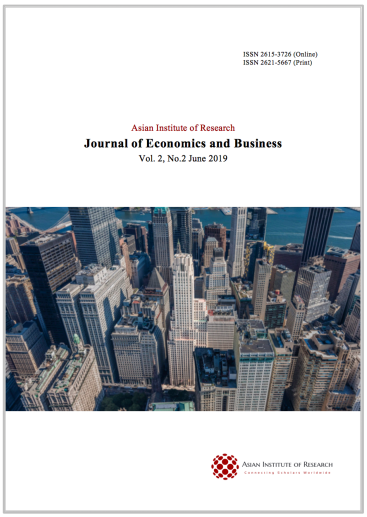

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Research on the Proportion of Underground Economy in China Based on NIPA Measurement

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Abstract
William White, in his book The Street Society deeply analyzes the unique social functions of illegal groups in the Clairville community. This social result based on interaction networks causes the illegal economy to attach it and nourish it. The Chinese society, which also has a network that emphasizes interaction, has a huge underground economy that affects our understanding of actual economic data. This paper provides a macro estimate of the proportion of China's underground economy to GDP in China and its regions through the NIPA (National Income and Products Account) assessment method for countries with economies in transition. The results show that the proportion of China's underground economy continues to rise, but the growth rate is declining year by year. The overall proportion is not high, but the regional differences are obvious. Individual provinces, municipalities, autonomous regions have shown a unique trend and need to be treated differently

Keywords: Underground Economy, Interaction Theory, NIPA Measurement

1. Introduction

In 1936, William White joined a field investigation in an Italian immigration area in Boston. He used the participatory observation method to observe and record the living conditions of the slum, the informal organizational structure and behavior, the relationship between these organizations and other social groups, and the interaction patterns between them, summarized the society of this corner community. The structure and interaction methods finally extracted the book Street Corner Society, which was published in 1943 and received wide attention. This book has a lot of highlights. One of them is that it has got rid of the research paradigm of community research in the past, focusing on the specific individuals and groups(Shilu, 1995). In the book, the "harmony" between illegal groups and police groups is a typical embodiment. By depicting the wine business during the toasting period and using gambling for profit in the illegal group, White made us fully understand that the illegal groups in the corner society seem to have become the towering tree that maintains the ecological balance of the Clavier region. Its roots penetrate this Italian Deep in the soil of the community, and there is almost every street corner gang; his branches are lush, covering the sky, the police are their "accomplice" so that their illegal activities are guaranteed. However, it is not to say that the police and the illegal groups are in the same group. White believes that "the relationship between them is not general, but it is built between individuals in these two

groups." Officials never and what form of contract is reached in the illegal group, the "intervention" of the police is only the obedience to this social structure. They protect the stability of the area in the form of street corner society. White pointed out: "The observations made on the form of Clavier show that the primary function of the police department is not to enforce the law but to manage illegal activities. The people of Clavier have established an organization that can be permanent. There is freedom that depends on the law"(White, 1994),the party in the illegal group, like the police's "blessing policy", sees that illegal activities that should be banned actually play their social functions, illegal groups in East City District provide local people with Employment opportunities, investment for startups, promotion of production and employment, and social mobility of local residents.

White used the theory of interaction to explain this pattern of activity. He believes that the pattern of activity in street corners is fixed. Street corner youths and community residents rely on the rules of illegal groups. Illegal groups follow the "business" concept of responsibility to residents. Even the police had to act in the manner of Clavier to keep the police in contact with illegal gangs. This approach is stable and fixed by the long-term activity of the group. If a corner youth wants to make himself feel spiritually happy, he must maintain his interaction. He needs to make his activities follow the customary channels, otherwise, he will be upset(Defeng & Mei, 2002). This model clearly reveals the extraordinary role of the illegal economy in the economic life of local communities. We can understand this informal economic activity as an economy in a network. It is in this corner of the youth, clubs, illegal groups, and police, politicians, etc. as "nodes," "density" in other community networks, the informal economy is "embedded" Social system. In this kind of informal trading, the development of Granovetter's "embedded dilemma" appears, that is, the only means to prevent dereliction of duty is the trust between ordinary members in the dominant social structure. The trust in informal transactions comes from the common identity and emotions and the desire to punish the scammers. He is excluded from his social network. This kind of punishment of forcible social exclusion, from the perspective of the flow of economic resources, is more deterrent than other punishments (Granovetter, 1985). Is China, also a strong networked society, like the corner society, the owner "embedded" with the underground economy in the social system? If he is ubiquitous, how much does he constitute our economic life?

2. Concepts

The underground economy was first proposed by the Southern European Economics Giorgio in 1997. It refers to the fact that the government failed to manage the taxation and implementation control due to various factors, the output value was not included in the part of the government's published gross national product. Economic activity, Feige later classified him more systematically based on institutional regulations that were violated by specific economic actions and dividing them into the illegal economy, undisclosed economy, unregistered economic behavior, and informal economic behavior. "Illegal economy refers to that goods and services which prohibited by the law of production and sales. The undisclosed economy has composed the act of "avoiding the legal regulations clearly stipulated in the tax law." Unregistered economic behavior refers to avoiding the reporting requirements of the government statistical department. And informal economic behavior refers to actions taken to save the costs of 'property relations, financial registration, labor contracts, infringement, business and social security systems' covered by laws and regulations (Feige, 1990)."

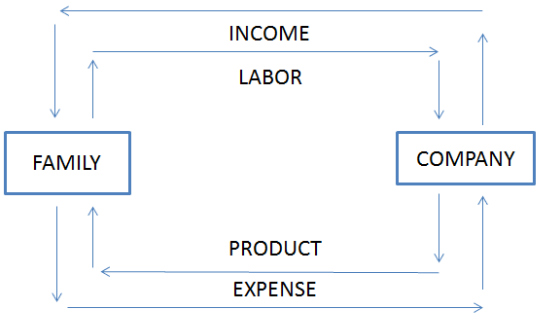
3. Measurements

3.1 Measurement Methods

At present, there are mainly physical estimation methods, investigation methods, and currency estimation methods for the measurement methods of the underground economy. The physical method of the underground economy refers to the use of some physical, economic variables that play an important role in daily economic activities to speculate on the scale of the underground economy. Internationally, the power consumption method is relatively popular. This method was first called "simple electric consumption models" (ECM), which assumes that electricity consumption can reflect the best indicator of overall economic activity because of the usual assumptions. It is believed that the elasticity of electricity consumption to GDP is generally equal to 1, which means that the growth of power consumption is synchronized with the growth of the overall economy. The total amount of electricity is estimated, the amount of underground economy is eliminated by excluding the officially recorded economic

volume in the population (Kaufmann, Kaliberda, & World Bank. Europe and Central Asia Region. Country Department IV., 1996). However, this method only uses electricity as an evaluation index, and there is a general tendency to underestimate the size of the underground economy (Harriss-White, 2010). The underground economy survey method refers to estimating the underground economy through census or questionnaire sampling surveys and specific non-sampling surveys. The typical example is the household consumption assessment method. James Smith and his assistant McCrohan used the national possibility survey under the guidance of UMich to study the informal goods and food provided by the family (Smith, 1987). This study considers the family the informality of supply is an effective indicator for estimating the proportion of the informal economy, but it is regarded as providing formal services for large companies and non-conforming labor activities contained within large companies (Williams & Martinez-Perez, 2014). The currency estimation method is the earliest use of systematic and rigorous data to study the beginning of the underground economy because of its succinct procedures and data acquisition. It is also relatively convenient, so the method has been widely used at home and abroad (Yongxing, 2009). The representative is the general cash ratio model (GCR), which is based on the circulation of money that needs to be stored. On the basis of the ratio, it is assumed that informal transactions are mainly carried out in cash to avoid penalties from regulatory oversight bodies (Gutmann, 1977). This method is more applicable in developed countries, where the government registration department and the national finance department are more developed because of the investigation. It is more effective with statistically applicable indicators such as currency flow and savings rate. (Map 3-1)

Map 3-1 BASIC ECONOMIC MODLE



Between them, this article selects the NIPA measurement method. NIPA (National Income and Products Account) is a macroeconomic estimate, known as the macro-differentiation method, which attempts to measure the proportion of all underground economies in the gross national product. This approach is based on the existence of two different but comparable measurement methods that measure a certain area of the national economy. This difference is attributed to underground economic activity, and this approach is very practical and developing countries in transition. In 2008, Feige used the unobserved proportion of national income and GDP as an indicator to measure the size of the underground economy of the former Soviet Union and Eastern European countries. This approach was found to be applicable to developing countries in transition (Feige & Urban, 2008). This paper uses the same measurement ideas to try to estimate the scale of China's underground economy in the post-communist system in transition (Nee & Opper, 2010).

3.2 Data selection and statistical calculation

From the point of view of macroeconomic operations, the most basic national economic model is a single input and a single output economy. Figure 3-1 shows all the economic transactions that take place between homes and businesses in this economy. The inner ring represents the flow of labor and products; the family sells their labor to the enterprise, and the enterprise sells its own products to the family. The outer ring represents the corresponding currency circulation, the family pays the money to the enterprise for the purchase of the product, and the enterprise pays the family wages and profits. In this economy, GDP is both the total expenditure on products and the total income of manufactured products. Therefore, the GDP calculated by both the expenditure method and the income method must be equal. Because according to accounting, the purchaser's product expenditure must be equal to the income of these product sellers (Mankiw, 2011). Therefore, in the macroeconomic model, income, expenditure

must be equal, and the difference, in reality, we can classify it as the share of the underground economy, because people always tend to conceal income rather than an expenditure. Estimate the difference between "During Urban Residents' Per Capita Income" (DPI) and "Urban Residents' Per Capita Consumption Level" as the total income of underground economic activities. We can estimate the share of China's underground economy in GDP.

4. Results and analysis

From a national perspective, the proportion of the underground economy in GDP increased from 0 to 2005 in the eight years from 2005 to 2012. In 2012, it increased by 1.06 percentage points compared with 2005. (Table 4-1) From the data of each year, the growth rate in 2012 was the highest, rising by 1.07 percentage points, and the negative growth in 11 years and 10 years, the proportions decreased by 0.27% and 1.39% respectively. (Table 4-2) However, on the whole, from the beginning of 2007, the increase in the proportion has been decreasing year by year. According to other studies in Asia, the shrinkage is related to the global financial crisis that began in 2007 (Hasan & Mohammad, 2015).On a month-on-month basis, China's underground economy's share of GDP is not as high as the countries in transition. According to the 2003 United Nations Economic Commission for Europe survey on the underground economy of FSU (former Soviet Union countries) and CEE (Eastern European countries) in 1998-2000, the proportion of countries in 2000 was [48%, 9%]. Among them, Moldova in Georgia and Romania is more than 30%, and Kyrgyzstan is 50% after all.

Table 4-1. Underground economic proportion

Region	Year							
	2012	2011	2010	2009	2008	2007	2006	2005
Northeast	4.21%	3.64%	3.79%	5.57%	6.25%	7.55%	8.25%	5.84%
North China	6.04%	5.18%	5.37%	6.73%	6.46%	5.44%	5.65%	5.32%
East China	8.42%	6.77%	7.08%	7.00%	6.73%	7.30%	6.38%	6.61%
Central China	11.11%	8.89%	9.63%	13.66%	12.67%	11.09%	9.41%	8.09%
South China	10.18%	9.21%	9.03%	9.62%	9.15%	8.37%	9.17%	9.63%
Southwest China	14.79%	13.81%	13.96%	14.96%	15.76%	16.71%	14.63%	12.08%
northwest	6.12%	6.52%	7.16%	10.89%	10.01%	9.23%	8.83%	7.28%
Total	8.21%	7.14%	7.41%	8.80%	8.54%	8.32%	7.85%	7.15%

Data from the National Bureau of Statistics of China

Table 4-2. Underground economic proportion

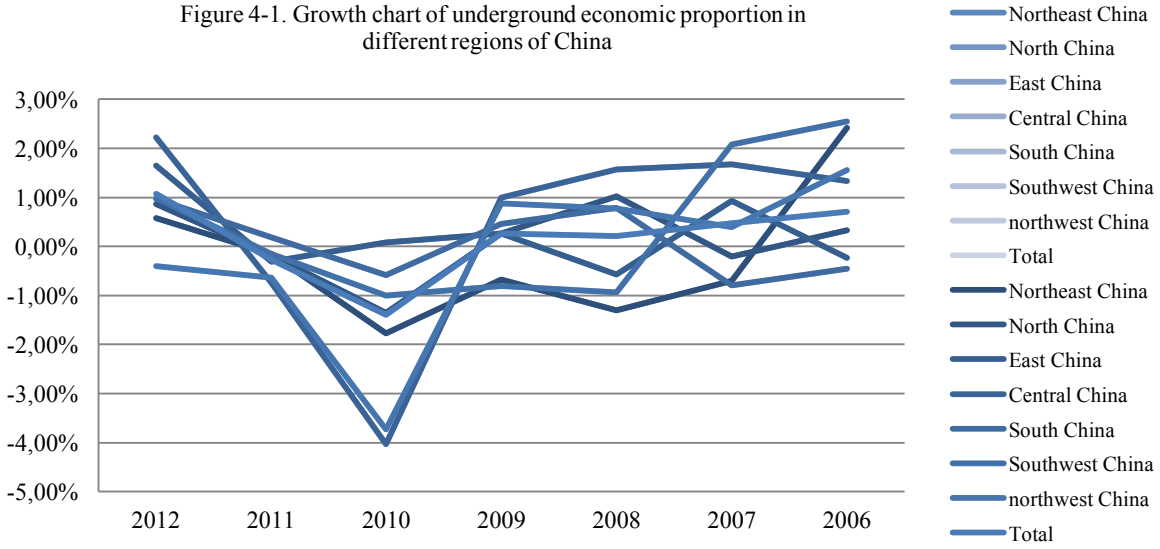
Area	Year							
	2012	2011	2010	2009	2008	2007	2006	2005
Northeast	4.21%	3.64%	3.79%	5.57%	6.25%	7.55%	8.25%	5.84%
North China	6.04%	5.18%	5.37%	6.73%	6.46%	5.44%	5.65%	5.32%
East China	8.42%	6.77%	7.08%	7.00%	6.73%	7.30%	6.38%	6.61%
Central China	11.11%	8.89%	9.63%	13.66%	12.67%	11.09%	9.41%	8.09%
South China	10.18%	9.21%	9.03%	9.62%	9.15%	8.37%	9.17%	9.63%
Southwest China	14.79%	13.81%	13.96%	14.96%	15.76%	16.71%	14.63%	12.08%
northwest	6.12%	6.52%	7.16%	10.89%	10.01%	9.23%	8.83%	7.28%
Add up	8.21%	7.14%	7.41%	8.80%	8.54%	8.32%	7.85%	7.15%

Data from the National Bureau of Statistics of China

However, less than 10% of the countries have only Croatia and the Czech Republic (Nations, 2003). Therefore, in general, China's underground economy has increased between 2005 and 12 years, but the increase has shown a downward trend, and its proportion of GDP is not high compared with international data.

From the perspective of various regions of the country, from 2005 to 2012, the underground economy of the northeastern region of China's six major regions has decreased, and the other five regions have risen. (See Figure 4-1, Table 4-1, Table 4-2) The growth rate in Central China was the most obvious, rising by 3.02%. The southwest and east China, respectively, rose by 2.71% and 1.81% as a fellow. The northwest region continued to rise by 1.65 percentage points before 2010 and began to decline in 10 years, down 4.77 percentage points, and the proportion was compressed to 6.12%. In terms of the proportion of the underground economy in GDP in various regions, the proportion of the underground economy in the southwest region is relatively high, and it has maintained the first place in the past eight years. In 2012, the underground economy accounted for 14.79% of GDP. The lowest proportion is still in the northeast. The decline in the proportion from the beginning of 2006 makes its proportion of the underground economy in 2012 only account for 4.12% of GDP. Generally speaking, consistent with the national data, the proportion of the underground economy in most regions has risen to varying degrees, and the regions with weak economic bases such as Central and Southwest have seen a large increase. The proportion of the underground economy in various regions also appears to be high in the south (14.79% in the southwest in 2012 and 10.18% in southern China). The situation is low in the north (4.21% in the northeast, 6.04% in the north, and 6.12% in the northwest).

Figure 4-1. Growth chart of underground economic proportion in different regions of China



From 2005 to 12 years, all provinces, municipalities, and autonomous regions in China, except for the proportion of the underground economy of some provinces and cities, have declined. In general, the proportion of the underground economy of various provinces and cities has increased to varying degrees. In particular, East China, North China, Central China, and Southwest China have experienced rapid economic development. Tibet has the highest rate of increase, rising by 12.60% in 8 years, followed by 10.95% of Yunnan, 9.69% of Hainan, and 9.61% of Guizhou. (Figure 4-2, Figure 4-3, Table 4-3) It can be seen from the figure that the proportion of the underground economic increase is mostly concentrated in Yunnan and Guizhou, as well as in Tibet and Hainan. These indicators have risen between these provinces and municipalities and autonomous regions during these eight years. The rapid development of the economy is inseparable. However, the provinces and cities with a decline in the underground economy are mainly concentrated in the three eastern provinces and Inner Mongolia (Lin, Yang, & Yingcai, 2006), the northwest region, and the two regions with the same economic environment. In particular, the decline in Guangxi was 11.56%, second only to Chongqing (11.78%). This fiscal policy that supports the transformation of Guangxi's economic development mode during the "Twelfth Five-Year Plan" period is inseparable from strengthening Guangxi's overall fiscal and taxation management(Dezhou, 2011), but as can be seen from the data, the proportion of Guangxi's underground economy has declined since 2008. This is closely related to the foreign trade environment that was so depressed at the time and so far. Guangdong is different. Guangdong's underground

economy is active, and its open economic structure is bright. A large number of small manufacturing and light industries require a large amount of informal labor and underground transactions (Yuanbiao, 2014). The overall decline in the three eastern provinces is inseparable from the economic conditions of the decline of its traditional old industrial base (Donglin, 2004; Xiaoli, 2014).

Table 4-3. Proportion of underground economy

Region	City	Year							
		2012	2011	2010	2009	2008	2007	2006	2005
Northeast China	Heilongjiang	6.22%	4.11%	4.73%	7.94%	8.00%	9.05%	10.91%	9.11%
	Jilin	7.68%	7.78%	7.36%	7.23%	8.25%	8.72%	10.25%	7.96%
	Liaoning	0.28%	-0.18%	0.53%	2.78%	3.56%	5.60%	4.83%	1.88%
North China	Beijing.	4.18%	3.56%	2.95%	4.48%	4.55%	2.84%	3.54%	2.59%
	Tianjin	4.45%	4.27%	5.37%	6.40%	5.20%	4.54%	4.05%	3.27%
	Hebei	10.94%	8.75%	9.33%	10.30%	11.38%	8.47%	8.02%	8.60%
	Inner Mongolia	2.89%	2.44%	3.31%	3.85%	4.52%	5.48%	6.98%	7.69%
	Shanxi	15.86%	13.01%	11.53%	15.74%	13.32%	13.03%	13.04%	14.35%
East China	Shandong	8.19%	6.09%	5.46%	4.98%	4.54%	5.93%	4.25%	6.50%
	Jiangsu	8.17%	7.63%	8.93%	10.40%	9.84%	10.06%	9.58%	9.21%
	Shanghai	1.29%	-1.62%	-3.69%	0.60%	-0.36%	-1.33%	-1.02%	-0.72%
	Zhejiang	9.94%	6.96%	7.28%	7.82%	9.05%	9.86%	7.83%	9.12%
	Anhui	17.02%	14.37%	12.19%	16.97%	19.37%	18.86%	18.84%	15.66%
	Fujian	13.95%	10.90%	9.73%	11.73%	9.72%	10.19%	10.04%	10.99%
Central China	Henan	10.61%	8.99%	8.03%	12.11%	12.74%	10.81%	7.60%	4.63%
	Hunan	9.77%	6.91%	7.61%	10.22%	11.44%	11.73%	8.36%	8.64%
	Hubei	9.20%	7.15%	8.91%	10.10%	7.58%	5.45%	6.42%	6.37%
	Jiangxi	15.77%	13.29%	14.77%	24.25%	20.35%	17.67%	16.32%	13.72%
South China	Guangdong	3.63%	2.71%	1.68%	1.85%	1.70%	2.18%	4.69%	4.73%
	Guangxi	13.60%	12.58%	14.68%	17.94%	20.01%	22.33%	20.63%	25.16%
	Hainan	18.17%	17.72%	17.75%	18.47%	15.91%	10.61%	10.03%	8.48%
Southwest China	Chongqing	7.99%	6.64%	8.27%	10.21%	10.78%	12.34%	19.86%	19.77%
	Sichuan	12.37%	8.47%	9.38%	12.37%	13.08%	11.84%	9.82%	9.00%
	Guizhou	16.57%	15.93%	11.40%	8.29%	7.59%	9.97%	-1.73%	6.96%
	Yunnan	20.61%	21.41%	22.17%	21.03%	20.45%	21.40%	14.30%	9.66%
	Tibet	22.28%	24.02%	23.38%	24.70%	28.01%	28.52%	20.82%	9.68%
Northwest China	Shaanxi	6.44%	6.08%	5.76%	8.65%	7.87%	5.55%	3.87%	2.98%
	Gansu	9.62%	7.23%	8.12%	8.79%	8.01%	8.13%	8.17%	8.91%
	Ningxia	6.60%	8.86%	10.04%	16.90%	15.65%	13.45%	12.06%	8.49%
	Qinghai	7.69%	7.67%	8.24%	9.51%	9.92%	10.09%	12.84%	11.10%
	Xinjiang	1.42%	2.84%	3.93%	9.55%	7.90%	8.80%	7.70%	5.94%

Data from the National Bureau of Statistics of China

The economic environment in the northwest region has been greatly improved over the years with the opening of the western region, especially the adjustment of the economic structure (Yang, 2013), the fiscal and taxation system reform(Rui, 2010) and the traditional production methods for ethnic minorities. Various traditional economic production methods have been incorporated into the track of marketization and industrialization (Yuming, 2009), which have led to effective statistics in the economy that could not be observed (Xiaolin, 2010). These initiatives have led to a good regulation of economic behavior, and the proportion of the underground economy in most provinces and cities in the Northwest has declined. Chongqing has become the city with the fastest decline in the past eight years. It is inseparable from the development after becoming a municipality. The high-speed opening and development require a sound market operation mechanism and standardized economic operation(Jian, Wei, & Yanqi, 2014). Since Chongqing's direct administration, it has continuously regulated its own economic

environment, which has led many economic activities that were not included in the formal channels to return to formality, especially as a fixed asset investment to promote Chongqing's economic growth, structural adjustment of ownership, opening up to the outside world, and accumulation of human capital. It needs to be heavily incorporated into the formal economy, otherwise, it will not work (Xinzhong, 2002). While observing the proportion of the underground economy in China's various provinces and cities as a percentage of GDP, we found that the 2012 interval was [0.28%, 22.28%], the 2011 interval was [0.18%, 24.02%], and the proportion in 2010 was [0.53%, 23.38%], the proportion in 2009 was [0.60%, 24.70%], the interval in 2008 was [0.36%, 28.01%], and the interval in 2007 was [1.33%, 28.52%], the interval in 2006.

Figure 4-2. Cities with an increasing proportion of the underground economy in 2005-2012 years

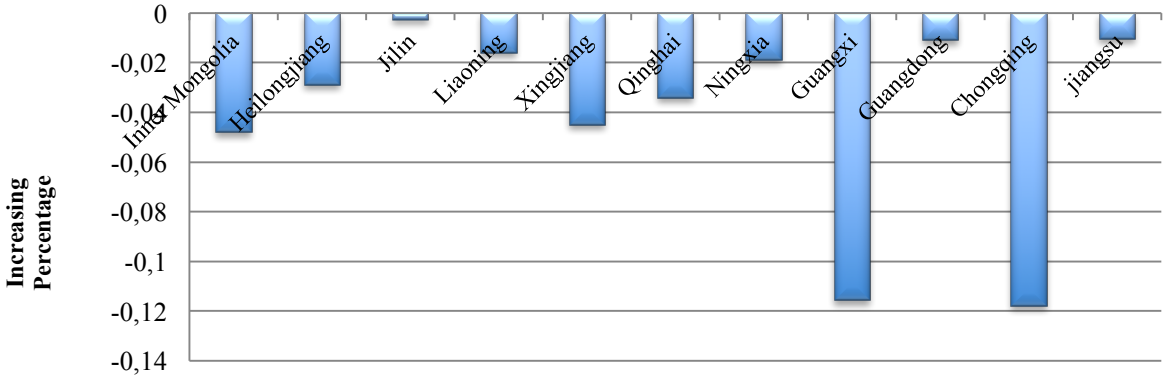
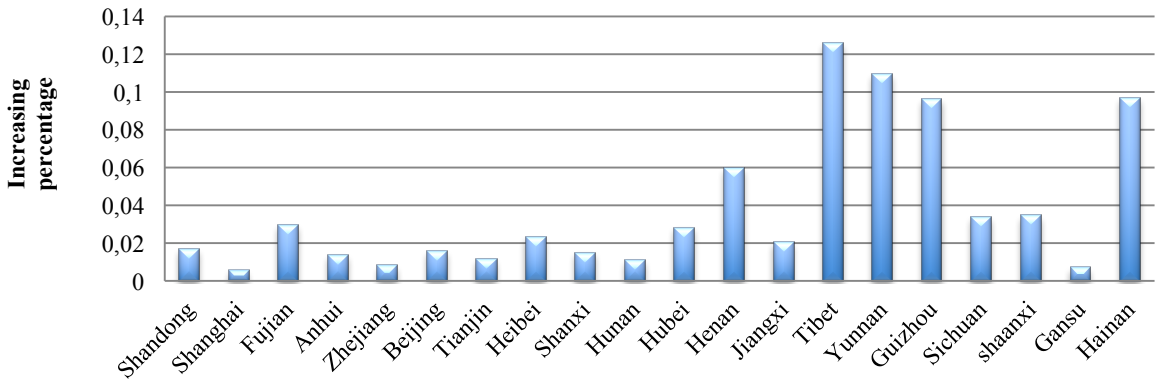


Figure 4-3. Cities with the declining underground economy in 2005-2012



For [1.02%, 20.82%], the range for 2005 was [0.72%, 25.15%]. It can be shown that the proportion of the underground economy in GDP from 2005 to 2012 is only active in the quarter of the national economy, only about 3 percentage points higher in 2007 and 2008, which is in line with China's economy at 07. According to the statistics of the National Bureau of Statistics, China's GDP growth rate in 2008 was 9.62%, down by 4.68 percentage points from 2007(NBSPRC, 2014). In the horizontal observation of the upper and lower limits, we will find that except for the highest in Guangxi in 2005 (25.16%), the upper limit is almost in Tibet. The Tibet Autonomous Region is located on the western border of China. Economic and social development has always been difficult. In particular, the region has relatively traditional folk customs, and it is difficult to standardize economic activities (Yanghai, 2009). According to the 2003 Economic and Social Development Report of Tibet, the economic and social development costs in Tibet are high, the market development is low, the farmers and herdsmen are not competitive in the market, and the human capital in the region needs to be improved (CTRC, 2009). The

lower limit was concentrated in Shanghai before 2010, which is consistent with Shanghai's position as the economic center of China and the internationalization of metropolitan cities (Lixin & Jiang, 2000). This type of province and city usually has sound economic rules and regulations, and economic actors usually follow the charter to ensure that their economic behavior is protected by law (Xuwei, 2006). After 2010, it was concentrated in Liaoning Province.

5. Conclusions

Although China also has an interactive social network structure as revealed by The Corner Society, the informal economy has not reached a position that is at least in terms of quantity. In particular, the proportion of the underground economy to GDP is relatively low compared to the post-communist economic system in the same period of economic transition. Moreover, in recent years, there has been a tendency for the growth rate to continue to decline. However, it is generally consistent with the economic development trajectory. Positive growth is more than negative growth, and the proportion of the underground economy is generally rising. Especially in Central China, East China, and Southwest China, where the economy is developing rapidly, the underground economy accounts for more than 10% of GDP, and ranks among the top three in the seven regions, especially in the Tibet Autonomous Region in the southwest. The underground economy accounts for two of the total GDP to 30%. In China, the situation of various provinces, municipalities, and autonomous regions is also quite complicated. Through the comparative analysis of each province and city, we also found interesting phenomena in some regions. For example, in the region where the underground economy continues to decline, only the Northeast And the northwest part of the region; and has been in the country's lowest underground economy, Shanghai gave way to Liaoning after 2009; and the underground economic downturn in various provinces and cities began in 2008 and 2009. Some of these phenomena are because the economic system reform regulates the market environment; some are because their own economic strength is shrinking, and a large number of resources are outflowing; some are because the open geo-economics force them to regulate the economic operation procedures. These are all areas of underground economic dynamics analysis and require more in-depth research and analysis.

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