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The Impact of Regulatory Changes on the Effectiveness to Earn Positive Margin for their Investors

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Abstract
It is often forgotten that banks are private companies and that shareholders and investors expect certain return on their investments. Banks are also highly leveraged companies increasingly dependent on the investors especially in long-term debt. On the other hand, during the period of "low-for-long" interest rates, we have witnessed that Return on Capital for major listed European banks was constantly falling. Average use to stand on 2.28% in 2002 and has fallen by 2021 to 1.87%[1]. In majority of listed European banks that was much lower than their Cost of Capital (4.4% in 2002 fallen to 2.8% in 2021) which is usually taken as the benchmark for investors' minimum expectations in terms of return on their investment. In line with the Modigliani–Miller theorem that has in recent research proven to be valid for the banks[2], this research had ignored the capital structure and used as key variables Cost of Capital and Return on Capital, both not sensitive to the capital structure of an entity. Every new regulatory requirement although strengthening the resilience also increases cost of compliance and possibly further reduces the positive margins banks are earning to their shareholders and investors. It is therefore a legitimate question will the shareholders and investors keep investing in banks capital if the Return on Capital will not cover Cost of the same Capital. Especially now that new investment opportunities arise and competition on the market for non-core banking services like payment services, digital services, etc. further intensifies. The research presented in this paper analysed the data for 53 European listed banks and based on the fixed effect model applied to the panel data concluded that regulatory changes do effect banks effectiveness to earn that positive margin for their investors and shareholders. It has also been concluded that traditional banks which are dominantly financed through deposits and oriented to extending loans are more resilient to regulatory changes. This paper contributes to the literature on factors influencing the Cost of Capital and Return on Capital for banks, but does so by analysing the influence of different regulatory changes and key business model variables on the differential of Return on Capital and Cost of Capital. In a brother sense, this paper is also consistent with the conclusions of the literature on "low risk anomaly" proving that "traditional" less risky banks, from their business model perspective, tend to outperform their counterparts.

Keywords: Banking Regulation, Cost of Capital, Return on Capital

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[1] Data on 53 listed European banks retrieved by author from Bloomberg
[2] Dick-Nielsen, Gyntelber, Thimsen: "The Cost of Capital for Banks: Evidence from Analyst Earnings Forecasts", 2022

1. Introduction

In the period of "low-for-long" we have witnessed that European banking system had constantly been reducing its profitability measured by Return on Capital (further RoC[3]). Average use to stand on 2.28% in 2002 and has fallen by 2021 to 1.87%[4]. Although, the profitability has improved after pandemic. Other measures interested for investors were also declining (for example Price to Book ratio). Investors have at the same time lowered their expectations measured mostly by Cost of Capital (further CoC[5]) which have on average fallen from 4.4% in 2002 to 2.8% in 2021. If the expectation of profitability expressed by CoC is on average always higher than the realised RoC it is a legitimate question why do investors still invest in the banking system that is not fulfilling their minimum expectation. The same phenomenon has been pointed out by Andrea Enria, Chair of the Supervisory Board of the ECB, in its speech at the 26th Annual Financials CEO Conference organised by Bank of America Merrill Lynch.[6] Nevertheless, the evidence shows that the difference between the RoC and CoC is narrowing down as well. This paper tries to determine if the regulatory changes influenced any of those trends in the "low-for-long" period, and whether that influence was different for the subset of traditional banks financed dominantly by deposits and extending loans from those deposits.
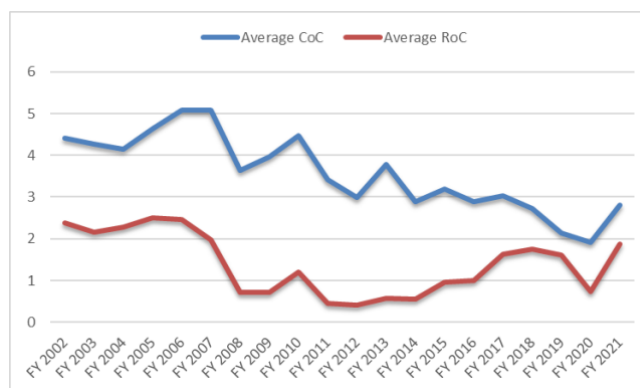

Figure 1: Average Cost of Capital and average Return on Capital for listed European banks

First challenge was to determine which regulatory changes to take on board because they are different in scope and impact. Some influence valuation (for example introduction of the International Accounting Standard 39 in 2005, and replaced by International Financial Reporting Standard 9 in 2018), other introduce new operational costs (for example introduction of the regulatory requirements for managing anti-money laundering, or consumer protection which require increased cost of compliance by 2008 and 2016), and finally all of them foster resilience of the bank (particularly the modification of the regulatory requirements for the calculation of the prudential requirements). It is therefore to be expected that their impact on banks and the banks' performance indicators will not be the same, but at the same time all of them do have important role to play and should not be overlooked.

Further to that, it is interesting to see if all banks reacted in the same way. Therefore, the first step was to explore literature on bank business model. All current approaches for the classification of banks into different business model include at least one category of traditional banks. Traditional banks are usually defined as the ones that are dominantly financed through taking deposits from the public and issuing loans. This is also the basic definition European legislation is using in defining a bank (i.e., credit institution).

This paper try to determine if there is a relationship between performance indicators of European banks and significant regulatory changes in the European banking regulatory framework and if that relationship is weaker for the business model of a traditional bank.

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[3] Return on Capital expresses return in units of total capital employed (equity and long-term debt)

[4] Data on 53 listed European banks retrieved by author from Bloomberg

[5] Banks use a combination of debt and equity to finance their business thus we have used the cost of capital derived from the weighted average cost of capital (WACC).

[6] https://www.bankingsupervision.europa.eu/press/speeches/date/2021/html/ssm.sp210922~df2b18acb9.en.html

This paper contributes to the literature on factors influencing the CoC and RoC for banks, but does so by analysing the influence of regulatory changes, key business model variables and capital adequacy ratio on the differential of RoC and CoC exploring if the realised RoC cover the calculated overall CoC.

2. Literature overview

There is plenty of literature discussing the factors influencing bank's profitability (namely RoE and RoC) and the factors influencing their expected rate of return on capital investment (namely CoE and CoC) but present literature rarely discusses the interplay between the RoC and CoC and the factors influencing both. Among the factors influencing RoC or CoC the impact regulatory changes can have on either of them is scarcely addressed. The most similar work is the paper published by Anna Kovner and Peter Van Tassel (2018[7]) which focused their work on the fact that since the passage of the Dodd-Frank Act, the value-weighted CAPM[8] cost of capital for banks has averaged 10.5 percent and declined by more than 4 percent on a within-firm basis relative to financial crisis highs. They have concluded that the decrease was much greater for the largest banks subject to new regulation than for other banks and firms. However, their work was dominantly focused on only one key regulatory change and proving an empirical relationship between bank-level CAPM cost of capital estimates and bank lending supply. Most of the research that do analyse the impact of regulatory change on RoC or CoC emphasize only on the regulatory changes that increase bank's capital requirements (mostly implementation of Basel I, II or III).

Some of the key research questions explored in the present literature and the relevant conclusions this paper contributes to are presented in the Table 1.

Table 1: Overview of the literature and relevant conclusions

Relevant research question	Literature	Relevant conclusions
Is the Modigliani-Miller (1958) framework relevant for banks?	Hart and Moore, 1995 Diamond and Rajan, 2001 Holmstrom and Tirole, 1997 Miles et al., 2012 Diamond, 1984 Dick-Nielsen, Gyntelber, Thimsen, 2022	− emphasizes the disciplinary role of debt on managers − capital should have a positive effect on performance − investors adjust their return expectations for banks in accordance with the MM conservation of risk principle
What are the factors influencing banks' profitability (RoC)?	Ayadi,De Groen, 2014 Roengpitya et al, 2014 De Bandt, Camara, Pessarossi, 2014 Berger,1995 Chronopoulos, McMillan, Wilson, 2015	− retail-funded commercial banks are the most profitable measured in terms of RoE − there is positive impact of an increase in capital ratios on the ROE − bank size is found to have a non-linear relationship with profitability

[7] "Evaluating Regulatory Reform: Banks' Cost of Capital and Lending", Anna Kovner Peter Van Tassel, Staff Report No. 854, June 2018 Revised in July 2020
[8] CAPM is a model for pricing an individual security or portfolio based on its relation to expected return and systematic risk (beta)

What are the factors influencing investors' expectations (CoC)?	Mehran and Thakor, 2011 Belkhir, Naceur Chami, Semet, 2019 Baker, Wurgler, 2015 Kovner, Van Tassel, 2018	– acquirers pay more for targets with a higher capital ratio – documenting a negative empirical impact of additional capital on the cost of equity – largest banks are most affected by post-crisis regulations and have experienced a significant decline in their CoC because of it

Further, this research builds on the research concentrated on different **methods to calculate CoC**. Models to calculate CoC can be roughly divided into ex-post models that are based on historical data and ex-ante which are based on the projections of income in the future and the probability of maintaining income as a source of equity in the future periods.

One of the most common **ex-post models** for the calculation of CoC is CAPM model. This model is described in many early works (Sharpe, 1964; Lintner, 1965 and Mossin, 1966). Although often criticized CAPM model is still the model used by the Federal Reserve System (Barnes and Lopez, 2006), and by the significant number of European banks (Altavilla et al., 2021). In theory, there are other ex-post models. The model developed by Zimmer and McCauley (1991) is based on the realised RoE. Besides one-factor models there are multy-factor models like the model developed by Fama and French (1993) which includes not only market indicators but also the indicator of the size, and indicator of market and book value of the firm.

There are also **ex-ante** models that calculate CoC based on the projections of income and dividend policies. One of the first models of such sort have been developed by Pastor et al. (2008). Maccario et al (2002) have developed model based on discounting of dividend which is adjusted for inflation. Even larger step was taken by Ohlson and Juettner-Nauroth (2005) which do not project dividends but base their model on the projection of income per share. Gebhardt (2001.) expected values of CoE base on the projections of RoE.

When deciding which model to use for this work the most useful information was found in the work of Altavilla et al. (2021) because they have calculated the CoC for 50 European banks using several of the models previously mentioned (CAPM, Fama-French, and two other multifactor models). They have proven that the value calculated by the CAPM is the lowest, and that statement is proven true independent on the size of the bank or the period of calculation. Based on the survey evidence published in that paper the largest group of respondents (41%) use some calibration of the standard Capital Asset Pricing Model (CAPM) to project their required rate of return. Based on the same survey the model-based approaches are favoured by listed banks, because they can make use of their stock price data to calculate their required rate of return. Thus, it was decided to use CAPM which is not only the widely used by investors but also producing the lowest result. By taking the lowest estimate of the CoC the argument of RoC not covering even the lowest estimated CoC is more compelling. Based on the analyses of the published works due to the fact that this paper concentrates on the 53 largest listed European banks the method used for the approximation of the CoC is decided to be Weighted Average Cost of Capital (WACC) as calculated by Bloomberg. The method uses two components of the CoC: Cost of Equity (CoE) and the Cost of Debt. Where the Cost of Equity is calculated by using the CAPM model.

When it comes to the business model literature the reference could be found in Roengpitya et al. (2014) which have based on the balance sheet data of 222 internationally active banks using the Ward algorithm (Ward, 1963) managed to identify three basic business models: a retail-funded commercial bank, a wholesale-funded commercial bank and a capital markets-oriented bank. They have used predefined variables on asset and liability side (share of loans, traded securities, deposits and wholesale debt, as well as the interbank activity of the firm). According to Roengpitya et al. (2014) retail-funded commercial banks are the most profitable measured in terms of RoE of 12.49%, with the CoE of 12%. While wholesale-funded commercial banks had RoE of 5.81%, and CoE of 3%. On the European market similar business model analyses have been performed by Ayadi and de Groen (2014) which have classified European banks into four business models: large investment-oriented banks, banks

with a heavy reliance on interbank funding and lending, retail-oriented banks with relatively non-traditional funding sources and retail-oriented banks which rely primarily on customer deposits. The sample included 147 large banking groups of the European Economic Area including their subsidiary outside EEA. They have also used Ward algorithm based on the six basic indicators (loans, trading portfolio, liabilities, deposits, issued debt, derivative exposure). Ayadi and de Groen also concluded that the two retail-oriented banking models were the most profitable. Diversified retail model has realised RoE of 9.54%, and focused retail model realised RoE of 6.74%. The major difference between those two retail models is that diversified model takes advantage of the diversified sources and become internationally active. Focused retail model was predominantly financed from retail deposits with share over 60%.

3. Major regulatory changes and their impact on listed European banks

In this paper, several major regulatory changes for European banks have been identified with potentially significant influence on the dependant variable:

– 2005 – Implementation of International Accounting Standard 39 (further IAS 39) in the EU – by adopting Regulation (EC) No 1606/2002 in 2002, EU established a stable platform of international accounting standards. However, certain important provisions in IAS 39 were at that time still subject of unfinished discussions between the IASB, the European Central Bank, prudential supervisors and the banking industry. These provisions related to the option to fair value all financial assets and liabilities and to hedge accounting. Since each of these provisions concern areas which were completely autonomous, distinct and separate from the rest of the standard, in order to respect the date of 1 January 2005 for the implementation of the IASs, EU decided to introduce IAS 39 with the exception of these provisions. Introduction of the valuation methods for the majority of the banking assets had a major influence on the European banks and their business decisions.

– 2008 – Introduction of the requirements for Anti Money Laundering (further AML) – by adopting Directive 2005/60/EC on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing in 2005 with the implementation in 2008 EU introduced more specific and detailed provisions relating to the identification of the customer and of any beneficial owner and the verification of their identity. That regulation established detailed rules for customer due diligence, including enhanced customer due diligence for high-risk customers or business relationships, such as appropriate procedures to determine whether a person is a politically exposed person, and certain additional, more detailed requirements, such as the existence of compliance management procedures and policies. In order to comply with those requirements banks had to establish processes, provide resources and education, which have raised costs prior to the year of the implementation and possibly affected basic performance indicators.

– 2010 - Regulatory response on the financial crisis - EU has adopted Directive 2009/111/EC by which it implements the Basel standard from 28 October 1998, on both the eligibility criteria and limits to inclusion of certain types of hybrid capital instruments in original own funds of credit institutions. It also included macro-prudential elements and strengthened liquidity requirements.

– 2013 – Implementation of the Basel III framework in the EU – by adopting Regulation (EU) No 575/2013 EU has for the first time harmonised in a directly implemented Regulation the basic prudential requirements applied to banks – framing these requirements as a Regulation have ensured that those requirements were directly applicable, and thus prevented diverging national requirements as a result of the transposition of requirements in a form of directive. Since this Regulation have entail that all banks in the EU follow the same rules it has also reduced regulatory complexity and firms' compliance costs, especially for institutions operating on a cross-border basis, and contribute to eliminating competitive distortions. All this should have positive effect on the basic performance indicators. In the same year, the Council Regulation (EU) No 1024/2013 was adopted conferring specific tasks on the European Central Bank as a first pillar in the creation of the Banking union in the EU. In the same year, IFRS 13 becomes effective in the EU.

– 2016 – Introducing more stringent rules for mortgage credits – by adopting Directive 2014/17/EU on credit agreements for consumers relating to residential immovable property this regulation aimed to develop a more transparent, efficient and competitive internal market, through consistent, flexible and fair credit agreements relating to immovable property, while promoting sustainable lending and borrowing and financial inclusion, and hence providing a high level of consumer protection. The provisions on processes, valuation and

consumer protection issues put additional burden on the banks that provide such loans and prior to the implementation have raised costs and possibly impacted basic performance indicators.

– 2018 – EU has implemented International Financial Reporting Standard 9 (IFRS9) – replacing the majority of the IAS 39 – by adopting Regulation (EU) 2016/2067 EU has addressed concerns that arose from accounting issues during the previous financial crisis. In particular, IFRS 9 replaced the so-called "incurred loss concept" introduced by IAS 39, by forward-looking model for the recognition of expected losses on financial assets. Based on the EBA Report[9] implementation of IFRS 9 have increased the provisions to 9% on simple average (and up to 15% for the 75th percentile of banks), and thus impacted performance indicators.

Regulatory framework has been changing rapidly and banks are constantly increasing compliance costs but also their resilience. Most of the regulatory requirements have increased the resilience of the banking system to the economic shocks (accounting standards, Basel framework) but some have been predominantly designed to addressed general goods issues (AML, consumer protection, etc.) contributing to increased compliance cost but also the resilience to conduct and operational risk. Therefore, it is important to analyse the impact of all of those regulatory changes on the banks' performance indicators, having in mind that banks rely on investors, which pay attention to those indicators.

4. Data and methods

For analysis, the datasets retrieved from Bloomberg is used. The data for each of the 53 European listed banks have been further validated in the published annual financial statements and public disclosures of the banks in the sample. The main advantage of these dataset is that the data is required by law to be published by listed companies and it is verifiable in audited financial statements. The data on CoC is calculated by Bloomberg in a comprehensive and transparent way and is widely used by banks themselves and market investors as an important indicator guiding their expectations and choice of investments.

Since the research deals with the panel data combining cross-sectional and time-series data, Hausman's (1978) specification test was performed in order to test whether the characteristics of individual banks are correlated with independent variables used in the model. Since the Hausman's test showed that individual characteristics have effect on the independent variable (P-value is 0.003), fixed effect model was used. In order to control for heteroskedasticity and not allowing variance of the residual term, or error term, in a regression model to vary widely the robust as an alternative to least squares regression was used.

5. Descriptive results and time series analysis

The sample included 53 European listed banks because it was decided that the basis for the calculation of the CoC is CAPM based on the quoted shares. The time series span for twenty years from 2002 to 2021 characterised "low-for-long" period. The data was retrieved from Bloomberg and checked in the published annual financial statements and publicly disclosed data for the banks in the sample. Some of the banks were not listed in some of the years in the sample. The missing values are considered missing and not replaced, so the variables are calculated based only on available data.

In the process of choosing the dependent variable for performance CoC was firstly analysed, but since it is only partly addressing banks′ performance mainly driven by the sentiments of the market in a given year and also highly influenced by the economic cycle it was decided that a hybrid variable will be constructed as a difference of the realised RoC and expected return measured through CoC. This hybrid variable if positive show that a bank is realising more than the investors expect it to, and vice versa. The most common investor's perception is that if RoC is higher than CoC, management is creating value, and if RoC is less than CoC, management is destroying value. Although, as shown in Figure 2, the median of such hybrid variable for the sample is negative, but it is

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[9] https://www.eba.europa.eu/sites/default/documents/files/documents/10180/2087449/bb4d7ed3-58de-4f66-861e-45024201b8e6/Report%20on%20IFRS%209%20impact%20and%20implementation.pdf?retry=1

slowly rising and the distribution show that some banks even in the "low-for-long" period have managed to produce return that was higher than the investors' expectations.
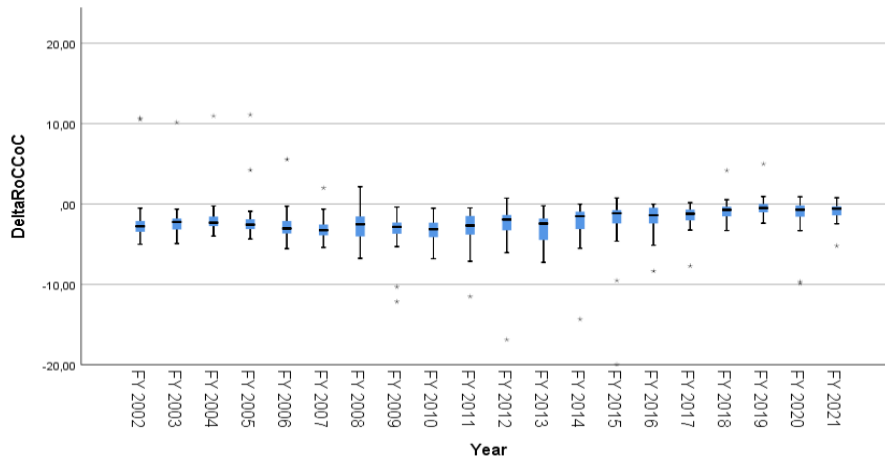

Figure 2: Distribution of the difference between RoC and CoC (Delta RoCCoC) for the European listed banks: 2002-2021

In order to emphasise the possible impact on traditional banks relying on deposits as the source and providing loans as a basic activity as opposed to the rest of the banks, the sample was divided in two basic business models: traditional and other banks. The sampling was based on the two indicators: the share of deposits in the total liabilities (further: DepP), and the share of loans in total assets (further: LoansToTotalAssets). The method used was a hierarchical cluster analysis. In order to decide which clusters should be combined in a hierarchical cluster analysis a measure of dissimilarity between sets of observations is required. In most methods of hierarchical clustering, this is achieved by use of an appropriate distance such as the Euclidean distance, between single observations of the data set, and a linkage criterion, which specifies the dissimilarity of sets as a function of the pairwise distances of observations in the sets. The method used in this paper is widely used Ward's minimum variance criterion that minimizes the total within-cluster variance. To implement this method, for every year of observations at each step the pair of clusters that leads to minimum increase in total within-cluster variance after merging is merged. The measurement method applied is squared Euclidean distance. Finally, banks have been categorised in Traditional if they have been included in Cluster 1 (Traditional) in the year of observation and if in that year the data on the basic indicators is available. Based on the performed cluster analysis all other banks have been distributed to Cluster 2 (Other banks) as shown in Figure 3.

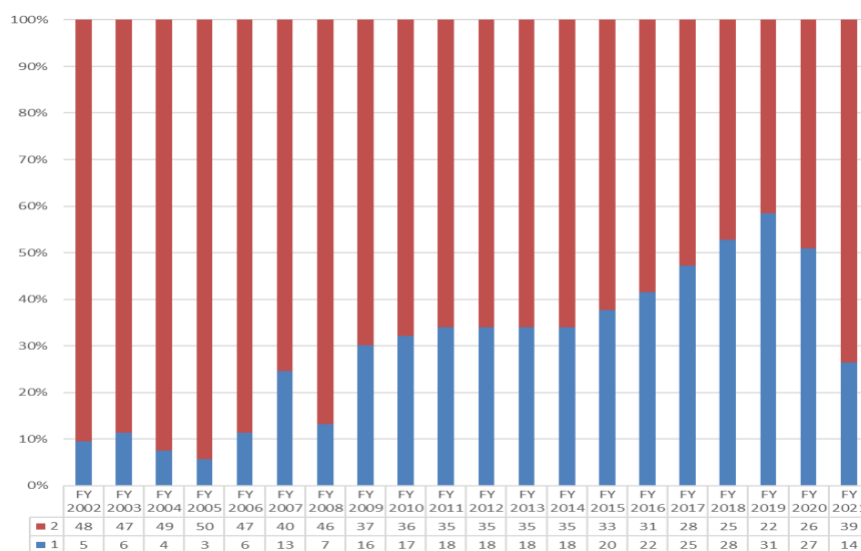|	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
2	48	47	49	50	47	40	46	37	36	35	35	35	35	33	31	28	25	22	26	39
1	5	6	4	3	6	13	7	16	17	18	18	18	20	22	25	28	31	27	14

Figure 3: Clustering of European listed banks in Cluster 1 (Traditional), and Cluster 2 (Other banks): 2002-2021

In the cluster of Traditional banks minimum of the ratio DepP was 38,27%, and maximum was as high as 93,52% with the Mean of 63,71%. When it comes to the ratio of LoansToTotalAssets minimum was 0%, and maximum was 88,38% with the Mean of 61,05%. This was in line with the initial idea to define as Traditional banks with high DepP and high LoansToTotalAssets ratios.

Those two clusters have performed quite differently over the period in question as shown in Figure 4.
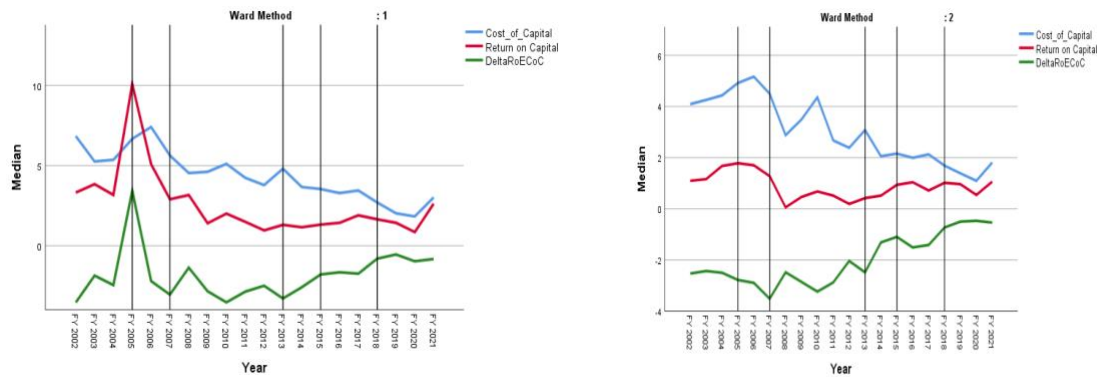

Figure 4: Performance indicators for European listed banks: 2002-2021

By looking at the Figure 4, it is easy to see the trend of the median values of the CoC, RoC and the difference between the two for those two distinct samples (Ward 1 – Traditional, Ward 2 – Other banks) and it is evident that the difference was narrowing down. It is also evident, as the works on "low risk anomaly" have concluded, that traditional banks are outperforming their peers by earning higher RoC, and median of the difference between RoC and CoC has been positive at least ones in the analysed period. Nevertheless, it is also evident that the difference between RoC and CoC was in majority of cases still negative although the difference was getting smaller by the end of the "low-for-long" period. The realised RoC and measured CoC had converged.

The correlation between the dependent variable (DeltaRoCCoC) with the Composite indicator of systemic stress (CISS) withdrawn from the ECB Statistical Data Warehouse was also tested. Since the literature has already established that profits are pro-cyclical the indicator CISS which is computed for the Euro Area as a whole is used to control for the macroeconomic conditions as it is considered representative indicator for the systemic risk on the market on which the banks in the sample operate. It includes 15 raw, mainly market-based financial stress measures that are split equally into five categories, namely the financial intermediary's sector, money markets, equity markets, bond markets and foreign exchange markets.

It is important to say that the data does not show that the difference between RoC and CoC was significantly impacted by the macroeconomic situation. In order to provide evidence, the correlation measured by Pearson Correlation Coefficient was calculated and it showed week negative relationship between those two variables with a degree of statistical significance of 0,429 as shown in a Figure 5.
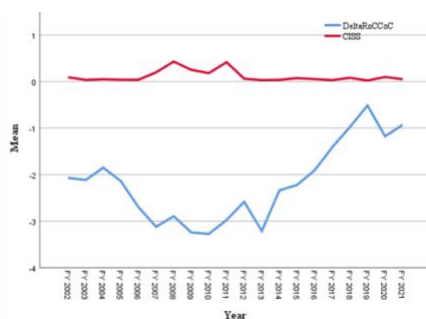
Correlation test		DeltaRoCCoC
CISS	Pearson Correlation	-0,187
	Sig. (2-tailed)	0,429
	N	20

Figure 5: Correlation of dependent variable DeltaRoCCoC and CISS

Finally, since slight linear relationship between the dependent variable (DeltaRoCCoC) and the independent variables representing business model (LoansToTotalAssets and DepP) was detected as shown in Figure 6 further analysis through fixed effect model has been conducted.
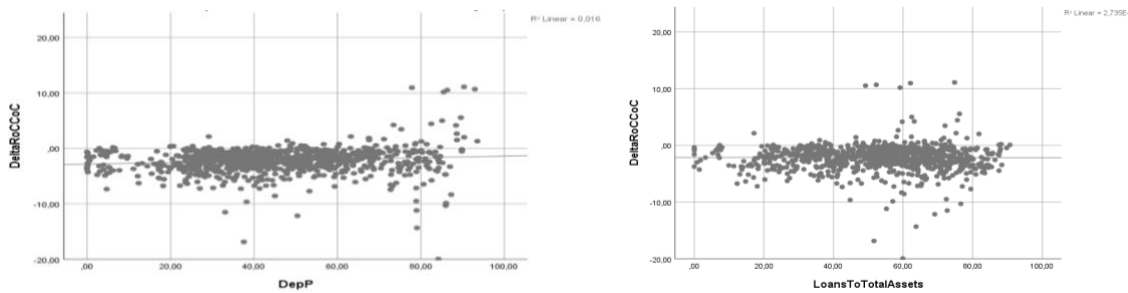

Figure 6: Relationship between dependent (DeltaRoCCoC) and independent variables (DepP, LoansToTotalAssets)

The final step was the creation of the independent variable for the regulatory change. (RegulChangeAvAdjCISS). Since all of the banks in question were impacted by the change in regulation, instead of using widely used method Difference in differences which requires data measured from a treatment group and a control group, the indicator which was constructed through the following steps, is used:

1. for each observation year the average of DeltaRoCCoC for the whole sample of banks is calculated and to account for the influence on dependent variable by any systemic risk so calculated negative average per year was slightly corrected upwards by the Composite indicator of systemic stress (CISS) that takes the value between 0,0222 in the years of low stress up to 0,4298 in the years of high systemic stress
2. for each period between two regulatory changes the average of the so calculated adjusted annual averages of DeltaRoCCoC is calculated
3. the impact of regulatory change in period t_1 is then calculated as the difference between those averages of adjusted annual averages between period t_1 and period t_0, and it was calculated for each period between previously detected regulatory changes.

So constructed variable showed the impact between periods in which significant regulatory change has occurred. Figure 7 shows the relationship in mean terms of the dependent variable DeltaRoCCoC and the so constructed independent variable reflecting the regulatory change (RegulChangeAvAdjCISS).
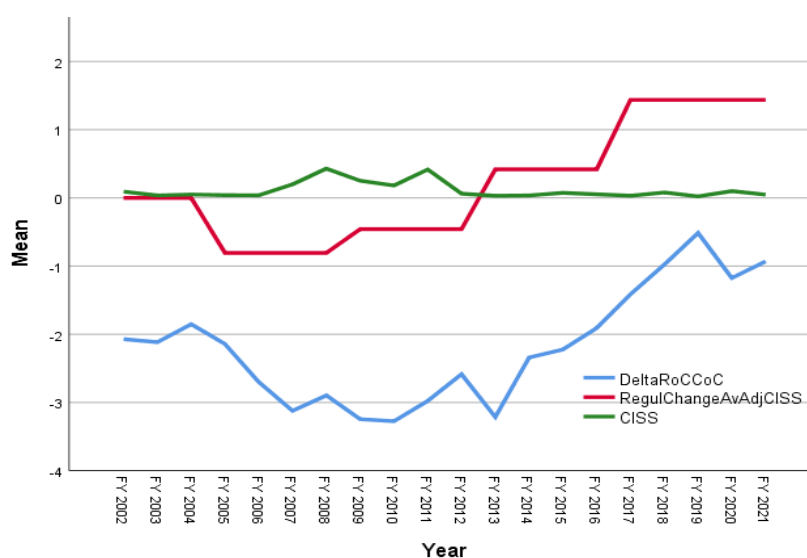

Figure 7: Trend of variables (DeltaRoCCoC, RegulChangeAvAdjCISS, CISS), through the years

By applying fixed effect model on total population (53 listed European banks) with DeltaRoCCoC as dependent variable, and RegulChangeAvAdjCISS, DepP and LoansToTotalAssets as independent variables model showed

significance for the variable of regulatory change. In order to eliminate the possibility that model might mistakenly attribute the effect of some potentially important variables identified in the literature, variables of size and capital adequacy were added to the linear regression model. The log of total assets (ln(Total Assets)) is included to reflect the effect of bank size on profitability, and the log of total capital ratio (ln(Total Capital Ratio) is included to capture the potential effect of increased capital requirement on the cost of capital. Log transformation for variables of Total Assets and Total Capital Ratio which exhibit right skewness was used. Thus, it was concluded that regulatory change measured through so constructed variable influence the effectiveness of the use of capital measured through the difference between RoC and CoC (as shown through results of the model in Table 2).

Table 2: Regression results of fixed effects for the European listed banks

DeltaRoCCoC	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DepP	0.031	.018	1.73	.089	-.005	.067	*
LoansToTotalAssets	0.006	.021	0.28	.779	-.037	.049	
RegulChangeAvAdjCISS	0.589	.202	2.91	.005	.183	.995	***
ln_TotalAssets	-0.45	.455	-0.99	.327	-1.363	.463	
ln_TotalCapitalRatio	1.049	.651	1.61	.113	-.259	2.357	
Constant	-1.235	4.96	-0.25	.804	-11.197	8.728	

In order to show if effectiveness of the use of capital of the traditional banks is more resilient to the regulatory changes, the same fixed effect model was implemented on the two subsets with the results as shown in Table 3:

Table 3: Estimation of fixed effects for two subsets of European listed banks

Subset of Traditional banks						
DeltaRoCCoC	Coefficient	std. err.	t	P>t	[95% conf. interval]	
DepP	0.074	0.049	1.510	0.140	-0.026	0.174
LoansToTotalAssets	-0.019	0.056	-0.330	0.741	-0.133	0.095
RegulChangeAvAdjCISS	0.578	0.420	1.380	0.178	-0.277	1.433
ln_TotalAssets	-0.723	0.987	-0.730	0.469	-2.734	1.287
ln_TotalCapitalRatio	0.103	1.669	0.060	0.951	-3.296	3.503
_cons	2.877	10.650	0.270	0.789	-18.816	24.570
Other banks						
DepP	0.023	0.014	1.700	0.096	-0.004	0.051
LoansToTotalAssets	0.022	0.020	1.100	0.276	-0.018	0.061
RegulChangeAvAdjCISS	0.547	0.144	3.800	0.000	0.257	0.837
ln_TotalAssets	0.052	0.227	0.230	0.819	-0.406	0.511
ln_TotalCapitalRatio	1.156	0.400	2.890	0.006	0.350	1.961
_cons	-8.076	3.142	-2.570	0.014	-14.409	-1.743

6. Conclusions

In the time of "low for long" interest rates that have now come to an end, banks' return has been narrowing down. Regulatory changes, mostly to overcome some vulnerabilities identified in the periods of economic stress, that have been introduced have increased banks' resilience but have also increased their cost of compliance, thus putting further pressure on their return. Lower return has, been accompanied by the lowering investors' expectations expressed by CoC. In line with the widely researched concept of the "low risk anomaly" banks that finance their business by taking deposits and are primarily oriented to extending loans (traditional banks), thus considered less risky, have outperformed their peers, not just by managing to yield higher returns, but also exhibit that the difference of the realised return and the expected return is more resilient to regulatory changes.

There have been many attempts to model the impact of regulatory changes on banks' performance indicators but due to the intensity and the verity of the regulatory changes enforced on the banking sector they have mostly concentrated on the increasing requirements regarding capital adequacy. This paper has tried to take a more comprehensive view by addressing all of the major regulatory changes that are impacting European banks. The paper focuses not just on RoC or CoC but their difference trying to capture whether realised return is sufficient to cover expected return from the investor's perspective.

The results of this paper show that regulatory changes have statistically significant positive impact on the difference of the return on total capital (including long term debt) banks are realising and the expected return measured through the cost of capital the investors are expecting them to realise. But when the group of banks that are predominantly financed by deposits and use those funds to extend loans (the basic feature of, in this paper, created subset called "traditional banks") have been singled out that positive relationship between the regulatory change and the measure of bank performance indicators disappear showing that their effectiveness to achieve positive difference between Return on Capital (RoC) and Cost of Capital (CoC) and thus incentivise their investors to invest in them is not significantly affected by constant regulatory changes.

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