorsch (1992) who contend that the frequency of audit committee meetings can encourage companies to monitor company operations superiorly and motivate companies to increase transparency. Thus the following hypothesis was made:

H7: Audit committee meeting has an impact on ESG disclosure.

2. Research Method

2.1 Samples

The study uses data from Bloomberg and annual reports starting from 2012-2016. The population used in this research is companies listed in the Indonesia Stock Exchange (IDX). In the beginning population consists of 80 companies; however, only 27 passed the criteria of five year observation period, i.e., from 2012-2016.

2.2 Independent Variables Measurement

- Earnings Management (EM) is measured with the Roychowdhury model of real earnings management.

- Ownership (PO, GO, FO) is measured by hand-collected data from the annual report from 2012-2016.

- Independent Commissioner (IC) is measured with Total independent commissioner against the total members of the board of commissioner

- Media Exposures (ME) is measured by hand-collected data from the annual report from 2012-2016.

- Audit Committee Meeting (ACM) is measured by the frequency of audit committee meeting.

2.3 Multiple Regression Model

The study uses multiple ordinary least squares regression model (OLS). The calculation of the OLS regression model is as follows:

ESG discl = α + β1 ACM + β2IC + β3ME + β4PO + β5GO + β6FO + β7ACFO + β8ADE + β9AP + ε

(1)

Notes :

ESG	= Environmental, Social and Governance
ACM	= Audit Committee Meeting
IC	= Independent Commissioner
ME	= Media Exposures
PO	= Public Ownership
GO	= Government Ownership
FO	= Foreign Ownership
ACFO	= Abnormal Cash Flow from operation
ADE	= Abnormal Discretionary Expenses
AP	= Abnormal Production

3. Empirical Results and Discussions

3.1 Roychowdhury Model

In calculating earnings management, this research uses Roychowdhury formula. Roychowdhury (2006) discovers evidences that companies use several real earnings management methods to fulfill certain financial reporting standards to avoid reporting on the yearly loss. Evidences show that managers offer price discounts to increase sales temporarily, reduce discretionary expenses to increase reported margins, and allow excessive production volume to reduce the cost of goods sold. In the study by Graham et al. (2005), providing evidences of managers preferring real earnings management activities compared to accrual-based earnings management.

Formulas used to calculate real earnings management are as follows.

a. Abnormal cash flow from operations

$$CFO_{it} / Assets_{i,t-1} = a_{1t} (1 / Assets_{i,t-1} + a_{2t} (Sales_{i,t} / Assets_{i,t-1}) + a_{3t} (\Delta Sales_{i,t} / Assets_{i,t-1}) + \mathcal{E}_{i,t}$$

Notes :

$CFO_{i,t}$	= Cash flow from company operations in year t
$Assets_{i,t-1}$	= Total company's asset in year t-1
$Sales_{i,t}$	= Company's sales in year t
$\Delta Sales_{i,t}$	= Change in company's sales in year t

b. Abnormal production

$$Prod_{it} / Assets_{i,t-1} = b_{1t} (1/ Assets_{i,t-1}) + b_{2t} (Sales_{i,t} / Assets_{i,t-1}) + b_{3t} (\Delta Sales_{i,t} / Assets_{i,t-1}) + b_{4t} (\Delta Sales_{i,t-1} / Assets_{i,t-1}) + \mathcal{E}_{it}$$

Notes :

$Prod_{it}$	= Total HPP and change in company's inventory in year t
$Assets_{i,t-1}$	= Total company's asset in year t-1
$Sales_{i,t}$	= Company's sales in year t
$\Delta Sales_{i,t}$	= Change in company's sales in year t
$\Delta Sales_{i,t-1}$	= Change in company's sales in year t-1

c. Abnormal discretionary expenses

$$Discexp_{it} / Assets_{i,t-1} = c_{it} (1 / Assets_{i,t-1}) + c_{2t} (Sales_{i,t-1} / Assets_{i,t-1}) + \mathcal{E}_{it}$$

Notes :

$Discexp_{it}$	= Total advertisement cost, R&D cost and sales, general and administrative (SG&A) cost
$Assets_{i,t-1}$	= Total company's asset in year t-1
$Sales_{i,t-1}$	= Company's sales in year t

3.2 Multiple Regression Analysis

Table 1. Pooled OLS Model

	Coefficient	P-Value
Abnormal Cash Flow from Operation	24.5744	0.0744*
Abnormal Production	18.0368	0.0154**
Abnormal Discretionary Expenses	3.32028	0.7117
Foreign Ownership	30.6991	0.0915*
Public Ownership	−25.0449	0.0006***
Government Ownership	27.7472	1.36e-08***
Independent Commissioner	3.65308	0.0011***
Media Exposure	6.18093	0.0138**
Audit Committee Meeting	0.608146	0.0031***
P-Value (F)	7.59E-13	
Adjusted R-Square	0.409982	
White's Test	0.002556	

This research model is pooled OLS model. For that reason, we conduct collinearity and heteroskedasticity tests.

White's test shows that the model contains heteroskedasticity (P-Value <0,05). Therefore, we conduct heteroskedasticity-corrected so that the model can be used to test the hypothesis.

Table 2. Collinearity Test –Variance Inflation Factor Value (VIF)

	VIF
Abnormal Cash Flow from Operation	2.848
Abnormal Production	3.169
Abnormal Discretionary Expenses	2.223
Foreign Ownership	1.416
Public Ownership	1.370
Government Ownership	1.656
Independent Commissioner	1.516
Media Exposure	1.469
Audit Committee Meeting	2.276

Collinearity test reveals that the model does not have collinearity because of the VIF >1.

Table 3. Panel Test

	P-Value
Fixed Estimator	0.0685075
Hausman test	5.13E-06

Table 3 reveals the result of the data panel model test. If the p-value of the fixed estimator is < 0.05, the model is fixed, otherwise pooled. And the final determinant test is the Hausman test; p-value of < 0.05 indicates that the model is fixed, whereas a p-value of > 0.05 shows a random model.

Table 4. Heteroskedakticity-corrected on ESG

	Coefficient	Std. Error	p-value	Sig
Abnormal Cash Flow from Operation (H1)	19.8931	6.56247	0.0030	***
Abnormal Production (H1)	19.0438	4.07762	7.64e-06	***
Abnormal Discretionary Expenses (H1)	3.51187	6.40582	0.5845	
Foreign Ownership (H2)	34.5518	7.89008	2.49e-05	***
Public Ownership (H3)	−21.1404	5.81382	0.0004	***
Government Ownership (H4)	30.1019	2.75608	6.57e-020	***
Independent Commissioner (H5)	2.59046	0.709075	0.0004	***
Media Exposure (H6)	3.16589	1.57606	0.0467	**
Audit Committee Meeting (H7)	0.450680	0.133168	0.0010	***

Note. *, **, *** significant at 10, 5, and 1 percent levels, respectively

Real earnings management can be done in 3 ways, which are abnormal operating cash flow, abnormal discretion expense, and abnormal production. From the result of regression test conducted, it can be concluded that abnormal production and abnormal operating cash flow from the operation have an impact on ESG disclosure, yet abnormal discretionary expenses does not. Therefore, H1 cannot be accepted. There is an indication that management does earnings manipulation in AbnCFO and AbnProd by increasing sales temporarily during a period of time by offering price discount excessively or by providing soft credit requirement, making the policy to manufacture products in a large quantity. Supported by the studies by Prior et al. (2008), Choi and Pae (2011), Kim et al. (2012) with result that there is a positive impact made by earnings management on ESG disclosure, this means that the more often managers manipulate earnings they will divert the stakeholders' attention all the more through ESG disclosure.

Ownership shows a significant relationship with ESG. In this study, ownership itself is divided into 3, namely foreign ownership, public ownership, and government ownership. These three parts are retrieved from companies' annual reports from 2012-2016. Foreign ownership has a positive effect on ESG disclosure, so H2 is accepted. Results of the study indicate that companies with high foreign ownership have high ESG disclosure scores. This is supported by research by Kim et al. (2018) which state that increased in foreign ownership can encourage managers to work actively in the company's ESG activities. This is because foreign companies, especially in Europe and America are more familiar with the concepts of ESG practice and disclosure. Therefore, foreign shareholders will put more pressure on the management in disclosing ESG.

Public ownership has a negative effect on ESG disclosure so that H3 can be accepted. The result is not supported by previous studies such as Khan et al. (2012) who discover that there is a positive association between public ownership and the level of ESG disclosure. This can happen because of the assumption that the public is an investor who wants to invest in the company, but does not pay attention to the level of ESG disclosure at the company. They will be more concerned with stock price movements due to the lack of public awareness of ESG.

Therefore, if the management finds that public ownership to be lower, then it must be able to increase the company's ESG disclosure.

Government ownership shows a positive influence on ESG disclosure, so H4 is accepted. This supports the studies by Kuo et al. (2012), Tagesson, Blank, Broberg, & Collin (2009) which state that there is a positive influence between government ownership and ESG disclosure. Based on these studies, it is discovered that government-controlled companies are more committed to disclosing environmental information than other companies. This is because government ownership has a positive effect on ESG disclosure. Therefore, the management is advised to increase the proportion of government share ownership because government ownership can improve the quality and quantity of disclosures.

Independent Commissioner shows a positive impact on ESG disclosure so that H5 can be accepted. This means supporting the studies by Jizi et al. (2014), Rao and Tilt (2016b), Chen & Jaggi (2000), Khan et al. (2012), Chang et al. (2012) and Johnson and Greening (1999). Independent commissioners are very involved in ESG reporting to promote the interests of stakeholders. Because independent commissioners have an impact on ESG scoring by Bloomberg, independent commissioners are expected to remain involved in ESG reporting so that they can continue to promote the interests of stakeholders.

Media exposure shows a positive impact on ESG disclosure, therefore H6 is acceptable. This is consistent with the studies by Deegan (2000b), Islam and Deegan (2010), Maistriau and Bonardi (2014), Zhang and Swanson (2006), Deephouse and Suchman (2008), Lyon and Montgomery (2013). This means that the greater the media exposure, the higher the extent of ESG disclosure. This is triggered by the public's awareness and interest in environmental and social issues. Because media exposures have an effect on ESG scoring by Bloomberg, the management is advised to keep regularly uploading company activities on the website so that stakeholders and the public have positive information and image of the company.

Audit committee meeting shows a positive impact on ESG disclosure, so H7 is acceptable. This is consistent with Tencati et al. (2004) and Lipton and Lorsch (1992). Audit committees that have high frequency of meetings can better manage their business operations, because in meetings usually ESG disclosure information is given a lot of attention, both by internal stakeholders (internal meetings of the Board of Commissioners, Joint Meetings of Directors and Commissioners, internal audit meetings with audit committee) and external (audit committee meeting with external auditors). Tencati et al. (2004) reveal that because audit committee meetings are impacting ESG scoring by Bloomberg, the audit committee is advised to routinely conduct audit committee meetings so that disclosure of ESG information can still be given attention.

4. Conclusion

Corporate social responsibility activities are increasingly given a lot of attention from the investors, customers, employees, and governments throughout the world (Kabir and Thai, 2017). For that reason, many companies have shown higher interests in reporting their social responsibilities and initiating ESG activities (Setiawan, 2016). ESG performances are considered well conducted if done by the company with the purpose to fulfill the stakeholders' interests. The benefit gained by the company that implements ESG is that the company becomes more competitive in the market. ESG becomes a strategy for a company and can function as an effective communication tool between the company and its stakeholders. It is because not all field activities conducted by a company can be known by the stakeholders.

ESG disclosure consists of sustainability performances and represents information that communicates whether the company has worked towards achieving sustainability targets (Bradford, Earp, and Williams, 2017). From the Bloomberg's ESG performance scores, a company can evaluate its own corporate practices in the aspects of environmental, social and corporate governances by using publicly-available data, annual reports, and sustainability reports, direct communications, pers releases, third-party studies, and news (Tamimi and Sebastianelli, 2017). The result from this study reveals that real earnings management, ownership, commissioner independent, media exposures, audit committee meeting have impacts on ESG disclosure, using Bloomberg's ESG disclosure database. Further, this study also supports the legitimacy theory as good ESG disclosures can improve company's image, that earnings management practice conducted by the company is ignored by the stakeholders (Martínez-Ferrero, Banerjee, García-Sánchez, 2016).

The limitation on this research is that it is done on 27 companies listed in the Indonesia Stock Exchange (IDX). Data used in this study is taken from Bloomberg, and financial reports and annual reports shared in the official website of the Indonesia Stock Exchange.

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Notes

Note 1. Multiple Regression Formula

ASIAN INSTITUTE OF RESEARCH
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Linking Occupational Health and Safety Management to Sustainable Competitive Advantage of the Firm

Hermas Kornelius[1]

[1] Doctor in Management, Faculty of Economics, Universitas Pelita Harapan, Indonesia

Correspondence: Hermas Kornelius, Doctor in Management, Faculty of Economics, Universitas Pelita Harapan, Karawaci, Tangerang, Indonesia. E-mail: hermas.kornelius@gmail.com

Abstract

There is a positive trend in the development of safety management in business practices and industries worldwide, including in Indonesia. In the early practices, safety management was adopted by an organization only to fulfil legal and customer's requirements. Because of increased awareness of how important safety is to an organization, it has now become part of business management practices, especially for companies in high-risk industries. Also, it is generally acknowledged that organizations that adopt and implement an occupational health and safety management system have an in the increase in organizational performance. The main objective of this literature review is to provide a portrait of existing research on the benefits of adopting and implementing an OHS management system for an organization and its direct as well as indirect effects on organization performance and sustainable competitive advantage, especially in developing country like Indonesia. There are also discussions about research gaps and possibilities for future study to fill these gaps.

Keywords: Competitive Advantage, Firm Performance, Occupational Health and Safety, Resource-Based View, Safety Management

1. Introduction

In Indonesia, organizations have been adopting and implementing safety management since the establishment of the safety regulation in Law No. 1 in the year 1970. This law required safety protection for all workers in order to ensure a safe workplace while improving national productivity and considering the development of industry, production technology, and society. Since then, organizations in Indonesia, lead by large manufacturing companies, started to implement safety management to fulfil the law requirement and to prevent accidents that can be costly for the company's operations.

(Rohani et al., 2015) explained that in the event of a work accident, the accident costs could include the cost of medical treatment, rehabilitation cost, and compensation related costs. (Zou & Sunindijo, 2015) further elaborate the cost of accidents and add the components of indirect costs: namely, overtime cost, additional substitute workers, refreshment training cost, investigation and traveling costs, government fines, and loss of productivity.

Occupational health and safety (OHS) has been evolving away from when it was first adopted in industry; that is, from conditions when there was not much attention to the safety of workers in the early industrial era to the traditional phase where employers have an obligation to fulfil safety regulations in order to avoid a penalty for accidents. Thus, the adoption of an OHS management system starts to find a place in business practices, then progresses to a transition phase where a company realizes the benefits from implementation of OHS management

in organization activities, and then evolves into a transformative phase where OHS becomes a part of risk management practices and is considered in any strategic decision made by a company (Zou & Sunindijo, 2015).

The developing trend in the more competitive business environment is that there is an increasing level of complexity and sophistication in production systems and processes, and this constantly imposes higher requirements for safety. New approaches in the system of OHS management require every person to be aware of potential risks, to identify these risks during the working process, to execute measures for their mitigation and to inform others about any residual risks. In a modern organization, OHS activities are part of integrated management systems in businesses and include environmental management systems and quality management systems, which creates the highest level of competitiveness in the market (Sinay, 2014).

Managing safety integration with the company management system and synchronizing it with business operations has become increasingly important in recent years. Thus, it is not only able to prevent costly accidents from happening but also can improve employee satisfaction, company productivity, and financial performance. A good safety management system can lead to fewer accidents, less property damage, less absenteeism, and it can lower insurance and medical costs. Hence, good safety management practices also increase company performance in term of higher productivity, higher efficiency, higher quality, better company image, and greater innovation (Mossink, 2002; Muniz, Peon, & Ordas, 2009).

As defined in ISO 45001: occupational health and safety management is "a management system developed to provide systematic programs supporting the company health and safety policy, providing a safe and healthy working environment to the employee, prevent accidents, injury and illness, and to achieve company strategic objectives such as health and safety performance and business performance". ISO 45001 also provides the most recent requirements for implementation of an OHS management system in an organization that consist of "leadership and commitments, policy and objectives, organization's structure, roles and responsibilities, planning, operation, performance evaluation, and continuous improvement" (International Standard Organization, 2018).

According to (Goetsch, 2015) occupational health and safety work close together; safety is concerned with unsafe conditions and dangerous hazards to workers, and health is concerned with disease-causing conditions. In this article, the word safety has been broadened to represent both occupational safety and health.

The main objective of this literature review is to provide a portrait of existing research on the benefits of adopting and implementing a safety management system for an organization and its direct as well as indirect effects on organization performance and sustainable competitive advantage, especially in a developing country like Indonesia. The literature review also presents discussions of research gaps and future research study and possibilities to fill these gaps.

2. What is Competitive Advantage?

Since introduced by (Porter, 1985), the concepts of competitive advantage and the value chain have enabled organizations to look in detail at each stage of their operations and then measure its competitiveness. Porter proposes three generic strategies for achieving above-average performance: cost differentiation, value differentiation, and focus in a niche market. Cost leadership and differentiation seek competitive advantage in a broad range of industry segments, while the focus was aimed at a narrow market segment. (Porter, 2008) suggested doing a competition on dimensions other than price by improving customer value through product features, support services, delivery time, and brand image in order to avoid loss of profitability.

(Hamel & Prahalad, 1989) criticize some strategy concepts, such as general strategy (low cost vs differentiation vs focus), strategic fit (between resources and opportunities), and strategy hierarchy (goals, strategies and tactics), and they propose strategic intent as an active management process that focuses on the organization's attention on motivating people, communication value, sustaining enthusiasm, providing new operational circumstances, and using this intent consistently to guide resource allocation to achieve strategic goals.

Another thought of competitive advantage comes from the Resource-Based View (RBV) theory that aims to explain the internal resources of a firm's sustained competitive advantage. RBV theory focuses on company resources and company capabilities to create unique core competences that enable it to produce superior performance in business activities compared to its rivals. To achieve a sustainable competitive advantage, a company has to acquire valuable, rare, inimitable, and non-substitutable resources and capabilities and organize

them to fully exploit the competitive potential of its resources, capabilities, and competencies. Also, a company should create resource-based entry barriers which are the source of competitive advantage and create sustained profitability (Barney, 1991, 1995, 2001). Competitive advantage should lead an organization to superior performance since competitive advantage is defined as superior firm performance relative to competitors in the same industry or above the industry average (Grant, 1991). In line with that, (Peteraf, 1993) suggests a model which explains that for a firm to enjoy sustained competitive advantage, it has to own unique heterogeneity, imperfect mobility, ex-post and ex-ante limitations to competition. (Rumelt & Kunin, 2003) concluded that competitive advantage comes from owning a scarce, useful resource that is highly priced and marketable.

(Sigalas, 2015) found that competitive advantage causes confusion to both academics and business executives because there are various definitions of competitive advantage which have different meanings in strategic management literature. (Sigalas, Economou, & Georgopoulos, 2013) identified two major concepts of competitive advantage. The first concept defines competitive advantage as a firm's performance, e.g., high profitability, superior returns, financial performance, and profits. The second concept defines competitive advantage as sources or determinants, e.g., cost leadership, differentiation, technologies, product features, locations, and other unique resources and capabilities. (Sigalas & Papadakis, 2018) investigate the relationship patterns between competitive advantage and firm performance and provide evidence that competitive advantage and firm performance are not functionally equivalent.

Based on the above literature, the author defines competitive advantage as a company's unique resources, capabilities, and competencies that are valuable, rare, inimitable and non-substitutable. Furthermore, if these are well managed and organized toward the company's objective, they can boost company performance above its rivals or above the industry average.

3. Safety Management, Competitiveness, and Firm Performance

Related to an OHS management system, (Rechenthin, 2004) conducted a study to examine the relationship between a safety management system and a competitive advantage. This study concluded that safety has characteristics that match sustainable competitive advantage requirements, such as: 1) Valuable: adding value above the cost of creating it, 2) Rare: not homogenous across industry, 3) Inimitable: unique, based on culture and history of company, 4) Non-substitutable: as a culture, safety cannot be substituted by other programs, 5) Organized: as supported by company management system.

(Bottani, Monica, & Vignali, 2009) investigated the performance difference between safety management system (SMS) adopters and non-adopters against its substantial benefits to a company. The results indicated that companies adopting SMS exhibit higher performance in safety and security goals and communication to employees, updated risk data from risk analysis, risk mitigation and corrective actions and employee's safety training programs. However, the study does not provide a direction and causality of the results; investigating SMS adoptees in a specific market field could provide additional useful insights since the implementation of safety management systems involves the expenditure of substantial resources for organizations.

In the study conducted by (Muniz et al., 2009), it was found that safety management can become an important source of competitive advantage with the opportunity to gain significant benefits in market growth and financial indicators. Although it has been shown that safety management has a positive effect on competitive advantage and firm performance, the relationships were evaluated from the safety officer point of view and did not include company's top management who had authority to exercise strategic decisions.

The subsequent study reported by (Muniz, Peon, & Ordas, 2012), confirmed the important role of a safety management system in an organization, not only in the improvement of safety performance but also in the organization's competitiveness. This study provides strong empirical support for the relationship between communication and management's commitment to safety performance, employee satisfaction and firm competitiveness in OHSAS 18001 certified organizations. Management's commitment has a positive influence on incentives and communication, and a negative influence on work pressure. Also, communication has a positive effect on the safety behaviour of employees. Safety behaviour has a positive effect on the safety performance, employee satisfaction, and firm competitiveness, and safety performance has a direct positive effect on employee satisfaction, and employee satisfaction, in turn, has a positive effect on firm competitiveness.

Another study by (Gopang, Nebhwani, Khatri, & Marri, 2017) showed a positive relationship between occupational health and safety (OHS) measures and the performance of small and medium-sized enterprises. The study reflects that SME participants agreed that practicing safety programs helped increase the reputation of the firm, productivity of the organization, the level of employee's satisfaction, and production operations and product quality; hence assisting firms to realize their sales and profit targets, accordingly.

The safety culture and credit worthiness are associated with better, as well as worse, OHS management practices in companies, as reported by the study of (Nordlöf et al., 2017). The more positive safety culture resulted in better OHSM practices. This resulted in a lower risk in creditworthiness, and that was associated with the better financial performance of the firm. In this case, the achievement of good OHS management practices is also important from a financial perspective.

(Kontogiannis, Leva, & Balfe, 2017) proposed a new framework called Total Safety Management that is more proactive, integrative, and performance-oriented than traditional safety programs. This will provide benefits to an organization which includes the following: compliance to relevant regulations, encouraging proactive management, effective measures for safety and risk, improvement of safety performance, operational effectiveness and efficiency, better organizational learning, and improvement of stakeholder confidence and trust.

Some studies reported in Indonesia have shown that implementation of occupational health and safety management has a positive and significant impact on an increase in employee motivation, employee satisfaction, employee performance, and company productivity, as described more in the following studies.

A study by (Paramita & Wijayanto, 2012) showed that there was a relationship between occupational health and safety with employee performance which was mediated by employee motivation. Occupational safety management considered factors of safety equipment, safety training, safety protection, and safety knowledge, while the occupational health variable considered factors of health indicators, medical equipment, and healthcare facilities. Employee performance considered factors such as time of delivery, the quantity of work, and the number of errors, while the motivation of employees considered the factors of safety feeling, the opportunity for growth, absenteeism, and time to work.

(Fitriani, Panji, & Dania, 2013) conducted a study that showed a positive relationship between occupational health and safety and company productivity with the dimensions of employee absenteeism, production targets, and on-time delivery. The dimensions of occupational health consist of work environment, medical facilities, and health care programs, while occupational safety was represented by support and communications, personal protective equipment, work pressure, and safety training.

Another study by (Sunariyanto, 2014) showed a positive relationship between occupational health and safety and employee performance. This was indicated by factors such as work quantity, work quality, work creativity, and work knowledge. The variable of occupational health and safety considered a safe workplace, safety training, healthy environment, employee facility, and healthcare facility.

(Busyairi, Tosungku, & Oktaviani, 2014) performed a study on the relationship between occupational health and safety with employee productivity and they found that these were positively correlated. There was a relationship between employee productivity and factors in occupational safety such as working environment, personal protective equipment, and working procedures, as well as a medical check-up, resting hours, and ergonomics. The more facilities related to occupational health and safety, the higher the productivity of employees.

(Sofyan, 2016) studied the relationship between employee performance and occupational health and safety and he found a positive relationship between them. The occupational health indicators included in the study were a workplace, machine, equipment, and work instructions. Employee performance was represented by indicators of work quality, work quantity, time of work, leadership, work facilities and systems, teamwork and employee absenteeism.

The study reported by (Sari, Susilo, & Brimantyo, 2017) showed that health and safety have a positive and significant impact on employee satisfaction, both individually or all together. This was a result from a multiple regression that showed a positive relationship between occupational safety (workplace, machine, and equipment, safety programs) and occupational health (employee conditions, work environment, medical facilities) with employee satisfaction (employee turnover, absenteeism, and level of occupation).

The study of (Setiawan & Khurosani, 2018) about the impact of physical safety on employee satisfaction and performance showed a positive relationship between them. Physical safety considered the equipment layout, toolboxes, health and accident insurances, and workplace conditions, while employee satisfaction considered salary, the work itself, teamwork, direct supervision, and the working environment. The results showed an increase in employee performance which consisted of work quantity, work quality, better on-time delivery, lower absenteeism, and better teamwork.

4. Discussions

From the literature, it has been found that there is a positive relationship between an OHS management system and both company competitive advantage and business performance. Occupational health and safety can contribute to competitive advantage since it is unique to each organization and it is a part of company history and culture that adds value to an organization above the cost of creating it. As a management system it also provides a company with a Plan-Do-Check-Act process for continual improvement of company operational excellence. Occupational health and safety management also contributes to competitive advantage both directly and indirectly by creating safe workplaces and a healthy environment. This results in an increase in employee satisfaction, motivation, productivity, communication, work quality, operational effectiveness and efficiency, organizational learning, risk management, and firm reputation. Thus, in turn, it increases firm performance; namely, market share, sales and revenue, profit and financial returns and it also improves shareholder's confidence and trust.

The link between safety management, competitive advantage, and firm performance can be summarized in the following figure.
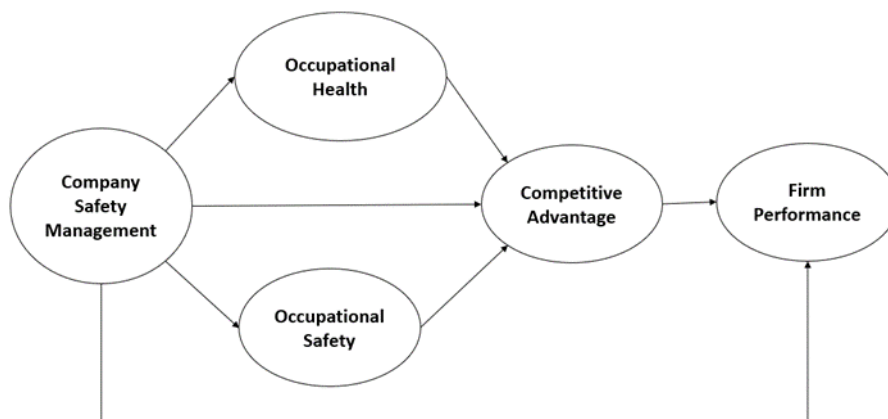

Figure 1. Safety Management, Competitive Advantage, and Firm Performance

From the literature, it was found that studies related to safety management, competitive advantage, and firm performance have covered several aspects of organizations, i.e., safety performance, safety culture, employee satisfaction, quality, productivity, customer satisfaction, financial performance, etc. However, most of the studies were conducted from safety professional's and employee's point of view, and As mentioned by (Muniz et al., 2009) these might not be suitable to represent the top management of organizations. (Bottani et al., 2009) highlighted that the studies also do not show clear causalities between the variables studied: i.e., relationships between safety management, competitive advantage, and business performance. This issue remains unexplored and further research is still necessary to fill this gap and provide more evidence on these topics.

There is also an opportunity to explore and develop a conceptual model that attempts to explain clearly the relationship between safety management, competitive advantage and business performance of an organization, including its mediating factors such as safety culture, employee satisfaction, company productivity, customer satisfaction, and company safety reputation.

(Sigalas & Papadakis, 2018) recommend retesting the relationship between competitive advantage and firm performance and hopefully this can solve the inconclusive results of the previous tests. By doing so, the scholarly community, both in safety sciences and business management, will have more rigorous evidence regarding causation of those key concepts of safety management and the competitiveness of firms from the strategic management point of view.

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Circular Economy: The Beauty of Circularity in Value Chain

Shaharia Pavel[1]

[1] Siam University, Bangkok, Thailand. Email: spavelnub@gmail.com, Cell: 0962307790

Abstract

Thought of Circular economy (CE) or circularity is widely accepted by corporations, academics and social & environmental concern individuals and organizations that create new opportunities & challenges to adapt and practicing in industry and customers. This model is sustainable in terms of a win-win situation from producers' and customers' ends; both are benefited from value proposition to consumption by ensuring economic, social and environmental well-being. The circular economy is all about circularity, and execution in the value chain. This research has been conducted by the qualitative method through mini literature review, studying business case, stakeholders' website, books, and journals. This paper aims to draw a framework of circularity in the value chain and to understand how circularity works in it and stimulates organizations to gain competitiveness and sustainability.

Keywords: Circular Economy, Circular Business Model, Circularity (10Rs), Circular Value Chain, Competitiveness.

1. Introduction

Take-make-dispose but what, how and where to take, make and dispose of? Extracting materials from nature for, by the human beings and ultimately for society through the artificial system of mining, manufacturing, distribution, consumption & use and lastly dispose in the environment and to create a carbon footprint for environmental degradation. The extractive industrial model makes the world as a garbage collector, but now the model of circular economy (CE) initiatives are to rethink decoupling economic activities to consume limited resources and designing waste out of the system. The CE based on three principles: design out waste & pollution, keep products & materials in use and regenerate natural systems (Ellenmacarthur Foundation, 2018).

The objectives of a circular economy are to systemic shift to build long-term resilience, create business and economic opportunities and deliver societal & environmental benefits through technical & biological cycles. The linear economy or traditional economy's growth has been accelerated since the 18th century by the invention of a steam engine that helps to ease human life, but all the industrial inputs are collected from natural resources, which are a limited and expensive mistake. Subsequently, industrial revolution 1.0 to 3.0 brought major invention in electricity distribution, both wireless & wired communication and lastly advances in computing power. *The Fourth Industrial Revolution can be described as the advent of "cyber-physical systems" involving entirely new capabilities for people and machines. While these capabilities are reliant on the technologies and infrastructure of the Third Industrial Revolution, the Fourth Industrial Revolution represents entirely new ways in which technology becomes embedded within societies and even our human bodies. Examples include genome editing, new forms of machine intelligence, breakthrough materials and approaches to governance that rely on cryptographic methods such as the block chain* (Davis, N 2016).

Through the industrial revolution 4.0; it is hoping to compensate linear system to new regenerative economic system getting the benefits of digital technology, which has the power to support the transition to the circular economy by radically increasing virtualization, de-materialization, transparency, and feedback-driven intelligence.

The enabler of circular business model (Geissdoerfer, M., Morioka, S.N., de Carvalho, M.M. and Evans, S., 2018): closing, narrowing, slowing, intensifying and dematerializing, and the resources looping depend on 10Rs principles (Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacturing, Repurpose, Recycle, Recover). In this literature, the 10Rs principles are considered as elements of circularity and implement in different stages in the value chain. The value chain in linear economy & circular economy are differentiated into the uses of Rs; in liner economy input and output are straightforward from taking to disposal, but in circular economy output is regenerative, and the 10Rs help looping materials over time and reduces using of primary raw materials, by converting used materials into secondary raw materials.

In previous literature, the Rs are considered in terms of uses of raw materials and products, but in this literature, the first 3Rs (R0-Refuse, R1-Rethink, R2-Reduce) are considered as a part of circular innovation practices besides product and raw materials uses in different stages of the value chain. The 3Rs together are to be called *Innovation Thinking* in every step to *rectify, enhance & modify* the circular value chain & circularity. In a linear economy, the value chain is a process and activities by which companies add value to an article including production, marketing, and after-sales service.

The value chain is adapted from Michael Porter's value chain model and trying to conceptualize a circular value chain.

Through the article, a complete view of circularity in the value chain is presented which helps to understand the circular economy & its elements, and a framework is created to show off. Through the literature reviews, it is observed that the concept of circular economy & presentation is scattered, and the major elements (Rs) of circularities are not well defined & positioned for that in this article, the perception of circularity and circular value chain are presented together as a holistic view.

The concept of sustainability is implemented and executed by practicing circular economy. The goals of the circular business model and sustainable business model are creating sustainable value, pro-active multiple stakeholder management, and long-term perspective. To gain organizational sustainability, and practicing circularity in the value chain is essential which creates competitive advantage, reduces import of raw materials and meets customer demand in an economical & sustainable way. Nowadays the demand for sustainable products is increasing due to consumer awareness, government initiatives, and environmental campaign.

2. Literature Review

Circular Economy (CE) and sustainability are related words. Each depends on others in different dimensions. The intentions (Homrich, A.S., Galvao, G., Abadia, L.G. and Carvalho, M.M., 2018) behind the Circular Economy are to practice the fortune in an ecological way to bring back, maintain our world clean and livable. In other words, Circular Economy is an approach to meet the bottleneck of resource scarcity & waste disposal, in a   balancing way from economy to value perspective. Industrialization (Szirmai, A., 2012) works as an engine of economic growth. Through the industrial revolution, we made our life comfortable & connected, but it generates a lot of drawbacks to withstand our life on the green planet. CE has gained (Reike, D., Vermeulen, W.J., and Witjes, S., 2018) attention over the last decade in practicing sustainable society, "Tableau Economique" (1758). The Ellen MacArthur Foundation (ellenmacarthur foundation, 2018) describes that the circular economy is based on three principles: design out waste & pollution, keep products & materials in use and regenerate natural system. On the other hand, sustainability that the ability to be upheld at a certain rate or level. Sustainability concentrates on meeting the needs of the present without compromising the ability of future generations to meet their needs. In the sustainability concept, there are three pillars: economic, environmental and social (profits, planet, and people) [Investopedia]. Sustainable development (Bridger, J.C., and Luloff, A.E., 1999) is arisen as a popular solution in the 1980s to overcome the challenges of material needs by growing population while protecting the ecosystem.

Sustainable consumer behavior (Peattie, K. and Belz, F., 2013) is consumers' behaviors that improve social and environmental performance as well as meet their needs. It relates reasons for consumer's response in sustainability into their consumption behavior and also studies consumer buying decision regarding sustainable products and afterward. Sustainable consumer behavior has a different viewpoint (Antonides, G., 2017) from the end of policy maker, marketing, consumer interest, and ethical focus. Consumer purchasing behavior is very multidimensional to evaluate and find a conclusion whatever it is sustainable or not. But some researcher did some works on sustainable consumer behavior whereas consumers perceive observation (Sohlberg, J., 2017) of threat on the environment has positively related to work on reducing environmental hazardous & positive effect of political party positions. Many authors have found specific correlations between socio-demographic features and pro-environmental behavior. Consumer awareness (Bonera, M., Corvi, E., Codini, A.P. and Ma, R., 2017) are also related to their background such education level, family status, educational level, and employee status and nationality as in important in describing eco-behavior.

Sustainable business model as a vital component to transfer organization from linear to circular approach. The circular business model is strongly linked to innovation adaptation and practices in value creation to value proposition (Charter, M., 2016). Enterprise's circular business model depends on the ability to innovate and new re-engineered. In a business model can be pointed out two main areas: new disruptive business model (new venture as circular) and hybrid business model (Tradition & circular) in another study to find the gaps on how firms conduct business relevant activities (Ritala, P., Huotari, P., Bocken, N., Albareda, L. and Puumalainen, K., 2018) that touch upon sustainable issues in a broad variety of societal & environmental domains, technological development, organizational practices, socially oriented activities and ending the conclusion that big companies have huge opportunity to find win-win situations but less evident for sustainability at first sight like cost savings , profitability and sufficiency for society & environment. And also noted that large business could be inspired and discuss with the innovative start-ups to pursue more radical innovation. In the conventional literature, the business model is a firm's strategy & practices that allows to examine: the value proposition, value creation, delivery and value capture.

In the literature on circular economy, the concept of circularity starts with "refuse" and ends with "recover energy" (Cramer, J., 2014) and then the 9Rs principles are oriented that are listed as follows:

(1) Refuse: preventing the use of raw materials;
(2) Reduce: reducing the use of raw materials;
(3) Reuse: product reuse (second-hand, sharing of products);
(4) Repair: maintenance and repair;
(5) Refurbish: refurbishing a product;
(6) Remanufacture: creating new products from (parts of) old products;
(7) Repurpose: product reuse for a different purpose;
(8) Recycle: processing and reuse of materials; and
(9) Recover energy: incineration of residual flows.

Some literature work on 9Rs, and put the new dimension by presenting and defining as hierarchy and differentiate the linear economy & circular economy based on the circularity movement and allocated in three parts: useful application of materials, extended lifespan of products & parts, and lastly smart products use & manufacturing (Kirchherr, J., Reike, D. and Hekkert, M., 2017; Potting, J., Hekkert, M.P., Worrell, E. and Hanemaaijer, A., 2017).
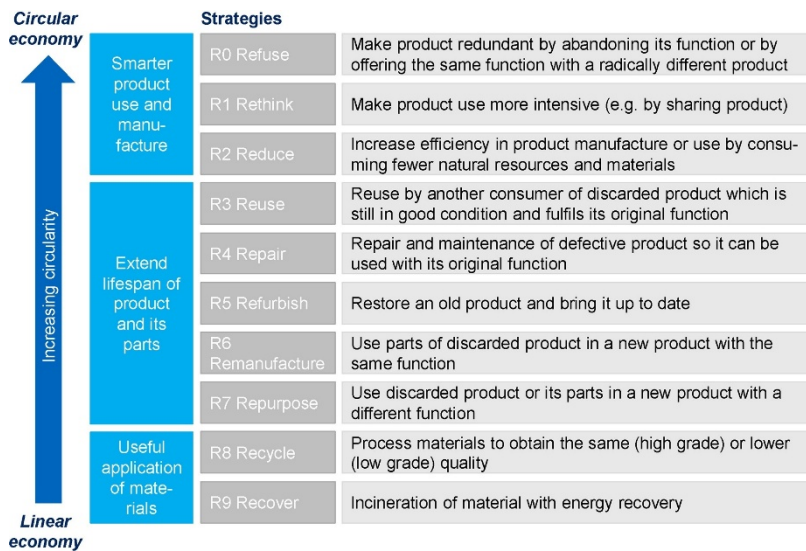
Fig-01 Source: Kirchherr, J., Reike, D., & Hekkert, M. 2017.

Linear and Circular value chain

The book "Competitive Advantage" by Michael Porter (Porter, M.E., 2008) defines value chain as a collection of activities to create value for customers to gain competitive advantage (Porter, M.E., 1985) and ultimately gain economic success. The value chain analysis aims to control cost factors like Economies of Scale, Learning and Spillovers, Pattern of Capacity Utilization, Linkages, Interrelationships, Integration, Timing, Organization policies and Location.

The sustainable value chain consists of the product development and supply chain processes of an organization. It covers all stages of the lifecycle from idea/concept, raw material sourcing, production, and distribution, and end customers use to the point where the product goes back to a biological or technical cycle, thus closing the loop (D'heur, M., 2015).
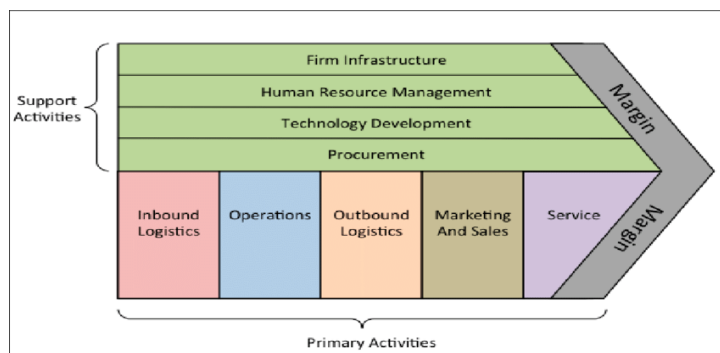

 Fig-02 Source: Michael Porter's value chain, businesssetfree.com

Michael Porter's value chain is a linear economy based, and it focuses on cost minimization, differentiation and gains a competitive advantage that all are related to product & supply chain management, but in circular value chain the objects are to ensure organizational as well as social & environmental benefits. In primary activities of the conventional value chain related to inbound & outbound logistics that ignore reverse logistics and the supporting activities only involve in organizational value creation and mostly ignored social and environmental value & sustainability.

 The circular value chain can be defined as "**A process and activities by which organizations retain and regenerate values to an article from secondary raw materials through reverse logistics and propose**

regenerative value by practicing sustainability in supporting activities: human resources, procurement, technology, and firm infrastructure."

In the proposed circular value chain, all functions & activities are considered that will help organizations to adapt circularity and gaining sustainability. In the circular value chain, the primary activities are involved in circular input (secondary raw materials), or partial inbound logistics (Primary raw materials) input, design innovation, outbound logistics, marketing and sales & service, consumer purchase & uses, reverse logistics and evaluation activities. Though consumers consumption & uses are not considered as a part in linear value chain the propose circular value chain likes to add due to its important functions in value transfer from purchase to reverse logistics. The beauty of circular value chain & circularity is consumers' contributions in reverse logistics and intensifying the loops could not be ignored. CE suggested keeping materials value and circulate over time that means value could not be zero and just transferring from producer to consumer that's why consumption & uses are considering as a part of the circular value chain. The supporting activities are mostly the same as the linear value chain, but sustainable procurement and practicing sustainability in supporting activities are added.

3. Research Method

Research is to see what everybody has seen and to think what nobody has thought (Albert Szent- Gyorgyi). Quantitative research pertinent knowledge from previous research and from everyday life is organized into theory - given what is known and one's best guess about reality - to build a cogent and best argument (Morse, J.M. and Field, P.A., 1995).

Qualitative research is characterized by its aims, which relate to understanding some aspect of social life, and its methods which (in general) generate words, rather than numbers, as data for analysis (McCusker, K., & Gunaydin, S. 2015).

The article is mostly based on qualitative research: mini literature review, journals, books, active organizations website and case study to gain knowledge on circularity & value chain, and finding the gap in latest work and concluding a framework.

3.1 Literature review

The literature search has been conducted in the Scopus database, Google Scholar, books and online website of practicing originations & stakeholders. The most publishing journals on the circular economy are Resources Conversion & Recycling, Journal of cleaner production, Procedia CIRP (Publisher-Science Direct), Journal of Industrial ecology (Publisher-Wiley Online Library), Sustainability Science (Publisher-Springer), Sustainability (Publisher-MDPI). Production Planning & Control (Publisher- Taylor & Francis). The active organizations are working on the Circular economy- Ellen MacArthur Foundation, European Commission, World Economic Forum, United Nations.

3.2 Framework

A framework is a basic conceptual idea (Merriam-webster) *or Outline or skeleton of interlinked items which supports a particular approach to a specific objective and serves as a guide that can be modified as required by adding or deleting items* (business dictionary). *A conceptual framework as a visual or written product, one that "explains, either graphically or in narrative form, the main things to be studied—the key factors, concepts, or variables—and the presumed relationships among them* (Miles, M.B., Huberman, A.M., Huberman, M.A., and Huberman, M., 1994).

From the definition of conceptual framework, it is also called comprehensible framework that is not finalized that could be changed over time as required, and the conceptual framework helps to presume relationships among key factors & concepts. In keeping the definition in mind, this conceptual framework is developed to connect the

concept of circularity and circular value chain. Here, the circularity opportunity in the value chain is defined and discussed.

In the proposed framework, the major two elements are looping circularity (R0 to R9) in the value chain and the circular value chain. In the analysis and discussion part, the circularity enabler techniques and appropriate positioning are presented. Here the important factor is considered that innovation practices in every stage in the value chain through refuse, rethink and reduce principles.

Refuse (obsolete or renounce), the traditional concept of value optimization and Rethink (reconsider, redefine) new CE approach and Reduce (consolidate, Restrict) the complexity in processing & implementation through the value chain. All together of the three circularities are called innovation practices or innovative design thinking.
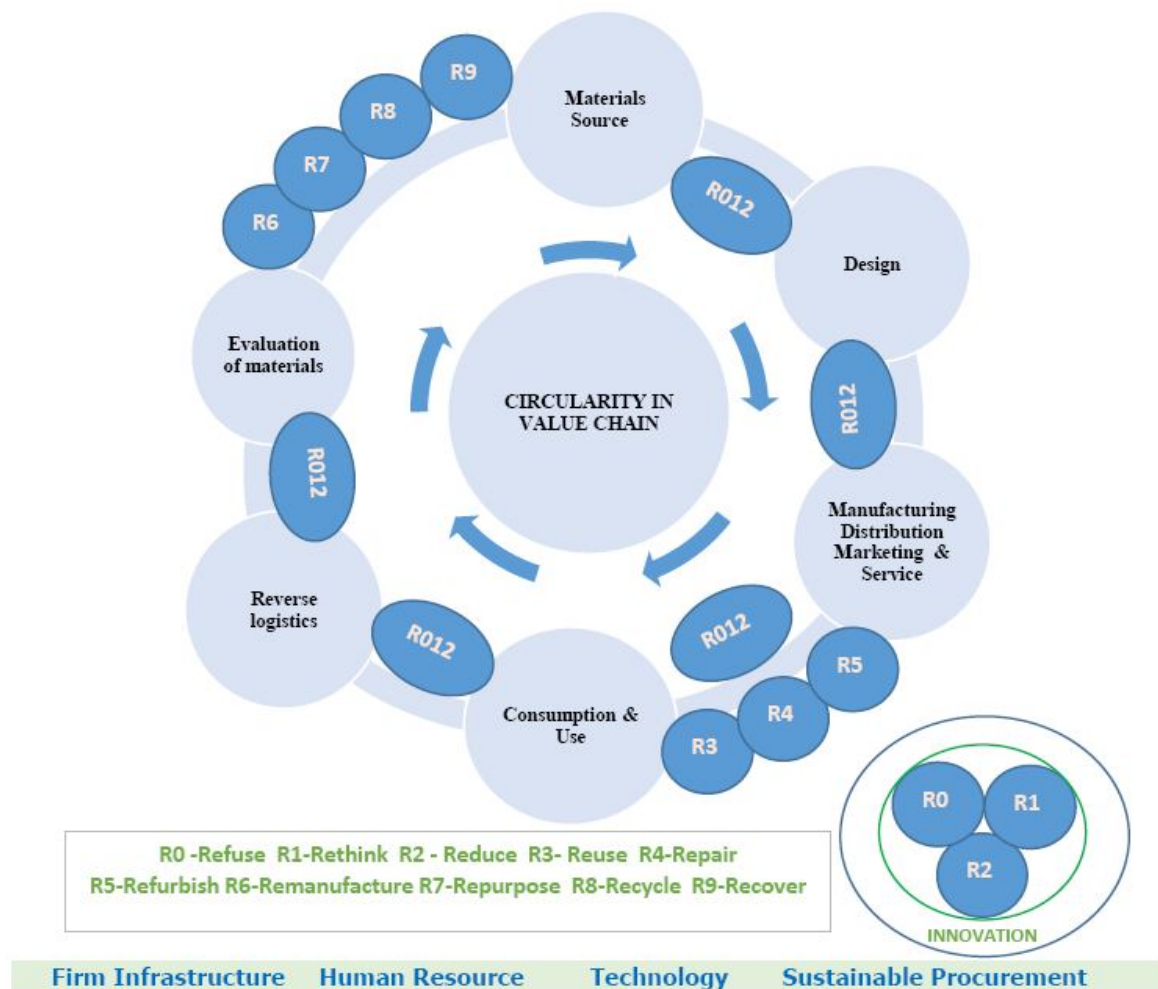

Fig-03 Source: Author

4. Limitations

The limitations of this literature that it is only based on the value chain, circularity, circular economy and sometimes sustainability. It follows qualitative research that only thought based and follow previously published literature and framework without mathematical evaluation and data analysis. CE has a vast area of analysis and evaluation parts for that presenting and conceptualizing CE in one article is not sufficient. It is written only based on core ideas without detailing the concept in clarity. Nevertheless, the analysis is in limited in organizational or economic concern, but social, environmental and consumer behavioral concept and practices are not mentioned.

5. Results & Discussions

5.1 Circularity in Primary Activities

5.1.1 Evaluation to Materials Sources
(R6, R7, R8, R9)
In the value chain, materials are sourced in two ways: primary and secondary sources (European Commission, 2018). Primary sources that fully depends on natural resources and secondary sources or secondary raw materials (Schweitzer Jean-Pierre, Eliaerts, Sylvie, Gionfra Susanna, Jones Harvey, Nanni, Sylvia and Solovieva, Anna, 2017) from existing used goods or urban mining (Di Maria, F., Micale, C., Sordi, A., Cirulli, G. and Marionni, M., 2013). In circular value chain Remanufacture (R6), Repurpose (R7), Recycle (R8) and lastly Recover (R9) are processed through which secondary raw materials are converted into finish goods. Remanufacturing – Uses parts of the discarded product in a new product with the same function whereas Repurpose-Use discarded the product or it's parted in a new product with a different function and Recycle-Process materials to obtain the same (high grade) or lower (low grade) quality and Recovery-Incineration of material with energy recovery. Here, through the Rs' materials are converted into value-added and create resale value that works as input in value creation by optimizing the value in it. The beauty of circularity is value created and delivered without touching or mining natural resources, and a new concept of materials sources is established.

After reverse logistics in the circular supply chain the used materials fully or partially belongs to the collector, and that is sent to manufacturing company or expertize company (Terra Cycle, 2018) to restore value or used as raw materials for next phase and lastly it sales again in the market as a value-added product.

The main objective of the Circular economy is to minimize the uses of natural resources due to resources scarcity and environmental degradation (ellenmacarthur foundation, 2018). The natural resources are limited and costly in terms of social, environmental and economic perspective, whereas CE emphasis on secondary and renewable sources of materials. As raw materials input from natural sources still continue and always have some sort of requirements of fresh raw materials and to enhance secondary raw materials, the experts are suggested to sustainable or green procurement (Appolloni, A., Sun, H., Jia, F. and Li, X., 2014) where goods & services are procured with the same primary function considering lower environmental footprint, narrowing the loops (Bocken, N.M., de Pauw, I., Bakker, C. and van der Grinten, B., 2016) of material input, integrated end-to-end supply chain model (SCOR) to increase efficiency, reduce the input of resources, and accelerate supply chain process (D'heur, M., 2015; Supply Chain Council. 2006).

In addition to industrial symbiosis (Chertow, M.R., 2000; Chertow, M.R., 2007) is to ensure maximum utilization of wastage and by-product to share and input for other industry or intra industry. Lifecycle Assessment (LCA) (Guinée, J.B., 2002), diversity and cross-sector linkages to ensure industry standards into transparency, financial & risk management tools, infrastructure development & education. Government regulations, tax credits, and subsidies to facilitate the factor of production (business dictionary) (Land, labor, capital & enterprise) to ensure the uses of secondary raw materials, technology, renewable raw materials and ease of circular supply chain practices.

Secondary raw materials reduce the risk of resources scarcity and leverage the import of raw materials that certainly helps to reduce costs in supply chain management and finally input cost of raw materials. Optimization of secondary raw materials and renewable sources could be the best for community development and social harmony through the sharing economy for supplier to consumer end and at the end helps decoupling economic growth from natural resources consumption (Kjaer, L.L., Pigosso, D.C., Niero, M., Bech, N.M. and McAloone, T.C., 2018).

5.1.2 Materials sources to design innovation
(R0, R1, R2)
The materials are collected from the sources (mostly from secondary raw materials) as stated above, and now the value will create in different ways of implementations and objectives. As CE objective is to maximize the value

and minimize uses of natural resource or increasing the uses of secondary raw materials from urban mining (Mining, U., 2015). The goals are set up in this stage, how to design the smart product or services that create greater values by ensuring economic, social and environmental benefits in return the organization to gain sustainability. In this stage R's are used to Refuse, Rethink and Reduce or innovation in product design. CE Product design requires to refuse, rethink and reduce in existing value creation system, complexity in design, distributions, functions and reverse logistics. In other words, it can be defined as innovation in design as a continuous process to ensure CE goals and objectives at the same time to meet customer demand and organizational sustainability. Circular economy's success mostly depends on the design of the products that help to ensure circularity over time as secondary raw materials considering value proposition, value co-creation & value co-delivery system as well as value capture (Biloslavo, R., Bagnoli, C. and Edgar, D., 2018; Bocken, N.M., Short, S.W., Rana, P. and Evans, S., 2014). Practicing innovation (R0, R1,R2) design in enabler driver (slowing, intensifying, narrowing loops and dematerializing) between circular supply chain (CSC) and circular business model (CBM) can accelerate the growth of circularity to gain sustainability by meeting the conditions (Economical, Environmental, Socials goal, Proactive stakeholder management and long-term perspective) . Presently scholars are suggested and already in practices some technologies and infrastructure that are designed to facilitate circularity in the value chain. Regenerative design or Bio mimicry: *Regenerative design is a concept based on process-oriented systems theory. The word "regenerate" means "to create again." A regenerative system makes no waste; its output is equal to or greater than its input, and part or all of this output goes toward creating further output — in other words, it uses as input what in other systems would become waste.* (Lyle, J.T., 1996; regenerative, 2018), Bio mimicry (biomimicry.org, 2018) *is an approach to innovation that seeks sustainable solutions to human challenges by emulating nature's time-tested patterns and strategies. The goal is to create products, processes, and policies—new ways of living—that are well-adapted to life on earth over the long haul.* Cradle to cradle is based on three principles: everything is resources for something else, biological nutrients that designed to degradable & mixed with soil, technical nutrients that (McDonough, W. and Braungart, M., 2010, Allen, J., 2007; Kumar, S. and Putnam, V., 2008; mcdonough.com, 2018) for new products without natural degradation that is mostly accepted design thinking, which helps circularity and extended life of products and services. Product-service system (PSS) is an integrated system of interconnected elements which provides an agreed-upon functionality for customers (Belkadi, F., Boli, N., Usatorre, L., Maleki, E., Alexopoulos, K., Bernard, A. and Mourtzis, D., 2018). This idea is suggested product stewardship instead of ownership (Kjaer, L.L., Pigosso, D.C., Niero, M., Bech, N.M. and McAloone, T.C., 2018).

Refuse, rethink and reduce are a continuous process in generating innovative idea and implementation. Innovations are classified into two categories: Evolutionary, incremental advantage in process & technology and Revolutionary, disruptive or new innovation (business dictionary). Both categories innovation are needed to articulate the design thinking and meeting the challenge customer demand and guarantee circularity. In a 1959 essay by Isaac Asimov, On Creativity, he concluded*,* one way of investigating the problem is to consider the great ideas of the past and see just how they were generated. Innovative ideas often come from happy coincidences and combining popular ideas or products from different disciplines (i-phone), considering a problem people have even if they don't recognize it (Magic whiteboard) and drawing connections between different ideas (Collins, B 2018).

5.1.3 Manufacturing, distribution and marketing & services (MDMS) to Consumption & Use (CU)
(R0, R1, R2) + (R3, R4, R5)
In this stage, design thinking is implemented through value creation and generating the desired product and services that meet the goals of circularity and will retain as secondary raw materials after first life. The circular supply chain has three parts: inbound logistics (mostly ignored or renewable sources), outbound logistics and reverse logistics, that plays a vital role for materials collection. This stage is divided into manufacturing smart products, outbound logistics, and consumer's uses. Innovative thinking (R0, R1, and R2) in manufacturing (energy efficiency, material productivity & adaptable manufacturing), outbound logistics, creating consumer awareness, reduce product knowledge gap and operate innovative products. Here the R3, R4 & R5 are used to increase circularity in consumptions & uses that helps to extend products life or intensifying the loops.

In the manufacturing process, efficiency in energy and productivity could reduce the price of the final product and helps to maximum utilization of raw materials or reduce the input of raw materials; in circular value chain, the

secondary raw materials processing is required to use innovative, efficient technology and human resources. The economic value of a product is created on the input secondary raw materials and processing cost. Reuse or sharing -R3 of industrial wastage and byproducts in intra-industry would help to minimize the cost, knowledge sharing on zero-wastage (Lombardi, D.R., and Laybourn, P., 2012) for that it is needed to ensure the practice of industrial symbiosis and industrial sourcing platform by the blessing of industrial revolution 4.0 (Davis, N 2016).

After getting product and energy efficiency with lower cost competitive advantage, now it turns to get marketing and distribution and implementation of Rs (R3-Reuse, R4-Repair & R5-Refurbish) from consumer to distribution level. To ensure circularity in this level, a new set of distribution, marketing & communication strategy should be developed.

The concept of green marketing is very appropriate for circular economy practices which defined *as Green or Environmental Marketing consist of all the activities designed to generate an facilitate any exchanges intended to satisfy human needs or wants such that the satisfaction of these needs and wants occurs, with the minimal detrimental impact on natural environment* (Jay Polonsky, M., 2008). Packaging materials help the company in value presentation and getting customer attention, but it brings vast negative impact on environment problem. Packaging materials' after use throw away and impact prevention is a very challenging task. Nowadays, government and scientists are trying to solve the problem of packaging materials discard in the environment by implementing laws and enhancing innovation. For example plastic adulteration in the environment are controlled by enforcing laws as well as encouraging reuse, invention of degradable plastic and bio-plastic (Pavel, S. and Supinit, V., 2017; Hejase, H.J., Hejase, A.J., Tabsh, H., Chalak, H.C., Wamitu, S.N. and Pavel, S., 2018; Ravenstijn, J., 2010) for packing as replacement of plastic that takes 100 of years to mix with soil.

In a circular economy, customer relationship management is an important factor of success and attractiveness. CE always focus on the maximum utilization of products and expansion of life, even after life management through reserve logistic. Extension of product life means to hold a long-run relationship with customers, and the even relationship depends on organization's value proposition and communication skills. Product quality or smart product, green marketing, green packaging, smart communication (Product labeling, Eco-labelling (Van Amstel, M., Driessen, P. and Glasbergen, P., 2008; zicla, 2018; Lewandowski, M., 2016) are very crucial to reduce communication gap and to build sustainable relationships and taking the opportunity of reselling and strong bonding with customers.

CE always stresses to participate in community development to value sharing & socially responsible consumption (Webb, D.J., Mohr, L.A., and Harris, K.E., 2008) organizations' corporate sustainable social responsibility (CSRS) practice instead of corporate social responsibility (CRS) and extended producer responsibility. Furthermore, products as a service or product service system (PSS) (Jensen, J.P., and Remmen, A., 2017) which has three categories: product oriented, use-oriented, result oriented that conceptualize product stewardship (dictionary.cambridge.org) instead of product ownership from the customer end. Through IOT, products and services virtualization will boost increasing circularity.

5.1.4 CU to Reverse Logistic to Evaluation
(R0, R1& R2)
After the product consumption & uses and maximum utilization of products' value through sharing, reusing, repairing, refurbishing or intensifying the product lifetime; the wastages are collected through reverse logistics and after evaluation or sorting, it is prepared for input as secondary raw materials. In this process, technological and biological process are decided through evaluation and taken action as it. This stage ensures closing loops and prevents the wastage to adulterate environment.

The European Working group on Reverse logistic, REVLOG (1998) puts forward the following definition "The process of planning, implementing and controlling backward flows of raw materials, in-process inventory, finished goods, and related information from the point of origin for the purpose of recapturing value or proper disposal" (Dekker, R., Fleischmann, M., Inderfurth, K. and Van Wassenhove, L.N., 2005).
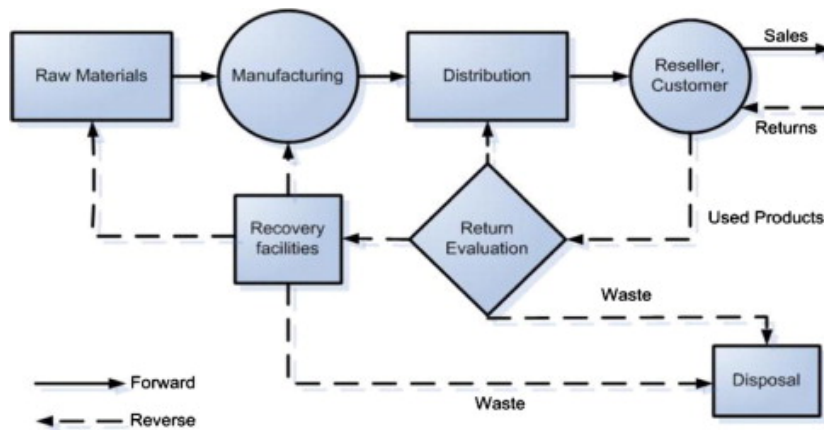
Fig-05 A generic form of forwarding/reverse logistics (Tonanont et al., 2008).

From the definition and figure 05; the objective of reverse logistics is to retain value or proper disposal through evaluation and recovery and lastly send as raw materials or directly for manufacturing. Many countries implemented law and regulation for practicing reverse logistic, but now it is taken as a business opportunity (Govindan, K. and Soleimani, H., 2017).

5.2 Supporting Activities for Circularity

5.2.1 Sustainable procurement

Procurement plays a key role in materials sourcing for input in operation that depends on the organizational purchasing policy and execution. To gain competitive advantage and cost efficiency, the organization could adopt reverse logistic in organizational value chain or long-term partnership with out-sourced organizations. If the organization directly adapt reverse logistics to collect and manage secondary raw materials or from the outsourced company then pressure on purchasing virgin materials will reduce gradually. CE suggested whenever the purchase is needed, always purchase secondary or renewable materials that could be intra-industry through sustainable or green or green public procurement. To understand a recycling outsourced company's business model, here TerraCycle's business model canvas is presented that will help to understand the nature of business and activities which facilitating reserve logistics in a sustainable way.

Business Model Canvas of TerraCycle

Business Types	Innovative Recycling Company
Customer Segment	Industrial organization & general people, Social Workers
Value Propositions	Free Recycling platform and solution for the community, free shipping labels, Investment opportunity (USD700 to USD100K) for all, Zero waste box platform, Earning a reward for waste, Large-scale recycling, Educational program.
Channels	Free Shipping, Social Worker, website-https://www.terracycle.com/en-US
Customer Relationships	The website, social awareness, charity works, customer support, long-term partnership with industrial organizations, customersupport@terracycle.com, digital press kit for instant up-to-date.
Revenue Streams	Funded by conscientious companies, brands, manufacturers, and retailers around the world and selling recycled to manufacturer.
Key Activities	Collecting waste to recycle, reuse including cigarette butts and chewing gum and selling services & products. Donate money per pieces of the collection to the collector's favorite charity and school.
Key Resources	Circularity, Innovative, Technology, Scope oriented, Management Team
Key Partners	Municipalities, companies want to close the loop on their products.
Cost Structure	Strategic brand partners cover the operating costs.

Sustainable procurement can be defined as the pursuit of sustainable development objectives through the purchasing and supply process. Sustainable procurement 'is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits, and promoting good governance' (Walker, H. and Brammer, S., 2009).

The concept of green procurement and green public procurement are the extensions of sustainable procurement both have the same objectives to meet economic, social and environmental benefits. The green procurement is benefited: organizational brand value, Customer satisfaction, Reduce the risk of law and policy, cost reduction and maximize shareholder value. The latest and wider concept of sustainable procurement is Green public procurement (GPP) that is *defined by the EU as "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured" (COM (2008) pg. 400 "Public procurement for a better environment"* (European Commission, 2017).

GPP is a wider practice of procurement from the government to private organization to ensure benefits and to justify triple bottom (Slaper, T.F., and Hall, T.J., 2011) line approach (economic, social & environment) (business dictionary). Green public procurement works as a holistic platform among supplier, purchaser, and government which ease and ensure purchasing green materials. Overall the objective to help to narrow the loop as much as possible to purchase virgin materials.

5.3 Technology

Circular value chain analysis not only depends on internal analysis but also external analysis. In different stages from materials sourcing to reverse logistics all activities should be connected in a way that data analysis on secondary materials sourcing, product demand & supply, consumer interface, target customer or cluster analysis are prompted. Adapting technology in organizational level to assist radical virtualization, dematerialization, and greater transparency on product use and materials flow to solve battle of agency problem (Allen, J., 2007).
The most innovative technologies are mentioned below:

Asset Tagging (camcode, 2018) for getting information on condition and availability on product, components, and materials.

Geospatial information (cgsatellite, 2018) for visibility on the flow of materials, components, products, and people as well as visualize traffic and population information base on maps.

Big Data Management (attunity, 2018) *is the organization, administration, and governance of large volumes of both structured and unstructured data and organization employ bid data management strategies to help them contend with fast-growing pools of data.*

Connectivity through mobile technology or telecommunication to facilitate leasing and sharing platform, reverse logistics, take-back system, distribution and remanufacturing.

Google operates some innovative technologies to help circular economy – Project sunroof (google, 2018), Nest learning thermostal (nest, 2018), Waze (Waze, 2018), Flow (flow, 2018), Project air view (sustainability.google, 2018), Maps (maps.google, 2018), Leanpath (lean path, 2018), Leafy green machine (freight firms, 2018).

The companies are practicing and facilitating the technology –Rubicon Global (Cloud, Big data) (rubiconglobal, 2018), NCC (Mobile) (ncc,2018), Hello Tractor (machine to machine communication) (hellotractor, 2018), Apple (robotics), gCycle (bio-based materials).

Several tools and methods from Biomimicry, Cradle to Cradle (C2C) and industrial economy - Design Spiral (biomimicry.org, 2018), Life's Principles (biomimicry 3.8, 2018), AskNature (asknature.org, 2018), ABC X

categorization (EPEA Internationale Umweltforschung GmbH, 2018), C2C Certification (c2ccertified.org, 2018), Life Cycle Assessment (LCA) (Iyyanki V. Muralikrishna, Valli Manickam, 2017).

To ensure competitive advantage with cost and differentiate strategies, technological improvement and implementation in primary and supporting activities are essential. There are many ways of deploying technologies in the organization, but out-sourcing operations and long-term partnership with the high-tech organization could be cost-effective as adopting new technology is costly and needed skilled manpower to manage.

5.4 Human resource management

Human resource management has four basic functions- staffing, training and development, motivation and maintenance. Organizational shifting from linear economy model to circular economy model requires skilled and motivated employees who will hold the objective of sustainability, and workers need to develop a long-term and interdisciplinary thinking in order to perform their jobs in a sustainable and environmental way. CE model helps to generate competitive advantage by leveraging on technology and innovation practices.

5.5 Firm infrastructure

Firm infrastructure denotes to an organization's structure and its management, planning, accounting, finance, and quality- control mechanisms. Organization's every activity in the circular economy has to follow rule and regulation in concern to environmental practice and taking advantages of tax holiday and subsidiaries. To gain a competitive advantage in a sustainable way, organizations requires planning to deploy technology, facilitate human resources, financing activities and connected accounting system as well as highly motivated management.

6. Conclusion

Circular economy to decouple economic growth from natural resources and finding the innovative path to maximum utilization of existing resources looping circularity in the value chain and at the same time inspiring renewable sources of virgin materials.

Value chain for the linear economy and the circular economy is different in implementation, but it has similarity in supporting activities though it is needed to ensure practicing sustainability among supporting activities.

Through the literature, a fusion of two thoughts (Circularity & Value Chain) are observed and the beauty of this combination that it strengthens organizations competitiveness through cost and differentiation strategy by getting the support of circularity, technology, and innovation. On the other hand, the practice and adaptation of circular business model in the organization can achieve the goal of organizational sustainability and government & customer preference of green environment. The circular value chain analysis helps an organization to gain competitive advantages in an ecological way. Successful implementation of circularity in the value chain helps to overcome pressure from internal and external stakeholder to ensure harmless operations and gaining high sustainability index leadership (Searcy, C. and Elkhawas, D., 2012).

The paper mostly focuses on materials circularity in the value chain and its implementation but avoid biological circularity for more visibility of materials circularity and to avoid diagram complexity and in consideration of less impact on the environment.

The enablers of circularity are shown every step that is changeable over time and here the presentation of circularity (9Rs) is based on the optimistic outcome.

The circular business model creates a scope of new business in the supply chain, communication, procurement, connectivity, reverse logistics, branding and labelling, and certification.

Organizations, community, and government have to extend the hand of cooperation to save the earth keeping garbage overtime and making a happy future.

Consumer awareness and education on responsibility for the environment should be enforced through the initiative on community development towards sustainability and practicing & thinking green. Industrial revolution 4.0, IOT, robotics and overall innovative technology are an accelerator of the circular economy that will assist to minimize the communication gap and to create a platform for customer, supplier, industry, and government.

The proposed circular value chain will support enterprises to gain knowledge on the circular business model, value creational activities as well as state of the art techniques to affluence in the decision-making process. The further study on the model could be extended by implementing in industrial level to test the viability of the model and how it works to gain competitive advantage. As this model is a fundamental and holistic view that will enrich over time by the invention and practicing.

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Consistent Environmental Performance: Does It Matter for Achieving Good Financial Performance?

Juniarti[1], Denvi Novendri Wijaya[2], Joshua Taruman[3], Rio Valentino[4]

[1] Accounting Department, Petra Christian University. Email: yunie@petra.ac.id
[2,3,4] Accounting Department, Petra Christian University

Abstract
This study examines the impact of environmental performance on financial performance in Indonesia. To improve the prior results, this study focuses on companies that consistently achieve good environmental performance and those who do not consistently obtain good performance. The environmental performance measured by environmental ratings that published through a PROPER Program, while the financial performance is measured by return on assets, earning per share, and Tobin's q. Some control variables included in this study such as firm age, firm size, leverage, and market share. The study finds that environmental performance is positive significantly associated with financial performance for the companies that consistently record a good environmental performance. The more consistent the company's performance in environmental, the higher the association with the financial performance.

Keywords: Environmental Performance, Financial Performance, PROPER

1. Introduction

Prior studies on the impact of environmental performance on financial performance that showed various results (Qi et al., 2014; Sarumpaet et al., 2017). Can environmental performance increase financial performance? Is going green cost worth with the return that the company gets in the future? Some studies argue that doing environmental performance cost more than the return that they got, but some researcher assumed that market appreciates green companies. Finally, environmental performance will increase financial performance indirectly (Sarumpaet, 2005).

The studies on the impact of environmental performance and financial performance are still inconclusive. Some of the studies found that there are significant and positive association of environmental performance and firm performance (Al-Tuwaijri, et al, 2004; Suratno, et al, 2006; Arafat et al, 2012; Alvarez et al, 2015; Vafeas & Nikolaou, 2015; Misani & Pogutz, 2015; Li, et al, 2017; Manrique, et al, 2017; Sarumpaet, et al, 2017), but the others showed insignificant results (Rockness et al., 1986; Sarumpaet, 2005; Almilia & Wijayanto, 2007; Earnhart & Lizal, 2007; Iwata & Okada, 2011; Liang & Liu, 2016). Several studies even find the negative impact of environmental performance and financial performance (Rahmawati & Ahmad, 2012; Vastola et al., 2016). Most of the previous studies are conducted in some developed countries such as the USA and Japan, where people lived in a high awareness of environmental issues.

Studies on environmental issues in developing countries become interesting since the awareness of people in developing countries on this issue tends to become increasing. In Indonesia as one of developing countries, the

Government has a big concern about this issue. Through the Environment Ministry, the Government of Indonesia conducted a national extensive environmental performance valuation that called PROPER (Sarumpaet, 2005).

The Indonesian Government released PROPER ratings published by the Indonesian Ministry of Environment. This rating is believed to have a reliable indicator since it is published annually so that it can reduce information asymmetry. PROPER ratings are used to describe each company's environmental performance from best to worst, i.e., gold, green, blue, red and black (Sarumpaet et al., 2017).

The concern of companies to the environmental issues should be paid by the high firm performance, as the argumentation of Stakeholders Theory. According to this theory, if the company fulfill the needs of stakeholder both economic and non-economic, they will get support from the stakeholder. Performance in environmental responsibility will improve the company's image & reputation, get more loyal customer and increase share price (Heinkel et al., 2001; Prisch et al., 2007; Guenster et al., 2011).

The contradictive of the previous results open the venue for the current study; therefore, the purpose of this study is to add the evidence on the impact of environmental performance on financial performance from the developing country. To improve the results, this study split the sample into two groups, the first group is the companies that consistently achieve good performance and the second group is the companies with consistent poor environmental performance. Consistency in environmental performance will enable the company to continue it is operating and keep the trust from the stakeholders (Misani and Pogutz, 2015; Vafeas & Nikolaou, 2015). Companies that have high environmental performance will also have high financial performance while companies with low environmental performance will also have low financial performance. PROPER is used to measure the environmental performance and return on asset, earning per share and Tobin's q is used to measure the financial performance.

2. Literature Review

Environmental performance is the performance of the company in protecting and preserving a suitable environment (Suratno et al. 2006). Ikhsan (2008) argues that environmental performance is an activity carried out by the companies that related to the surrounding natural environment. In Indonesia, the rules regarding environmental performance are regulated in the regulations of the environment minister number 6 in 2003 which says "The program for rating the performance of companies in environmental management referred to as PROPER, is a research program on the efforts of those responsible for businesses and activities in controlling pollution and environmental damage or management of hazardous and toxic materials. The purpose of this program is to make companies to be more concerned with the needs of stakeholders and to encourage companies to be better manage their environmental performance and their responsibility.

Environmental responsibility is a form of organizational obligation that not only provides goods and services for the community but also participates in maintaining environmental quality and contributing positively to the community (Januarti and Apriyanti, 2006). Companies that have environmental responsibility can avoid claims from the public and the government so that it will improve product quality which will ultimately increase economic benefits (Porter and Linde, 1995). According to stakeholders theory, there is a relationship between a company which concerns environmental performance and financial performance.

According to Sari (2012), companies are not only responsible to stakeholders but shifting to be broader namely to arrive at the social (stakeholder) domain by taking into account factors social dimension. The relationship between environmental performance and financial performance in the theory of stakeholders, stating that the company must take direct action into stakeholders (shareholders, customers, investors) and indirect stakeholders (community, society).

Financial performance is the result obtained by the company due to carrying out various activities in using the resources they have. Financial performance can be seen through financial statement analysis and financial ratio analysis (Husnan, 2005). Susanto and Tarigan (2013) argue that financial performance is a result of decisions

obtained based on an assessment of the ability of a company, both regarding profitability, liquidity, activity, and solvency. Horngren & Harisson (1993) argue that financial performance is useful for measuring company performance and management of a business where financial performance is a tool for management that is useful in controlling a company.

Previous studies on environmental performance or reporting have used different measures of financial or economic performance. For example, Bragdon and Marlin (1972) used accounting-based measures that are earning per share and return on equity; while Spicer (1978) used both accounting-based and market-based measures, i.e., profitability and the price-earnings ratio). This study uses Earning Per Share (EPS), Return on Assets (ROA) and Tobin's Q as the financial performance measurement. EPS is net income that is ready to be shared with shareholders divided by the number of shares of the company (Tandelilin, 2010). The following formula calculates EPS:

$$EPS = \frac{Earning\ After\ Tax}{Shareholders\ Outstanding} \tag{1}$$

Return on Assets ratio that shows the company's ability to use the number of assets it has to generate profits in a period (Almilia et al., 2009). According to Rachmithasari (2015), return on assets can be measured by using the formula for net income after tax divided by total assets.

$$ROA = \frac{Net\ Income}{TOtal\ Asset} \tag{2}$$

Tobin's Q measures the company's financial performance concerning potential market value, and Tobin's Q is more directed at investment growth potential. Mathematically Tobin's Q can be calculated by formulating the formula as follows Lindenberg & Ross (1981):

$$Tobin's\ Q = \frac{Market\ Cap + Debt}{Total\ Asset} \tag{3}$$

2.1 Hypothesis Development

Companies do not just have to focus on shareholders but also must focus on the stakeholder (Ferner and Quintanilla 1998). Besides that, the success and sustainability of a company are in the hands of stakeholders, by maintaining the support from stakeholders. The commitment of companies to protecting and preserving the environment is one of the ways to get support from the stakeholders (Prisch et al., 2007; Li et al., 2017). Muhammad et al., (2015) showed that there was a significant influence impact of the company's environmental performance on the company's financial performance. Coopers and Lybrand (1993) argue that company with excellent environmental performance can get trust from society and make the company have a better financial performance. The company should be concerned with not only short-term profit but also the long-term profit by attracting the stakeholder interest (Li et al. 2017). The company with excellent environmental performance does not only disclose the company concern for the environment but also about product quality, product safety, corporate social responsibility towards the surrounding community, and the company concern for the safety and employee prosperity (Rakhiemah and Agustia, 2009). Verrecchia (1983) argues that a company with good environment reveal good news for the stakeholder to invest in that company better than other competitors. Suratno, et al., (2006) argue that good news is essential to company and stakeholder for the future company operating to improve financial performance and have more valuable company than others. Based on the above explanation, the hypothesis is as follow.

H_1: Environmental Performance has a significant positive effect on Financial Performance

Some of the previous studies indicate that environmental performance has insignificant or even negative effect on financial performance. However, some researchers have successfully found the consistent results on the on the association between environmental performance and financial performance, Vafeas & Nikolaou (2015),

Sarumpaet, et al., (2017) and Misani and Pogutz (2015). Sarumpaet et al., (2017) found a positive relationship between PROPER and the stock price when dividing the sample into the ratings of "Good" and "Poor", but found no influence when using all sample data without dividing it. Misani and Pogutz (2015) argue that companies that have high environmental performance will also have high financial performance while companies with low environmental performance will also have low financial performance. Consistency in environmental performance will enable the company to continue it is operating and keep the trust from the stakeholders. Following Vafeas & Nikolaou (2015) that prove the consistent results this study divide sample into two groups. The first groups are the companies that consistently get an excellent PROPER ranking (Gold, Green, and Blue) and the second group is the companies that consistently records the poor rating (Red and Black). When the company consistently contribute to environmental performance, it will contribute to the significant positive effect on financial performance.

H_2: Companies that consistently receive good environmental performance have positive financial performance compared to those who do not have consistent environmental performance

3. Research Method

3.1 Sample

This study is applied to listed firms in Indonesia Stock Exchange (IDX) and participated in the PROPER Program for the period of 2010 to 2017. Companies that have information that needed for this study will directly exclude from the sample. After strong selection for the completeness of the data, the sample of this study are 48 companies that come from 8, and that will make total observation around 384 firm-year observation. In table 3.1 explained in the sample selection to 48 companies and made the data of this study to be 384. Data are collected from Bloomberg; meanwhile, for the company's annual environmental performance are gathered from the website of the Indonesia Ministry of Environment

Table 3.1 Sample selection output

Sample Requirement	The amount of observation
The company that listed in BEI	626
Incomplete data	(182)
Companies that do not enter in PROPER Program from 2010 to 2017	(396)
Total company	48
Total Observations	**384**

3.2 Variables Operationalization

Financial performance is measured by return on assets (ROA), earning per share (EPS), and Tobin's Q. Return on asset is measured by earning after tax divided by total asset (Rachmistasari, 2015). Return on asset is a critical component to show how well a company deals with the asset to generate profit in a period (Almilia et al., 2009). Earnings per share are measured by earning after interest and tax divided by total outstanding share (Tandelilin, 2010). Earnings per share are as an indicator of company sustainability in the future, the stable value of earning per share as a positive signal to companies sustainability (Young, 2002; Kasmir, 2008). Tobin's Q is measured by Total

Debt plus market value of all outstanding stock (MVS) are divided by the total asset. MVS is closing price multiplied with the outstanding share (Lindenberg & Ross, 1981). Tobin's Q is an investor perception towards company about their share price. The high price of the share will also increase the value of the company (Brealey et al., 2007). PROPER ratings measure environmental performance. This rating is divided into five color ranks which are gold for the best, and then green, blue, red, and black for the worst (Indonesia Ministry of Environment, 2015).

Gold was given to the company that consistently show the excellence of environment in the production process or service process. Green was given to the company that does the environmental management better than the applicable law. Blue was given to the company that does the environmental management following applicable law. Red was given to the company that does environmental management, but their effort is below the standard of the applicable law; meanwhile, Black was given to the company that intentionally break the law that was given that can make serious effect that will harm the environment, black was also given to the company that violates the rule and ignore the administration fine that given to them.

To increase focus on our study, we use some control variables which are firm size, firm age, leverage, and market share. Firm Size is measured by the logarithm of the total asset of the company (Johnson and Greening, 1999; Ball and Foster, 1982; Dechow and Dichev, 2002). Firm age is measured by the logarithm of the total years of the companies since listed in IDX (Chun *et al.*, 2008). Leverage is measured by the ratio of total debt divided by total equity (Weston and Copeland, 2012). Debt to equity ratio (DER) informs a company equity structure to help investors to assess the company's risk (Husnan and Pudjiastuti, 2002). Market share is measured by a ratio of total company sales divided by total industry sales (O' Regan, 2002).

3.3 The Model of Analysis

The study uses multiple ordinary least squares regression model to test the hypothesis. The following is the model of analysis

$$FP_{i,t} = \alpha + \beta_1 PROPER_{i,t-1} + \beta_2 PROPCONS_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 FSIZE_{i,t-1} + \beta_5 FAGE_{i,t-1} + \beta_6 MSHARE_{i,t-1} + \mathcal{E} \tag{4}$$

Where:

$Q_{i,}$ t: Tobin's Q of company $_i$ at year $_t$

$FP_{i,}$ t: Firm performance of company $_i$ at year $_{t-1}$, measured by ROA, EPS and Tobin's Q

$PROPER_{i,}$ t: PROPER rank of company $_i$ at year $_{t-1}$

$PROPCONS_{i,}$ t: Dummy variable for the consistency of the PROPER rank of company $_i$ at year $_{t-1}$

$LEV_{i,}$ t: Leverage of company $_i$ at year $_{t-1}$

$FSIZE_{i,}$ t: Firm size of company $_i$ at year $_{t-1}$

$FAGE_{i,t}$: Firm age of company $_i$ at year $_{t-1}$

$MSHARE_{i,}$ t: Market Share of company $_i$ at year $_{t-1}$

4. Result and Discussion

Table 4.1 shows the descriptive statistic for the full sample. Companies that accomplish good PROPER rating consistently show different characteristics from companies that get good PROPER rating inconsistently. The market share, firm size, and firm age inconsistent group, on average is smaller than the other one, except leverage. The financial performance of companies that achieve good PROPER rating consistently is better than inconsistently get a good PROPER rating. The PROPER inconsistent group is higher than the inconsistent group, this is indicated by the mean of the PROPER inconsistent group is 3.29, and the inconsistent group is 2.95.

Table 4.1. Descriptive Statistic for the Full Sample

Variable	All Sample	Inconsistent PROPER	Consistent PROPER
ROA			
Mean	0.0677	0.0538	0.0817
std dev	0.106	0.0870	0.122
EPS			
Mean	265	224	305
std dev	655	657	652
Tobin's Q			
Mean	1.96	1.5	2.42
std dev	2.59	1.13	3.42
PROPER			
Mean	3.12	2.95	3.29
std dev	0.438	0.379	0.426
MSHARE			
Mean	2.06	2.16	1.96
std dev	1.9	2.23	1.49
FSIZE			
Mean	12.9	13	12.9
std dev	0.574	0.622	0.521
AGE			
Mean	1.2	1.27	1.14
std dev	0.264	0.18	0.315
LEV			
Mean	0.408	0.26	0.556
std dev	2.89	3.9	1.2
Observation	384	192	192

Table 4.2 shows that PROPER do not have significant effect to return on asset (p-value= 0.3412) and Tobin's q (p-value= 0.2843), but have significant negative effect to earning per share (p-value= 0.0196). It seems that the increase in PROPER can cause a decrease in earning per share. However, after dividing the sample into two groups, we find that PROPCONS has positive significant effect to return on asset (p-value= 0.0235), earning per share (p-value= 0.0278), and Tobin's q (p-value= 0.0007). These findings show that consistent good environmental performance has a significant impact on firm performance. This result is in line with stakeholder theory and previous research (Sarumpaet et al., 2017).

The company that has consistent good environmental performance will have a competitive advantage, that can be translated into better financial performance (Al-Tuwaijri et al., 2004; Sarumpaet et al., 2017). Good environmental performance leads to a positive market response, building good relations with stakeholder especially primary stakeholder, that finally create a competitive advantage (Hillman & Klein, 2001).

Table 4.2 The Results of Hypothesis Testing

Variables	Return on Asset		Earnings per Share		Tobin's Q	
	Coefficients	*p*-value	Coefficients	*p*-value	Coefficients	*p*-value
Const	0.2462.85	0.1322	−4872.53	<0.0001***	6.4689.2	0.0874*
PROPER	0.0130.289	0.3412	−195.503	0.0196**	0.3389.40	0.2843
PROPCONS	0.0269.166	0.0235**	159.423	0.0278**	0.9313.10	0.0007***
MSHARE	0.0152.797	0.0001***	−37.3272	0.1180	0.4500.07	<0.0001***
FSIZE	−0.0208.091	0.1126	466.218	<0.0001***	−0.5547.58	0.0675*
FAGE	0.0352.151	0.0852*	−66.4276	0.5939	1.2543.0	0.0082***
LEV	−0.0003.1642.7	0.8611	0.931235	0.9327	−0.0111.858	0.7891
IDSector	−0.0115.410	0.0001***	−63.6745	0.0006***	−0.3983.80	<0.0001***

Notes: *, * * and * * * denote statistical significance at the 10%, 5% or 1% level.

Good environmental performance will lead to being better environmental reputation, improve company's image, increase loyal customer, and reduce unnecessary costs like workers or society demonstrate on (Heinkel et al., 2001; Cai & He, 2014). Environmental performance is an investment, where the benefit cannot be expected in the short-term but long-term (Wong et al., 2016). The result is in line with stakeholder theory which states that if a company fulfill the needs of stakeholder both economic and non-economic needs, the company will get support from stakeholder like a more loyal customer, improve brand image, increase the share price, and financial performance (Crisóstomo, Freire, & Vasconcellos, 2011). The results explain the inconsistent results of the previous research in environmental performance and financial performance. The firm determination to maintain good environmental performance will have a positive impact on financial performance information.

The findings of this study support that the concern of the Government of Indonesia to encourage companies to be responsible for their environmental impact produce good results. The restricted regulation on the environmental impact matter since it can save the stakeholders' interest and prevent a potential violation of the environmental responsibility. The company that disobeyed the rule must be punished based on the regulation. Stakeholders appreciate to the company that consistently have a good ranking of environmental performance. Their role is essential in motivating companies to keep good performance in the environmental aspect. Therefore, there is a payoff for the consistently good performance and vice versa.

Some control variables show as the determinant of the firm performance, MSHARE has positive significant effect to both return on asset (*p*-value= 0.0001) and Tobin's Q (*p*-value= 0.0001), FSIZE has significant effect to both earning per share that has *p*-value= 0.0001; coef= 466.22 and Tobin's Q that has *p*-value= 0.0001; coef= -0.54. FAGE has positive significant effect to return on asset (*p*-value= 0.0852) and Tobin's Q (*p*-value= 0.0082), however, LEV has no significant impact on financial performance. A company that has high market share, it means that the company can fulfill market demands and most of the consumers like that company's products. Because of that, the company will get more profit and increase financial performance. Companies that have a high market share also indicate that the company has a good image in the perspective of a stakeholder. Financial performance is also explained by firm size. Big companies usually have more stable in operations, have a competitive advantage that small companies and have a good reputation in stakeholder's perspective. The big companies are trusted by the stakeholder that it has a better future. Company's age shows the experience of the company in running their business Age of company is one of the components of company success. This makes more experienced companies more trusted by the market. Leverage should be a positive impact towards financial performance because the higher debt that owned by the company can maximize the profit and operations. However, hypothesis testing shows the opposite result.

5. Conclusion

This study examines whether environmental performance will be followed by good financial performance, especially for the consistent good performer. The results support that the consistency of the companies to keep good environmental performance resulting in good financial performance. We find that the group of firms that consistently have a good environmental performance achieve good financial performance and vice versa. This finding can explain the inconsistent results of prior studies. It confirms that environmental information is needed to inform stakeholder that the companies made a better contribution to the environmental issues.

There are some limitations to this study. First, we fail to include all the companies participate in the PROPER Program since many companies are not listed in Indonesia Stock Exchange so that data are not available. Second, our results should be carefully generalized, since it is only applicable to the listed companies. Future research is still needed to convince the companies the benefit of involving in PROPER and environmental issues, as well.

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The Effect of Advertising Information on Materialism and Buying Behavior – An Empirical Study

Farah Ahmad[1], Yasser Mahfooz[2]

[1] College of Business Administration, Dar Al Uloom University, Riyadh, Kingdom of Saudi Arabia

[2] College of Business Administration, King Saud University, Riyadh, Kingdom of Saudi Arabia

Correspondence: Farah Ahmad, College of Business Administration, Dar Al Uloom University, Riyadh, Kingdom of Saudi Arabia. E-mail: farahahmad1324@gmail.com

Abstract

The objective of this study is to determine the effect of exposure to information in television advertisements on the consumer buying behavior in the Kingdom of Saudi Arabia (KSA). The study also explores the influence of television advertisements on materialism as a personality trait of consumers. The data was collected in Riyadh, KSA, through self-administered questionnaires using a convenience sampling technique. Out of 180 responses, 164 were chosen for the purpose of the study and analyzed for descriptive statistics as well as the relationship between information, materialism and buying behavior. A significant positive relationship was found between all dimensions. Information had the maximum effect on buyer behavior, which relates to the need for cognition in consumers. The advertisers need to develop campaigns with the objective of generating awareness about the offerings and also providing information.

Keywords: Advertisements, Television, Information, Materialism, Buyer Behavior, Saudi Arabia

1. Introduction

Consumer behavior is considered to be a study of individuals, groups and organizations, and their behavior in the process of buying decision making. It involves studying the effect of external and internal psychological factors on how individuals buy. Advertising is an external influencer which cannot be controlled by an individual, and there is always a need to study how it influences consumers in different context. Advertising on television and the internet promote the imitation of western lifestyle (Assad, 2008). Advertisements are an integral part of our society and are a key source of communication for both consumers and businesses (Belch & Belch, 2012). Television is a part of every household and thereby very effective in influencing buying decisions (Assad, 2008). Businesses might be promoting their offering through advertising, whereas consumers might be discussing the offering on various channels like social media, internet forums, etc. The continuous exposure of consumers to advertisements from varied media has an effect on their lifestyle, attitude and buying behavior (Sutherland, 1993), which makes advertisers very keen to spend more on marketing promotion activities (Harper, 2007), especially in developing markets.

According to the global expenditure on advertising statistics (GroupM, 2018), the world figures are pegged as USD 221 billion by the end of 2018. Among all regions, the maximum growth in advertising expenditure for television advertising will be in the Middle East and Africa; whereas the lowest will be in Europe.

The information provided by Statista (2018) says that media spending worldwide in 2017 was estimated to exceed 584 billion U.S. dollars. It is projected to grow to 757.44 billion by 2021. Television is the second largest medium for advertising after digital advertising, and in 2019, digital advertising is expected to have 41.1 percent of advertising expenditures.

Researchers in marketing have studied most areas of consumer behavior including the impact of everything related to the purchase behavior of the consumer, and how the products are consumed (Hawkins et al., 2010; Schiffman et al., 2010; Solomon, 2011). Frideres (1973) identified two effects of advertising campaigns. Firstly, it is a source of information for the audience, and secondly, it creates a need for a product or service. This is the reason why marketing communication exercise from an advertiser is also found to create a trigger which ultimately leads to a buying decision.

One significant issue in marketing is an understanding of the effect of specific mass media like television or newspaper advertising on consumers (Razzouk & Al-Khatib, 1993; Ghani, 2004; Woo et al., 2015). Business critics are concerned with the power of mass media to synthesize and stimulate wants. Defenders of mass media respond to this challenge by citing things such as the high failure rates of new products and the difficulties involved in changing consumers' attitudes (Belch & Belch, 2012; Clow & Baack, 2014; Moore & Moschis, 1978).

Rostow (1964) found that for economic growth there has to be an effective national marketing system and it further involves branding, advertising and different forms of promotion and physical distribution. Companies make full use of the promotional techniques to sell their manufactured goods in the developing countries. These goods are originated elsewhere, and the academic neglect of their activities can perhaps in part be explained by the use of the models that are applied so differently in the environment for the market analysis in which they were developed (Harper, 1975).

The communication process of advertisements and the response of viewers to various forms of advertising have been studied multiple times (Razzouk, & Al-Khatib, 1993; Ghani & Zain, 2004; Jayasinghe & Ritson, 2013; Jin & Lutz, 2013). Much research has been done on the effects and results related to the variables like broadcast, and social context on audience reception and engagement presented (Murry & Dacin, 1996; Raghunathan & Corfman, 2006). Recall of advertisements and attitude towards a brand are studied (Murry et al., 1992). Advertising information and socially engaging advertisements have held power over various viewers during the viewer event (Jayasinghe & Ritson, 2013), and a theoretical framework about the advertising engagement and consumption in domestic settings by studying the culturally framed viewing contexts and practices was proposed.

The research was found on the effect of advertising (Ha et al., 2011; Johnson, 1984; Yoo et al., 2000). The research on consumer personality, attitude, perception, and buying behavior started very early. Significant research exists on the effect of advertising on consumers (Chan & Cai, 2009; Collier, 1940; De Fleur & Petranoff, 1959; Ghani & Zain, 2004; Hawkins, 1970; Jin & Lutz, 2013; Kelly, 1979). Advertising is found to have an effect on all sections of society irrespective of age, gender, location, income, education, etc. Apart from the impact on demography, research was also done on the effect of advertising on sales of a brand. A relationship between television advertising and sales was explored by Tellis et al. (2005).

Lazarsfeld (1955) has done a good amount of work on the exposure of television and for the demand on the purchased product, validated by Ward (1974). Dotson and Hyatt (2005) identified the role of three factors, i.e., media, parents and peers. The primary media to trigger a response for advertised products is television.

The present study highlights the impact of television advertisements on the buying behavior of consumers in the Saudi Arabian context. Although, literature exists on the effect of television advertising on the purchasing pattern as well as the lifestyle of consumers. Still, this fulfills the gaps related to no significant work on the Middle East region, especially Saudi Arabia. The only study found was by Razzouk, and Al-Khatib (1993). Secondly, the market for digital advertising is booming, and often it is mentioned that mass media like television is losing its

charm. The present study tries to analyze whether television advertisements still can influence consumers or they are no more needed due to the existing digital advertising tools.

The research questions are:

1. In the age of alternate forms of advertising like digital advertising, is traditional mass advertising medium (television) can effectively influence consumer buying behavior?

2. Can television advertisements have an impact on materialism as a personality trait of consumers?

The research questions were answered through the following research objectives:

1. To study the impact of television advertisements on the buying behavior of consumers.

2. To study the impact of television advertisements on consumer materialism.

2. Method

Research is available on the effects of television advertising, but no recent research was found in the Saudi Arabian context with a focus on dimensions of advertising and influence on consumers. The present research addresses this issue and reinvestigates the direct and indirect relationships that are visible in the conceptualized model. The model has 3 dimensions (information, materialism, and buying behavior).

Various studies have addressed the effects of advertising (Karadeniz, 2013; North & Kotze, 2001; Saraf, 2012; Yavas & Abdul-Gader, 1993). Yet, these studies don't establish a relationship between perception towards television advertisements, and the buying behavior of consumers in the Arab context.

The conceptual model is shown in figure 1.
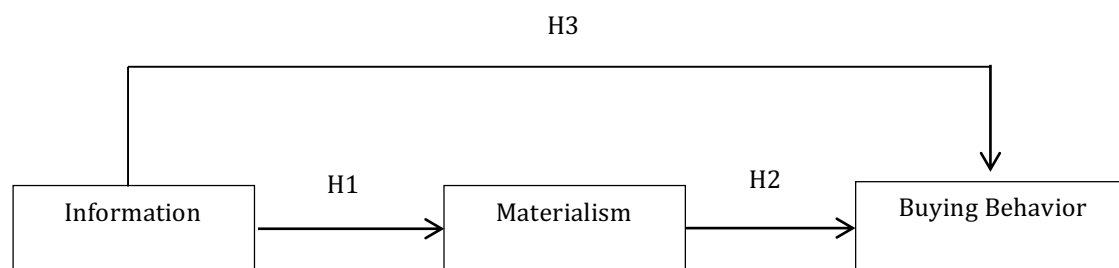
Figure 1: Conceptual Model

The research by Bauer and Greyser (1968) is considered to be the first study to assess attitudes and beliefs towards advertising (Jin & Lutz, 2013). Advertisers contend that advertising strongly influences the consumer attitudes, values, and behavior (Chan & Cai, 2009; Ghani & Zain, 2004; Hanzaee et al., 2011; Jin & Lutz, 2013; Karadeniz, 2013; Saraf, 2012), such as non-rational choices, buying decision, and materialism. Television advertising was specifically found to be an important driver of consumer perception (Jin & Lutz, 2013), and a study of information in television advertisements and consumer behavior can help in the understanding of the effect of advertisements on households (Abe, 1997; Ghani & Zain, 2004).

Mass media is effective for inducing long-term changes in attitude and behavior towards products (Jarlbro, 2001; Jin & Lutz, 2013). Commonly used mass media includes television, radio, print and outdoor. The advertising exposure of consumers is affected by the intensity of advertisements during the process of viewing an advertisement (Abe, 1997). Television advertisements are a source of topics for interpersonal communication, which in turn influences the behavior of consumers (Clow & Baack, 2014). A report by Consumers International (1999) lists contemporary medium for advertising like product placement, merchandise, or fan clubs as a source of interpersonal communication stimulation. But there can be other sources of interpersonal influence, like parents

or peers (Goldstein, 1999), which are often very strong in nature. Researchers have found that advertisements lead to materialism in consumers (Greenberg & Brand, 1993; Wulfemeyer & Mueller, 1992) because it arouses a desire for products that would otherwise be salient. Materialism is operationally defined as an orientation emphasizing possessions and money for personal happiness and social progress (Ward & Wackman, 1971). Advertising provides information and exposes viewers to new products available in the market. Wulfemeyer and Mueller (1992) opine that the ideology of advertising is to inculcate thinking that goods and services are important to obtain success and create happiness. This also shows the materialistic influence of advertising. Goldberg and Gorn (1978), Greenberg and Brand (1993), and Moschis and Moore (1982) studied the materialistic influence of advertising. Still, no major evidence is found on materialism due to advertising. This leads to the following hypothesis:

H1: There is a positive effect of information in television advertisements on the materialism of consumers

Several studies on materialism have been conducted across the globe (Hoffman et al., 2014; Shek et al., 2014; Segev et al., 2015; Shek et al., 2016; Tuu et al., 2017; Pradhan et al., 2018). Another research on the influence of advertisements found that children from low-income households are influenced more by advertising, and make more requests for purchase; whereas children from high-income households are found to make fewer requests (Young, 1990). More requests from children are a cause of parent-child conflict in low-income households (Young, 1990). A higher number of requests in low-income households can be attributed to a higher viewership of television (Moore & Moschis, 1981), and also the reason that parents in low-income families rarely discuss the adverse effects of advertising with children. Research by Gunter and Furnham (1998) and Saraf (2012) found that high-income households frequently have a discussion on the effects of advertising and genuineness of the claims made in the advertisements. Less discussion in low-income households makes their children susceptible to influence by whatever is shown in the advertisements (Donohue & Meyer, 1984). Consumerism in Saudi Arabia can be attributed to the products imported from western countries. The macro environmental factors have led to the Saudi Arabian society becoming materialistic in nature (Assad, 2008). This leads to the following hypothesis:

H2: There is a positive effect of the materialism of consumer on his buying behavior of consumers.

Researchers have always worked to know the relationship between advertising and buying behavior and the recent ones are Waheed and Yang (2017) and Martinez-Ruiz et al. (2017). The earlier research includes Ekelund and Gramm (1969) who studied the relationship between advertising and aggregate consumption and no positive relationship was found between advertising and consumption. Taylor and Weiserbs (1972) found aggregate demand and aggregate consumption to be positively related. While many other studies rejected the hypothesis for the effect of advertising on consumption, Ashley et al. (1980) as well as Razzouk, & Al-Khatib (1993) opined that advertising affects consumption. Verdon and McConnell (1968) studied the relationship between advertising and aggregate demand and it was found that advertising has a positive effect on aggregate demand. This leads to the following hypothesis:

H3: There is a positive effect of information in television advertisements on the buying behavior of consumers

Methodology

At the operational level, the hypotheses have to be tested empirically to know the relationship between variables (Neuman, 2007). The items for information were adapted from Chan and Cai (2009), and Jin and Lutz (2013); items for materialism were adapted from Jin and Lutz (2013), Moschis and Moore (1982), and Richins and Dawson (1992). The items for consumer buying behavior were adapted from Bishnoi and Sharma (2009), Ghani (2004), as well as North and Kotze (2001).

The initial questionnaire which had 23 items was reviewed by 2 academicians with significant research in advertising and brand management; and 2 advertising professionals. This ensures that the selection of scale items extends past just empirical issues to also include theoretical and practical considerations (Hair et al., 2010). It also evaluates the accuracy of the tool used for measurement (questionnaire) and suggests if the items of scale cover the specific construct to be measured (Malhotra & Dash, 2010). After screening by reviewers, 17 items were retained: 5 for information, 6 for buying behavior, and 6 for materialism.

The survey instrument demographic data of the respondent which included gender, location, age, income, and education. Multiple choice questions were used for this purpose. Further, the respondents were asked to provide a

response to 17 items. A 5-point Likert scale was used with 1=strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, and 5= strongly agree. The sampling units are all households with a personal television set(s) for regular viewing in Riyadh, Kingdom of Saudi Arabia. The city of Riyadh was chosen for being the biggest city in terms of population. In this study, 180 questionnaires were received. After examination of missing data points, 164 were used for the final analysis (91% valid response rate). The filled questionnaires were rejected due to missing data or absurd answers. The questionnaire with missing responses was eliminated to prevent overestimation (Tabachnick & Fidell, 2007)

The questionnaires were administered to the respondents personally. This way the response rate is high, responses are fast, clarifications can be easily sought, and quality of responses is better (Kassim & Abdullah, 2010; Malhotra & Dash, 2010). Like the majority of methods, this too has its disadvantages. One key disadvantage of direct administration of the questionnaire is the bias of interviewer and the cost of administering (Malhotra & Dash, 2010). Still, this method was followed as a high rate of response with quality responses was needed in a short time. The responses were collected during August-October, 2018.

3. Results

The sample characteristics were analyzed using MS Excel, IBM SPSS Version 22, and IBM AMOS Version 20. The respondents are representative of the genders, education levels, age groups, income levels and region/city of study. The value of Kaiser-Mayer-Olkin (KMO) is found to be 0.81 which was above the recommended value of 0.8. The statistical test for the Bartlett test of sphericity was found to be significant. This signifies that the sample has adequate size for factor analysis (Nunnally, 1978).

Unidimensionality was found as a result of exploratory factor analysis (Hair et al., 2010). A reliability test was conducted, and Cronbach's Alpha for the factors is found to be 0.887, 0.894, and 0.911 respectively. The values have been accepted as they are found to be greater than the recommended value of 0.60 (Hair et al., 2006; Nunnally, 1978). The Cronbach's Alpha for the entire scale comprising of 17 items was also measured and was found to be 0.899; which is also higher than the accepted level. This shows that the scale used to measurement is reliable.

Hair et al. (2006) suggested factor loadings and average variance extracted (AVE) to assess the construct validity. The result of the analysis indicates that factor loading is in the range 0.815-0.910. The value of factor loading greater than 0.50 is acceptable (Hair et al., 2006; Malhotra & Dash, 2010). The Average Variance Extracted is 5.43 is also above the suggested limit of 0.5 (Hair et al., 2006). This establishes the construct validity for the measurement model of this study.

For the purpose of testing hypotheses H1, H2, and H3, regression analysis was used. A positive relationship was found between information-materialism, materialism-buying behavior, and information- buying behavior. All the relationships in the conceptual model were found to be positive at $p < 0.05$, and therefore all hypotheses H1-H3 were supported. All the beta coefficients (β) were in the positive direction as conceptualized in the model.

Further to the regression analysis through SPSS, structural equation modelling technique and path modelling was used to re-test the proposed model and hypotheses. Before examining the proposed hypotheses, the model fit indices are examined.

The Goodness-of-Fit Index (GFI) was created by Jöreskog and Sorbom (1982) as an alternative to the Chi-Square test and calculates the proportion of variance that is accounted for by the estimated population covariance (Tabachnick & Fidell, 2007). Whereas Adjusted Goodness-of-Fit (AGFI) adjusts the GFI based upon degrees of freedom, with more saturated models reducing fit (Tabachnick & Fidell, 2007).

The Comparative Fit Index (CFI) is equal to the discrepancy function adjusted for sample size. CFI ranges from 0 to 1 with a larger value indicating better model fit. Acceptable model fit is indicated by a CFI value of 0.90 or greater (Hu & Bentler, 1999). Root Mean Square Error of Approximation (RMSEA) is related to residual in the model. RMSEA values range from 0 to 1 with a smaller RMSEA value indicating better model fit. Acceptable model fit is indicated by an RMSEA value of 0.06 or less (Hu & Bentler, 1999). After achieving the model fit the proposed model/hypotheses were tested.

The results of the path analysis are shown in table 1 below:

Relationship	Standardized Estimates	Unstandardized Estimates	P
Information→Materialism	0.381	0.300	***
Materialism→Buying Behavior	0.14	0.189	0.002
Information→ Buying Behavior	0.360	0.355	***

Table 1: Hypotheses Results for Path Analysis (H1-H3)

The results from the table show that all direct effects as proposed in the model are significant.

4. Discussion

The marketing activities related to advertising play a significant role in the fulfillment of company strategies and goals. Harper (1975) opines that the increased focus on advertising budgets is due to the same reason, and lately the manufacturers have been increasing the investment on promotion. Almost every producer has to think of the selling point for offering, the reason why the offering will appeal to consumers, and why consumers will buy the offering (Copeland, 1924).

The conceptual model was formed on the basis of a literature review. Factor analysis resulted in three distinct factors; information, buying behavior, and materialism. To test the conceptual model, hypotheses were formulated. After regression analysis and path analysis, a significant positive relationship was found between information-materialism, materialism-buying behavior, and information-buying behavior. All the relationships in the conceptualized model were found to be positive, and therefore all hypotheses H1-H3 were supported. All the relationships were in the positive direction as conceptualized in the model.

While testing the effect of information and materialism on buying behavior, the beta coefficient of the first relationship was found to be higher. This implies that information through advertisements has a greater influence on buyer behavior. Companies can include more information in their advertisements as the information is found to influence the buyer behavior. Various tools and techniques can be used by advertisers to make the messages more interesting. Another key element of successful advertisements with a higher recall is entertainment through good humor (Belch & Belch, 2012; Clow & Baack, 2014; Ghani & Zain, 2004).

Prior research has looked into the effects of advertising spending on post-purchase intention like word of mouth, brand loyalty, etc. (Ha et al., 2011; Tellis, 1988). It also found that the expenditure on advertising can benefit the organization in multiple ways other than just boosting sales. The advertisements can also have behavioral outcomes. This study also advances the literature related to the effects of advertising.

The study has certain limitations. It is focused on a single city and cannot be generalized to represent the entire population. Also, the mall-intercept method though easy to apply created some issues while getting the responses. The difficulty was experienced while requesting prospective respondents because of cultural reasons where most are either busy in shopping etc. or unwilling to spare a few minutes to interact with a stranger.

This study can be extended to more cities and also study the influence of demographic factors on the buying behavior. Further, the study can study the effect of more personality traits of consumers like variety seeking or cognition.

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ASIAN INSTITUTE OF RESEARCH
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The Evolution of Craft Beer Industry in Brazil

Dr. Murillo de Oliveira Dias[1], Davi Falconi[2]

[1] Coordinator of the DBA Program at Fundação Getulio Vargas, Brazil

[2] Fundação Getulio Vargas, Brazil

Correspondence: Dr. Murillo de Oliveira Dias, Fundação Getulio Vargas, Praia de Botafogo, 190, Botafogo, Rio de Janeiro – Brazil. Tel: +55 21981917474 E-mail: murillo.dias@fgv.br // agenda.murillo@gmail.com

Abstract

The present article investigated the craft beer industry in Brazil. Beer id the most consumed alcoholic beverage in Brazil with approximately 14 million kl/year, and Brazil is the third largest beer producer in the world. Almost 98 percent of beer consumption is Brazil is light beer, Pilsen, 3-5 percent alcohol. In the 1980s, craft beers began to produced in increasing scale in North America. In the 2000s, the global trend on changing consumer habits stroke Brazil. From 2002 to 2018, the number of regular craft brewing industries jumped from less than 50 to more than 830. This single case study investigated craft beer activities in the Brazilian market, its challenges, pitfalls, and ultimate performance, since its offspring to the present. Discussion and recommendations for future research complete this article.

Keywords: Craft Beer, Brewing Industry, Brazil

1. Introduction

The present descriptive case study investigated the craft brewing industry in Brazil, as unit of analysis of this case (Yin, 2009).

Following an international trend, craft beers (*cervejas artesanais*), skyrocketed sales in Brazil, with an increasing a number of built factories, who jumped from 356 to 835 in the last four years, almost 2.5 times (G1, 2018). If *cervejarias ciganas* (gypsy brewing industries, out translation – i.e., those unregistered brewing industries) were counted, the number would jump to 1,200 (CERVBRASIL, 2018).

Beer is defined, as "an alcoholic drink made from yeast-fermented malt flavoured with hops" (p.1). In Brazilian Portuguese, it is called *cerveja.* The etymology of beer is originated from:

> Old English beor "strong drink, beer, mead," cognate with Old Frisian biar, Middle Dutch and Dutch bier, Old High German bior, German Bier; a West Germanic word of much-disputed and ambiguous origin. (…) Probably a 6c. West Germanic monastic borrowing of Vulgar Latin biber "a drink, beverage" (from Latin infinitive bibere "to drink," from PIE root *po(i)- "to drink"). (…) Spanish cerveza is from Latin cervesia "beer." (Online Etymology Dictionary, 2018,p.1)

According to Law Nº 8.918/94, Chapter II, Section I, Beer is classified as fermented alcoholic beverages, hereafter defined as: "the beverage obtained by the alcoholic fermentation of brewer's wort from barley malt and potable water, by the action of yeast, with the addition of hops" (Brasil, 1994, Art. 64).

Brazilian beers are classified according to Law Nº 8.918/94, Art. 66: (a) light beer; (b) common beer; c) Extra beer; (d) strong beer (item I). Regarding item II - for color: (a) light beer, with a color corresponding to less than 20 EBC (European Brewery Convention) units; (b) dark beer, the color of which corresponds to twenty or more EBC (European Brewery Convention) units. The same for item III - in terms of alcoholic strength in: (a) non-alcoholic beer; b) beer with alcohol, when its alcohol content is equal to or greater than one-half percent by volume; item IV - for the proportion of barley malt in: (a) pure malt beer, one containing one hundred percent malt of barley by weight on the original extract as a source of sugar; (b) beer having a proportion of barley malt greater than or equal to fifty percent by weight on the original extract as a source of sugar; (c) beer bearing the name of the predominant vegetable, one having a proportion of barley malt greater than twenty-less than fifty percent by weight on the primitive extract as a source of sugar. Item V - for fermentation; a) low fermentation; and b) high fermentation (Brasil, 1994, Art 66, items I-V)

Beers in Brazil may be termed as "Pilsen", "Export", "Lager", "Dortmunder", "München", "Bock", "Malzbier", "Ale" , "Porter", "Weissbier", "Alt" (Brasil, 1994, Art. 67).

Finally, it is also prohibited in Brazil by Law Nº 8.918/94, beers with "flavoring and artificial colors in the brewing" (Brasil 1994, Art. 70, single paragraph).

Brazil is the third country in global consumption, according to the Kirin Global Beer Report 2017, with 12,654 thousand kl consumption, representing 6.8 percent of the global beer market, as depicted in the following Figure 1:
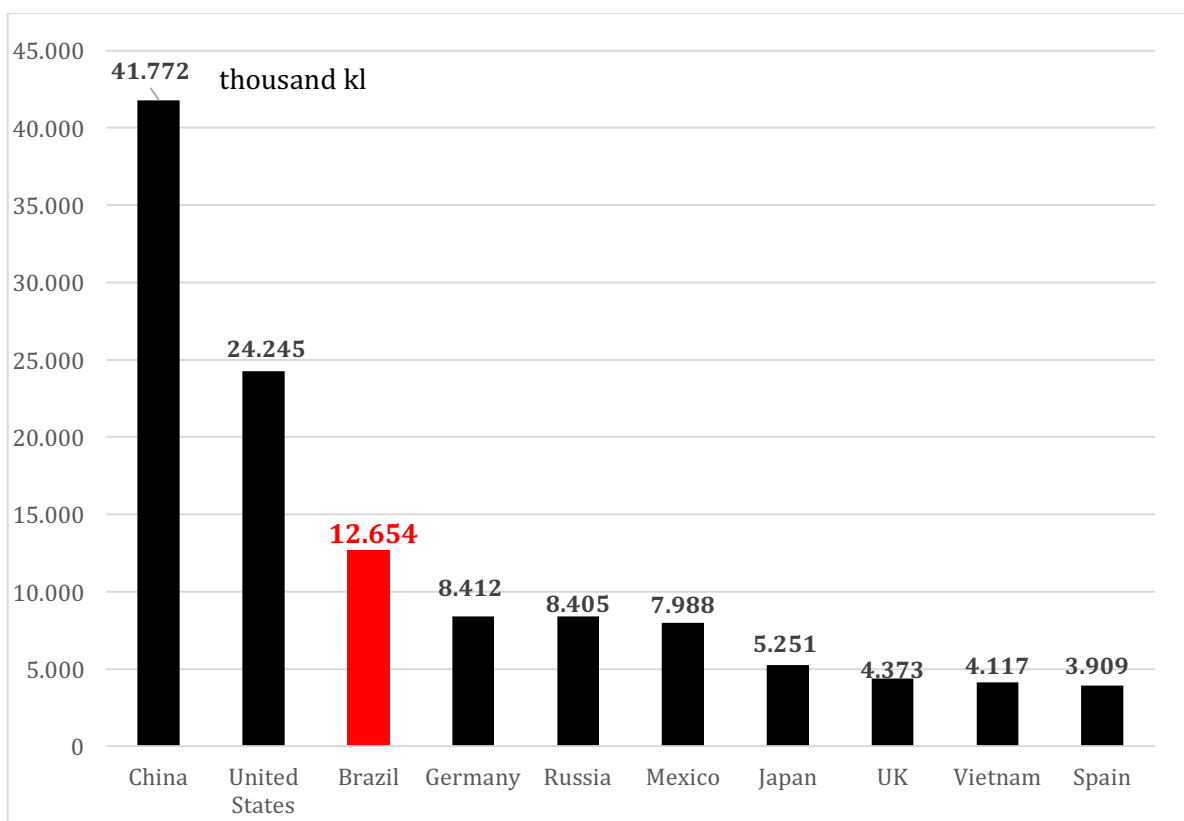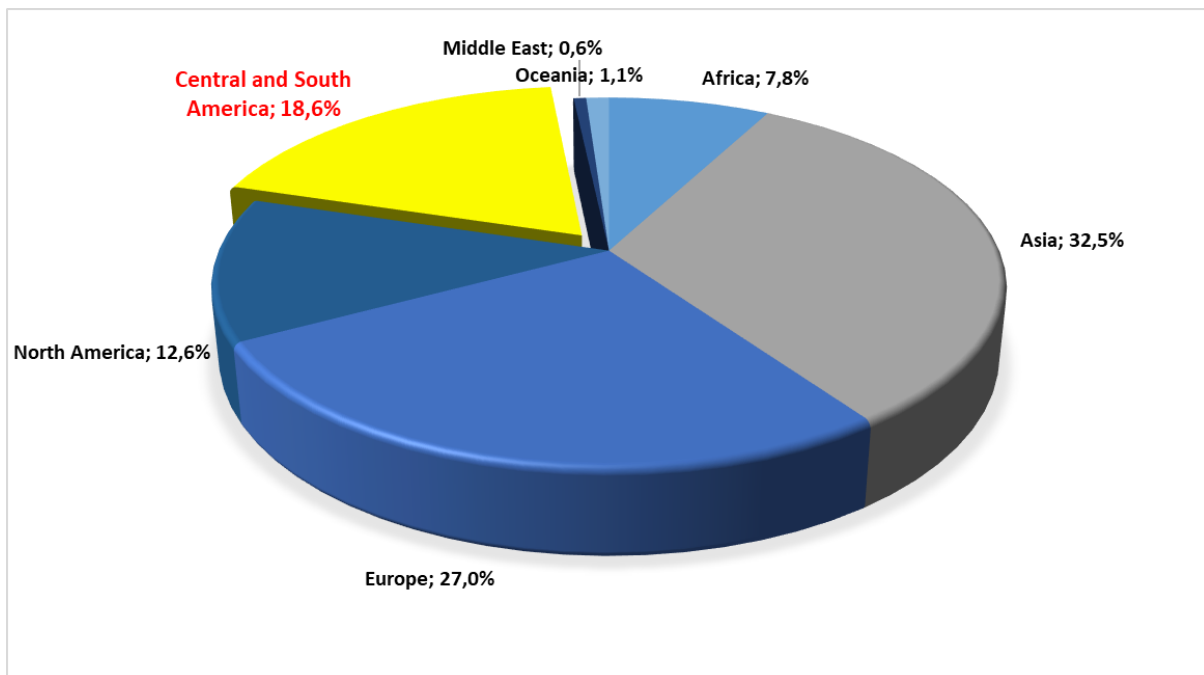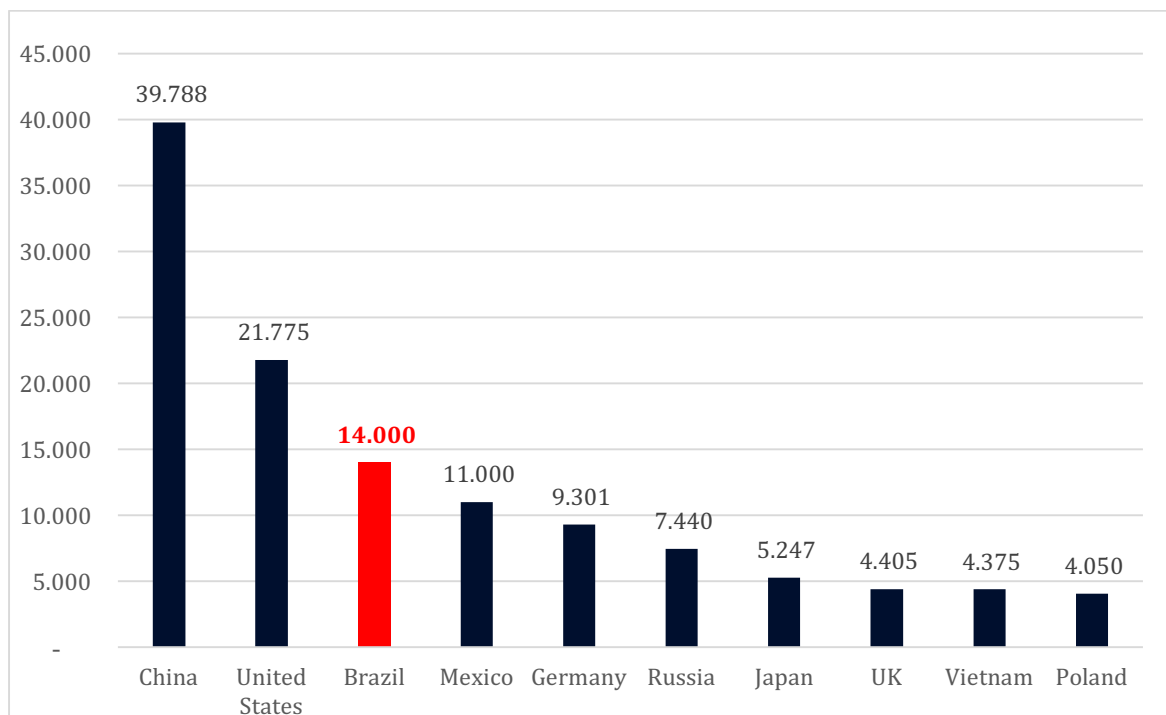

Figure 1 World Consumption.Source: Global Beer Report 2017

Figure 2 depicts the global market share by world region, as follows:

Figure 2 Market Share by region. Source: Global Beer Report, 2017

Figure 3 depicts the global beer production, which shows Brazil as the third largest beer producer, as follows:

Figure 3 Global beer production 2017. Source: Global Beer Report, 2017

Figure 4 depicts the beer consumption in Brazil. Beer is, by far and large, the most consumed alcoholic beverage in Brazil. Beer consumption is approximately 24 times the second one, the popular *cachaça*, according to Euromonitor (2018) statistics, as follows:
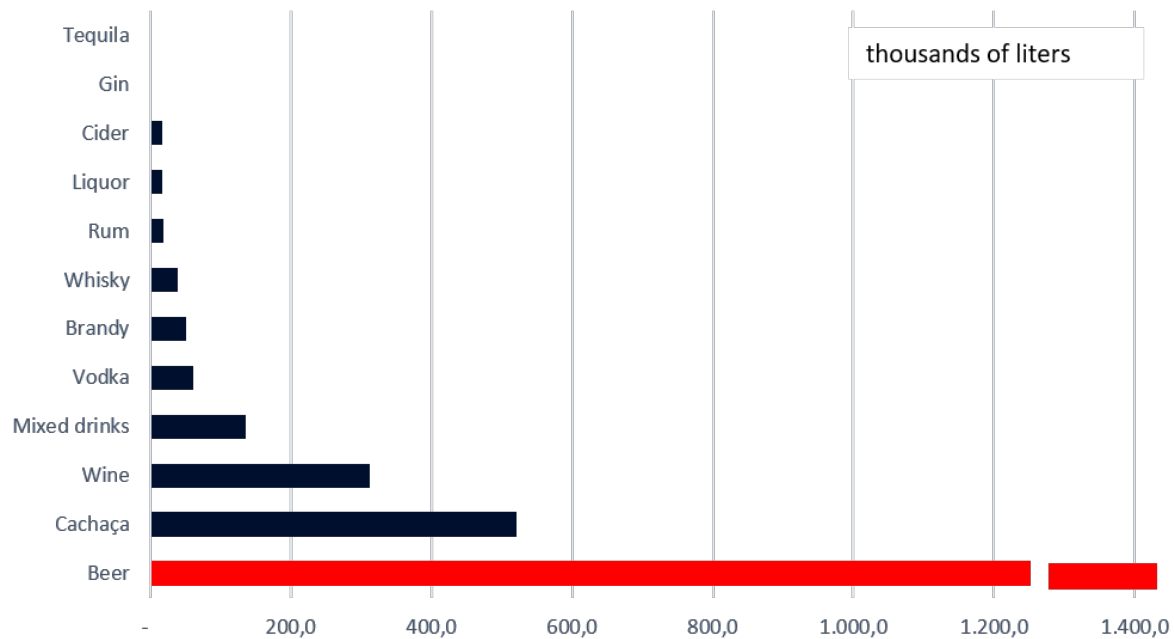
Figure 4 Brazilian consumption per type of beverage. Source: Euromonitor, 2018.

2. Methodology

This is a qualitative, inductive, interpretive, multiple methods study, involving extensive archival research, direct observation, and single case study, which unit of analysis (Yin, 2009) is the craft beer industry in Brazil. This research is limited to the Brazilian beer market, excluded other countries and beverages, such as *cachaça*, and wine, for instance. This work is limited to the Brazilian Beverage the Law Nº 8.918, from July 14, 1994 (Articles 64 to 71). The present study is also limited by the Decree No 2.314, from September 4, 1997, which regulates, in turn, the Law Nº 8.918/94.

3. Beer laws: background

The first Law on Beer k quality known in Europe, was the German Beer Purity Law (*Reinheitsgebot*), issued by Duke William IV of Bavaria (southern Germany), on April 23, 1516. *Reinheitsgebot* established that beers should be made only with water, barley malt, and hops. This law fixed the quality of ingredients, not the way the should be prepared. However, only in 1906 *Reinheitsgebot* was extended to all Germany (before, it was limited to the Bavarian states). Then, after World War II, the *Reinheitsgebot* was then incorporated to the current Beer German Law *Biersteuergesetz* (Cervesia, 2014).

The United Kingdom (UK) Parliament issued the *Beerhouse Act* in 1830, aiming at fostering the brewing industry, also reducing *gin* consumption, and other much stronger spirits, among other formalities, reducing taxes for beer production and granting selling licenses to public houses and breweries all over UK (Cervesia, 2014).

Despite issuing restrictive alcoholic consumption Laws, such as (a) *Vandervelve Act* from 1919 (Belgium (b) *Volstead Act* – also known as National Prohibition Law (US), from 1919.

In Belgium, the (a) Vandervelve Act from 1919 prohibited beer to be commercialized in public places, aiming at combating alcoholic abuses. Also ruled traditional monk trapist beer production, providing stricter production norms.

In the same vein, the North American Government issued the (b) Volstead Act, on October 28, 1919, to prohibit alcohol consumption, and "intoxicating beverages, and to regulate the manufacture, production, use, and sale of high-proof spirits for other than beverage purposes, and to ensure an ample supply of alcohol and promote its use

in scientific research and in the development of fuel, dye, and other lawful industries" (Volstead Act, 1929, p.1). The prohibition helped to create a parallel alcoholic beverage market, driven by gangsters like AlCapone, among others. Such prohibition lasted until the elected president, Franklin Delano Roosevelt, extinguished Volstead Act in 1930. In Brazil, alcoholic consumption has never been criminalized in the whole history of the Country.

In Brazil, Beer brewing industry is ruled under the Law Nº 8.918, from July 14, 1994, which "provides for the standardization, classification, registration, inspection, production and inspection of beverages" Brazil (1994, caput). However, Law Nº 8.918/94 is driven to any beverages, alcoholic and non-alcoholic ones. Also the Decree No 2.314, from September 4, 1997, which regulates the Law Nº 8.918/94. On Article 2, beverages are considered: "any industrialized product intended for human consumption, in liquid form, for non-medicinal or therapeutic purposes" (MAPA, 1997, Art. 2, item I).

4. Brazilian Beer Industry

According to the Brazilian Association of the Brazilian Beer (*Associção Brasileira da Indústria da Cerveja –* CERVBRASIL), the Brazilian beer industry is responsible for 1.6 percent of the Brazilian GDP, producing more than 14 billion l/year, collecting near 21 billion BRL (approximately 7 billion USD) taxes to the Brazilian Federal Government per year, with approximately with 38 thousand vehicles in the fleet, with 1.2 million outlet points, attending 99 percent of the Brazilian households (CERVBRASIL, 2018).

The Brazilian Beer brewing market is divided between (a) Ambev, (b) Heineken, (c) Grupo Petropolis, and (d) others, as depicted in the following Figure 5, as follows:
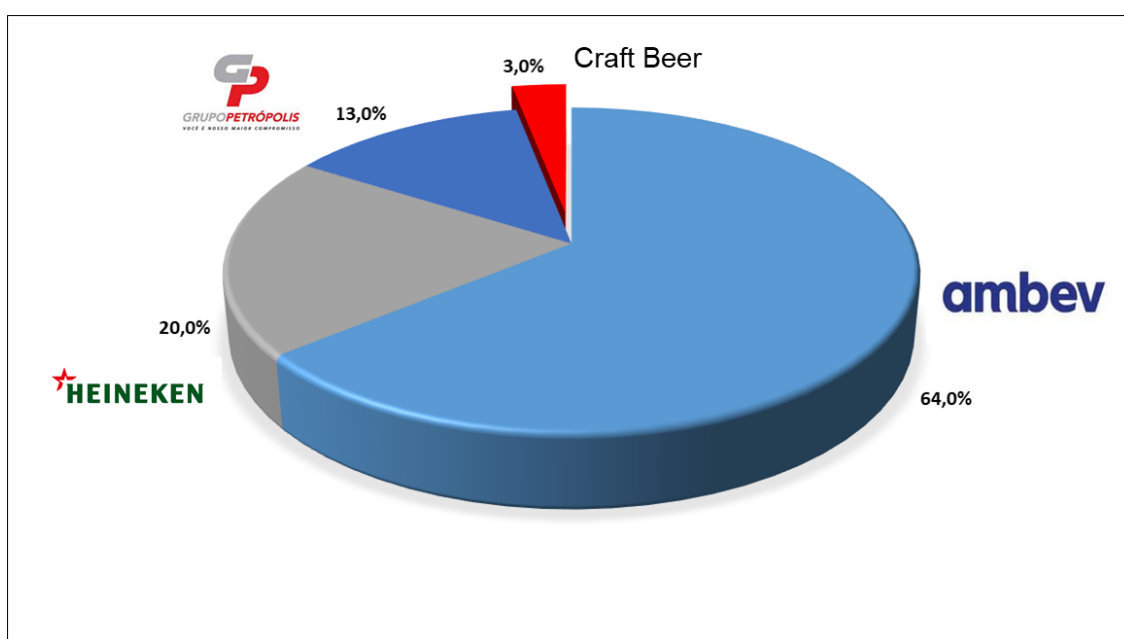
Figure 5 Brazilian Beer market. Source: Euromonitor, 2018.

Ambev in Brazil is the owner of the following beer brands: (a) Skol, (b) Brahma, (c) Stella Artois, (d) Quilmes, (e) serra Malte, (f) Corona, (g) Colorado, (h) Franziskaner, (i) Hertog Jan, (j) Hoergaarden, (k) Löwenbräu, (m) Bucanero, (n) Patagonia, (o) Polar, (p) Budweiser, (q) Caracu, (r) Leffe, (s) Original, (t) Negra Modelo, (u) Norteña, (v) Bohemia, (w) Wäls, (x) Goose Island, (y) Adriatica, (z) Beck's and (a.1) Antarctica.

Heineken is also the owner of the following brands: (a) Heineken, (b) Sol, (c) Kaiser, (d) Bavaria, (e) Bavaria 0.0%, (f) Xingu, (g) Amstel, (h) Kirin Ichiban, (i) Schin, (j) Schin 0.0%, (k) No Grau, (l) Devassa, (m) Baden Baden, (n) Eisenbahn, (o) Glacial, (p) Birra Moretti, (q) Desperados, (r) Dos Equis, (s) Edelweiss.

Grupo Petropolis holds the following brands: (a) Itaipava, (b) Crystal Beer, (c) Lokal, (d) Black Princess, (e) Petra, and (f) Weltenburger-Kloster.

5. Evolution of the Craft Beer Industry in Brazil

The craft beer market in Brazil, although not representative in comparison to other brands, is a growing one. From the last decades, passed from scarce initiatives to a growing market. According to the Ministry of Agriculture, Fishing and Supply (2018), there are 835 registered craft beer industries in Brazil, according to Figure 6, depicted as follows:
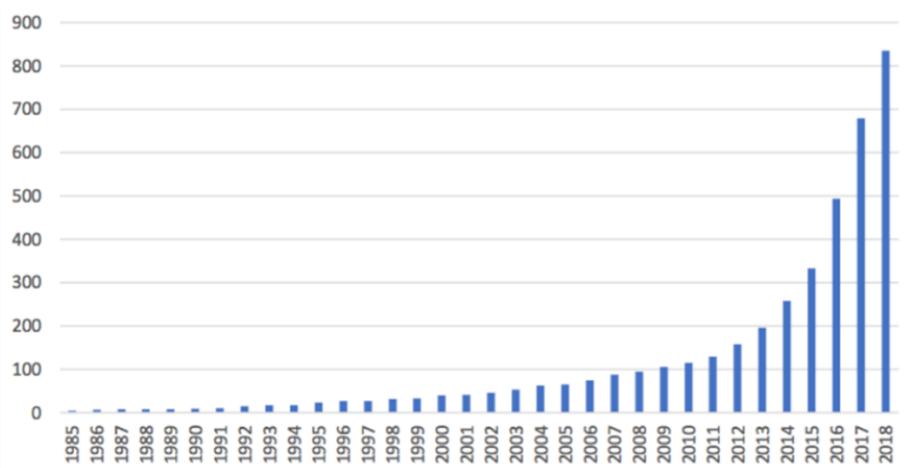
Figure 6 Craft beer industries in Brazil (1985 to 2018) . Source: Ministry of Agriculture, Fishing and Supply, 2018.

The craft beer industries are located in the Brazilian territory as shown in the next Figure 7:
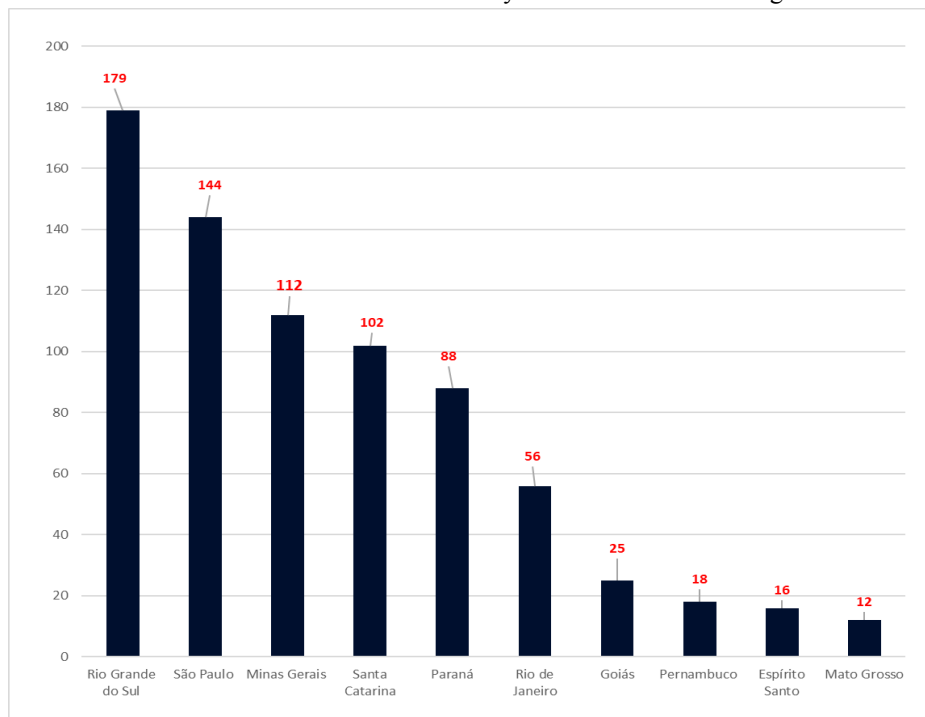
Figure 7 Craft beer industries in Brazil, per state . Source: Ministry of Agriculture, Fishing and Supply, 2018.

Figure 8 depicts the distribution of craft beer industries per region. Note the concentration of industries through South and Southeastern regions (92 percent), as follows:
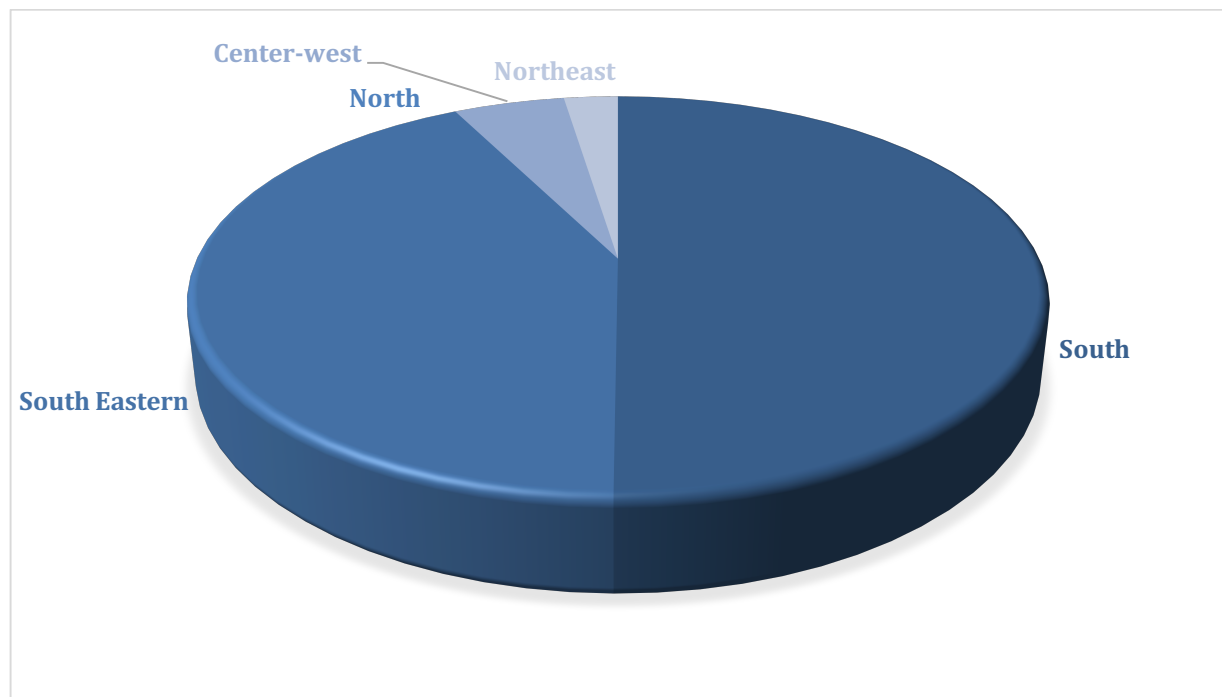
Figure 8 Craft beer industries in Brazil, per state . Source: Ministry of Agriculture, Fishing and Supply, 2018.

6. Discussion: Challenges and Pitfalls

Enterprises in Brazil have experienced similar challenges on adaptation to Brazilian consumers' habits, not restricted to: Netflix (Dias & Navarro, 2018), VLT Carioca (Dias & Teles, 2018), Dudalina (Dias et al. 2014, 2015), Fiat Chrysler in Brazil (Dias & Duzert, 2016). Dias (2018) also investigated the acquisition of Brasil Kirin by Heineken.

Craft beers are being popularized in Brazil, without the support of television media, which is directed to the brand leaders (Dias, 2018). According to the Brewers Association, craft beer consumption in The United States is about 20 percent of the market (Brewers Association, 2018). It may suggest that the Brazilian market has room for expansion.

The three bigger competitors in Brazil, perceiving the consumer habits changes, also started buying craft beer industries. It is the case of Eisenbahn and Baden Baden, Brazilian craft beer brands, acquired by Heineken in 2017 (Dias, 2018).

The fact is that the Brazilian do consume a large amount of beer (Dias, 2018). The conclusion is that the Brazilian consumer is benefited with this fierce competition, in the outlet points, bars, restaurants, supermarkets. Never in the overall Brazilian history was too easy to find beers from different brands. In comparison to Jamaica, where the Red Stripe is the only locally available beer, in Brazil, there are hundreds of different types of beers, with the majority of global brands available to the Brazilian costumers.

It is possible in the future that Grupo Petropolis mergers with one of the main competitors, ABInBEV or Heineken. This research was limited to the Brazilian beer beverage market. Other countries should be investigated in separate studies, as well as the evolution of the craft beer market in these countries.

For future research, it is encouraged the case visitation as well as the investigation of the craft beer performance in the Brazilian beer, and other markets as well.

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The Effects of Booming Credit Growth on the Soundness of Commercial Banks: Empirical Research with the Case of Vietnam

Do Hoai Linh[1], Phan Anh Khoa[2]

[1] Banking Department, School of Banking and Finance, National Economics University, Vietnam

[2] International School of Management and Economics, National Economics University, Vietnam

Correspondence: Do Hoai Linh, Banking Department, School of Banking and Finance, National Economics University, Vietnam. Email: linhdh@neu.edu.vn, linhdo.neu@gmail.com

Abstract

The research aims at investigating the impacts of rapid credit growth in Vietnam, that is called booming period occurred from 2007 to 2010, on the soundness of the Vietnamese commercial banks with quantitative methods. By using bank data collected from 18 major commercial banks from 2007 to 2013, the quantitative method is reflected through a strong regression model linking with variables for both microeconomic and macroeconomic factors. The influence of the credit boom was examined on basic aspects as asset quality, profitability, liquidity, capital adequacy. The findings seld lights on is that rapid credit growth weakens commercial banks on both sounder and less sound banks. Moreover, the findings also witnessed the relationship among rapid credit expansion and soundness of commercial banks, taking account the crucial role of bank performance as a determinant of credit growth.

Keywords: Rapid Credit Growth; Soundness of Banks; Asset Quality, Profitability, Liquidity, Capital Adequacy

1. Introduction

In recent years, across recent several emerging markets, the world observed a significant credit expansion for the private sector. The rapid credit growth reflected through a combination of numerous factors including higher corporate leveraging, booming the market capital, the financial development, and innovations of the whole country. The expansion of credit has brought crucial advantages, supporting saving channels both in domestic and while foreign, as well as helping economic growth. However, the vigorous economic improvement creates an upward trend in the price of assets, leading an increase for the borrowers' creditworthiness, which in turn encourage them to seek more loans against greater values of collateral. At the micro level, the fast credit growth may involve making new loans originated without proper screening and risk management, leading the constraint of capacity. Regarding macro-perspective, fast credit expansion may associate with strategy concerns that the whole financial market system becomes riskier when banks and financial institutions are willing to take on more risks. In addition, it may include reliance on the same asset types and loans, leading borrowers are becoming more exposed to shocks. Hence, the recent fast credit expansion may affect loan quality, promote systemic risk and deteriorate bank soundness. Most existing research has witnessed that credit extension and the soundness of the banking system are interrelated (Gourinchas, 2001). The brisk pace of rapid credit growth also associated with threats about prudential risks in terms of micro and macro levels. Therefore, the paper examines the effects of rapid credit growth on bank soundness by using Vietnam as a case study. Through quantitative method based on

macroeconomic factors and data of banks from 2007 to 2013, findings show that fast credit extension would weaken banks and its interconnection with sounder and less sound banks; besides, its effects on the soundness of banks linking with detail influence of rapid credit growth through main aspects such as profitability, liquidity, capital adequacy and the quality of assets.

2. Literature Review

2.1 Overall impacts of credit boom to the soundness of commercial banks

The majority of the field has primarily focused on developed economies, as the US Banking system and EU markets (Contessi and Fracis, 2009). Using the statistics quarterly from 1992 to 2001 in Latin American area, Maechler at al (2009) found that while the general, increasing loans of eight major banks had been associated with an enhancement in the soundness of banks, he argued the fast extension credit could weaken banks' soundness. Additionally, almost existing models anticipate a negative correlation among credit expansion and the soundness of commercial banks (Dell' Ariccia and Marquez, 2006), the sign of the result is ambiguous. It could be reviewed that banks' efficiency grows positively with credit extension in case of sounder banks because of their larger capacity and caution, while less sound banks tend to apply aggressive policies and bet their resources to take more risks to promote their customer base or to survive. In the assessment of credit quality, the quality of credit based on macroeconomic variables, which generally reflected by real GDP growth. If credit shocks happened in the period of the economy boom while provisions based on customer defaults of the current years, the provisions and LLRs is estimated to relate with GDP growth negatively. Hence, the relationship seems to have small lags variable in the business. (Arpa et al. 2001; Salas and saurina, 2002). Following a result from Idia case, Pandit et al. (2006) proposed suggestions in terms of banking lending system that big-scale banks have more advantages to insulate their lending supply through contractionary rules shocks compared to other small-scale names. In the same period, by collecting data from 1996 to 2000, RBI (2006) claimed that the major determinants of bank credit growth included non-performing loans, asset price, capital factor. Otherwise, credit booming is believed to associate positively with the output of the financial market (RBI, 2006).

2.2 In the assessment of rapid credit growth

Tornell and Westerman (2002) estimated the movement of credit growth linked with a range of explanatory variables such as: the real exchange rate, real GDP, real investment and non-tradable output ratio in developed countries. Furthermore, Catao (1997) estimated the demand and support for private credit sector in Argentia from 1992 to 1997, a range of factors were found that weakened the credit channel such as interest rate, the level of indebtedness linking with the unemployment rate. On the other hand, two different correlation types were identified that included positive relationship among credit channel and real GDP, and negative impacts of both short and long-term interest rate with credit expansion. Shijaku (2013) tested a similar model method with Albania market, in this case, he proposed a positive link between lending channel to economic growth. In other words, the authors believed that the more qualitative of the banking credit system, the more return earned. Baraja et al. (2010) using the credit data in both Middle Eastern and North African, the researcher found that the crucial determinant was the funding quality of the bank. For more details, the main difference sign in terms of credit growth between 2 areas based on capitalization and liabilities quality. In the following years, Guo and Stepanyan (2011) examined the movement of banking credit system by the data collected from 38 emerging countries. He selected both pre-crisis and post-crisis period, and the results showed that credit expansion was fed by the increasing of domestic deposits and non-residents loans, the loose monetary policy coupled with greater credit growth ratio. Furthermore, their findings indicated that high level of GDP growth create a strong credit expansion and a higher level of the inflation rate, while the nominal credit trend was opposite line with real credit growth. Finally, Stepanyan reviewed a recommendation that credit expansion period should be linked with commercial banks having the safety balance sheet and low level of non-performing loans. In a similar research topic, Igan and Pinheiro (2011) reviewed the correlation among credit growth and the soundness of bank by observing two-way causality. Two periods were divided included moderate growth time and boom period. The findings proposed that credit expansion is recorded more-dependent on soundness in the non-boom period and at this sub-period, a bank with a higher level of soundness tend to build up faster. According to some recent estimations of credit growth, Tan (2012) pointed out

inefficient commercial banks in Philipines caused limitation for credit expansion. Besides, he indicated that interest margin is increasing along with the size, capitalization and ownership and overhead costs of banks. An analysis by Allen et al. (2014) also witnessed that some bank's specific factors like the growth rate of deposit, return ratios have become crucial determinants for credit growth in both normal period and booming time. Agreed with that finding, Scharfstein (2010) concluded that commercial banks focused more on deposit management leading to sounder performance during crisis-period.

2.3 Factors driving the soundness of commercial banks

 In the assessment about the soundness of commercial banks, Kumbirai and Web (2010) examined the efficiency of South Africa commercial banking system from 2005-2009. They firstly investigated that banks' performance based on main serial factors such as credit quality, liquidity, size and ROE ratio. Also, they witnessed an upward trend in the overall bank performance by the first 2-year period of the entire research, associated with the onset of the current global financial crisis, which mainly is related to the credit boom. For more details, they reported a falling in the ROE annual, reducing liquidity and deteriorating the quality of the credit sector in the South African banking system. Similarly, in the study of profitability determinants in the Africa banking system, Avanda et al. (2013) revealed some different main factors included Bank Size and, in this case, the author denied the impacts from Cost Efficiency by the statistical result. However, the research by Avanda used First Bank of Nigeria Plc as the only case. Besides, he pointed out the significant impacts from Credit Risk (Loan Loss Provision - Total Assets) and Equity- Total Assets as Capital Adequacy in both long and short term. Furthermore, another factor called Labour efficiency, which based on the main concept of human capital and Staff-income-Total Assets was proposed to have impacts on the only side of long-run. He also addressed macroeconomic variables determined bank return, but only Broad Money Supply was recorded as a significant statistical value.

There is a range of existing research mentioning factors driving banks soundness, Al-tamimi (2010) divided selected factors into two different groups named external factors and internal factors. Ownership, the control of the firm, the return of the bank, the capital level will influence the soundness of commercial banks through internal policies of management and even the board.

Bank capital is considered as a stable source to maintain bank liquidity when the deposits from customers are mainly short-term, especially in markets which are not really developed. The capital rate also witnessed the abilities for intermediary institutions to cover harmful effects from the market (Sangmi and Nazir, 2010). In order to deal with the mentioned issue, almost central banks decided to control the capital ratio of commercial banks, also used capital adequacy such as rate to estimate the internal power of banks to cope with a crisis situation. In other words, the reducing in sub-optimal capital level leading a decrease of banking profit in terms of investment. Another factor was liquidity, which is generally considered as the capability reserved of a particular bank to meet its obligation or unexpected shocks from the customer. Regarding Dang (2011), he claimed a positive relationship between the liquidity of banks and the level of potential return. It is generally agreed to bring remarkable impacts on bank performance such as in researches by Tumin, Ilhomovich in 2009 and 2011 respectively. Nevertheless, with the same test by Said in 2011, the author witnessed that there is no correlation among liquidity and bank efficiency level based on his research in China and Malaysia cases.

By 2011, Gul et at pointed out that almost existing financial literature assumed to total banks' assets applied as a proxy of bank size. In other words, the size of commercial banks has considered important drivers of the variation of performance across intermediary institutions (Hassa, 2002). Hence, these findings were of the view that for banks to operate optimally by obtaining scope and scale, banks must possess a certain degree of size. Large-scale banks are more likely to gain economic advantages due to their superior capital and historical development compared to smaller banks (Dogan, 2013). Besides, Scheer in 1987 supported the initial theory with ideas of greater competitiveness power, higher market share, more ability in diversification their products in favor of larger banks. However, Jonsson in 2007 also raised a question that existing diseconomies of scale might make them become less efficient and less profitable compared to new-comer names. He tested the relationship among company size and its ROE through data collected from 250 firms included banks, civil engineering consulting during the period 2000 to 2004 and pointed out a weak and negative relationship between variables mentioned.

In order to measure the soundness of the bank, distance to default (Z-score) is mainly considered a method to estimate bank soundness, De Nicolo et al. (2005). For more details, it is directly based on the probability of default, when the value of current liabilities raised to higher than the total value of assets. the author suggested the greater value of the distance to default, the lower the probability for insolvency risk. Regard to recent research about indicators of banking system soundness, the report of Fitch's banking system considered asset quality, capital adequacy, liquidity, exchange rate compared to a system average of individual bank ratings. The Department of Banking and Finance in Ghana (2013) examined the activities of the bank by lending channel. Their result showed a statistically significant and positive among bank size as well as capital form with lending growth by using GMM-system indicators. Turning into macroeconomic factors, they also pointed out clues about negative impacts on lending behavior by exchange rate and lending rate of commercial banks. On one side, they provided clues in how bank characteristics and market environment affect the composition of liabilities portfolio. Besides, they also found out negative evidences and significant impacts of some macroeconomic indicators such as central bank lending rate and exchange rate on bank lending behavior. The relationship of banks although the negative evidences come out in a conclusion that this, policies aimed at maintaining stable macroeconomic fundamentals would greatly accelerate bank lending decision. On another side, bank characteristics and the institutional environment influence strongly to the composition of banks' loan portfolio.

A viewpoint to determine bank soundness and the impacts of rapid credit growth, bank-specific variables are likely to influence bank performance, while banks grow up their lending represented the supply-side factors of credit growth (Rajan, 2005). In the same assumption with recent research about bank soundness, Worrell in 2010 estimated bank ROE, liquidity, the size of total assets, bank ownership selected as explanatory variables. While bank regulators recently increasing their confidence about the distance-to-default measure in order to estimate bank soundness due to the successful commercial application by Moody's KMV, the theory also has been chosen through pervious serial economist such as Black and Scholes in 1973, Ghosh (2010).

3. Methodology

3.1 Data Description

The authors looked at the bank-level data in Vietnamese from 2007 to 2013 from their own financial reports published, in which the impacts of credit growth 2007 - 2010 might be delayed to the following years. In addition, the credit boom has been estimated when the credit-to-GDP ratio increase greater than that is implied by a back-ward-looking. In other words, a credit boom period for the banking system in Viet Nam was estimated to be credit boom as in the period 2007-2010 when the total credit to GDP was much higher than 10 percent, up to 28% and 30% in 2007 and 2009 respectively. In comparison to historical trend from 1990, the credit boom episodes followed two conditions: the growth rate exceeded 10 percent, and the deviation is reported to be higher than 1.5 times of the historical standard ratio. The reason for limiting the sample period researched to before 2014 to be able to derive new policy implications at that time, linking with the effects of the global financial shock appeared and the entry to WTO in 2007. Another motivation for ranging time series of the soundness from 2007 to 2013 because the asset expansion in the banking system has been clear since 2007, which doubled from 2007 to 2010. Furthermore, this soundness of bank and impacts of credit growth obviously associated with non-performing loans sectors. Hence, this research limits the estimated period to avoid influencing of the formation of Vietnam asset management company - VAMC, issued in the Decree 53 at the middle of 2013, which support banks to dispose NPLs from their balance sheet up to 5 years.

The statistics are selected from 18 major ranked commercial banks in Vietnam in market share field from Bank Scope data. The banks elected for the model follow requirements. First, it is required to remain active at the end of 2013 with continuous data published at least 5 years. Second, the banks selected have to ensure legally its representation in Vietnam banking system, which is mainly divided into 2 major groups such as State-owned commercial banks (SOCBs); Joint-stock commercial banks.

To avoid potential estimation errors and to misreport, the paper dropped 5 percent of the observations on the tails of the distributions of the two main variables. Besides, the bank's total assets are reported that more than 85% of the total assets in the whole banking system during the period. Otherwise, the paper examined the macro-statistics through reports and information disclosure by the General Statistics Office of Vietnam; State Bank of Vietnam, the International Monetary Fund and the World Bank in the same period.

3.2 Dependent Variables

The paper firstly is seeking for the major impacts of the credit boom on Vietnamese commercial banks, in the period case from 2007 to 2013. Credit Growth (bankCrgrit) is reflected through the annual lending ratio published in commercial banks reports, which is estimated as to the total fund of commercial banks allocated to the market in terms of credit. In other words, data is ensured to collect from financial statement year by year, which is not adjusted for seasonal factors. According to the commercial banks' soundness, four bank-special factors are estimated as profitability, asset quality, capital adequacy as International Monetary Fund recommendation and the preferred factors which has been selected by many economists, namely distance to default - Zscore, Ghosh (2010), Izan and Pynheiro (2011) and Scoles (1973).

The profit advisability of 18 commercial banks is delivered by the Return on Equity (ROEit), currently the most extensive measure of indicating profit, which demonstrates the generating profit and added value ability for banks' shareholders. In observational research towards commercial leverage, ROEit is an efficient approach, such as in Goddard et al. (2004), Hoffmann (2011).

According to To Ngoc Hung (2013), commercial banks now use the ratio of provision for credit losses on lending (LLRGLit) rather than NPL to reflects asset quality. The NPL has instead used to shows the loan portfolio aspect in researches, which is different in Vietnam because of the impaired regulation regarding debt arrangement (as cited in Do et al., 2017).

To display capital competence, commercial banks use The equity-to-total capital ratio (CAPit), in which they have a tendency to adopt financial leverage as holders strongly are the main capital streams, however, a low CAPit would put banks into a tough situation when it comes to economic variables. Hence, they need a high ratio of CAPit to avert a financial crisis.

To measure the soundness of commercial bank, most existing research use "distance to default" reflected the possibility of a particular bank. In this case, we applied the simple form of Z-score proposed by Black and Scholes (1973). The higher value of Z-score took account, the safer financial leverage, and potential return.

3.3 Independent Volatilities

There are two branches of independent volatility, which are macro and micro fluctuation.

Macro fluctuation
Through elected macro changes, it is quite clear to notice credit demand and profit advisability of individual commercial banks. To present the credit capital demand, the real GDP growth rate is favored, in which the higher GDP growth, the bigger investment flow in the country, specifically in the Vietnam economy of banking finance. To illustrate the credit capital need, the real lending interest rate (realIRit) is preferred, in which the high-interest rate would lead to high borrowing costs. Thus, it is important to have a converse increase in real GDP and reakIR. To express the foreign currency loan demand, the change of the real multilateral exchange rate (delReeRit) is suggested in the context of exchange rate variations (Igan and Pinheiro, 2011, as cited in Do, et al., 2017). The above macro fluctuations confirm the economic shifts as well as the business risks that would create certain impacts on banks.

Micro fluctuation

According to De Nicolo et al. (2005) (as cited in Do et al., 2017), the factors influencing a bank' solidity are related to its authority on price, scale, as well as its total asset construction. The liquid assets-to-total assets ratio (LIQit), suggesting the available liquid assets for instant expanse, which is used to demonstrate a bank's liquidity situation. This ratio offers safety improvement in business activities, however, creates an unhealthy effect on the bank's profit advisability.

The cost-to-income ratio (CIit), specifying the competence of a bank in price authority, is another factor making changes to the solidity of the bank (De Nicolo et al., 2007). Another obvious factor was the size of assets which mainly influences to bank's competition position such as improvement, return, and safety. This factor is estimated to follow the form of the natural logarithm of the total assets instead of using total assets, Sizeit, Berger et al. (2005). Generally, the size is expected to associate with a positive relationship with banks' soundness. It could be explained because the market share in Vietnam mainly belongs to large-scale state-owned banks such as Agribank, Vietcombank, Vietinbank, and BIDV because their advantages about capacity, client's confidence and government supporting.

Table 1: Variables

	Variables	Description	Symbol
Dependent Variables	The soundness of commercial banks	Profitability [Profit after Tax / Equity]	ROE_{it}
		Asset quality [Loan-loss Provisions/Outstanding Loans]	$LLRGL_{it}$
		Capital adequacy [Equty/Total Capital]	CAP_{it}
		Distance to default [zscore = (ROA + CAP)/δROA]	$ZSCORE_{it}$
	Credit growth of commercial banks	Credit growth rate [(Outstanding Loans in the period of t – Outstanding Loans in the period of t-1)/ Outstanding Loans in the period of t-1)	$bankCrgr_{it}$
Independent variables reflecting the characteristics of commercial banks	Size of assets	Ln (Total assets)	$SIZE_{it}$
	Liquidity	Liquid Assets/Total Assets	LIQ_{it}
	Structure of assets	Outstanding Loans /Total Assets	LA_{it}
	Operation Effectiveness	Cost/Income	CI_{it}
Macro independent variables	The cycle of the economy	Real GDP Growth Rate	$RealGDP_{it}$
	Interest rate	Real average Lending Interest Rates	$RealIr_{it}$
	Exchange rate	Annual Change of the Real Multilateral Exchange Rate	$DelReeR_{it}$

Source: Synthesized by authors

3.4 Model Specification

In order to reveal the impacts of fast credit expansion on banking system soundness, the paper ran the three stage least squares with two equations as follows:

Equation 1:
BankCrgr$_{it}$ = f(bankCrgr$_{i,t-1}$; banksoundness$_{i;t-1}$; RealGDPt-1; RealIr$_{t-1}$; DelReeRt-1; SIZE$_{i,t-1}$; LA$_{i,t-1}$)

Equation 2:

$Banksoundness_{it} = f(bankCrgr_{i,t-1}; banksoundness_{i;t-1}; RealGDP_{t-1}; SIZE_{i,t-1}; LAi_{,t-1}; CI_{i,t-1}; LIQ_{i,t-1})$

In this case, i reflects for the commercial bank called i, t reflects year t. Otherwise, a couple of lagged explanatory variables are also listed in the model to estimate the lagging impact of the rapid credit expansion and soundness of commercial banks. Furthermore, the variables are listed with the natural logarithm structure to value impacts among variables selected and to avoid auto-correlation.

Regarding to economist perspective, the three-stage least squares method is generally considered as suitable and proper regression model for panel statistics link with a short period and include lagged dependent variables. In this case, my paper applied this method to reveal reciprocal correlation among two equations mentioned. Another reason was that three-stage least squares provide a higher level of consistency and adequacy compared to the dynamic regression or two-stage least squares method. Furthermore, the method allows to estimate a generating of the covariance matrix of the residuals through equations, leading the results becomes reliable. (Chris Brooks, 2008).

4. The regression results and implications

4.1 Correlation results and implications

Following the results recorded in Appendix 1, looking at the descriptive data of variables selected in the model. The paper witnessed the average expansion of credit in the case of Vietnamese banks was very high through the examination period with the standard ratio is about 46,58%, while this credit extension associated with high dispersion when the standard deviation recorded as near 39 proportion. In fact, looking at the Vietnam financial market, there is a range of banks experienced a high credit expansion while the rate of others is reported by a negative growth by 15.93 percent. It seems to fit with the real structure and competition for the banking system in Viet Nam, where the small number of state-owned commercial banks owned the most major credit market shares. Hence, despite the fact that quantity of Vietnamese commercial banks counted as high number compared to other countries in ASEAN, small-scale branches had less opportunities to grow up their credit field in the booming period because of the lack of resources, capital and client base. The result showed an outstanding increase in terms of asset quality (LLRGL), profitability (ROE) and CAP followed by an upward trend during the credit boom period. Besides, the loan loss reserves level for outstanding liabilities is indicated as 1.29% on average while this rate was just about 1.19% in the rapid credit growth period, much lowering than the remained rate (1.381%). Also, the average CAP and ROE rate of the commercial branches selected in the examined period was much greater than the normal rate compared at the same period. Recording to economist perspective, Keyness (1932) explained the reason through "Financial Accelerator Mechanism," which is supported by Fisher in the following year. The main theory claimed that the increasing asset price and market confidence affected positively to economic indicators. One of the most obviously benefits of using Z-score is that the estimator takes into account the banking operation risk level by the change of ROE. The regression also resulted that the commercial banking system in Vietnam has prepared a great safety level when the Z-score data remained over 30 on average during the examination period. Nevertheless, throughout the booming period in question, the Z-score has a lower level compared to the that in the remaining period, it seems a downward trend in the field of bank's soundness. Additionally, the data recorded a quite high level of dispersion of the Z-score, witnessing a limitation of harmonization in the Vietnamese banking system. This could lead to systemic risk and make commercial banks to be more vulnerable to prevent shocks from the real market.

The indicator also draws that the percentage of outstanding liabilities on the total banks' assets (LA) taking account about 55 percent on average, with a slightly high level of dispersion. In this period, the rate is reported to jump correspondingly, reflecting credit growth at this time. Similarly, the rate of liquid assets to total assets (LIQ) was 33.2% throughout the researched time. A reasonable explanation for that was commercial banks tend to expand their credit portfolio. The average real credit growth in Vietnam in the entire researched time was 6.23% while during the period of the credit boom, the real GDP growth rate is much lower than that of the minimum rate. In addition, the real average leading interest rates (RealIr) is indicated to be lower level throughout the credit boom.

This results suggested that due to the expansion of the credit field, the real leading rate was lower than that in other periods because of high inflation. In terms of exchange rate factor, delReeR data showed a depreciation of the Vietnamese currency (VND) compared to the branches of key global currencies. The increasing of the devaluation led a significant jump in exchange rate risk, which affecting the soundness of Vietnam's banks negatively.

Looking at the Appendix 2, it was generally accepted that the correlation could describe the relationship among variables but not the causality. It also is ranged from -1 to 1 with the value of 1 reflected a positive linear correlation, and in the case of negative linear correlation (-1). Furthermore, a model with strongly correlated variables led to the multicollinearity problem, which harmed the accuracy findings. According to the Kenedy theory (2008), who suggested that a strong correlation among variables occurs when the absolute values exceed 0.8. In other perspectives, Sweeney and Williams (1990) examined the strongly correlated result should be above 0.7. In this case, it is clear to see that multicollinearity appeared by the value between a couple of variables such as (Z-score; CAP) and (realIr; delReeR). Nevertheless, there is no clue for auto- correlation in the model because of the low level of the correlation coefficients values recorded.

### 4.2 Regression results for the period 2007 – 2013

Looking at the data from Appendix 3, commercial branches in Vietnam tend to remain high credit growth. For more details, the credit growth variables (BankCrgr)is reported as a positive value in all equations and took significant account level. This results also witnessed that sounder banks would likely to keep credit expansion. The reason for that because commercial banks with greater Z-score coefficient in the previous year, they tend to concentrate more on credit growth in the next year. Similarly, increasing in CAP and ROE rates made commercial banks to be willing to grow up their credit (seeking more profits). In turn of LLRGL, the negative sign of the coefficient witnessed the greater risk provisioning ratio along with the deteriorated liability portfolio quality, which leads commercial banks to be more cautious in the expansion of credit. It could be explained when the profitability and the soundness followed an upward trend, and they may be willing to take more risks to maintain cash inflows. It is remarkable when credit extension in Vietnamese names selected remain higher and includes a large number of small-scale branches in favor of the variable Size took negative values in all equations and was significant at 10 percent. Hence, despite the fact that large-scale commercial banks had advantages in capital and cost compared to smaller names in the Vietnam market, they tend to become more cautious in credit growth. In another side, small branches tend to seek more market share and profit through the credit channel. It is reasonable because small-scale names mainly belong to new-comers, so they are willing to apply aggressive policies to extend customer base and to survive. This explanation is agreed with existing researches anticipating that the less-efficient banks are willing to take more risk (Berger and DeYoung, 1997; Berger and Humphrey, 1997). For policy-maker perspective, an important task is to determine what the bank takes more risk is. My paper outcomes suggest foreign-owned banks took part in higher level risk compared to other domestic banks by an aggressive strategy to entry Vietnam's market. Is also is claimed by Igan and Tamirisa in 2008, they provided clues that there is significant statistical evidence that credit growth of foreign banks associated with distance to default, the case applied was European countries. As a result, the increasing high-risk loans and lowering lending standards in terms of credit growth will harm the quality of credit expansion, which leads the whole banking system will be more instable when adverse shocks occur. The mechanism can answer why a financial shock is usually preceded by rapid credit expansion.

Figure 1: Credit and Deposit Growth in Vietnam banking system
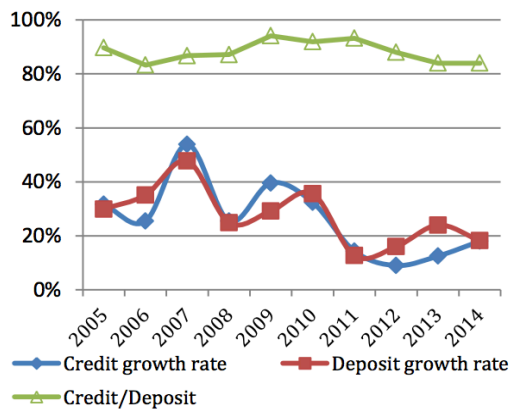
Source: The SBV's website

Figure 2: Loans-to-deposits rate
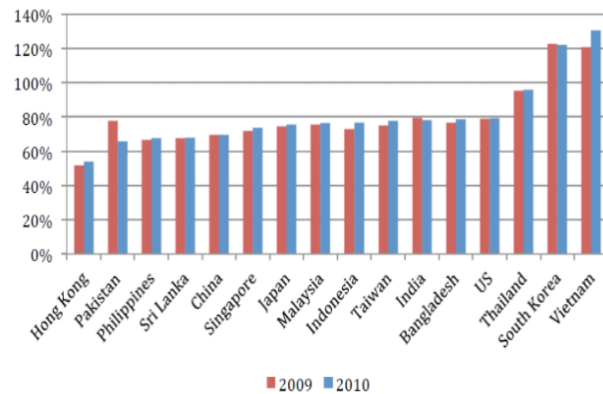
Source: The SBV's website

According to the real situation, in the period of the crisis, liquidity pressures have been appeared frequently in the Vietnam banking system due to the fast increasing of credit was much higher than that of existing deposit, causing a remarkable gap among assets and liabilities. Throughout the period from 2007 to 2010, the credit growth peaked at about 29% annual while the rate of deposits expansion average is reported as just 21.15% per annum by State Bank of Vietnam. The serious imbalance led loan-to-deposits rates up to the high level at 80-90% in this period. In the next following years, the banking system liquidity enhanced but recorded as relatively high level over 82% for loan-to-deposit rates, while this rates at Asian developed countries is controlled as 30-40% in same period. Another obvious reason agreed with the paper's results, the high level of liquidity risk was an imbalance of maturity of loans and deposits due to the rapid expansion of credit factors throughout 2007 to 2012. For more details, long and medium run loans were at about 40% while the major proportion in deposit belongs to short-term data, was about 80% (Figure 1 and 2), (Figure 3 and 4).

Figure 3: Vietnam banking deposit structure
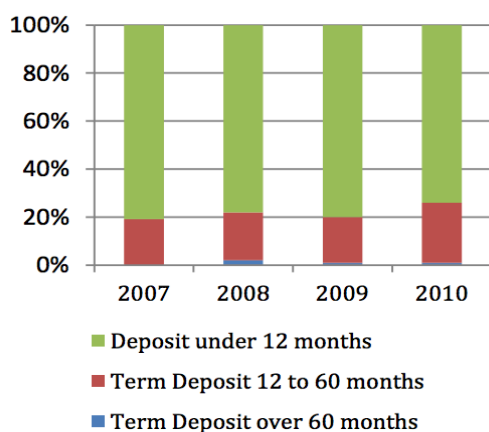
Source: The SBV's website

Figure 4: Vietnam banking credit structure
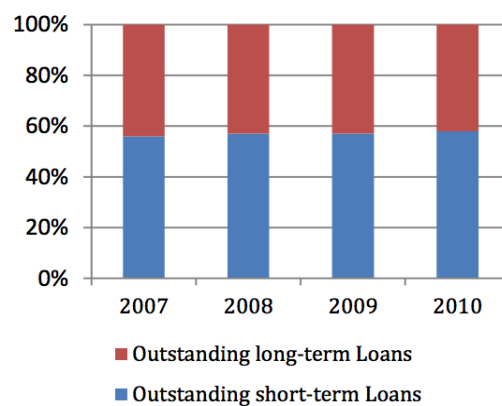
Source: The SBV's website

The realGDP variable indicated the effect of the business cycle on the expansion of credit in banks. The result reviewed that the coefficient value is reported as positive and statistically significant in all equations listed. Bank credit often increases significantly throughout the period of economic expansion because of the relative growth of investment and the aggregate demand in the economy. It seems to become a factor keeping real credit growth

remain at great level by 6%. Nevertheless, policies about credit applied in the fast-growing period are quite "over-optimistic," which caused decisions about leading to being easier and riskier due to the increasing value of assets and corporate value.

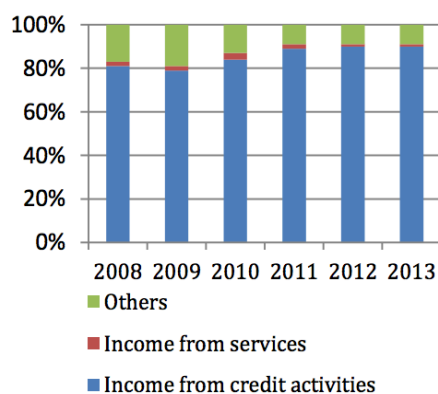In the fields of RealIr and delReeR variables, they both showed a similar sign with anticipations, but both are not statistically significant enough in the estimation from 2007 to 2013. It suggests the change in both real interest rates and exchange rate bring little effect on the lending decision of banks in Vietnam. In the assessment of Vietnamese commercial banks soundness.

In fields of banks profitability, the high level recorded in ROE makes commercial banks more lucrative. The is reasonable for the real situation in Vietnam when commercial banks at the period of high credit growth compared to other developed ASEAN countries, in this case, banks preferred credit actions to gain the possible income. Besides, the rate of outstanding liabilities minus total assets (LA) brings a positive effect on the profitability. The result also witnessed that larger scale of commercial banks associated with higher profitability. It could be answered with the situation in Vietnam at the period when the large scale of commercial bank had the major market share. It is reported mainly as state-owned banks which has many competitive advantage and customer confidence.

The return for commercial banks is also promoted during the expansion time. It explained the correlation among credit growth and ROE in the case of Vietnam, which is not really developed market when the commercial bank has been focusing on credit activities. However, the result showed a decline in the return of commercial banks after the period of crisis. The remarkable reason because following the expansion of credit, there is an outstanding increase in the amount of non-performing loans. In order to deal with the issue mentioned, clearly, SBV in 2012 imposed regulations based on the concept of Basel II in to force commercial banks that they have to promote risk provision by their income, leading a decline of ROE in the period after the current global crisis. (Figure 5 and 6).

Figure 5: Vietnam banking income form   **Figure 6: ROA, ROE situation in Vietnam**
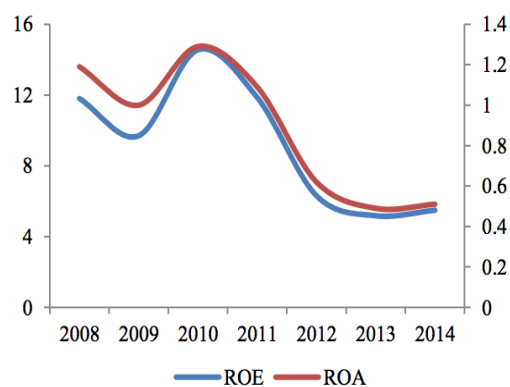
Source: The SBV's website   *Source: The SBV's website*

Looking at the capital form (CAP), credit expansion brings a negative effect to the rate of the equity of all capital. In this situation, it proves that commercial banks in Vietnam controlled their operation through deposits and mobilized funds channel instead of their own equity. Nevertheless, the data results were not significant enough, indicating the dispersion for using the fund to control loans between commercial branches.

According to the quality of assets, there is a negative correlation among credit expansion and risk provision, which mainly deteriorated through the NPL ratio. The rate also improved rapidly since 2011, which reflected the new non-performing loans has raised significantly by the credits granted previously. However, the model results showed not really significant outcomes because bad debt has jumped rapidly by a range of reasons such as

inefficient corporate governance, poor investment method, inadequacies in credit risk provision (To Hung, 2012). Furthermore, following outcomes of credit boom from 2007, this led to unstable economic expansion in Vietnam banking system such as an increasing a huge amount of credit flowing into stock and real estate factors leading bubbles in the real estate financial market. In addition, the coefficient of LLRGL variable witnessed a positive sign, linking with high confidence. It is clearly to see that less effective banks associated with greater credit risk also bring a remarkable effect of asset quality. The result also is supported by Marque (2006), and Lowy (2002), they proposed speeding up of credit factors is the main reason for increasing risk in the banking system through credit losses and raising NPL rates. The more details for the Vietnam case will be mentioned as in (Figure 7). The model results also found that large-scale banks have focused more in fields of credit risk provision because they tend to avoid systemic risk. Figure 8 also shows the real situation that some large-scale listed bank tend to build up credit risk provision.

Figure 7: NPL rates in Vietnam
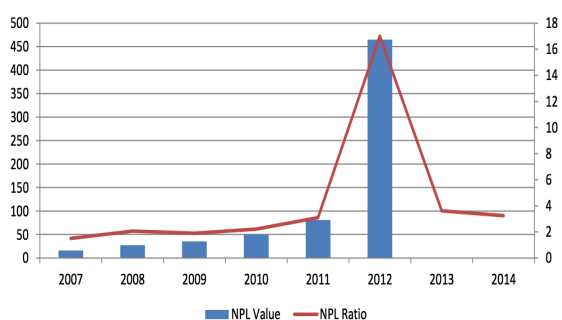
Source: Synthesized by authors

Figure 8: Credit loss management

Source: Synthesized by authors

Regarding to the distance to default (Z-score), the regression outcomes witnesses a negative effect of credit expansion on the Vietnamese commercial bank's soundness by great significance level of the coefficient of Bankcrgr variable. It is reasonable because commercial banks especially small-scale focusing on high-speed credit expansion, which in the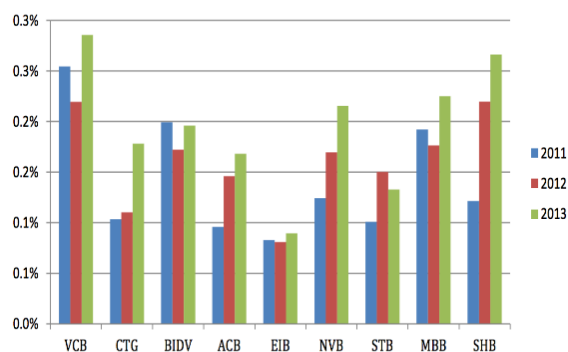 period of the credit boom and financial crisis considered as non-traditional lending, causing a higher level of risk. To cover fast credit growth, SBV also takes actions to depreciate Vietnam currency to ensure domestic goods competitiveness, leading reducing the high speed in following years.

In sum, the credit expansion from 2007 to 2010 brought considerable impacts on the stability of the market as well as the soundness of commercial banks, which has been estimated by applying the three-stage least squares method. There is a range of significant results has been founded such the outcomes about Z-score, the profitability, the liquidity of commercial banks and the fast expansion impacts on the size of bank as well as bank's ownership has been revealed.

5. Recommendations

In order to deal with the issue mentioned, the paper proposes a range of policy recommendations to avoid another unexpected negative impact in the near future. First, to avoid potential outcomes of credit shocks, early warning estimators need to prepared before introducing solutions to make sure that credit expansion met the line with natural capital absorption of Vietnam financial market. For more details, one of the most obvious changes related to credit boom period was as a credit-to-GDP ratio. Hence, there is a necessary to oversight the speed of credit growth based on the capacity of capital absorption, represented by the economic growth ratio. In addition, 2% threshold is considered as a proper rate to alarm early warning of the credit boom period in a range of countries with 87% confidence related to existing banking shocks (BIS, 2010). Turning into the case of Vietnam, the paper suggested the same rate as 2 percent threshold should be addressed. Besides, we also need to consider real economic growth as another reliable indicator due to the positive relationship between credit demand of the market in terms of consumption and investment and high-speed GDP growth period. Another alternative indicator is

focusing on substantial movements in asset prices such as real estate and securities, which reflects potential risks when bank lending increase sharply related to economic factors like real estate and security markets. According to the recent global financial crisis, the fast expansion in house price-to-per capita income rate which up to over 2% is one of the first sign for the beginning of the credit boom. Turn into macroeconomic policies, my recommendation focusing on enhancing the role of supervision in the banking system. It is necessary for SBV to apply transparent risk provision method to commercial branches. Furthermore, commercial banks should be required to joining stress test frequently, including promoting specific prepared solutions to deal with unexpected shocks from the credit market. Likewise, the State Bank of Vietnam should adjust its supervisory model as the first actions to prevent uncontrollable expansion in the credit market. In terms of macro-prudential surveillance, it is also necessary to apply specific supervision for non-bank credit institutions. Regarding to commercial banks, during the rapid credit extension period, credit risk provision needs to be promoted, linking with raising their awareness and liquidity. Judging from the case of Vietnam, when major banking system activities focusing on credit field, maintaining a decent market share of state-owned banks could be a reasonable method to boost customer confidence as well as claim reliable insurance to deal with the downturn of the economic market. Last but not least, diversification in the banking system should be addressed to raise the competitiveness between the foreign bank and domestic banks.

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The RAS Method with Random Fixed Points

Bui Trinh[1], Nguyen Viet Phong[2], Bui Quoc[3]

[1] Ph.D., Vietnam development research Institute, Association of Regional Econometrics and Environmental Studies (AREES) Japan

[2] Director at construction and capital department – Vietnam GSO

[3] Student at mathematical faculty – Vietnam National University

Abstract

Today many economists believe that RAS is the initials of economist Richard Stone, who is also the father of the National Financial System (SNA). This idea was introduced to update and reconcile the total supply and total use vectors in the input output table (I.O.T), supply and use tables (S.U.T) and social account matrix (SAM). This article attempts to explain and devise new algorithms so that the user can easily feel the practical application with more variable customized assumptions based on the application of information technology to the processing of the algorithm. This article appears to be a continuation of the article "A Short Note on RAS Method" at Advances in Management and Applied Economics (2013) vol.6, Issue 4.

Keywords: RAS method, Supply-Use tables, Input-Output Tables, Correct Row Total, Correct Column Total.

JEL Classification Numbers: I32, I31, C43

I. Introduction

For many researchers around the world and statistical offices of some countries, the application of the RAS method can be said in both easy and difficult ways. In this study, we want to give readers the best way to understand the balance of the supply and use tables or the input-output table in the normal process. This job will become easier if there is effective software to automatically make all necessary balancing steps in the quickest and easiest way. GDP can be estimated by three approaches: income, expenditure, and production, see Lee (2011) and Lequillier and Blades (2006). In theory, these three approaches will yield the same estimate; In fact, they are different because they are based on different data sources, each with its own fault structure as well as different estimation methods. The Swedish Statistical Office has developed A System for Product Improvement, Review and Evaluation basic indicators of the National Accounts system called ASPIRE.

The difference between the GDP estimates generated by each approach is called "statistical error." The size of the statistical error is a measure of the quality of Country account statistics. In many statistical agencies, including Sweden, steps are taken to balance different estimates of GDP. A number of techniques are used but are usually based on the RAS methodology, and the Trinh and Phong (2013) research are applied in a number of countries, especially Sweden, which are named of economist Richard Stone, who proposed this idea.

In previous research by B. Trinh and N.V. Phong (2013) molecules of the origin, matrix are allocated with the equal role of the elements, meaning that all elements in the original matrix can be modified upon updating. But

when updating a table S.U.T or table, I.O.T may be some element in the matrix is constant. This article attempts to solve this problem. This article appears to be a continuation of the article "A Short Note on RAS Method" at Advances in Management and Applied Economics (2013) vol.6, Issue 4

II. Problem solving

The main objective of the RAS method is to balance the columns and rows of the input - output table or supply and use tables when updating or modifying these tables. The basic equations are cycles depending on the degree of difference. These equations are described as follows:

$X_C^{new}(tn). X_C^{new}(tn-1)..X_C^{new}(t1).A.X_R^{new}(t1)… X_R^{new}(tn-1). X_R^{new}(tn) = A^{new}$ (1)

With:

$X_C^{new}(ti)$ is a diagonal matrix with elements on the diagonal that is the element of the column vector of new output in the time ti; $X_R^{new}(ti)$ is a diagonal matrix with elements on the diagonal that is the element of the row vector of new output in the time ti; A is coefficients of direct input matrix or original matrix that can be updated by time. $X_C^{new}(ti)$ has form;

$$X_C^{new}(ti) = \begin{matrix} X_{C1}^{new}(ti) & 0 & 0 \\ 0 & Xci^{new}(ti) & 0 \\ 0 & 0 & Xcn^{new} \end{matrix}$$

(2)

Same with $X_R^{new}(ti)$

$$X_R^{new}(ti) = \begin{matrix} X_{R1}^{new}(ti) & 0 & 0 \\ 0 & X_{Ri}^{new}(ti) & 0 \\ 0 & 0 & X_{Rn}^{new} \end{matrix}$$

(3)

In the case where matrix A has fixed elements in the time of update or modification, then analysis of matrix A:

$A = A_1 + A_2$ (4)

A_1 is a matrix with mutable elements, A_2 is a matrix with immutable elements, such as A_{i1} and A_{1n} are constant,

Matrices A, A1, and A2 are shown below:

$$A = \begin{matrix} A_{11} & A_{1i} & A_{1n} \\ A_{i1} & A_{ii} & A_{in} \\ A_{n1} & A_{ni} & A_{nn} \end{matrix}$$

(4)

$$
A1 = \begin{matrix} A_{11} & A_{1i} & 0 \\ 0 & A_{ii} & A_{in} \\ A_{n1} & A_{ni} & A_{nn} \end{matrix}
$$

(5)

And:

$$
A2 = \begin{matrix} 0 & 0 & A_{1n} \\ A_{i1} & 0 & 0 \\ 0 & 0 & 0 \end{matrix}
$$

(6)

Or:

$$
A_2 = \begin{matrix} A_{11} & A_{1i} & A_{1n} & 0 & 0 & 1 \\ A_{i1} & A_{ii} & A_{in} & 1 & 0 & 0 \\ A_{n1} & A_{ni} & A_{nn} & 0 & 0 & 0 \end{matrix}
$$

(7)

Put: $B = \begin{matrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 0 & 0 \end{matrix}$

Matrix B implies that elements of the original matrix A are fixed in the update, and thus relational (7) is easily

simulated using a simple software.

A2 is the constant consisting of constant elements, the remainder being 0
And

$A^{new} = A_1^{new} + A_2$

A_1^{new} apply relationship (1)

III. Case study

The original matrix with dimension is (10 x 10) shown in table 1, two columns and rows are the sum of them and correct vectors (column and row) that need to adjust origin matrix. The vectors to be adjusted are the CORR COLUMN. SUM and CORR. ROW

Table 1. Origin matrix

	1	2	3	4	5	6	7	8	9	10	Row SUM	Corr. Row
1	41,845	16,269	47,279	93,040	29,050	88,709	88,072	20,847	57,283	7,502	489,896	489,891
2	41,176	72,797	17,788	71,340	25,068	11,251	21,610	55,919	61,651	58,134	436,734	436,736
3	29,401	22,413	93,191	30,336	87,009	49,762	61,830	9,813	74,335	49,266	507,356	507,359
4	54,873	45,663	78,843	6,113	65,307	42,004	83,710	65,059	89,662	44,981	576,215	576,208
5	93,838	76,045	77,752	22,148	3,088	37,941	52,996	5,670	87,146	43,373	499,997	500,005
6	60,949	36,728	69,028	89,716	44,044	31,459	52,891	80,338	52,734	33,153	551,040	551,044
7	89,093	85,460	45,861	94,053	69,782	49,051	38,189	63,176	76,580	96,277	707,522	707,526
8	93,430	31,165	31,492	48,101	89,338	74,046	16,372	11,045	38,275	30,581	463,845	463,842
9	88,845	88,563	19,492	47,562	37,621	64,296	3,073	15,736	26,801	34,550	426,539	426,537
10	23,190	30,187	74,229	19,800	39,272	97,604	86,543	47,041	98,545	87,367	603,778	603,774
Col. SUM	616,640	505,290	554,955	522,209	489,579	546,123	505,286	374,644	663,012	485,184	5,262,922	5,262,922
Corr. SUM	616,634	505,295	554,958	522,200	489,573	546,119	505,291	374,642	663,018	485,192	5,262,922	

After that determine the constant elements in the original matrix ($A = (A_{ij})$), the determination of the A_{ij} values unchanged in the above matrix is done customarily. In the example above, the A_{ij} defined as constant are: $A_{1,4}$; $A_{1,7}$; $A_{2,1}$; $A_{2,5}$; $A_{2,8}$; $A_{3,3}$; $A_{3,8}$; $A_{4,6}$; $A49$; $A_{6,1}$; $A_{6,8}$; $A_{7,2}$; $A_{7,5}$; $A_{7,9}$; $A_{8,4}$; $A_{9,3}$; $A_{9,10}$; $A_{10,7}$; $A_{10,9}$.

Table 2. Matrices define constant variables

Mã	1	2	3	4	5	6	7	8	9	10
1	-	-	-	1	-	-	1	-	-	-
2	1	-	-	-	1	-	-	1	-	-
3	-	-	1	-	-	-	-	1	-	-
4	-	-	-	-	-	1	-	-	1	-
5	-	-	-	-	-	-	-	-	-	-
6	1	-	-	-	-	-	-	1	-	-
7	-	1	-	-	1	-	-	-	1	-
8	-	-	-	1	-	-	-	-	-	-
9	-	-	1	-	-	-	-	-	-	1
10	-	-	-	-	-	-	1	-	1	-

Applying the algorithm above gets the matrix to be adjusted.

Table 3. Adjusted matrix

	1	2	3	4	5	6	7	8	9	10	Row SUM	Corr. Row
1	41,844	16,269	47,279	93,040	29,049	88,707	88,072	20,847	57,283	7,502	489,891	489,891
2	41,176	72,798	17,788	71,338	25,068	11,251	21,610	55,919	61,652	58,135	436,736	436,736
3	29,401	22,413	93,191	30,335	87,009	49,762	61,831	9,813	74,336	49,267	507,359	507,359
4	54,871	45,663	78,842	6,113	65,305	42,004	83,710	65,058	89,662	44,981	576,208	576,208
5	93,838	76,047	77,754	22,148	3,088	37,941	52,997	5,670	87,148	43,374	500,005	500,005
6	60,949	36,729	69,029	89,714	44,044	31,459	52,892	80,338	52,735	33,154	551,044	551,044
7	89,093	85,460	45,862	94,051	69,782	49,051	38,190	63,177	76,580	96,280	707,526	707,526
8	93,428	31,165	31,492	48,101	89,337	74,045	16,372	11,045	38,275	30,581	463,842	463,842
9	88,844	88,564	19,492	47,561	37,621	64,296	3,073	15,736	26,801	34,550	426,537	426,537
10	23,190	30,187	74,229	19,799	39,271	97,603	86,543	47,040	98,545	87,368	603,774	603,774
Col. SUM	616,634	505,295	554,958	522,200	489,573	546,119	505,291	374,642	663,018	485,192	5,262,922	5,262,922
Corr. SUM	616,634	505,295	554,958	522,200	489,573	546,119	505,291	374,642	663,018	485,192	5,262,922	

IV. Discussions

In previous studies, the RAS method was mostly used to balance the supply and use tables (or input output table) when the total input or output varied. It does not solve the problem when the total input or output changes but some elements in the matrix of the intermediate cost or the coefficient of the make matrix do not change, such as a sector or a group of industries has a dramatic change in technology in the years following the year in which the supply and use tables can be investigated, and only some industries have changed the Aij coefficient in the intermediate cost matrix or the main product and by-product ratios in the production. This method makes it easy to update the supply and uses tables, and it is also easy to write application software for the RAS method with random fixed points. The steps for solving in the diagram below:

The RAS method with random fixed points

```
            ┌─────────────────────┐
            │    Inputing Aij      │
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      │  Inputing Correct Column    │◄────────┐  FAIL
      │  Inputing Correct Row       │         │
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      ┌─────────────────────────────┐          │
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                      ▼  TRUE
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      │   Identifying Fixed Aij      │
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      ┌─────────────────────────────┐
      │  Identifying Correct-Total  │
      │       Rows/Columns          │
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      ┌─────────────────────────────┐
      │   Building a new matrix     │
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      │   Balancing Rows/Columns    │
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      │  Aggregating Old matrix and │
      │        New matrix           │
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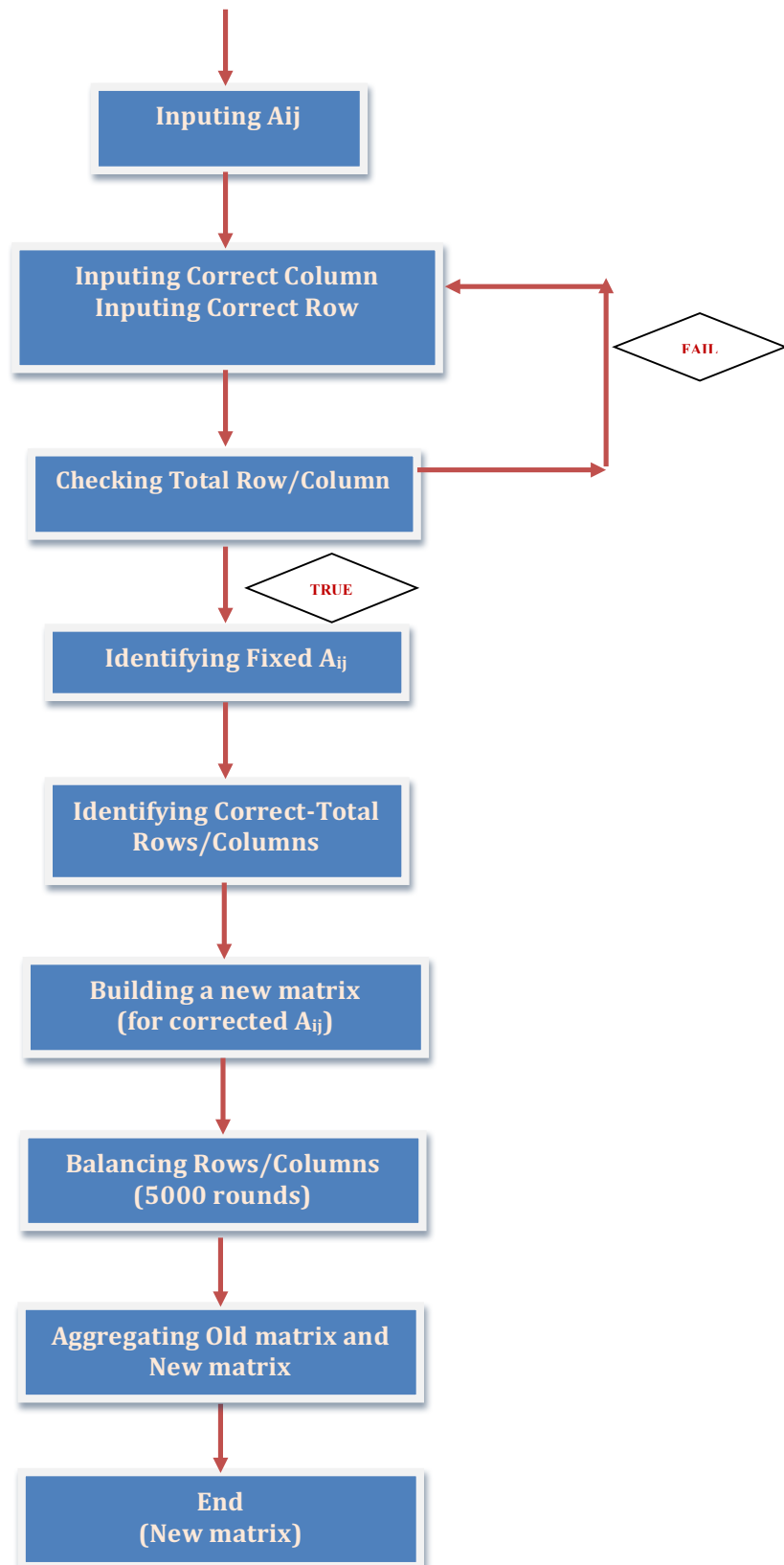
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Cameroon-Congo Economic Relations: A Basis of Propinquity and Trans-Border Trade Opportunities

Damian T. Akara, Ph.D.[1]

[1] Department of History, ENS, University of Maroua, Cameroon. E-mail: akaradt@yahoo.com

Abstract

Since independence, the Republics of Cameroon and Congo (Brazzaville) have not only established diplomatic relations but have also engaged trans-border trade as part of the said relations. These are made possible due to the contiguity of both states. However, Cameroon poses itself as the bread basket of the Central African sub-region as it takes a dominant position in the trans-border commerce among the countries here as is the case with Congo. Over time, the initiation of the Ketta-Djoum and Brazzaville-Yaounde Transport Facility Project came in as a morale booster to accelerate the commercial and other related trans-border activities between both countries. As such, this work argues among other things that despite such innovation, Cameroon maintains its dominant position in the commercial engagements which act as a binding force between the two countries.

Keywords: Economic Relations, Propinquity, Trans-border Trade, Opportunities, Cameroon, Congo

Introduction

Formal relations between the Republics of Cameroon and Congo were established in the years after the independence of these countries. Even though both belong to different regional groups such as the Customs and Economic Union of Central Africa (CEMAC), ECOWAS and CEMAC, they have, that notwithstanding, maintained economic and socio-cultural relations which make their relationship unique in the West African sub-region. Before delving into the relations between both countries, it is important that we trace the geographical propinquity of the two neighbours in order to understand better the bond or foundation on which their trans-border economic relations stand.

Location

Congo or Congo-Brazzaville is situated in west central Africa, bounded on the north by Cameroon (494 km) and the Central African Republic (487 km), on the east and south by the Democratic Republic of the Congo (DRC, formerly Zaire, 1, 229 km), on the southwest by Angola (Cabinda enclave, 231 km) and the Atlantic Ocean, and on the west by Gabon (2, 567km). On the part of the south is the Atlantic Ocean which covers 200 nm. Formerly called the People's Republic of the Congo, it has a total area of 342,000 sq km (132,000 sq m) (CIA, 2014:2).

The Republic of Cameroon on its part is largely situated in Central Africa, bordering the Bight of Biafra between Nigeria and Equatorial Guinea at 6 00 N, 12 00 E on the African continent. Specifically, Cameroon shares borders with six countries. On the West is the Federal Republic of Nigeria (about 1,975 km), on the North-East is the

Republic of Chad (1,116 km), on the East is the Central African Republic (901 km), and on the South there is Equatorial Guinea (183km), Gabon (349km) and Congo (494km). Meanwhile, the territorial waters (Atlantic Ocean) stretches on the west below Nigeria by12nm (Ibid.).

Ground Moves for Economic Cooperation

At the dawn of independence, most African countries decided to pull themselves into different economic and customs groups with the intention of working in synergy for the socio-economic development and for the general good of all. The leaders of the Central African Republic, Congo (Brazzaville), Chad and Gabon agreed to come together in order to sustain the economic services they were about taking over from the colonialists. They, therefore, resolved to establish a customs union, *Union Douarniere Equatoriale* (UDE) or Equatorial Customs Union (ECU) which came to fruition in 1961. A partial free area came into being comprising the UDE countries and Cameroon which were all members of the Franc Zone. In December 1964 the leaders of these states signed the Brazzaville Treaty which led to the birth of the Central African Economic and Customs Union (UDEAC) which replaced the UDE. It emphasized liberalizing exchange regulations between the member states, free trade, and movement among members, and fostering economic cooperation. Unfortunately, in April 1968 Chad and the Central African Republic withdrew from the union because they thought they were not benefiting enough from it. The Central African Republic only came back to the union in late 1968 while Chad did so in 1984 (Neba, 1999:211).

A number of African countries could not sacrifice the much intended economic integration on the altar of political differences and tensions. They all had to look towards one direction in an attempt to channel their efforts in increasing intra-African trade and economic cooperation. For example, on 3 June 1966, the West African Customs and Economic Union (UDEAO), signed a convention, which came into effect on 1 May 1977, on new rates of duty applicable to goods exchanged between Senegal and Ivory Coast. It was later extended to Mauritania.

In spite of such moves, regional integration remained an anthill task for the economies of Central African countries. Regional trade or economic relations lags behind as opposed to trading with developed countries. For example, oil dominates 70 percent exports to European Union (EU) countries from this part of Africa with the exception of the Central African Republic. Other exports from Central African countries to the EU include bananas, cocoa, wood, copper, and diamonds. On the other hand, the EU exports manufactured goods to these countries in the likes of machinery, mechanical appliances, vehicles, pharmaceutical products, and foodstuffs. The EU went on to negotiate an Economic Partnership Agreement with Cameroon, the Central African Republic, Chad, Congo, the Democratic Republic of Congo, Equatorial Guinea, Gabon, Sao Tome and Principe in 2009 (European Union, 2017:3). Despite all of these, it is rather unfortunate that bilateral economic relations between some of these countries as in the case of Cameroon and Congo, no matter the magnitude, seems to be underestimated by some writers and institutions. It is based on this argument that we need to take a step in finding out what Cameroon and Congo got to offer in terms of economic resources. As such it is imperative, to begin with, an idea of what each had and still has in terms of natural and other resources.

The Congolese economy is based primarily on subsistence and plantation agriculture (cassava, maize, coffee, and cocoa among others) besides the exploitation of natural resources. The produces petroleum, timber, potash, lead, zinc, uranium, copper, phosphates, gold, magnesium, natural gas, and hydropower (CIA, 2014:p.2). Congo engages in extensive trade with the neighbouring countries of Cameroon, the Central African Republic, and Gabon, with which it is joined in the Customs and Economic Union of Central Africa. The country also has extensive commercial ties with France, the United States, and Italy.

Commercial activities are also important, primarily because the country provides key port and transport facilities for the Central African Republic, Chad, and Gabon. On the other hand, Neba (1999:209) states that Cameroon produces mostly agricultural and forest products which include cocoa, coffee, palm products, cotton, rubber, bananas, tobacco, and groundnuts. Besides the country also exports nonagricultural products such as petroleum (crude oil), bauxite, iron ore, timber, and hydropower (Neba, 1999:209; CIA, 2014:p.2). Nkenda, Nzouessin, and

Moussa (2014:p.12, p.16) argue that plantains, tomato, onion, cassava sticks, pepper, potato, peanuts, macabo, and avocado are largely among the products that Cameroon exports to its neighbours.

Trade Pitch in, Prospects and Quandaries

Since independence, the Republic of Cameroon has been constantly referred to as Africa in miniature, because it has a conglomeration of the physical, human and cultural characteristics found in different parts of the continent. Its endowment with natural and other resources, and its ability to produce food crops and other products to feed the populations of some of its neighbours, also earned the country the prestige of being denoted as the "bread basket" or "the nourishing breast" of the Central African sub-region. Nkenda (2010:7) and Nkenda, Nzouessin and Moussa (2014:p.2) maintain that in terms of agricultural and horticultural commodities, Cameroon is the main trading partner of each of the CEMAC states, of which Congo is a party, and trade balance is generally in its favour where its direction is a "one way" trend. In this light, therefore, Cameroon's imports from CEMAC countries are marginal.

Even before the creation of various regional groupings, Cameroon had dominated the Central African region in the trade with agricultural products. It was, however, unfortunate that for quite some time, especially between the 1960s and 1970s, there was the exhibition of the passiveness of economists in showing interest in gathering real statistics and other related information on trade not only between Cameroon and Congo (Brazzaville) but also in the rest of the region. According to Cameroon's Ministry of Agriculture and Rural Development (MINADER), trade between Cameroon and Congo, besides other neighbours, is generally underestimated. The ministry's hierarchy claims that the informal trade and strong socio-cultural proximity between Cameroon and her neighbours seem to be taken for granted by state agents like the customs' services (MINADER-DESA, 2008 as cited by Nkenda, Nzoussin and Moussa, 2014:p.1).

Furthermore, some of the difficulties connected to the engagement of data related to trade between Cameroon and Congo (Brazzaville) could be attributed to the ups and downs in relations between both countries. In the mid-1960s, for example, Cameroon's relations with France and other western powers were on a good footing, but that with some of its neighbours declined. In fact, ideological discordancy and the continuous presence of guerrilla fighters of the proscribed *Union des Populations du Cameroun* (UPC) in Brazzaville strained relations between Cameroon and Congo. Besides, Cameroon also clashed with Gabon over the instant eviction of some Cameroonians from Gabon as well as quarrels over the marketing of Gabonese oil in Cameroon. In March 1968, presidents Ahidjo and Bongo managed to engage dialogue which brought an uneasy calm to the tensions. In January 1982 President Denis Sassou N'guessou of Congo visited Cameroon with the intention of improving bilateral relations and to discuss the trans-border trade with the Ahidjo government (Ndzi, 2016:p.4).

As earlier highlighted, some of the political or economic problems that pitted Cameroon against Congo and other neighbours could not melt off the trans-border trade in agricultural products which acted as the economic life wire of the Central African sub-region. Cameroon kept the trade commitment with Congo and other neighbours. Nkenda, Nzoussin, and Moussa (2014: pp 12-16) and Ndzi (2016:5-7) content that over 70 different agricultural and horticulture products are exported from Cameroon to CEMAC countries, of which Congo is a member, but only a few are marketed regularly over the 12 months of the year. The various authors go-ahead to identify some of the said products. These include, but not limited to, plantain, banana, potato, yam, groundnut, onion, tomato, cassava sticks, bell pepper, vegetables and fruits such as carrots and avocado. The authors maintain that plantain was and still remains the most important agricultural product in terms of regular tonnage reaching its peak during the first months of the year before declining to increase again as from the month of October. During the period when the export of plantain is at its lowest (July, August, and September), the tonnage of onion supply reaches its peak. Meanwhile, the export of tomato is constant with about 100 tons exported each month though the quantity of supply drops in the months of May, August, and September.

The point of contact pertaining to almost all commercial transactions is by land. For example, the Mouloundou and Kentzou trajectories serve as links with Congolese border towns like Sembe and Ketta. Besides Congo, Cameroon has many border outlets that enable the country to engage trade with the rest of its neighbours (see

Table I). Looking at table I, we can see that Cameroon has at least 11 border and market outlets to neighbouring countries. Most of the border markets are located in the South Region followed by the East, the Far North, North, and Littoral in descending order. As concerns trade with Congo, we realize that the main market outlets from Cameroon are at Mouloundou and Kentzou in the East Region of Cameroon. From these sales points, products like plantains, macabo, cassava, and vegetables are taken across the border to Congo. The towns of Mouloundou and Kentzou also stand as border market outlets to the Central African Republic.

Table I. Characteristics of Border Markets between Cameroon and its Neighbours

Border Markets	Border with	Geographical Location	Main Agricultural and Horticultural Products Exchanged
Abang Minko	Gabon	South (Olamze)	Banana, Plantain, Cassava, Stick, Vegetables, Beans, Tomato, Onion, Macabo, Pepper, Peanut, Potato
Kyo-Ossi	Gabon, Equatorial Guinea	South (Olamze)	Cassava, Stick, Vegetables, Tomato, Onion, Fruits, Macabo, Pepper, Peanut, Potato
Aboulou	Gabon	South (Ma'an)	Plantain, Macabo, Pepper, Peanut, Potato, Tomato
Idenau	Equatorial Guinea	South West (Idenau)	Okok/Eru, Garri, Potato
Garoua-Boulia	Central African Republic (CAR)	East (Garoua-Boulia)	Yam, Cassava, Peanut, Corn, Vegetables
Mouloundou	CAR, Congo	East (Mouloundou)	Pantain, Macabo, Cassava, Vegetables
Kentzou	CAR, Congo	East (Bomba)	Cassava, Corn, Macabo, Plantain, Peanut
Kousseri	Nigeria	Far North (Gfey)	Corn, Sorghum, Rice, Yam, Onion, Sugar Cane, Fruits
Amchide	Chad, Nigeria	Far North	Sorghum, Groundnut, Bambara Nut, Onion, Sugar Cane, Fruits
Mbaimboum	CAR, Chad	North (Touboro)	Sorghum, Groundnut, Bambara Nut, Onion, Fruits
Port Peschaud	Gabon, Equatorial Guinea	Littoral (Wouri)	All Commodities

Sources: Nkenda (2010:p.19) and Nkenda, Nzoussin, and Moussa (2014: p.16).

They are several actors who make the entire process of trans-border trade between Cameroon and Congo and other CEMAC countries practicable. Nkenda (2010:pp.21-22) and Nkenda, Nzoussin, and Moussa (2014: p.18) maintain that about 90 percent of the retailers are adults. Of this figure, about 23 percent are women while 70 percent are men. Children under 18 years play a less important role in the formal cross-border trade in the area and therefore represent only 07 percent of the traders. These authors further claim that most of the children carry small quantities of goods on behalf of their parents or guardians who are traders and most of whom live in the border towns.

Generally, the trans-border trade brings to Cameroon some remittances that help in the running of its economy. In terms of figures, the example of trans-border trade between Cameroon and Congo and a few other neighbours in 2008 would buttress this point. In 2008, for example, Cameroon's exports to Congo through the Moloundou trajectory amounted to 17,818 tons while the Kentzou point of exit registered 18 tons. This means in that year, a total of 17,836 tons of trade items were exported to Congo from Cameroon. In terms of value, the products marketed fetched for Cameroon the sum of FCFA 2,962,956,487 which stood at 11.5% of the country's remittances from trade with its CEMAC neighbours (see Table II).

Meanwhile, Ndzi (2016:p.4) and Nkenda (2010:p.23) postulate that transporters play the intermediary role of moving the goods from one point to the other. Big carriers such as trucks and pick-ups can transport up to 20 tons of products to the markets. Rickshaws and wheelbarrows are also among the means of trans-border transport. According to Nkenda (2010: pp. 7-8), the balance of trade is in favour of Cameroon in the intra-CEMAC flows except for Equatorial Guinea and to a lesser extent the Congo. The reason here is that these two serve as countries for the transit of imported products from other parts of the world into Cameroon. Such merchandises include red wine and cigarettes.

Table II. Quantity and Estimated Values of Products Exported from Cameroon to Congo and Some Selected Neighbours in 2008

Countries of Destination	Border Markets	Quantities (in Tons)	Value (in FCFA)	%
Gabon	Aboulou	19,346.35	4,569,328,727	12.4
Equatorial Guinea	Kyo-ossi, Idenau	63,726.25	17,986,656,508	41.2
Congo	Moloundou, Kentzou	17,818 + 18 = 17,836	2,962,956,487	11.5
CAR	Mouloundou, Groua-Boulia, Kentzou, Mbaimboum	8,677	1,697,869,653	5.6
Chad	Amchide, Mbaimboum	45,869	10,639,870,720	29.5
TOTAL		**155,454,60**	**37,856,682,095**	**100**

Source: Compiled from Nkenda, Nzoussin, and Moussa (2014: p.24).

Over the years, several moves have been made by the Central African countries just as in other regional groups to forge greater integration among them which they considered as a condition *sine qua non* for economic development and prosperity. In fact, one of the major challenges or obstacles towards the realization of this goal remains the lack of good transport and other related facilities linking these countries. In an attempt to exterminate the nightmares, some of these countries took the bold step to develop and/or improve on the roads and other communication networks in an attempt to further boost their economic relations. This was the case of Cameroon and Congo that agreed to embark on the Ketta-Djoum Road and Brazzaville-Yaounde Corridor Transport Facility Project which was to commence in 2010 and reach its completion point in 2014. The highway was to connect the two capital cities of these countries, that is, Brazzaville and Yaounde (see Map 1).

Map 1. The Ketta-Djoum and Brazzaville-Yaounde Road Project Area
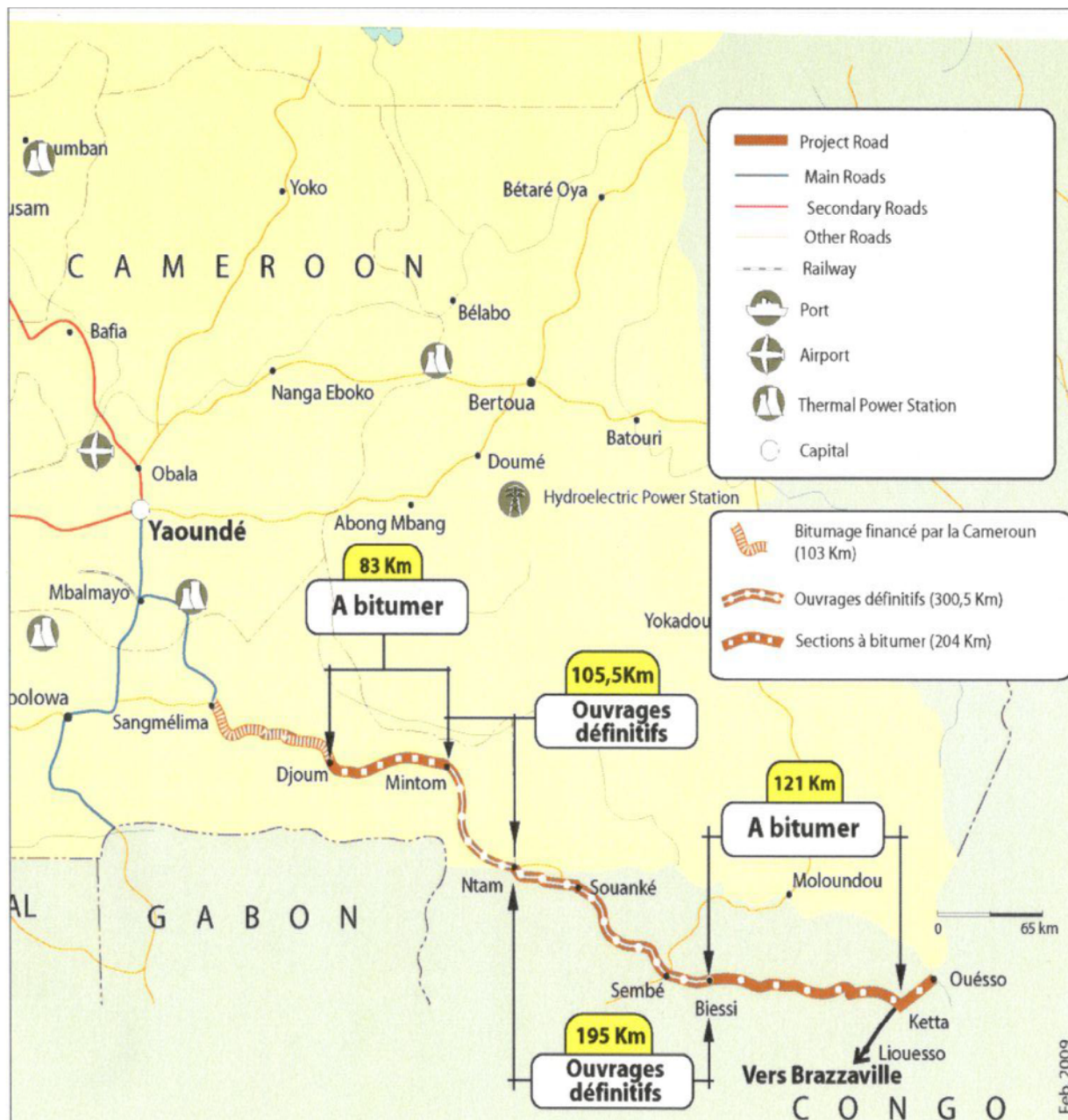
Source: African Development Fund (2009:p.30).

The Ketta-Djoum and Brazzaville-Yaounde transport network scheme was conceived in February 2009 and was approved by the African Development Fund (ADF), in September that same year. The project was to start in January 2010 and was expected to be completed by March 2014. The Ketta-Djoum road (504.5 km) is a major road link on the 1,612 km highway which connects Brazzaville and Yaounde. The construction or road development scheme was divided into two phases. The first phase, on the Congo side, was to concentrate on the Ketta-Beissi section (121 km) and Beissi-Cameroon border earth road (195 Km). On the Cameroon side, the main focus was on the Congo-Mintom earth road section (105.5 km) and the paving of the Mintom-Djoum section (83 km). The second phase had to do with the paving of the remaining Beissi-Cameroon border earth road section (195 km) from within Congo. On the Cameroon side, there was to be the paving of the remaining Congo border-Mintom earth road section. The entire project was estimated to cost FCFA 208,640,000. Of this amount, the ADF was to contribute FCFA 61,900,000 as grant and FCFA 59,270,000 as interest-free loan. On its part, the government of Congo was to contribute FCFA 80,880,000 as investment budget while that of Cameroon was to provide FCFA 6,590,000 as investment budget (African Development Fund, 2009:pp.iii-iv).

According to the African Development Bank (ADB) (2009: pp. 3-4) and the African Development Fund (ADF) (2009: pp. iv-v), the successful implementation of the first phase of the project was aimed at providing a permanent connection between Cameroon and Congo. They intimate that it would help to boost trade between the two countries as well as in the rest of the Central African sub-region, and would contribute to poverty reduction in the area. The ADF went on to make a sound judgement of what it thought would be some of the benefits of the transport project by the time it came to fruition by arguing that:

> Besides helping to develop trade between the two countries [Cameroon and Congo], the project will also contribute to strengthening regional integration in Central Africa by permitting the inter-connection of highways linking Cameroon, Congo, Democratic Republic of Congo, Gabon, Equatorial Guinea and the Central African Republic. The direct project beneficiaries are the transport system users as well as dwellers within the project impact area (Sangha District in the North of Congo and Cameroon's South/South East Provinces [now South and East Regions]. The project is expected to not only improve the movement of people and goods between the two countries but also to open up areas with significant economic potentials in Northern Congo (agriculture, ore, timber, etc.) and in Cameroon's South East. Furthermore, the project will help reduce overall transport costs and improve living conditions of people dwelling along the road (Ibid.:p iv).

In addition, the result-based logical framework of the road project gave total assurance that the expected long-term progress would see the rate of commercial transactions between Cameroon and Congo increase from 04% in 2009 to approximately 15% as from 2014. In terms of value, transactions were estimated to rise from FCFA 55 billion in 2009 to FCFA billion as from 2014. Overall travel speed on the Brazzaville-Yaounde road axis was expected to move up from 30 km/h in 2009 to 80 km/h by 2014 (ADF, 2009:p.vi). This means that lesser time would be taken to deliver supplies using the new road network. This would be of great benefit to business persons. Apart from reducing the fatigue suffered on the old roads, traders would also gain time to safe the perishable products and to engagement other activities. After all, is often said that "time is money."

Apart from the expected increase in commercial transactions and the lesser time taken to supply products at various destinations, the Brazzaville-Yaounde project was to bring in other benefits to its users. The project was to make provision for the passing of an optical fibre, the construction of two weighing stations to control heavy-duty trucks transporting products, and the provision of checkpoints for security alongside facilities such as latrines and drinkable water. Besides, road safety sensitization campaigns and HIV/AIDS/STI campaigns were to be organized periodically along the said axis in order to promote the safety and social wellbeing of traders and other users. The project itself was to accommodate at least 5,000 direct and indirect jobs with an additional 2,000 permanent jobs (ADB, 2009: pp. 3-4; ADF, 2009: pp. vi-vii).

In spite of the efforts made in sustaining trade between Cameroon and Congo as well as other states in the Central African sub-region, a number of challenges still help to render this mood of integration near illusive. For example, there still exist little integration of the production systems. Thus, in relation to trade statistics, the International Monetary Fund (IMF) reported in 2001 that the share exports between CEMAC members stood at only 1.15% of total exports in terms of formal trade. Again, laid down principles of trade are hardly respected because of the obnoxious behaviour of police and gendarmerie officers on the road at border posts. They impose and extort high informal taxes from traders and transporters out of state regulations. To cross the border, traders pay at least FCFA 1,000, but no receipt is issued to them. In addition, the traders must also have a visa which costs FCFA 31,000 (IMF, 2001, as cited by Nkenda, Nzoussin and Moussa, 2014: p. 5). These are just a few of the nightmares that bedevil trans-border commerce between Cameroon and Congo and by extension other Central African states.

Conclusion

As ordained by nature, Cameroon and Congo are bound to live and interact together. This spectacle also applies to the rest of Cameroon's neighbours. In fact, one of the principal conditions that guides man's existence is the ability to satisfy some if not all of his basic needs. Food items fall within these priorities, and one of the means to get such products from areas of plenty to areas of scarcity is through trade. In order to improve trade and stimulate the advancement of the African continent, many countries went into regional groupings to create a common pool from which their common interest could be promoted. Within the confines of the region Central African sub-

region, Cameroon poses itself as the "nourishing breast" or "bread basket" of the area. This is thanks to its endowment with natural blessings in terms of its geographical and ecological advantages which gives it the ability to produce and supply agricultural and horticultural items to its neighbours. Like it does to other states, Cameroon dominates trade with Congo. In all, several moves have been made over the years to improve on trade relations between these two countries, ranging from the strengthening of bilateral relations to the improvement of communication facilities. That notwithstanding, the attempts at forging greater integration are usually marred by a number of obstacles or impediments. Be it as it may, however, the propensity for Cameroon-Congo economic relations stands tall in the hub of the daunting challenges.

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Impact of Human Resources Recruitment and Management of Process, Quality, Technology on Total Factor Productivity of Cooperative Industry

Nguyễn Duy Thành[1]

[1] Economy & Management Department, Thang Long University

Abstract

The objective of this research is to evaluate the impact of human resources recruitment and management of the process, manufacturing quality, and technology on outcomes of cooperative industry (total factor productivity (TFP) and revenue (R)). We link indicators of management and outcomes of management based on two sets of data: (i) annual business survey by General Statistic Office (GSO) and (ii) technological survey of cooperate industry in 2016 including 3.830 enterprises considered input and output variables of 4 management models. The results of the estimation show that general management and management of process and quality improvement management have a good impact on increasing revenue and TFP of enterprises. However, the human resources recruitment problem has not met the objective of increasing revenue and TFP of enterprises yet. The ability of management on both human and technological resources of the business on average has not been effective in encouraging revenue and TFP.

Introduction

Human resources recruitment is not only an important part in human resources practices of firms, but also it is an important topic in the field of human resources management (Boudreau, 1991; Jones & Wright, 1992; Kleiner, 1990).

An increasing part of the recruitment job contains work practices, including comprehensive employee recruitment, incentive compensation, effective work management systems, extensive employee involvement and training can improve knowledge, skills, and abilities of a firm current and potential employees, increase their motivation, reduce shirking and inhance retention of quality employee while encouraging nonperformers to leave the firm (Jones & Wright, 1992; U.S. Department of Labor, 1993). Unfortunately, their dataset does not contain information other than information about the level of the employee that we consider a representative variable for the selection.

This paper analyses the impact of management based on two sets of data, although indicators are not complete, but it also contributes to conclusions about human resources practices that can help create a resource of sustained competitive advantage, especially when they are aligned with a firm's competitive strategy (Begin, 1991; Butler, Ferris, & Napier, 1991; Cappelli & Singh, 1992; Jackson & Schuler, 1995; Porter, 1985; Schuler, 1992; Wright & McMahan, 1992).

Previous human resources researches have often been conducted in three ways: (i) analytical studies using enterprise-level impact estimates of human resource management practices. This approach is supported by the development of a tool that reflects a system of highly effective work practices researched by enterprises; (ii) the analysis is comprehensive, which means the independent variable includes both intermediary results and enterprise-level measures of financial performance and these results are based on a sample. Those businesses obtained from a variety of industries. Moreover, the analyzes address two methodological issues based on survey researches on this topic: Potential for simultaneity, or reverse causality, between highly effective work practices and business performance and trend of survey responses; (iii) the study provides a first step in predicting the impact of business practices on business performance based on either the degree of complementarity or internal suitability among the practicality and level of alignment, or external relevance, between a system in an enterprise based on the business practices and competitive strategies of the enterprises.

It is possible to believe that individual performance is linked to enterprise-level results that are prevalent both academically and experimentally. This concept comes from the fact that employees of a company can provide a unique source of competition that is difficult for competitors to imitate (see Wright and McMahan (1992), Barney (1991)). The study by Wright and McMahan (1992) showed the importance of human resources in creating competitive advantage.

Human resource management practices influence employees' skills through the development of human capital. The recruitment process provides qualified applicants. A reliable and relevant selection program will have a significant impact on the quality and type of skills that new employees have.

The influence of highly skilled workers will be limited if they are not motivated to perform. Human resource management practices, however, can influence employee motivation by motivating them to work harder and smarter. Baily (1993) also pointed to the contribution of the skilled and motivated workforce to be limited to rigid stereotyping because they did not have the opportunity to use the skills and competencies to design the ways new and better ways of expressing their roles in the workplace. Human resource management practices can, therefore, affect the performance of an organization by providing an organizational structure to motivate members among employees and allow them to improve. Their work is a more creative way.

Therefore, the theoretical overview clearly suggests that the behavior of employees in the company has important implications for the performance of the organization. And human resource management practices can influence the performance of individuals through their influence on the skills and motivations of their work. The structure of the organization also allows employees to improve their work creatively.

This study differs from other studies in pure human resource management in that we consider that workers in the present era can only work effectively if they combine in harmony and technology. So we analyze human resource management and technology management at the same time. That is, we suggest the following hypotheses:

Assumption 1: If recruiting the right people to the right job will help businesses increase revenue (R) and aggregate factor productivity (TFP).

Assumption 2: If the right people are recruited, technology innovation will help businesses increase revenue (R) and aggregate factor productivity (TFP).

The remainder of this study includes: Presenting the methodology in section 2, presenting data descriptions descriptions and variables in section 3, the results of the estimation in section 4 and finally the conclusion.

1. Methodology

To illustrate the impact of the recruitment practices, process management and technology quality on factor productivity (TFP) of manufacturing firms, we use a two-step process: (i) Step 1 presents the TFP estimation

procedure and (ii) the model estimates the impact of human resource recruitment and process management, technology quality on factor productivity (TFP) of the manufacturing sector.

1.1. TFP estimation methodology

We use the semi-parametric estimation of the production function parameters proposed by Olley-Pakes (1996) to account for the endogenous problem of enterprise input selection. We assume that at the beginning of each period, a business will select labor and investment inputs, which together with the current capital value determine the quantity capital at the beginning of the next period. Capital accumulation scheme is given as:

$$k_{t+1} = (1 \quad)k_t + i_t \tag{1}$$

In which: k means capital and I means investment

We start with the Cobb-Douglas production function model:

$$y_{it} \quad m_{it} = \quad + \quad_l l_{it} + \quad_k k_{it} + \quad_{it} + \quad_{it} \tag{2}$$

Where y - m is the logarithm of output and is equal to the logarithm of value, l is the logarithm of labor, i and t denote the enterprise and period respectively. And ω is the symbol for productivity, and η is the symbol for the measurement error (possibly chain correlation) or an unpredictable productivity shock during the period in which we can adjust labor. Both ω and η are not observable. The difference is that ω is a stop variable in business decision making and affects input demand, and η is not. Labor is assumed to be a freely variable input. Capital is a fixed factor and is only affected by the distribution of ω conditional information on t-1 period and past value of ω.

Because the unobserved productivity shock is assumed to be correlated with the k_{it}, the estimated coefficient $β_k$ will be deviated. The point of this approach is that the observable characteristics of the entrepreneurs can be modeled as a monotonous function of the firm's productivity. Inverting this function allows us to model unobserved components of productivity as a function of observable variables, namely investment.
Investment decisions depend on the amount of capital and productivity of entrepreneurs:

$$i_t = i_t (\quad_t, k_t) \tag{3}$$

By reversing the above equation, we can express the unobserved productivity ω by the observed level of investment and capital, and thus we can control ω in the estimation:

$$_t = h_t (i_t, k_t) \tag{4}$$

Instead of (4) (2), we obtain the estimated percentage in the first step:

$$y_{it} \quad m_{it} = \quad + \quad_l * l_{it} + \quad_k * k_{it} + h(i_{it}, k_{it}) + \quad_{it} \tag{5}$$

The function of h(.) is unknown. Therefore, coefficients $β_i$ and $β_k$ can not be estimated at this stage. We estimate the partial linear model by using the form of the polynomial of capital and investment to approximate the function form of h(.). From this stage, we have a firm estimate of the labor input coefficient (βl) as well as the estimate of the third hat of i_{it} and k_{it}, and we call it $Ψ_{it}$.

$$Ψ_{it} = α + β_k * k_{it} + h(i_{it}, k_{it}) \tag{6}$$

So:

$$h(i_{it}, k_{it}) = Ψ_{it} - β_k * k_{it} \tag{7}$$

The second step of the estimation procedure is to look at expectation of $y_{t+1} - m_{t+1} - β_l * l_{t+1}$.

$$E[y_{t+l} \quad m_{t+l} \quad_l * l_{t+l} / k_{t+l}] = \quad + \quad_k * k_{t+l} + E[\quad_{t+l} / \quad_t] \quad_k * k_{t+l} + g(\quad_t) \tag{8}$$

Assume ω_{it} corresponds to the sequence, we can rewrite ω_{it+1} as a function of ω_t, we denote ξ_{t+1} as technological advances in ω_{t+1}. Using (4) and (7), the above equation becomes the function of i_{it} and k_{it}.

$$y_{t+l} \quad m_{t+l} \quad {}_l * l_{t+l} = \quad {}_k * k_{t+l} + g\left(\quad {}_t \quad {}_k * k_t \right) + \quad {}_{t+l} + \quad {}_{t+l} \tag{9}$$

Where g is the third polynomial of $\quad {}_t \quad {}_k * k_t$. This equation is estimated in the second stage of the procedure. Only at this stage will we be able to obtain stable estimates of β_k. Because the capital used in the given period is assumed to be known at the beginning of the period and $\quad {}_{t+l}$ is the independent mean of all variables at the beginning of the period, $\quad {}_{t+l}$ the mean independent of k_{t+l}. We use the smallest nonlinear squared to estimate the above equation.

1.2. A model for assessing the impact of human resource management on the output

Arnold and Feldman (1982), Baysinger and Mobley (1983), Cotton and Tuttle (1986) claimed that perceptions of job security, union status, compensation, job satisfaction, ownership rights, as well as the age, gender, education and number of dependents, the commitment of the organization, whether a job fulfills the individual's expectations and intentions of looking for a new job are all about anticipation of employee's engagement with the company. Sheridan (1992) argued that the perceptions of organizational culture could influence the output of the business. Among empirical studies based on the effects of specific human resource management practices on aggregate revenue, McEvoy and Cascio (1985) point to interventions in job enrichment and previewing actual work may have been effective in influencing the output.

In order to find the impact of human resource management on the outputs, we set up two model groups to assess the impact of human resource recruitment practices and process management, the influence of technology quality on total factor productivity (TFP or R-revenue) from manufacturing enterprises: (i) model for assessing the impact of human resource recruitment practices and process management, technology quality on aggregate factor productivity (TFP)) of the manufacturing enterprises, aiming to test hypothesis 1 and (ii) model for assessing the impact of human resource recruitment practices and technological process management on the revenue in the manufacturing sector to test hypothesis 2.

In this section, we will present two model groups: the first group consists of model 1 and model 2 which illustrates how human resource management and technology affect output and TFP. The second group, model 3 and model 4, is the expansion of models 1 and 2, which is complemented by the reflection variables that combine management of manpower and technology.

Model 1:

$$\ln R = \quad {}_0 + \quad {}_1 x_{1,i} + \quad {}_2 x_{2,i} + \quad {}_3 x_{3,i} + \quad {}_4 x_{4,i} + \quad {}_5 x_{5,i} + \quad {}_6 x_{6,i} + \quad {}_7 x_{7,i} + \quad {}_8 x_{8,i} + \quad {}_9 x_{9,i} + \quad {}_{10} x_{10,i} + \quad {}_{11} x_{11,i}$$
$$+ \quad {}_{12} x_{12,i} + \quad {}_{13} x_{13,i} + \quad {}_{14} x_{14,i} + \quad {}_{15} x_{15,i} + \quad {}_{16} x_{16,i} + \quad {}_{17} x_{17,i} + \quad {}_{18} x_{18,i} + \quad {}_{19} x_{19,i} + \quad {}_{20} x_{20,i} + \quad {}_{21} x_{21,i} + u_i$$

Model 2:

$$\ln TFP = \quad {}_0 + \quad {}_1 x_{1,i} + \quad {}_2 x_{2,i} + \quad {}_3 x_{3,i} + \quad {}_4 x_{4,i} + \quad {}_5 x_{5,i} + \quad {}_6 x_{6,i} + \quad {}_7 x_{7,i} + \quad {}_8 x_{8,i} + \quad {}_9 x_{9,i} + \quad {}_{10} x_{10,i} + \quad {}_{11} x_{11,i}$$
$$+ \quad {}_{12} x_{12,i} + \quad {}_{13} x_{13,i} + \quad {}_{14} x_{14,i} + \quad {}_{15} x_{15,i} + \quad {}_{16} x_{16,i} + \quad {}_{17} x_{17,i} + \quad {}_{18} x_{18,i} + \quad {}_{19} x_{19,i} + \quad {}_{20} x_{20,i} + \quad {}_{21} x_{21,i} + u_i$$

Model 3:

$$\ln R = {}_0 + {}_1 x_{1,i} + {}_2 x_{2,i} + {}_3 x_{3,i} + {}_4 x_{4,i} + {}_5 x_{5,i} + {}_6 x_{6,i} + {}_7 x_{7,i} + {}_8 x_{8,i} + {}_9 x_{9,i} + {}_{10} x_{10,i} + {}_{11} x_{11,i}$$
$$+ {}_{12} x_{12,i} + {}_{13} x_{13,i} + {}_{14} x_{14,i} + {}_{15} x_{15,i} + {}_{16} x_{16,i} + {}_{17} x_{17,i} + {}_{18} x_{18,i} + {}_{19} x_{19,i} + {}_{20} x_{20,i} + {}_{21} x_{21,i}$$
$$+ {}_{22} x_{718,i} + {}_{23} x_{719,i} + {}_{24} x_{720,i} + {}_{25} x_{721,i} + {}_{26} x_{918,i} + {}_{27} x_{919,i} + {}_{28} x_{920,i} + {}_{29} x_{921,i} + u_i$$

Model 4:

$$\ln TFP = {}_0 + {}_1 x_{1,i} + {}_2 x_{2,i} + {}_3 x_{3,i} + {}_4 x_{4,i} + {}_5 x_{5,i} + {}_6 x_{6,i} + {}_7 x_{7,i} + {}_8 x_{8,i} + {}_9 x_{9,i} + {}_{10} x_{10,i} + {}_{11} x_{11,i}$$
$$+ {}_{12} x_{12,i} + {}_{13} x_{13,i} + {}_{14} x_{14,i} + {}_{15} x_{15,i} + {}_{16} x_{16,i} + {}_{17} x_{17,i} + {}_{18} x_{18,i} + {}_{19} x_{19,i} + {}_{20} x_{20,i} + {}_{21} x_{21,i}$$
$$+ {}_{22} x_{718,i} + {}_{23} x_{719,i} + {}_{24} x_{720,i} + {}_{25} x_{721,i} + {}_{26} x_{918,i} + {}_{27} x_{919,i} + {}_{28} x_{920,i} + {}_{29} x_{921,i} + u_i$$

Where LnTFP and LnR are dependent variables.

Independent variables include:
(1) X1: Innovation is a variable that can take one of 10 values from 1 to 10
(2) X2: Process improvement is a dummy variable receiving value 1 if there is a process improvement and not in the opposite case.
(3) X_3: Quality improvement is a dummy variable receiving value 1 if there is a process improvement and not in the opposite case.

Variables represent recruitment of manpower
(4) X_4: Labor recruited but not trained that equals the number of unskilled laborers divided by the total labor force of the enterprise.
(5) X_5: Labor recruited but trained less than 3 months that equals to the number of laborers trained under 3 months divided by the total labor force of the enterprise.
(6) X_6: Labor recruited at primary level which equals to the number of laborers recruited at primary level divided by the total labor force of the enterprise.
(7) X_7: Labor recruited at intermediate level which equals to the number of employed workers with intermediate degree divided by the total labor force of the enterprise.
(8) X_8: Labor recruited with a college degree which equals to the number of employed workers with college-level degree divided by the total labor force of the enterprise.
(9) X_9: Labor recruited with a graduate degree which equals to the number of employed workers with university degree divided by the total labor force of the enterprise.
(10) X_{10}: Labor recruited at masters level which equals to the number of employed workers with master degree divided by the total labor force of the enterprise.
(11) X_{11}: Labor recruited with a doctoral degree that equals to the number of employed workers with doctor degree divided by the labor force of the enterprise.
(12) X_{12}: Labor recruited outside the above criteria which equals the number of workers recruited divided by the labor force of the enterprise.

General innovation and innovation inside enterprise
(13) X_{13}: General innovation is measurement variable of the management of basic research activities without affecting any specific output.
(14) X_{14}: Internal corporate innovation is the measurement of management of the research activities that addresses specific issues, which have been identified to only affect businesses.

Variables belonging to human resources management and operating process
(15) X_{15}: Salary improvement is a dummy variable that assumes a value of 1 in the case of wage improvements and zero in the opposite case.

(16) X_{16}: Expansion product is a dummy variable that assumes a value of 1 in the case of product expansion and zero in the opposite case.

(17) X_{17}: The expansion of manufacturing factor is a dummy variable that assumes a value of 1 in the case of expansion of the production sector and zero in the opposite case.

Variables belonging to technological management

(18) X_{18}: Decision on buying and spending on purchasing technology from Vietnamese enterprise.

(19) X_{19}: Decision on upgrading and spending on purchasing technology upgrades from Vietnamese enterprises.

(20) X_{20}: Decision on buying and spending on purchasing technology from foreign enterprises.

(21) X_{21}: Decision on upgrading and spending to upgrade technology from foreign enterprises.

Dummy variables belonging to technological management

(22) X_{188}: Dummy variable with the value of 1 on decision to buy technology from Vietnamese enterprises and zero in the opposite case.

(23) X_{189}: Dummy variable receives value of 1 on decision to upgrade and spending to upgrade technology from Vietnamese enterprises and zero in the opposite case.

(24) X_{200}: Dummy variable receives value of 1 on decision to buy and purchasing technology from foreign enterprises and zero in the opposite case.

(25) X_{211}: Dummy variable receives value of 1 on decision to upgrade and spending to upgrade technology from foreign enterprises and zero in the opposite case.

Variables belonging to human resources management and technology

The following variables test human resource management and technology in the sense that personnel recruitment is consistent with technological innovation decisions.

(26) X_{718}: To be the multiplication of dummy variables x_{188} and variable x_7. This variable indicates whether the recruitment of technical staff at intermediate level meets the decision to buy technology from Vietnamese enterprises or not.

(27) X_{719}: To be the multiplication of dummy variables x_{189} and variable x_7. This variable indicates whether the recruitment of technical staff at intermediate level meets the decision to upgrade technology from Vietnamese enterprises or not.

(28) X_{720}: To be the multiplication of dummy variables x_{188} and variable x_7. This variable indicates whether the recruitment of technical staff at intermediate level meets the decision to buy technology from foreign enterprises or not.

(29) X_{721}: To be the multiplication of dummy variables x_{200} and variable x_7. This variable indicates whether the recruitment of technical staff at intermediate level meets the decision to buy technology from Vietnamese enterprises or not.

(30) X_{918}: To be the multiplication of dummy variables x_{188} and variable x_9. This variable indicates whether the recruitment of staff at university level meets the decision to buy technology from Vietnamese enterprises or not.

(31) X_{919}: To be the multiplication of dummy variables x_{189} and variable x_9. This variable indicates whether the recruitment of staff at university level meets the decision to buy technology from Vietnamese enterprises or not.

(32) X_{920}: To be the multiplication of dummy variables x_{200} and variable x_9. This variable indicates whether the recruitment of staff at university level meets the decision to buy technology from foreign enterprises or not.

(33) X_{921}: To be the multiplication of dummy variables x_{200} and variable x_7. This variable indicates that the recruitment of staff at university level meets the decision to upgrade technology from foreign enterprises or not.

2. Data and results

2.1. Data

The data used for this study include the GSO 2000 to 2016 enterprise survey data and the GSO statistical survey data for 2016. We consider these two data set into one. From the first data set (GSO annual enterprise survey) we used the following criteria: turnover (R), capital (K), labor (L), intermediate input (M), investment (I), worker's income (salary, bonus), depreciation, etc. Using the income approach and information obtained on enterprise surveys, we calculated every business. Use and calculation and information about capital, labor, and other information and use parametric techniques to estimate the TFP of each enterprise and extract TFP by 2016 for use as one dependent variable of the model. Using information from dataset of the survey on technology, we built the variables on human resource management and technology management as well as variables describing the interaction between human resource management and technology management. in production and business activities.

2.2. Results

In this section, we represent the results of models 1, 2, 3, and 4. For distinguishing between human resources and technology management with human resource management and technology and the ability to coordinate both human resource management and technology management. We split into 2 tables. Table 1 outlines the impact of human resource and technology management on revenue (R) and on total factor productivity (TFP). Table 2 shows the impact of human resource and technology management on the combination of human resource and technology management to revenue (R) and total factor productivity (TFP).

Table 1: Estimates of models 1 and 2 by OLS and
(II) the feasible generalized least square

	OLS method		II	
	LnR	LnTFP	LnR	LnTFP
x1	-0.0031 (0.0097)	-0.0057 (0.0044)	-0.0032*** (0.0004)	-0.0055*** (0.0001)
x2	0.1817** (0.0728)	0.0178 (0.0334)	0.1782*** (0.0048)	0.0159*** (0.0014)
x3	0.0168 (0.0782)	-0.0608* (0.0359)	0.0149*** (0.0029)	-0.0617*** (0.0014)
x4	-1.0997*** (0.1300)	-0.5206*** (0.0597)	-1.1044*** (0.0072)	-0.5215*** (0.0012)
x5	-0.7120*** (0.1289)	-0.4930*** (0.0596)	-0.7116*** (0.0067)	-0.4919*** (0.0014)
x6	-0.3911** (0.1668)	-0.2829*** (0.0767)	-0.3953*** (0.0099)	-0.2872*** (0.0032)
x7	-1.1327*** (0.2441)	-0.3851*** (0.1120)	-1.1355*** (0.0164)	-0.3861*** (0.0049)
x8	-1.0389*** (0.3904)	-0.4894*** (0.1792)	-1.0498*** (0.0247)	-0.4933*** (0.0097)
x9	-0.8044*** (0.2947)	0.5380*** (0.1342)	-0.8232*** (0.0278)	0.5383*** (0.0042)
x10	-1.5664 (1.4696)	-0.2153 (0.6756)	-1.3239*** (0.1818)	-0.1814* (0.1091)
x13	0.0060 (0.0042)	0.0006 (0.0019)	0.0062*** (0.0007)	0.0007*** (0.0002)
x14	0.0183*** (0.0056)	0.0088*** (0.0026)	0.0183*** (0.0003)	0.0088*** (0.0003)
x16	0.2935*** (0.0667)	0.0807*** (0.0307)	0.2895*** (0.0032)	0.0812*** (0.0008)
x17	0.1136 (0.1026)	-0.0594 (0.0471)	0.1133*** (0.0036)	-0.0583*** (0.0022)
x19	-0.0001 (0.0001)	-1.5E-05 (3.62E-05)	-0.0001*** (0.0000)	0.0000*** (0.0000)

x20	0.0000*** (0.0000)	6.85E-06** (4.17E-06)	0.0000*** (0.0000)	0.0000*** (0.0000)
_cons	11.3468*** (0.1274)	2.3957*** (0.0586)	11.3560*** (0.0074)	2.3976*** (0.0019)

Source: Author estimates from GSO data

Table 1 presents two methods for estimating OLS (columns 2 and 3) and estimates using the least significant general means of elasticity to overcome the defects of the model (columns 4 and 5). First of all, the two estimation methods show that the sign of the coefficients do not change, but the estimation results are more meaningful.

First of all, innovation management skills x_1: The signs of coefficients of this variable are negative, meaningless in models 1 and 2 but statistically significant in models 3 and 4. This indicates that managers innovative skills not only did not meet the demand for increased sales and TFP but also revealed to be counterproductive.

Process management (x_2) and quality improvement management (x_3): The sign of the coefficient of this variable is positive, statistically significant in models 3 and 4. This indicates that process governance (x_2) and good quality improvement management are required to increase sales and increase TFP of businesses.

The issue of recruiting inputs is shown in the sign and coefficients of variables x_4, x_5, x_6, x_7, x_8, x_9, and x_{10}. The signs of these variables are negative and statistically significant in all four models excepted for the coefficients of x_{10} in model 1. This suggest that recruitment of such items has not met the target to increase revenue and TFP.

The issue of production and personnel management are shown in signs and coefficients of variables x_{13}, x_{14}, x_{16} and x_{17}. The markers of these x_{13}, x_{14}, x_{16} variables are positive and statistically significant in most models. This suggests that general innovation management, internal innovation, and product expansion strategy have met the goal of increasing sales and TFP of business. However, the strategy of expansion of the field has failed to increase TFP since mark of x_{17} is negative and statistically significant in models 3 and 5.

The decision on purchasing to upgrade technology has only a positive impact on revenue and TFP when the technology is purchased from overseas.

Table 2: Estimations of models 1 and 2 by the feasible generalized least square (to overcome the variance of variance)

Dependence variables: LnR				Independence variables: LnTFP			
Var	Coef.	Var	Coef.	Var	Coef.	Var	Coef.
x1	-0.0075*** (0.0004)	x17	0.1014*** (0.0039)	x1	-0.0074*** (0.00014)	x17	-0.0589*** (0.00375)
x2	0.1391*** (0.0026)	x19	-0.0002*** (6.26E-06)	x2	0.00078 (0.00119)	x19	-0.00004*** (0.00001)
x3	-0.0434*** (0.0016)	x20	2.05E-05*** (4.00E-06)	x3	-0.0838*** (0.00104)	x20	0.00001*** (0.00000)
x4	0.0007*** (3.04E-06)	x718	0.0034*** (0.0011)	x4	0.00005*** (0.00000)	x718	0.00146*** (0.00030)
x5	0.0002*** (8.82E-06)	x719	-0.0040*** (0.0014)	x5	-0.00005*** (0.00000)	x719	-0.0012*** (0.00032)
x6	0.0008*** (1.78E-05)	x720	-0.0046*** (0.0014)	x6	0.00005*** (0.00000)	x720	-0.00044 (0.0003)
x7	0.0025*** (4.03E-05)	x721	0.0069*** (0.0022)	x7	0.00026*** (0.00000)	x721	0.00084 (0.00065)
x8	0.0016*** (5.35E-05)	x918	-0.0046*** (0.0010)	x8	-0.0001*** (0.00003)	x918	-0.0024*** (0.0002)
x9	0.0113*** (2.95E-05)	x919	0.0095*** (0.0021)	x9	0.00385*** (0.00002)	x919	0.00118*** (0.0004)

x10	0.0120*** (0.0002)	x920	0.0018 (0.0021)	x10	0.00580*** (0.00036)	x920	-0.00057 (0.00049)
x13	0.0006 (0.0005)	x921	-0.0042* (0.0022)	x13	-0.0004*** (0.00002)	x921	-0.00025 (0.00052)
x14	0.0040*** (0.0007)	_cons	10.3582*** (0.0019)	x14	0.00625*** (0.00009)	_cons	2.07180*** (0.00124)
x16	0.1689*** (0.0009)			x16	0.05898*** (0.00098)		

Source: author estimates from GSO data

Table 2 presents estimates of models 3 and 4 using the feasible generalized least square to overcome the defects of the model. Models 3 and 4 differ from models 1 and 2 in considering the ability to simultaneously manage the human and technological resources of the business. Therefore, we did not repeat the analysis results in models 1 and 2 but only additional analyzes of the concurrent management capabilities of enterprises.

First of all, the recruitment of technically qualified graduates seem appropriate when purchasing domestic technology and upgrading technology from overseas because of the positive coefficients of x_{718} and x_{721} and statistically significant. It is not, however, suitable when using new technology from overseas and upgrading technology in the country because the mark of the coefficient of x_{719} and x_{720} is positive and statistically significant.

We consider recruiting staff at university graduates, in general, seem not compatible with buying local technology and buying technology from overseas because the mark of the coefficients of x_{918} and x_{921} is negative and is statistically significant, x_{20}. There are only the coefficients of x_{919} which are positive and statistically significant, meaning that the level of sophistication would be only suitable for technological upgrading and not suitable for use of new technology. These conclusions are however limited because we have not separated the number of college graduates how many are the technical department so the inclusion of all may not be entirely accurate.

3. Conclusion

This study was designed to test two hypotheses. By combining two sets of survey data, we have built a database, creating variables for the two hypothesis test models. has given. The first hypothesis where the right recruitment of the right person will help the company to increase revenue (R) and aggregate factor productivity (TFP) has been rejected data. This can have profound implications as the training of human resources is problematic, and the problem of professional training for recruiters is a big policy issue. Proper adoption of appropriate technology innovations will enable businesses to increase revenue (R) and aggregate factor productivity (TFP), which is only acceptable for only one of four cases. This is a very important issue of governance where appropriate technology could be matched with people to be effective. However, the results of this research are limited by the separation of technical and non-technical workers, especially at the university level, so further research needs to be undertaken to draw stronger conclusions.

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Graphene Revolution: An R&D-Based Growth Model Interpretation

Nor Azam Abdul-Razak[1], Bakti Hasan-Basri[1], Mohd Zaini Abd-Karim[2], Kavintheran Thambitratnam[3], Thilagavathi Muttu[1]

[1] School of Economics, Finance and Banking, Universiti Utara Malaysia, Kedah, Malaysia

[2] Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia, Kedah, Malaysia

[3] Photonics Research Centre, Universiti Malaya, Selangor, Malaysia

Correspondence: Nor Azam Abdul-Razak, School of Economics, Finance and Banking, Universiti Utara Malaysia, 061010 Sintok, Kedah, Malaysia. Tel: 604-928-6793. E-mail: azam@uum.edu.my

Abstract
In the physics community, there is a new nanomaterial known as graphene which has been invariably referred to as the disruptive technology arguably due to its capability to revolutionize the information and communication technology. In the economics community, there is a celebrated model of economic growth which has been termed the R&D-based growth model due to its stipulation that growth is achieved through creative destruction, an idea introduced by the late economist Joseph Schumpeter. Inasmuch as the idea of disruptive technology is akin to that of creative destruction, this paper explores the extent to which the so-called graphene revolution can be given an R&D-based growth model interpretation. Although such consistency exists, there are some discrepancies which may alter the conclusions of the model.

Keywords: Graphene, R&D-Based Model, Economic Growth, Technology Progress, Human Capital, Endogenous

1. Introduction

The idea that sustained economic growth is driven by technological progress has long been embedded in the economic growth literature. However, the way in which technological progress can be modeled to generate sustained growth has been quite fuzzy. Neoclassical economists postulate that technological progress is very much like manna from heaven – no deliberate attempt is needed to achieve it in order to promote growth. Dissatisfaction with this so-called exogenous growth had led some economists to model technological progress as a deliberate attempt by the society to produce knowledge or ideas, and this culminated into the so-called endogenous growth theory [for a survey, see Barro & Sala-i-Martin (2004), Grossman & Helpman (1994), Pack (1994), Romer (1994), and Solow (1994)].

Although there are a few available strands of endogenous growth theory, the one that figures prominently is invariably known as the R&D-based growth model, which is evident from the 2018 Nobel Prize in Economic

Sciences, which was jointly awarded to Paul Romer for his pioneering work on this model. Even within this strand, a few varieties exist: one variant hypothesizes that technological progress takes place as a result of a continuous expansion in product variety [Romer (1990) and Grossman & Helpman (1991), Chapter 3] while another variant postulates that technological progress takes places as a result of continuous improvements in product quality [Aghion & Howitt (1992) and Grossman & Helpman (1991), Chapter 4]. While each of these R&D-based models offers a fascinating story of endogenous growth on its own, it remains to see whether technological innovation that has been actively taking place today fits a particular model or more. In other words, it is interesting to explore which of the existing R&D-based growth models matches the current innovation.

Once we start talking about current innovation, one big picture that quickly comes to our mind is information and communication technology (ICT), as evident from the continuous improvement in telephones (beginning with fixed line telephones to mobile phones, and to smartphones) and personal computers (beginning with desktops to laptops and notebooks, and to smartphones). Complementing this ICT is the development and mushrooming of social media with the introduction of Facebook, Twitter, Whatsapp, Telegram, Instagram, etc. Adding to this list of innovations is graphene, a newly extracted carbon-based nanomaterial or, more precisely, an allotrope of carbon atoms that are tightly packed in a hexagonal, honeycomb lattice (Kumar et al., 2013). An alternative way of conceptualizing graphene is by deriving it from graphite which, in turn, is one form of carbon. When a particular arrangement of carbon atoms appears in many layers, they form graphite, and graphene is essentially a single layer of graphite (Geim & Novoselov, 2007).

What is interesting about graphene is that it possesses many superior properties: it is mechanically very stiff, strong, thin, transparent and elastic/flexible; it is electrically very conductive (more conductive than silicon); it is thermally very conductive (more conductive than copper); and it is also completely impermeable to molecules (Novoselov et al., 2012; Kumar et al., 2013; Ren & Cheng, 2014). All of these remarkable properties make graphene an extremely attractive nanomaterial to be studied and ultimately exploited in a host of applications in diverse areas ranging from electronics to photonics, composites, energy storage, medicine and even aerospace (Novoselov et al., 2012; Ferrari et al., 2015).

Of these, electronic applications of graphene have received the overwhelming attention of scientists, industries, and governments due to its electrical property (highly conductive) and mechanical property (highly transparent). Naturally, these properties make graphene a suitable transparent electrode, which is used in certain flexible electronic devices such as touch screens, electronic papers, solar cells, liquid crystal displays (LCDs) and organic light emitting diodes (OLEDs) (Novoselov et al., 2012; Kumar et al., 2013).

Consider touch screens, which are computer display screens that are sensitive to human touch and are often found at automatic teller machines (ATMs), smartphones, and computer game consoles. Like other flexible electronic devices, touch screens require transparent electrode. At present, the material used as transparent electrode is indium tin oxide (ITO). However, ITO is brittle; i.e., it has a low fracture strain (Ahn & Hong, 2014). Since graphene is flexible, it may be a suitable replacement for ITO in the near future. However, the substitution of graphene for ITO is complicated by the fact that touch screens require a transparent electrode that has low sheet resistance and high transmittance where ITO outperforms graphene (Novoselov et al., 2012).

Besides its role as a transparent electrode in flexible electronics, graphene has been argued to play an important role in transistors, which are essentially electronic devices that regulate current or voltage flow. Unlike an electrode, which is "an electric conductor used to make contact with the nonmetallic parts of an electronic circuit" (https://en.wikipedia.org/wiki/), a transistor is "a semiconductor device which acts as either an amplifier for electrical power or a switch for electronic signals" (https://en.wikipedia.org/wiki/). Invented in 1947 and arguably the greatest invention of the 20th century, transistors are currently made of silicon, a chemical element with several remarkable properties too (Woodford, April 27, 2017). As silicon is anticipated to reach its fundamental limit soon, the search for a new, superior material is on its way and graphene appears to be the one. However, the substitution of graphene for silicon is complicated by the fact that graphene has zero band gap (more on this in Section 3).

Both flexible electronics and transistors are electronic devices that serve as intermediate goods in the production of consumer electronics such as ATMs, computer games, televisions, computers, and smartphones. From the perspective of the R&D-based growth models, it is clear that graphene technology that is expected to give rise to

flexible electronics and modern transistors fits the increasing product quality model pioneered by Aghion and Howitt (1992). In the physics literature, the anticipated replacement of the existing material(s) by a new one (e.g., graphene) is referred to as disruptive technology (Novoselov et al., 2012); in the economic growth literature, it is referred to as creative destruction. Because the term creative destruction was coined by the late economist Joseph Schumpeter, the model is often referred to as the Schumpeterian growth model, or more broadly, the R&D-based growth model. In the next section, a sketch of this model will be provided with a deliberate reference to graphene technology; for simplicity, the exposition is based on a simplified yet elegant version of the model by Barro & Sala-i-Martin (2004) which, in turn, is based on Aghion and Howitt (1992).

2. The R&D-based Growth Model

Consider an economy consisting of three sectors: final-goods sector (final-output producers), intermediate-goods sector (R&D firms), and household sector (consumers). First, the producers of final output hire labor from the household sector and intermediate goods from the R&D firms to produce final output. Second, the R&D firms invest resources to improve the quality of existing intermediate goods. Finally, consumers maximize their utility subject to the budget constraint. Of these three sectors, the first two deserve some elaboration with a special focus on the intermediate goods.

Consider the intermediate goods. At each point of time, there exists a technology to produce several varieties of intermediate goods indexed by j. Letting the total number of these varieties be designated by N allows the varieties to be denoted by integers $j = 1, 2,\dots, N$. Letting N be fixed allows us to focus on the ongoing improvements in the quality of a fixed number of intermediate goods. For a given intermediate good j, there exists a technology to produce an array of quality of the good. However, only the leading-edge quality is actually produced and sold to the producers of final output. This result follows from the assumption that different qualities of the intermediate good j are perfect substitutes; therefore, the invention of a new, higher quality of the good drives out its current, lower quality one. This process is assumed to apply for each of N varieties from time to time; hence, the term creative destruction.

Let us consider the behavior of firms in the first two sectors. Beginning with the final-goods sector, the production function for a representative firm i can be expressed as

$$Y_i = AL_i^{1-\alpha} . \sum_{j=1}^{N} (\widetilde{X}_{ij})^{\alpha} \tag{1}$$

where α is a parameter such that $\alpha \in (0,1)$, Y is the quantity of final output, A is a measure of productivity, L is the amount of labor input employed, and $\widetilde{X}$ is the quality-adjusted amount of intermediate goods employed, which is given by $\widetilde{X}_{ij} = q_j^{\kappa} . X_{ij}$, where X is the (raw) amount of intermediate goods employed and q^{κ} is the highest quality level attained so far (of good j). Letting the quality ladder of good j be indexed by $k = 0, 1,\dots, \kappa$, then the quality ladder of good j can be written as $1, q, q^2,\dots, q^{\kappa}$. This specification reflects the idea that only the highest quality of good j is employed. If we substitute this specification into Eq.(1), we obtain

$$Y_i = AL_i^{1-\alpha} . \sum_{j=1}^{N} (q_j^{\kappa} . X_{ij})^{\alpha} \tag{2}$$

Following the standard producer theory, firm i is assumed to maximize its profit,

$$\pi_i = Y_i - w. L_i - \sum_{j=1}^{N} P_j X_{ij} \tag{3}$$

with respect to its inputs, L_i and X_{ij}, taken the input prices, P_j and w, as given. (Note that the price of output is normalized to unity.) If we substitute Eq.(2) into Eq.(3), we obtain

$$\pi_i = AL_i^{1-\alpha} . \sum_{j=1}^{N} (q_j^{\kappa} . X_{ij})^{\alpha} - w. L_i - \sum_{j=1}^{N} P_j X_{ij} \tag{4}$$

Assuming that labor L_i is fixed, the firm's problem reduces to one of maximizing its profit with respect to X_{ij} only, and this yields the first-order conditions which, in turn, yield the marginal products of X_{ij}. Under

competitive assumption, these marginal products are equal to P_j. Equating the two expressions yields the demand function for good j:

$$X_j = L. \left[\frac{\alpha A (q_j^\kappa)^\alpha}{P_j} \right]^{\frac{1}{1-\alpha}} \tag{5}$$

Now we turn to the behavior of R&D firms that compete with each other to produce higher quality intermediate goods from time to time. The nature of their competition can be characterized by a two-stage decision making process. First, they decide whether to engage in the R&D investment and if so, how much to invest. Second, upon inventing the new, higher quality intermediate good, they determine its price before it is sold to the final-output firms. Basically, the decision to invest (and how much to invest) depends on the expected flow of profits accrued to the successful, innovating firm, which is the difference between the expected flow of revenues and the expected cost of R&D investment. Since these profits depend partly on the price to be charged, it is sensible to model the firm's behavior backward [which is essentially what Barro & Sala-i-Martin (2004) did].

A key feature of the new intermediate good j is that it is costly to invent but non-rivalry in production. Thus, the successful, innovating firm should be given an incentive in the form of the monopoly right to produce and sell the good. However, this monopoly right does not last forever; it ends once a newer, higher quality good is invented. As mentioned earlier, innovation is measured by the multiple q; i.e., q^0, q^1, q^2, and so on. Hence, the k^{th} innovator in sector j raises the quality from q_{j-1}^κ to q_j^κ and obtains the (instantaneous) flow of profit given by

$$\pi(q_j^\kappa) = (P_j - 1).X_j \tag{6}$$

where the marginal cost of production has been normalized to unity. Since X_j is given by Eq.(5), substituting Eq.(5) into Eq.(6) yields an expression that is free from X_j. Thus, the innovator maximizes this profit with respect to P_j, yielding the optimal price $P_j = 1/\alpha$ which is constant over time and across firms or sectors. Since $\alpha < 1$, it follows that $P_j > 1$ = marginal cost, which is consistent with a characteristic of firms under imperfect competition.

Having determined the price of good j, we proceed to the decision to invest. As stated earlier, this decision depends on the expected flow of profits or the present value of profits:

$$V(q_j^\kappa) = \frac{\pi(q_j^\kappa).[1 - e^{-r.T(q_j^\kappa)}]}{r} \tag{7}$$

where $\pi(.)$ is the profit flow given by Eq.(6), T(.) is the profit duration enjoyed by the innovator, and r is the market rate of return. Inasmuch as the outcome of R&D investment is uncertain, this profit duration is random. As a result, V(.) in Eq.(7) is indeed a random variable to be denoted by its expected value:

$$E[V(q_j^\kappa)] = \frac{\pi(q_j^\kappa)}{r + p(q_j^\kappa)} \tag{8}$$

where p(.) is the probability of a successful innovation which, in turn, depends on the amount of R&D expenditure $Z(q_j^\kappa)$, and the position of the quality ladder q_j^κ:

$$p(q_j^\kappa) = Z(q_j^\kappa).\phi(q_j^\kappa) \tag{9}$$

where the function $\phi(.)$ specifies the effect of q_j^κ on the probability of success: if future innovations are getting harder and harder, then $\phi'(.) < 0$; otherwise, $\phi'(.) \geq 0$. Basically, the R&D investment is attractive only if the

expected return $p(q_j^\kappa).E[V(q_{j+1}^\kappa)]$ is at least as large as the cost $Z(q_j^\kappa)$. If we entertain the possibility of free entry into the research business (which is a characteristic of monopolistic competition), the decision to invest reduces to one in which the net expected return is zero:

$$p(q_j^\kappa).E[V(q_{j+1}^\kappa)] - Z(q_j^\kappa) = 0 \tag{10}$$

As stated earlier, the probability of success p(.) depends partly on the amount of R&D investment Z(.) to be made by the innovating firm. Let us express Z(.) as

$$Z(q_j^\kappa) = (q_{j+1}^\kappa)^{\frac{\alpha}{1-\alpha}}.(\bar{\pi} - r\zeta) \tag{11}$$

where $\bar{\pi} = \left[\alpha/(1-\alpha)\right]\alpha^{2/(1-\alpha)}.A^{1/(1-\alpha)}.L.$ Basically, Eq.(11) states that the amount of R&D investment is an increasing function of the quality-ladder position of the intermediate goods: more R&D resources are devoted to the product line with a higher quality ladder than the one with a lower quality ladder.

It remains to specify ϕ(.). Let us specify that

$$\phi(q_j^\kappa) = (1/\zeta).(q_{j+1}^\kappa)^{\frac{\alpha}{1-\alpha}} \tag{12}$$

where ζ is a parameter such that $\zeta > 0$. Basically, Eq.(12) states that as good j climbs up its quality ladder, the subsequent steps are becoming more and more difficult; in other words, future innovations are getting harder and harder.

Although our exposition is confined to the behavior of firms producing final and intermediate goods only, a complete setup of this model requires a set of assumptions on households as well. Collectively, the behavior of these economic agents generates sustained, endogenous growth (owing to the premise that sustained economic growth is generated from purposeful R&D activities). While this feature of the model alone is intrinsically appealing, a compelling feature of the model is its welfare implication, namely, its ability to achieve Pareto optimum. Usually, this outcome is assessed by comparing the performance of the decentralized economy (based on the individual actions of households and firms) to that of the centralized economy (based on the single action of a benevolent social planner), and Pareto optimum is achieved when their performance coincides.

There are two alternative scenarios depending on the presence or absence of the industry leader among the R&D firms. If there is an industry leader, then it can be shown that the rate of return on investment in the decentralized economy is lower than that in the centralized economy. Accordingly, the growth rate of the economy in the former falls short of that in the latter, and Pareto optimum is not achieved. If there is no industry leader (i.e., firms take turn in becoming successful innovators from time to time), then it can be shown that the opposite occurs (i.e., the rate of return on investment and the growth rate in the decentralized economy exceed those of the centralized economy). Since this implies excessive R&D investment by the innovator, Pareto optimum is not achieved as well.

In both cases, the failure of the decentralized economy to achieve Pareto optimum calls for the government intervention in the form of subsidy (in the first case) or tax (in the second case). Basically, there are basically three kinds of subsidy (tax) at the government's disposal: subsidy (tax) to the purchase of intermediate goods, subsidy (tax) to the production of final goods, and subsidy (tax) on the R&D investment. Of the six (three subsidies and three taxes), the second last one (subsidy on the R&D investment) figures prominently in reality. Yet it remains to determine whether this policy option is appropriate for graphene in the first place.

3. An R&D-based Growth Model Interpretation

Now let us confront this model with the "data"; i.e., how well this model fits the development that has been taking place in graphene technology so far (as well as how it deviates from reality). The discovery of graphene and its potential optoelectronic applications have seen burgeoning research interest in other 2D and 3D materials to cater to a variety of new photonic applications (Woodward et al., 2014). While graphene had been theoretically studied as early as 1947 by P. Wallace, the conventional wisdom at that time was that it is infeasible to isolate graphene from graphite due to its unstable atomic structure (Geim & Novoselov, 2007). Hence, it came as a significant breakthrough to the scientific community when in 2004 Andre Geim and Konstantin Novoselov demonstrated a remarkably easy exfoliation of graphene from conventional graphite, a feat which earned them the Nobel Prize in Physics in 2010 (Woodward et al., 2014).

What is interesting about graphene is not its discovery per se but rather the fact that it possesses so many superior properties that can be turned into many useful applications. Many 2D and 3D materials have since been studied for their optical properties, including topological insulators (TIs) and transition metal dichalcogenides (TMDs), and have demonstrated remarkable opto-electronic characteristics including ultrafast recovery times (Bao et al., 2009; Zhang et al., 2009; Song et al., 2010), wide operating spectral bandwidths (Song et al., 2010; Tan et al., 2010), layer dependent absorption properties (Zhang et al., 2015; Li et al., 2014) and even considerably high modulation depths (Ahmad et al., 2016; Howe et al., 2016). As a consequence, it has attracted a huge amount of public and private investment in R&D totaling $2.5 billion (http://www.ceramicindustry.com/articles/95791). In the public domain, the top investors have been the European Union, China, the South Korea, and the United States; in the private domain, the leading companies have been Samsung, IBM, and Nokia (Ferrari et al., 2015; Zurutuza & Marinelli, 2014).

In addition to that, the advances in graphene and other carbon-based nanomaterials such as nanotubes have now spurred the exploration of various other 2D and 3D materials for their potential use in photonics and opto-electronic devices. Among these are TMDs which are a category of materials under the family of 2D materials which is generally atomically thin layered material in nano-meters range (Sun 2016). TMDs exhibit the general formula of MX_2 where M represents the transition metal atom such as Molybdenium (Mo) and Tungsten (W) and X represents the chalcogen atoms such as Sulphide (S) and Selenide (Se) (Bhattacharyya, 2012). These materials show promise as they demonstrate the same characteristics as graphene from graphite, and the weak interlayer bonding of TMDs materials make it easily fabricated using simple mechanical exfoliation, similar to that used to fabricate graphene.

Moreover, TMDs are also good in that they possess the combined advantages of other 2D materials such as graphene and TIs. The blending of the 1T (metallic) and 2H (semiconducting) phases in TMDs make them similar to graphene and TIs in terms of band gap (see the next paragraph) and surface state respectively and thus capable of broadband saturable absorption (Bhattacharyya, 2012). In the field of photonics, the broadband saturable absorption properties of graphene and similar materials is important to ensure its functionality as saturable absorber for the generation of pulsed laser in wide wavelength region.

Although the R&D investment by these public and private entities has been made in diverse areas, it is useful to focus on a specific one, say, transistors. It has been recognized right from the outset that graphene has zero or no band gap, defined as the gap between the space in a material that is fully occupied by electrons (known as the conduction band) and the space in the material that is relatively empty from electrons (known as the valence band). It follows that the presence of this band gap allows electrons in the valence band to travel freely in the conduction band, thereby conducting electricity. Inasmuch as the presence of a band gap is required in the fabrication of transistors, employing graphene as an input in the production of transistors seems to be out of the question (Chahardeh, 2012; Sood et al., 2015).

Nevertheless, there are two ways to overcome this problem: engineer the band gap in graphene or circumvent the need to have a band gap in transistors. Both of these methods have been attempted: in the first case, a group of IBM researchers has found a way to engineer the band gap in graphene; in the second case, a team of scientists from the University of California at Berkeley has found a way to circumvent the zero band gap problem (Johnson, 2010; Yirka, 2013; Ferrari et al., 2015). In both cases, the attempts have been successful during a relatively short period of time, pointing to the relative ease with which the graphene-based transistors can be designed. If we take

this outcome at face value (which may need to be qualified in light of possible side effects on unwanted byproducts), we may conclude that climbing up the quality ladder is becoming easier and easier as we accumulate more stock of knowledge, which runs counter to the premise of our model.

One may object to this conclusion by arguing that this outcome could be an isolated incident and that it might not be applicable to other devices. However, if one looks at flexible electronic devices, one could easily be convinced that a similar outcome holds for them as well; i.e., graphene-based touch screens, LCDs, and OLEDs are readily available now (Novoselov et al., 2012; Kumar et al., 2013); as a matter of fact, they have been invented shortly after graphene was isolated.

Despite the relative ease with which the graphene-based devices are invented, their commercialization efforts have been deferred, at least up to this point, due to the high production cost of graphene itself. To date, there exist several methods of synthesizing graphene: mechanical exfoliation, chemical exfoliation, and chemical vapor deposition (Kumar et al., 2013). As usual, there exists a trade-off between low-cost and high-quality graphene: while low-cost graphene is feasible with chemical exfoliation, it comes at the expense of high-quality graphene; by the same token, while high-quality graphene is feasible with chemical vapor deposition, it comes at the expense of low-cost graphene (Ren & Cheng, 2014; Ahn & Hong, 2014). Inasmuch as high-quality graphene is desirable and sometimes crucial, it is not economical at this point to replace the existing, inferior material with graphene. It is not economical, for example, to replace the current ITO-based touch screens with graphene-based ones. Hence, we may conclude that the production cost may dictate the adoption of new technology irrespective of the quality ladder position, a feature which is absent in our model.

4. Conclusion

In this paper, an attempt has been made to give the current graphene mania an economic interpretation via the R&D-based growth model. On the surface, we find that the model provides a fairly good description of the development that has been taking place with regard to graphene exemplified by the introduction of graphene-based devices such as touch screens, electronic papers, solar cells, LCDs, and OLEDs. Upon a closer scrutiny, however, we find that there are some discrepancies between the model and the "data." First, there is some evidence that future innovations are becoming easier and easier, which is equivalent to the saying, "the more we learn, the easier it is to learn further." Second, the model seems to focus on the technology of producing a new intermediate good (i.e., graphene-based devices) to the neglect of the technology of producing a sufficiently low-cost raw material (i.e., graphene itself). It is interesting to see how the conclusions of this model are altered (if any) by the incorporation of these concepts.

Acknowledgments

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