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The influence of the CEO tenure and Board co-option on the level of risk taking of banks

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Abstract: The CEO, as top-decision maker of the company, may to a great extent determine the risk attitude of the company. The riskiness of the CEO's decisions may have a large influence on the companies performance and the stakeholders' appreciation. Ultimately, the riskiness of the CEO's decision may even lead to bankruptcy. This thesis focuses on the influence a CEO can have on the level of risk taking of banks by analyzing the variables CEO tenure and Board co-option. There is no objective data directly representing the CEO power, but on basis of agency theory, stakeholder theory, and stewardship theory three hypotheses are formed on how the CEO tenure and board co-option ratio are influencing both the CEO power and the CEO's willingness to take risks. The more power the CEO has, the more influence he can have in the amount of risk the bank takes. To test these hypotheses, the predictions were compared to a dataset consisting of data for 1060 banks from all over the world in the period 2000-2019. Small correlations were found, suggesting that both a higher CEO tenure and a higher Board co-option ratio come with an increase in the risk taking of the bank, which is not in accordance with the hypotheses and the agency theory. Furthermore, the interaction term of the CEO tenure and Board co-option ratio is positive whereas the individual trends are negative. This indicates that the common part of the CEO tenure and Board co-option ratio behaves differently than the non-overlapping part. This result is unexpected and is not in accordance with the hypothesis. However, all the observed correlations were either not statistically significant or very small and as such little support for the proposed models was found in the data. This indicates that the idea that the riskiness of the CEO's decisions is driven by the CEO tenure and Board co-option has marginal predictive power and that other factors influencing the riskiness are dominant.

Jel-codes: C33, D81, G21

Keywords: CEO tenure, Board co-option, CEO power, bank risk taking, agency theory, panel data

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Outline

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1. Introduction

This thesis analyzes how the CEO tenure and Board co-option influence the risk attitude of a bank.

The Chief Executive Officer (hereinafter referred to as CEO) generally has a very powerful position within a company. He is the main person responsible for managing the company and the top-decision maker (Ho et al., 2016). According to the agency theory, the more power the CEO has, the more he can make decisions based on his own preferences which might differ from the preferences of the shareholders, being the owners of the company (Chen, 2013).

This thesis focuses exclusively on CEOs of banks. The risk level of banks can have enormous societal impact, e.g. in case of bankruptcy such as during the economic bank crisis in 2008 (Bullard et al., 2009). Furthermore, I did not want to complicate the study by including different business sectors; obviously factors involving risk taking can differ strongly between banks, automobile industry, food industry, lawyer firms, etc. For banks, we have a set of good indicators that are strongly related to risk taking, and using one single type of business makes the data more homogeneous.

The decisions CEOs make are naturally prompted by their risk preference. Being the top-decision maker, the CEO's risk preferences may to a great extent determine the risk attitude of the bank. To get a better understanding of what influence and power CEOs can have on the risk level of a bank, this thesis analyzes arguments from the perspective of the agency theory, the stakeholder theory and the stewardship theory in the theoretical framework. Furthermore, this thesis discusses the effect of two variables related to the CEO's power on the level of risk taking of a bank. Firstly, the CEO tenure will be analyzed as a variable influencing the decision-making of the CEO and risk level of the bank. Chen (2013) assumes that the CEO power increases with a longer tenure, which is in line with the agency theory. During his tenure, the CEO can use this increase in power to influence (the way in) which Directors are appointed. For this reason, the second variable that will be

researched in this thesis is the Board co-option. This study defines Board co-option as the proportion of the Board that is composed of Board members that joined the Board after the CEO assumed office. For banks to make sure that CEOs make decisions that are in line with the interests of the bank's shareholders, there is a Board of Directors that monitors the CEO (Fama and Jensen, 1983). The Board of Directors can influence (the riskiness of) the decision-making of the CEO (Ho et al., 2016).

The concept of CEO power and its influence on a company's performance has been widely researched as surmised in the literature review of this thesis. Less research is available on the influence of specific CEO power elements on the risk attitude of banks. It is of high importance to have a broad understanding of the risk attitude of banks since this is linked to profitability on the one hand and potential bankruptcy on the other hand (Iturriaga and Sanz, 2015; Wiggins et al., 2014). Bank failure or even the threat of bank failure (e.g. because of excessive risk taking) can lead to a bank run and spillovers to other banks. (Brown et al., 2017; Uhlig, 2010). Ultimately, this could even lead to a financial and/ or systemic banking crisis and in the long-run to an economic recession, as we have seen with the financial crisis of 2007-2008 (Bullard et al., 2009). Excessive risk taking by banks can thus put the stability of the entire financial sector and the security of individual institutions at risk (Srivastav and Hagendorff, 2016).

To be able to better foresee and prevent crises, it is relevant to gather knowledge on the risk attitude of banks and, more particularly, on the variables that may influence this risk attitude. This thesis aims to contribute to this by investigating the following research question:

What influence do the CEO tenure and Board co-option have on the level of risk taking of banks?

This thesis tries to fill a gap in this research field and differentiates from previous studies in three ways. Firstly, this thesis uses a dataset from banks all over the world rather than focusing on a certain geographical area or on (non-)financial firms in general. Secondly, many studies on CEO power (variables) base their theoretical framework either on the

agency or the stewardship theory. Rather than focusing on one theory, this thesis uses the agency, stewardship and stakeholder theory to probe the motivation, decision-making and power of CEOs and interprets the results from the empirical research in terms of the developed theoretical framework. Lastly, this thesis investigates the relationship of the CEO tenure and the Board co-option ratio. Accordingly, this research contributes to existing literature by studying banks from all over the world, focusing on multiple theories and researching the relationship between the CEO tenure and Board co-option ratio. The results of this thesis can help banks better understand the influence a CEO can have on the bank's risk taking. Banks can change their strategy accordingly: If a bank e.g. would like to take little risk and the results show that longer tenured CEOs take less risk, it is desirable for banks to give CEOs incentives to stay on. Furthermore, if the results e.g. show that a higher co-option ratio leads to less risk then risk averse banks could include rules on a maximum tenure Directors should have in the Board. Additionally, the results of this thesis can further help customers choosing a bank based on the CEO tenure and Board co-option ratio of the banks depending on their personal risk appetite.

Section two outlines the theoretical framework of this thesis in the context of agency, stakeholder and stewardship theory, and gives a more extensive review of literature. Section three consists of a proposed data collection method and description. The numerical analysis of the data and the interpretation of the quantitative results are described and discussed in Section four. Finally, the results and conclusions are summarized and presented in Section five.

2. Literature Review and Hypotheses

This Section describes the theoretical framework on the basis of the agency, stakeholder and stewardship theory followed by a literature review. The theories and subsequent literature on the topics CEO power, CEO tenure and Board co-option lead to the hypotheses as described in Section 2.5 to 2.7.

2.1 Agency theory

A central concept in the agency theory is the misalignment of interest between the manager (i.e., the agent) and the shareholders (i.e., the principals) of a firm (Jensen and Meckling, 1976). The theory is based on the assumption that agents are self-interested, opportunistic and strive to maximize personal economic wealth rather than maximizing shareholder wealth (Bruce et al., 2005). CEOs have reason to be risk-averse, e.g. to safeguard their job, while shareholders tend to prefer risk in order to obtain higher returns (Shleifer and Vishny, 1989; Ho et al., 2016). Furthermore, the information asymmetry between the manager and the shareholders creates a need to ensure that the manager acts in the interest of the shareholders (De Haan and Vlahu, 2016).

An important information system that can monitor managerial behavior and align the manager's interest with the shareholders' interests is the Board of Directors (Eisenhardt, 1989). If the Board of Directors is more favored towards the shareholder's interests, the bank will take more risk since shareholders prefer risk to obtain higher returns (Pathan, 2009). Similarly, banks that have a more powerful CEO that is capable of compelling board decisions will take less risk (Pathan, 2009). Later on, this study will dive deeper into the relationship between CEO decision-making and the Board of Directors.

There are critics on the agency theory such as the unrealistic description of human behavior and action (Doucouliagos, 1994; Jensen and Meckling, 1994). In order to take into account other driving factors (outside the agency theory) in the behavior and risk taking of a manager, one must analyze addition theory, which includes non-economic assumptions as well.

2.2 Stakeholder theory

While the agency theory considers the relationship between the CEO and the shareholders of a company, the stakeholder theory considers a wider group of stakeholders. According to Freeman's stakeholder theory (1994), firms should take into account the interest of all stakeholders when making a decision. While shareholders generally prefer risky decisions that could result in higher returns, other stakeholders of a bank, such as employees, regulators and creditors, are likely more risk averse (Himaj, 2014; Srivastav and Hagendorff, 2016; Tanda, 2015). Thus, maximizing stakeholder interests (as envisaged by the stakeholder theory) could incentivize managers to take less risk than when they would maximize shareholders interests (as envisaged by the agency theory).

2.3 Stewardship theory

An alternative theory analyzing managerial behavior and motivation is the stewardship theory. Under the stewardship theory, stewards (i.e. managers) interests are aligned with their principals interests. Rather than individualistic and self-interested, the manager exhibits pro-organizational, collectivistic behavior; he aims to realize the objectives of the organization, rather than personal objectives. By maximizing shareholders' wealth through firm performance, the steward maximizes its own utility. The steward can be trusted by the principals and agency costs, such as monitoring or incentive costs, are lower than pursuant to the agency theory (Davis, Schoorman and Donaldson, 1997; Podrug, Filipovic and Milic, 2010). Thus, following the stewardship theory, firms should focus on structures that facilitate and empower managers rather than monitor and control them (Davis, Schoorman and Donaldson, 1997).

2.4 CEO power

In various papers, the relationship between CEO power and the financial performance of a firm have been discussed (for an extensive overview, see Daily and Johnson, 1997, and references therein). Many of these studies dive deeper into this

relationship by researching different variables related to CEO power that could influence the financial performance of a firm, such as executive compensation (Bebchuk and Fried, 2003), ownership structure (De Haan and Vlahu, 2016), managerial traits (Delgado-García and De La Fuente-Sabaté, 2010), CEO overconfidence (Ho et al., 2016; Malmendier and Tate, 2005) and the size and composition of the Board of Directors (Combs et al., 2007). The variables this thesis focuses on, CEO tenure and co-option, have likewise been analyzed in different papers related to the influence they have on the performance of firms (Allgood and Farrell, 2000; Coles et al., 2007; Harjoto and Jo, 2009; Henderson et al., 2006). The variables are often analyzed together because of the influence the CEO power, that is acquired from a long tenure, can have on the appointment of new Directors.

Similarly, a notable number of studies have examined the influence on different variables related to CEO power on the risk level of firms (e.g. Ho et al., 2016; Pathan, 2009; Romano et al., 2019). Some research has also been done on the influence of CEO tenure and co-option on a firm's risk taking: Chen and Zheng (2014) found that tenured CEOs tend to take more risk. They suggest that the CEO's risk taking incentives are highly affected by career concerns of CEOs, rather than by CEO power or experiences. Thus, according to Chen and Zhen, a longer CEO tenure is associated with more risk taking due to declining career concerns. However, Atayah et al. (2021) find a significant negative relationship between the CEO tenure and the risk taking of firms. Their results show that long-tenured CEOs in Malaysian companies take less risk when making and executing strategies and decisions resulting in a decrease in corporate performance. They draw the conclusion that the decreased corporate performance comes from the excess experience of the tenured CEO. Baghdadi et al. (2020) examine the influence co-option has on corporate decision-making and find that a larger degree of co-option is associated with more unstable and poorer decision-making: Co-opted boards are less critical and engaged in the decision making and pursued strategy of the CEO. While the paper highlights the negative role co-option seems to have on the firm's decision-making, no conclusive evidence was found that co-opted boards contribute to greater risk taking of companies.

2.5 CEO tenure

One important consideration is that managers' way of decision-making and risk attitude can change over time (Davis, Schoorman, & Donaldson, 1997). Managers grow more into becoming an agent or a steward: Over time, they may attach more value to investment and growth opportunities for the company and dare to take more risk (Simsek, 2007). On the other hand, managers may over time acquire more power and use this power to attain their personal goals. This could mean that the manager will take decisions that are less risky than the shareholders wish.

In this thesis, I will analyze whether observations from the observations from Miller and Shamsie (2001), Atayah et al. (2021) and Von den Driesch et al. (2015) - that the CEO tenure has a negative relationship to the level of risk taking - will also hold in the context of international banking. I expect that CEO tenure has a negative influence on the level of risk taking of a bank.

This is in line with the agency theory; the CEO acquires more power over time, for instance due to a greater network, acquired knowledge and experience (Chen, 2013). The CEO can use this power to focus on its personal goals rather than the bank’s interests. Moreover, in the beginning stage of the CEOs career, he might have to take more risk in order to keep the shareholders (and the Board of Directors) satisfied and safeguard his job (Chen, 2013). Another reason for CEOs to become more risk averse during their tenure is that CEOs have been with the company for a longer period and may have invested a lot in it, both tangibly and psychologically (Simsek, 2007).

H1: A higher CEO tenure decreases the level of risk taking of a bank.

2.6 Board co-option

Co-option in this study is defined as the fraction of the Board composed of directors that were appointed after the CEO assumed office. The co-option ratio is the amount of directors appointed after the CEO assumed office as a percentage of the total board size.

The Board of Directors can be seen as an instrument to monitor managers and protect the shareholders' interests (Fama and Jensen, 1983; Ho et al., 2016; De Haan and Vlahu, 2016; Eisenhardt, 1989). It is important that the Board members are capable collectively and individually to oversee the management's risk taking (Ho et al., 2016). From a stakeholder theory view, it is important that the Board of Directors is diverse in order to better represent the interests of various stakeholders (Srivastav and Hagendorff, 2016).

From an agency theory perspective, monitoring by the Board of Directors is necessary to ensure that the manager's actions are aligned with the shareholders' interests. When a CEO's (decision-making) power remains unchecked, he will most likely make self-interested decisions that may be at the expense of the shareholders (Combs et al, 2007). Ocasio (1994) argues that less monitoring is needed when the CEO has little power. The more power the CEO has within the company, the more monitoring by the Board of Directors seems to be required (Fama and Jensen, 1983; Eisenhardt, 1989). A more powerful CEO will most likely (to some extent) be involved in the decision-making regarding the nomination of new directors. Directors that are nominated by or with help of the CEO are generally more compliant and will monitor the CEO less strictly (Shivdasani and Yermack, 1999;). Directors might even join the Board for the prestige and the mutual favors between the managers and them rather than out of interest for the function itself. Directors that are appointed after the CEO assumes office, are more likely to monitor the decision-making of the CEO less well to avoid putting their board seat and the associated perks at risk (Kosnik, 1987). In accordance with the agency theory, this study expects the CEO to use the power, acquired due to less monitoring of the Board of Directors, to take less risk at the cost of the shareholders' wealth. As such, this study has the following hypothesis:

H2: A higher co-option ratio decreases the level of risk taking of a bank.

2.7 Relationship CEO tenure and Board co-option

Coles et al. (2014) imply that the greater the tenure of the CEO, the more influence the CEO has had on who is in the Board of Directors and the decisions the Board makes. Furthermore, Baghdadi et al. (2020) find that a larger degree of Board co-option is associated with less critical and poorer decision making of the Board. They furthermore state that co-opted boards are less engaged in the strategy and decision making of the CEO. Thus, a relationship between the variables CEO tenure and Board co-option could be expected and a change in one of the variables may increase the effectiveness of the other in the model. Also, if CEO tenure and Board co-option are strongly correlated, one cannot easily distinguish how much each of these variables individually affect the level of risk taking; the effects of one variable may be attributed to the other variable via the cross-correlation between the two variables. For this reason, an interaction term of these two variables is included in the regression equations. One can then determine the mutual cross-correlation. As shown in hypotheses H1 and H2, an increase in either one of the variables (CEO tenure and Board co-option) is expected to come with a decrease in the risk taking of the bank. Therefore, the third hypothesis of this thesis is:

H3: The interaction term of the variables CEO tenure and Board co-option has a positive coefficient and high values for this interaction term correspond to low levels of risk taking.

3. Data Collection and Description

This section introduces my data collection method and descriptive statistics.

3.1 Data Collection

To begin with, an unbalanced dataset consisting of 1275 banks from all over the world is utilized, which was sourced from WRDS BoardEx. This dataset has the timeframe 2000-2019 and includes data for the control variable Large shareholder, and the independent variables, CEO tenure and Board co-option ratio. The data for the dependent variable -the level of risk taking of a bank (as measured as Z-score, LLP ratio and NPL ratio) -, and the control variables Bank size and Leverage was retrieved from Thomson Reuters Eikon. The data for the control variable Tier 1 capital ratio was retrieved from Thomson Reuters Eikon and Wharton Research Data Services (WRDS). For Tier 1, both databases only had data after 2012. Via Stata, the dummy variables for country and year were created. Appendix A states the number of observations of the dataset per year and country. In order to create the country dummy, data on the nationality of the bank had to be retrieved. These data were partly retrieved from the World Bank DataBank and partly manually by searching on the internet.

The dataset is narrowed down as follows. First, the banks that did not include data on CEO tenure and the co-option ratio were filtered out. Secondly, the banks whose data were not available on either Thomson Reuters Eikon or WRDS have been taken out. This leaves us with an unbalanced dataset of 1060 banks from 74 countries.

In order to match the data from Thomson Reuters Eikon and WRDS, I manually created 20 rows in Excel per bank, one for each year (2000-2019). Here I included all data and after that deleted the rows that did not include data on the CEO tenure and Board co-option ratio.

Table 1: Data Specification

Variable type	Variable	Description	Source
Dependent Variable Bank risk taking	NPL ratio	The ratio of the nonperforming loans to total loans.	Thomson Reuters Eikon
	LLP ratio	The ratio of loan loss provision to average gross loans.	
	Z-score	Z = Mean(ROA+CAR) / volatility(ROA) where CAR is the capital-to-asset ratio and ROA is return on assets.	
Independent Variables	CEO tenure	The number of years a CEO has been in a company.	WRDS BoardEx
	Board co-option ratio	The ratio of the number of directors that have been appointed after the CEO assumed office, divided by the total size of the Board of Directors.	
Control Variables	Bank size	The total assets of the bank in EUR.	Thomson Reuters Eikon
	Leverage	The total leverage of the bank in EUR.	
	Large Shareholder	Measurement that shows the percentage of voting right of the largest shareholder of the company	WRDS BoardEx
	Tier 1	The ratio of a bank's core tier 1 capital - that is, its equity capital and disclosed reserves - to its total risk-weighted assets	Thomson Reuters Eikon and WRDS
	Country dummy	Every country and year get a different number to represent the multiple groups. The dummy variables are included to take care for unobserved country and year heterogeneities and make the regression estimates more reliable.	World Bank DataBank, Google and Stata
	Year dummy		Stata

3.2 Data Description

3.2.1 Proxies for banks risk taking

Three different measurements are used to calculate the level of risk taking of a bank. Firstly, the Z-score is used as an indicator for the level of risk taking of a bank. The Z-score is also called the bankruptcy predictor. A higher Z-score means the bank has less insolvency risk. Beltratti and Stulz (2012) and the International Monetary Fund (2014) use the Z-score as a measure for default risk of a bank.

The LLP ratio is used as a second measurement for the risk taking of banks. Zheng et al. (2019) use the LLP ratio method in their paper as a ‘measure of credit risk as a proxy for bank risk-taking behavior profits and banks’ sustainability’’. The ratio indicates how well a

bank is protected against future losses. A higher LLP ratio indicates that the bank is exposed to less risk and can better withstand future losses.

Lastly, the NPL ratio is used as a measurement for the risk taking of a bank. A higher amount of nonperforming loans comes with more risk for the bank since the likelihood of receiving the repayments of these loans is estimated to be significantly low. Thus, a higher NPL ratio means more risk for the bank; the bank is generally considered less attractive for potential investors, stock prices may decrease and future profitability may suffer. Ellul and Yerramilli (2013) used the NPL ratio in their research and found that banks with a higher Risk Management Index generally have a lower fraction of nonperforming loans.

3.2.2 Control variables

Including control variables is necessary to determine the real impact of the CEO tenure and Board co-option ratio on the risk taking of banks. In order to identify control variables, previous studies that research bank risk levels have been taken into account. For each individual control variable, the reasoning behind this variable is given.

Bank size is the first control variable and is used in different previous studies on risk taking (Chen and Zheng, 2014; Erkens et al., 2012; Laeven and Levine, 2009; Pathan, 2009; Romano et al., 2019). Bank size may play an important role in the risk taking of banks. On the one hand, one could argue that larger banks take less risk than smaller banks: Large banks in general have access to more capital (markets), and better (managerial) skills and tools (Anderson et al., 2000).For that reason large banks would be more capable of diversifying risk than small banks. On the other hand, a positive relationship between bank size and risk taking could be argued: Large banks (that are sometimes even too-big-to-fail) might be incentivized to take excessive risks (Barrell et al., 2010). Furthermore, monitoring (the CEO of) a larger bank is more complex, difficult and costly than monitoring small banks (Eisenbach et al., 2016). Thus, size may play an important role in bank risk taking and for that reason should be included in the empirical model as a control variable. In accordance

with previous studies on bank risk taking (as mentioned earlier in this paragraph), total assets will be taken as a proxy of risk taking.

The second control variable is leverage as also used in various studies related to bank risk taking (Erkens et al., 2012; Ho et al., 2016; Romano et al., 2019; Srivastav and Hagendorff, 2016). According to Srivastav et al. (2016) increasing risk taking comes with amplified benefits for highly leveraged banks. The study suggests that the higher the leverage the more risk the bank takes. Therefore, leverage should also be included in the empirical model as a control variable.

The Tier 1 capital ratio variable is included in the model as a proxy for regulation. Basel is the international regulatory framework for banks and its measures aim to strengthen the risk management, supervision and regulation of banks. Under the current Basel model, Basel III, the requirement for banks has been set up to have a minimum Tier 1 capital ratio of 6% (King and Tarbert, 2011).

Lastly, large shareholder is included in the model as a control variable. The variable shows whether banks are widely held or have a large owner. Demsetz et al. (1997) found significant results that suggest that an increase in large shareholders of a bank leads to more risk taking.

3.2.3 Descriptive Statistics

Table 2 shows descriptive statistics for the full dataset excluding the dummy variables to keep the table concise. To minimize the influence of outliers in the data, all variables are winsorized at p(0.05) so for each variable 5% of cases are modified in each tail. Furthermore, to improve the accuracy and integrity of the data, the variables that are more dispersed, namely the variables BankSize and Leverage, are normalized.

On average the CEO has a tenure of 5.49 years for the bank they work for with the highest CEO tenure in this winsorized dataset being 17 years. The average co-option ratio is 47.68% which means that on average approximately half of the Board of Directors members of this sample have started this job after the CEO assumed office. For all three

measurements for the risk level of the bank, the average value represents the average risk level of the banks in the dataset of 2000-2019. The Z-score is on average 6.41%. A higher Z-score comes with less risk. The LLP ratio has an average of 0.42%. A low LLP ratio suggests that the bank is exposed to high risk. The NPL ratio has a mean of 2.18% and a low NPL ratio suggests low risk levels. A regression will be done for all three variables using Stata.

The bank size is measured as total assets in EUR and on average is 60,780,750,068. However, since the variable bank size is normalized, much smaller values are showcased in Table 2. The same goes for the variable Leverage, which on average is 9,933,898 EUR. Furthermore, on average the banks in the sample have a Tier 1 capital ratio of 12.73% which is higher than the minimum leverage ratio requirement as introduced by the Basel III model. Thus, on average, the banks hold more capital than required by regulation. Looking at the minimum Tier 1 capital ratio of 8.5%, all banks in this winsorized dataset have capital above the amount required by Basel which might mean none of the banks are very risky. Lastly, the Large shareholder mean is 19.26% which means that on average the largest shareholder of a bank has 19.26% voting right.

Table 2: Descriptive Statistics: Full Sample

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
CEO tenure	9,335	5.489609	4.711457	0.4	16.9
Co-option ratio	9,335	.4767995	.3080851	0	1
Z-score	6,053	6.410921	7.562702	-.315908	28.96892
LLP ratio	8,880	.0041727	.0096021	-8.30e-06	0.0380853
NPL ratio	5,808	.0218316	.024215	.0013887	.091673
Bank size	9,009	.0129323	.0295786	.0001129	.1189983
Leverage	8,849	.0041152	.0000131	.0040853	.0041416
Tier 1	2,235	12.73297	2.770117	8.5	18.9
Large shareholder	5,691	.1926192	.2138211	.0192	.75

3.3 Empirical Strategy

The dataset is analyzed using regression analysis. In order to investigate the research question and test the three hypotheses introduced in Section 3, I estimate the following regression equations in Stata:

$$NPL\ ratio_{it} = \beta_0 + \beta_1 CEOtenure_{it} + \beta_2 Co\text{-}option_{it} + \beta_3 CEOtenurexCo\text{-}option_{it} + \beta_4 Size_{it} + \beta_5 Leverage_{it} + \beta_6 LargeShareholder_{it} + \beta_7 Tier1_{it} + y_8 Year_i + \ldots + y_n Year_i + y_{n+1} Country_i + \ldots + y_z Country_i + u_{it}$$

$$LLP\ ratio_{it} = \beta_0 + \beta_1 CEOtenure_{it} + \beta_2 Co\text{-}option_{it} + \beta_3 CEOtenurexCo\text{-}option_{it} + \beta_4 Size_{it} + \beta_5 Leverage_{it} + \beta_6 LargeShareholder_{it} + \beta_7 Tier1_{it} + y_8 Year_i + \ldots + y_n Year_i + y_{n+1} Country_i + \ldots + y_z Country_i + u_{it}$$

$$Z\text{-}score_{it} = \beta_0 + \beta_1 CEOtenure_{it} + \beta_2 Co\text{-}option_{it} + \beta_3 CEOtenurexCo\text{-}option_{it} + \beta_4 Size_{it} + \beta_5 Leverage_{it} + \beta_6 LargeShareholder_{it} + \beta_7 Tier1_{it} + y_8 Year_i + \ldots + y_n Year_i + y_{n+1} Country_i + \ldots + y_z Country_i + u_{it}$$

where i = 1, . . . , z identifies a bank, β_0, . . . , β_7 are equation parameters for the dependent variables (CEOtenure and Co-option), the interaction term of the CEO tenure and Board co-option, and the control variables (Size, Leverage, LargeShareholder and Tier1), y_8, . . . ,y_z are equation parameters for the Dummy variables Year and Country, and u_{it} is the error term.

4. Results and Interpretation

Section 4 reports the results obtained from regression analysis and interprets the outcomes to answer the hypotheses stated in Section 2. Throughout this thesis a 5% threshold confidence level will be used to determine significance and stars (*) are included in the tables to showcase which outcomes are significant.

4.1 Correlation Matrix

Table 3 shows the correlation matrix of the three dependent variables and the independent variables CEO tenure and Board co-option. Section 2.7 of this thesis outlines the expectation that the CEO tenure and Board co-option ratio have a positive relationship. This seems to be correct: As shown in Table 3, the correlation between the CEO tenure and the Board co-option ratio is 0.5075 which indicates that the two variables are strongly positively correlated. Furthermore, the two variables have a covariance of 0.85110. Since the covariance measures the direction of the relationship between two variables, the positive covariance indicates that both variables tend to be high or low at the same time. In order to take into account the relationship of the two variables, an interaction term is included in this study.

From table 3 we also observe that the correlations between the Z-score, LLP ratio, and NPL ratio are rather small, less than 10 percent. Mathematically this implies that at most one of these three parameters has a strong correlation with the risk level of the bank. If for instance both the Z-score and LLP ratio are good indicators of the risk level, then both parameters should correlate strongly with this risk level and therefore also with each other. However, the NPL ratio and LLP ratio are correlated with less than a permille, meaning that less than 0.1 percent of the data show an overlapping trend. The LLP ratio and Z-score have a significant correlation, albeit only -0.0377, which implies only 3.7% coherence. Moreover, this correlation is negative. The correlation between the risk level and Z-score and the risk level and LLP ratio should both be negative according to our theoretical assumptions, so the

overlapping part of the data for the Z-score and LLP ratio gives opposite predictions for the risk level. The only consistent correlation is the one between the Z-score and NPL ratio; a high Z-score and low NPL ratio are predicted for low risk taking, and the correlated part of the Z-score and NPL ratio can be into accordance to that. Still, a coherence of 0.081 is not high, implying that the majority of the values in the Z-score and NPL ratio are randomly distributed.

Table 3: Correlation Matrix

Variable	*Z-score*	*LLP ratio*	*NPL ratio*	*CEO tenure*	*Board co-option*
Z-score	1.0000				
LLP ratio	-0.0377*	1.0000			
NPL ratio	-0.0810*	0.0005	1.0000		
CEO tenure	0.0093	-0.0794*	-0.0142	1.0000	
Board co-option	-0.0313*	-0.0158	0.0235	0.5075*	1.0000

4.2 Regression analysis

In the following section, a regression analysis is done to see the effect the independent variables have on the dependent variables Z-score, LLP ratio and NPL ratio. All three models are estimated using fixed effects to deal with endogeneity. Furthermore, for all models the command *vce(robust)* is used to deal with the heteroskedasticity and panel autocorrelation in the idiosyncratic error term. Next to the fixed effects model, General Method of Moments (GMM) estimation can be used for panel data to deal with endogeneity. I estimated all models using GMM as well. However, for the three different models, the number of observations largely drops under the GMM model and with the GMM model only one significant result was found. Therefore, this thesis mainly focuses on the results using the fixed effects model and only the significant result of the GMM estimation for the co-option ratio in the model where the LLP ratio is the dependent variable will be discussed.

4.2.1 Z-score

The results for the regression analysis under fixed effects having the Z-score as the dependent variable can be seen in Table 4. The full regression results, including the data on the dummy variables year and country are shown in Appendix B.

Table 4: Regression analysis Z-score

Dependent Variable: Z-score

Variable	Coefficient	Robust Std. Err.	T	P>t	[95% Conf.	Interval]
Ceotenure	.0889027	.0934673	0.95	0.342	-.0948894	.2726949
Co-option ratio	-.3891346	.6979509	-0.56	0.577	-1.761571	.9833013
Interaction term (tenurexco-option	-.0499361	.1136287	-0.44	0.661	-.2733732	.1735009
BankSize	14.68926	16.30481	0.90	0.368	-17.37218	46.7507
Leverage	13860.19*	5394.079	2.57	0.011	3253.391	24466.99
Tier1	.0486831	.0601753	0.81	0.419	-.0696444	.1670106
Largeshareholder	-1.119027	1.032992	-1.08	0.279	-3.15028	.9122265
sigma_u	5.0359072					
sigma_e	2.3100258					
rho	.82616242	(fraction of variance due to u_i)				

Number of Observations = 1,323
R-squared within = 0.5372 between = 0.0004 overall = 0.1340
Corr(u_i, Xb) = -0.1181

Notes: The dummy variables Country and Year are included in the regression but excluded from this table (see Appendix B for full table)

When the CEO tenure goes up by another year, the Z-score seems to slightly increase ceteris paribus. Since a higher Z-score means less default risk for a bank, this result suggests that a longer CEO tenure comes with a slightly lower bank risk level in accordance with hypothesis H1 of the thesis. Furthermore, there seems to be a negative relationship between the co-option ratio and the Z-score ceteris paribus: If the fraction of the directors that have been appointed after the CEO assumed office increases by 0.01, the Z-score decreases by 0.39 percentage point. Thus, a higher co-option ratio, comes with an increase in bank risk level which is not in line with hypothesis H2. Lastly, the interaction term between the variables CEO tenure and Board co-option is slightly negative. Thus, the overlapping, common part of the CEO tenure and Board co-option ratio data has a negative correlation with the Z-score. This is not in line with hypothesis H3. However, the note has to be made that for the CEO tenure, Board co-option and interaction term variables, the p-value is higher than the 0.05 threshold significance level. Thus, the results of the regression analysis are not

significant which means that the variables CEO tenure and Board co-option do not have a significant influence on the dependent variable Z-score.

The errors u_i are correlated with the regressors but only for a fairly small amount. Also, the rho is 0.83 which means 83% of the variance is due to differences across panels. Lastly, table 4 shows that the R-squared is quite low with an overall R-squared of 0.134. A low R-squared value indicates that your independent variables are not explaining much in the variation of your dependent variable - regardless of the variable significance.

4.2.3 LLP ratio

The results for the regression analysis under fixed effects having the LLP ratio as the dependent variable can be seen in Table 5. The full regression results, including the data on the dummy variables year and country are shown in Appendix C.

Table 5: Regression analysis LLP ratio

Dependent Variable: LLP ratio

Variable	**Coefficient**	**Robust Std. Err.**	**T**	**P>t**	**[95% Conf.**	**Interval]**
Ceotenure	-.0004497*	.0001786	-2.52	0.012	-.000801	.0000985
Co-option ratio	-.0025078	.0013496	-1.86	0.064	-.0051614	.0001457
Interaction term (tenurexco-option)	.0006032*	.0002399	2.51	0.012	.0001316	.0010749
BankSize	.0862515	.0642624	1.34	0.180	-.0400976	.2126007
Leverage	-3.786407	16.3854	-0.23	0.817	-36.00248	28.42966
Tier1	-.000284*	.0001425	-1.99	0.047	-.0005641	-3.84e-06
Largeshareholder	.000325	.002087	0.16	0.876	-.0037783	.0044284
_cons	.0249476	.0672603	0.37	0.711	-.1072959	.1571911
sigma_u	.00822363					
sigma_e	.00566827					
rho	.67792612	(fraction of variance due to u_i)				

Number of Observations = 1,418
R-squared within = 0.1813 between = 0.5174 overall = 0.4812
Corr(u_i, Xb) = -0.4636

Notes: The dummy variables Country and Year are included in the regression but excluded from this table (see Appendix C for full table)

Table 5 shows that the CEO tenure seems to have a significant slightly negative relationship with the LLP ratio ceteris paribus: A higher CEO tenure comes with a slightly lower LLP ratio and thus a higher risk level of the bank. This result is not in line with hypothesis H1 that a higher CEO tenure decreases the level of risk taking of a bank.

Furthermore, there seems to be a slightly negative relationship between the co-option ratio and the LLP ratio ceteris paribus which is not in line with hypothesis H2. However, the p-value of the Board co-option variable is higher than 0.05 so this result is not significant: Board co-option does not have a significant influence on the LLP ratio. Moreover, the interaction term of the CEO tenure and Board co-option is positive. As the p-value is lower than 0.05, the interaction term is statistically significant at the 5% significance level which justifies the inclusion of the term in the model. The positive interaction term coefficient shows that the common, overlapping part of the parameters CEO tenure and Board co-option ratio has the opposite sign of the correlation with the LLP ratio data than the individual correlation values of CEO tenure and Board co-option. This indicates that the overlapping part has a different trend than the non-overlapping part. This result is not in accordance with hypothesis H3.

Table 5 additionally shows that the errors u_i are negatively correlated (-0.4636) with the regressors. This indicates that the fixed effects model, as used for this regression analysis, is consistent for this model. Furthermore, the rho is 0.6779 so 67.79% of the variance in the model is due to differences across panels. Lastly, the R-squared is quite high, with an overall R-squared of 0.4812, which suggests that the co-option ratio, CEO tenure and the control variables included in the model are explaining 48.12% of the variation of the dependent variable.

Next to the fixed effects model, a GMM estimation has been done to research the relationship between the LLP ratio and the independent variables. The results of this regression analysis are shown in Appendix D. There is a significant negative relationship between the Board co-option ratio and the LLP ratio of -.0015766. Thus when the Board co-option ratio goes up by 0.01, the LLP ratio decreases by 0.0016 percentage points. This result indicates that an increase in the Board co-option ratio comes with an increase in the level of risk taking of the bank, which is not in line with hypothesis H2.

4.2.3 NPL ratio

The results for the regression analysis having the NPL ratio as the dependent variable can be seen in Table 6. The full regression results, including the data on the dummy variables year and country are shown in Appendix E.

Table 6: Regression analysis NPL ratio

Dependent Variable: NPL ratio

Variable	**Coefficient**	**Robust Std. Err.**	**Z**	**P>z**	**[95% Conf.**	**Interval]**
Ceotenure	-.0001491	.0005047	-0.30	0.768	-.0011418	.0008436
Co-option ratio	-.0049262	.0032374	-1.52	0.129	-.011294	.0014415
Interaction term (tenurexco-option)	.0004955	.0006911	0.72	0.474	-.0008638	.0018549
BankSize	.0090462	.0939841	0.10	0.923	-.1758116	.193904
Leverage	-119.0833*	47.7243	-2.50	0.013	-212.9525	-25.2142
Tier1	.0004499	.0004226	1.06	0.288	-.0003812	.0012811
Largeshareholder	-.0068205	.0048298	-1.41	0.159	-.0163203	.0026793
_cons	.5092556*	.1967506	2.59	0.010	.1222659	.8962453
sigma_u	.02654813					
sigma_e	.01402567					
Rho	.78179208	(fraction of variance due to u_i)				

Number of Observations = 1,216
R-squared within = 0.1269 between = 0.0007 overall = 0.0165
Corr(u_i, Xb) = -0.0604

Notes: The dummy variables Country and Year are included in the regression but excluded from this table (see Appendix E for full table)

Table 6 shows that when the CEO tenure goes up by another year, there seems to be a slight decrease in the NPL ratio. In other words, a longer CEO tenure comes with a slightly lower bank risk level which is in accordance with hypothesis H1. Furthermore, a one percent point increase of the percentage of directors that have been appointed after the CEO assumed office increases, decreases the NPL ratio by 0.0049 percentage points. Thus, a higher co-option ratio, comes with a decrease in the bank risk level which is in line with hypothesis H2. In addition, the interaction term of the CEO tenure and Board co-option is positive while the individual coefficients are negative. However, the p-value of the CEO tenure, Board co-option ratio and the interaction term variables are higher than 0.05 so the results are not significant: The CEO tenure and Board co-option do not have a significant influence on the NPL ratio.

Lastly, the R-squared of the model is low so the CEO tenure, Board co-option ratio and the control variables included in the model do not explain much in the variation of the NPL ratio.

5. Discussion and Conclusion

This thesis studies the influence the variables CEO tenure and Board co-option have on the risk taking of banks. For the risk taking of banks, three different measures are used: the Z-score, LLP ratio and NPL ratio. A sample of 1060 banks from all over the world is used to test my hypotheses. No significant results were found for the models with the Z-score and NPL ratio as dependent variables using fixed effects and GMM estimation. Only under the models using the LLP ratio as the dependent variable, significant results were found. The correlations between the dependent variables Z-score, LLP ratio and NPL ratio are all low. This means that these variables do not have much in common. Therefore one cannot expect that these parameters all three are sensitive to the risk level taking, and also one cannot expect high correlations between the data and all three independent parameters simultaneously. The assumption that the LLP ratio, NPL ratio, and Z-score all are good indicators for the bank risk level is therefore demonstrated to be wrong.

The hypotheses of this thesis were shaped by researching the agency, stakeholder and stewardship theory and are in line with the agency theory. Under the fixed effects model a significant, slightly negative relationship between the CEO tenure and the LLP ratio was found. This result is not in line with hypothesis H1 that a higher CEO tenure decreases the level of risk taking of a bank. Furthermore, under the GMM estimation a significant negative relationship between the Board co-option ratio and the LLP ratio was found. This result indicates that an increase in the Board co-option ratio comes with an increase in the level of risk taking of the bank, which is not in accordance with hypothesis H2. Thus, the results found in this thesis do not support the agency theory. Lastly, under the fixed effects model having the LLP ratio as the dependent variable a significant positive coefficient for the interaction term of the CEO tenure and Board co-option is found while the individual correlation values of the CEO tenure and Board co-option have a negative coefficient. This indicates that the common part has a different trend than the non-overlapping part which is not in accordance with hypothesis H3. The results shows that a higher CEO tenure and

higher Board co-option ratio come with a lower LLP ratio. Thus, if a bank wants to influence the LLP ratio, that seems possible with these variables. However, the effect is small. Since according to the assumptions a low LLP ratio indicates high risk, banks could aim for a low risk by increasing the LLP ratio and vice versa.

My results show little correlation between all variables except the correlation between the Board co-option ratio and CEO tenure. The co-option ratio and the CEO tenure have little influence on the Z-score, LLP ratio and NPL ratio and some of the assumptions are observed to be unimportant: Either the CEO power is not measured well by looking at the Board co-option ratio and CEO tenure, or the CEO power does not modify the willingness to take risks, or the risk taking is weakly correlated with the Z-score, LLP ratio and NPL ratio. For all the parameter choices I had theoretical guidance, but the data proves that at least some of these premises are wrong.

The most urgent step in further analysis must be in understanding what the best parameter is to assess the risk taking of a bank. One could research more proxies for the risk taking of a bank such as the Value at Risk or daily stock returns. Furthermore, more research could be done on the variables that influence CEO power and decision making. Future research could include variables such as CEO age, CEO education, CEO gender, CEO-board chair duality, Board size, and remuneration schemes.

In this thesis, I hope to have offered new insight into the relationship between the risk taking of a bank and the CEO tenure and Board-co-option and inspired others to do related future research into this interesting topic.

6. References

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7. Appendixes

Appendix A: Dummy variables Country and Year

CountryID	Country	Observations
1	Argentina	20
2	Australia	109
3	Austria	58
4	Bahrain	7
5	Bangladesh	12
6	Belgium	35
7	Belize	20
8	Brazil	46
9	Canada	157
10	Chile	7
11	China	33
12	Croatia	2
13	Cyprus	26
14	Czech Republic	13
15	Denmark	59
16	Egypt	13
17	Finland	6
18	France	54
19	Georgia	10
20	Germany	63
21	Greece	72
22	Greenland	8
23	Hong Kong	42
24	Hungary	16
25	India	346
26	Indonesia	14
27	Ireland	44
28	Italy	167
29	Jamaica	2
30	Japan	59
31	Kenya	26
32	Korea	3
33	Kuwait	3
34	Libanon	13
35	Liechtenstein	19
36	Lithuania	7
37	Malaysia	29
38	Malta	1
39	Mauritius	5
40	Mexico	30
41	Monaco	5
42	Morocco	1
43	Netherlands	49

Year	Observations
2000	135
2001	150
2002	150
2003	362
2004	471
2005	524
2006	522
2007	530
2008	543
2009	519
2010	516
2011	536
2012	575
2013	585
2014	592
2015	592
2016	561
2017	575
2018	590
2019	307

44	New Zealand	6
45	Nigeria	87
46	Pakistan	31
47	Panama	11
48	Peru	13
49	Philippines	37
50	Poland	52
51	Portugal	15
52	Puerto Rico	46
53	Qatar	17
54	Romania	9
55	Russia	22
56	Saudi Arabia	33
57	Serbia	1
58	Singapore	15
59	Slovakia	3
60	South Africa	41
61	Spain	117
62	Sri Lanka	26
63	Sweden	64
64	Switzerland	15
65	Tanzania	1
66	Thailand	32
67	Togo	6
68	Turkey	83
69	UK	139
70	United Arab Emirates	30
71	USA	6659
72	Venezuela	3
73	Vietnam	9
74	Zambia	1

Appendix B: Regression analysis Z-score fixed effects

Dependent Variable: Z-score

Variable	**Coefficient**	**Robust Std. Err.**	**T**	**P>t**	**[95% Conf. Interval]**	
Ceotenure	.0889027	.0934673	0.95	0.342	-.0948894	.2726949
Co-option ratio	-.3891346	.6979509	-0.56	0.577	-1.761571	.9833013
Interaction term (tenurexco-option	-.0499361	.1136287	-0.44	0.661	-.2733732	.1735009
BankSize	14.68926	16.30481	0.90	0.368	-17.37218	46.7507
Leverage	13860.19*	5394.079	2.57	0.011	3253.291	24466.99
Tier1	.0486831	.0601753	0.81	0.419	-.0696444	.1670106
Largeshareholder	-1.119027	1.032992	-1.08	0.279	-3.15028	.9122265
2001	0	(omitted)				
2002	0	(omitted)				
2003	19.81621*	3.573397	5.55	0.000	12.78956	26.84286

2004	16.46163	2.520724	6.53	0.000	11.50493	21.41833
2005	13.64602	2.668425	5.11	0.000	8.398887	18.89315
2006	12.89956	2.964212	4.35	0.000	7.070799	18.72833
2007	5.433237	.950667	5.72	0.000	3.563865	7.302608
2008	2.22892	1.904929	1.17	0.243	-1.516893	5.974733
2009	.3182253	.7272847	0.44	0.662	-1.111892	1.748342
2010	.2326783	.5998867	0.39	0.698	-.9469263	1.412283
2011	-.2469217	.4284777	-0.58	0.565	-1.089471	.5956279
2012	.126814	.3564183	0.36	0.722	-.5740394	.8276674
2013	.5551203	.3881521	1.43	0.154	-.2081339	1.318374
2014	.555786	.3374191	1.65	0.100	-.1077078	1.21928
2015	.5443402	.333061	1.63	0.103	-.1105839	1.199264
2016	.6802694	.3480131	1.95	0.051	-.0040562	1.364595
2017	.515683	.2706646	1.91	0.058	-.0165461	1.047912
2018	.2768548	.1870639	1.48	0.140	-.0909836	.6446933
2019	0	(omitted)				
Country 2	0	(omitted)				
Country 3	0	(omitted)				
Country 4	0	(omitted)				
Country 5	0	(omitted)				
Country 6	0	(omitted)				
Country 7	0	(omitted)				
Country 8	0	(omitted)				
Country 9	0	(omitted)				
Country 10	0	(omitted)				
Country 11	0	(omitted)				
Country 12	0	(omitted)				
Country 13	0	(omitted)				
Country 14	0	(omitted)				
Country 15	0	(omitted)				
Country 16	0	(omitted)				
Country 17	0	(omitted)				
Country 18	0	(omitted)				
Country 19	0	(omitted)				
Country 20	0	(omitted)				
Country 21	0	(omitted)				
Country 22	0	(omitted)				
Country 23	0	(omitted)				
Country 24	0	(omitted)				
Country 25	0	(omitted)				
Country 26	0	(omitted)				
Country 27	0	(omitted)				
Country 28	0	(omitted)				
Country 29	0	(omitted)				
Country 30	0	(omitted)				
Country 31	0	(omitted)				
Country 32	0	(omitted)				
Country 33	0	(omitted)				
Country 34	0	(omitted)				
Country 35	0	(omitted)				
Country 36	0	(omitted)				
Country 37	0	(omitted)				
Country 38	0	(omitted)				
Country 39	0	(omitted)				
Country 40	0	(omitted)				

Country 41	0	(omitted)				
Country 42	0	(omitted)				
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Country 46	0	(omitted)				
Country 47	0	(omitted)				
Country 48	0	(omitted)				
Country 49	0	(omitted)				
Country 50	0	(omitted)				
Country 51	0	(omitted)				
Country 52	0	(omitted)				
Country 53	0	(omitted)				
Country 54	0	(omitted)				
Country 55	0	(omitted)				
Country 56	0	(omitted)				
Country 57	0	(omitted)				
Country 58	0	(omitted)				
Country 59	0	(omitted)				
Country 60	0	(omitted)				
Country 61	0	(omitted)				
Country 62	0	(omitted)				
Country 63	0	(omitted)				
Country 64	0	(omitted)				
Country 65	0	(omitted)				
Country 66	0	(omitted)				
Country 67	0	(omitted)				
Country 68	0	(omitted)				
Country 69	0	(omitted)				
Country 70	0	(omitted)				
Country 71	0	(omitted)				
Country 72	0	(omitted)				
Country 73	0	(omitted)				
Country 74	0	(omitted)				
_cons	-54.46222	22.6088	-2.41	0.016	-98.9185	-10.0046
sigma_u	5.0359072					
sigma_e	2.3100258					
Rho	.82616242	(fraction of variance due to u_i)				

Number of Observations = 1,323
R-squared within = 0.5372 between = 0.0004 overall = 0.1340
Corr(u_i, Xb) = -0.1181

Appendix C: Regression analysis LLP ratio fixed effects

Dependent Variable: LLP ratio

Variable	**Coefficient**	**Robust Std. Err.**	**t**	**P>t**	**[95% Conf. Interval]**	
Ceotenure	-.0004497*	.0001786	-2.52	0.012	-.000801	.0000985
Co-option ratio	-.0025078	.0013496	-1.86	0.064	-.0051614	.0001457
Interaction term (tenurexco-option)	.0006032*	.0002399	2.51	0.012	.0001316	.0010749
BankSize	.0862515	.0642624	1.34	0.180	-.0400976	.2126007
Leverage	-3.786407	16.3854	-0.23	0.817	-36.00248	28.42966

Tier1	-.000284*	.0001425	-1.99	0.047	-.0005641	-3.84e-06
Largeshareholder	.000325	.002087	0.16	0.876	-.0037783	.0044284
2001	0	(omitted)				
2002	.0160275*	.00525	3.05	0.002	.0057053	.0263497
2003	.0088225*	.0035645	2.48	0.014	.0018141	.0158309
2004	.0031284	.0016829	0.79	0.430	-.0019805	.0046373
2005	.0006577	.0010453	0.63	0.530	-.0013974	.0027129
2006	.000527	.0013621	0.04	0.969	-.0026253	.0027308
2007	.0028508	.0016178	1.76	0.079	-.0003301	.0060318
2008	.0089937*	.0036504	2.46	0.014	.0018164	.016171
2009	.0149251*	.0042517	3.51	0.001	.0065656	.0232846
2010	.0101759*	.0029666	3.44	0.001	.0043628	.0159891
2011	.0082927*	.0027793	2.98	0.003	.0028283	.0137572
2012	.0045707*	.0011297	4.05	0.000	.0023496	.0067918
2013	.0034716*	.0011362	3.06	0.002	.0012376	.0057055
2014	.0016683	.0008963	1.86	0.063	-.0000939	.0034305
2015	.0005157	.0007908	0.65	0.515	-.0010392	.0020706
2016	.0004001	.0007035	0.57	0.570	-.000983	.0017832
2017	-.0001348	.0005848	-0.23	0.818	-.0012845	.0010149
2018	-.0005834	.0004502	-1.30	0.196	-.0014686	.0003018
2019	0	(omitted)				
Country 2	0	(omitted)				
Country 3	0	(omitted)				
Country 4	0	(omitted)				
Country 5	0	(omitted)				
Country 6	0	(omitted)				
Country 7	0	(omitted)				
Country 8	0	(omitted)				
Country 9	0	(omitted)				
Country 10	0	(omitted)				
Country 11	0	(omitted)				
Country 12	0	(omitted)				
Country 13	0	(omitted)				
Country 14	0	(omitted)				
Country 15	0	(omitted)				
Country 16	0	(omitted)				
Country 17	0	(omitted)				
Country 18	0	(omitted)				
Country 19	0	(omitted)				
Country 20	0	(omitted)				
Country 21	0	(omitted)				
Country 22	0	(omitted)				
Country 23	0	(omitted)				
Country 24	0	(omitted)				
Country 25	0	(omitted)				
Country 26	0	(omitted)				
Country 27	0	(omitted)				
Country 28	0	(omitted)				
Country 29	0	(omitted)				
Country 30	0	(omitted)				
Country 31	0	(omitted)				
Country 32	0	(omitted)				
Country 33	0	(omitted)				
Country 34	0	(omitted)				

Country 35	0	(omitted)				
Country 36	0	(omitted)				
Country 37	0	(omitted)				
Country 38	0	(omitted)				
Country 39	0	(omitted)				
Country 40	0	(omitted)				
Country 41	0	(omitted)				
Country 42	0	(omitted)				
Country 43	0	(omitted)				
Country 44	0	(omitted)				
Country 45	0	(omitted)				
Country 46	0	(omitted)				
Country 47	0	(omitted)				
Country 48	0	(omitted)				
Country 49	0	(omitted)				
Country 50	0	(omitted)				
Country 51	0	(omitted)				
Country 52	0	(omitted)				
Country 53	0	(omitted)				
Country 54	0	(omitted)				
Country 55	0	(omitted)				
Country 56	0	(omitted)				
Country 57	0	(omitted)				
Country 58	0	(omitted)				
Country 59	0	(omitted)				
Country 60	0	(omitted)				
Country 61	0	(omitted)				
Country 62	0	(omitted)				
Country 63	0	(omitted)				
Country 64	0	(omitted)				
Country 65	0	(omitted)				
Country 66	0	(omitted)				
Country 67	0	(omitted)				
Country 68	0	(omitted)				
Country 69	0	(omitted)				
Country 70	0	(omitted)				
Country 71	0	(omitted)				
Country 72	0	(omitted)				
Country 73	0	(omitted)				
Country 74	0	(omitted)				
_cons	.0249476	.0672603	0.37	0.711	-.1072959	.1571911
sigma_u	.00822363					
sigma_e	.00566827					
Rho	.67792612	(fraction of variance due to u_i)				

Number of Observations = 1,418
R-squared within = 0.1813 between = 0.5174 overall = 0.4812
Corr(u_i, Xb) = -0.4636

Appendix D: Regression analysis LLP ratio GMM estimation

Dependent Variable: LLP ratio

Variable	**Coefficient**	**Robust Std. Err.**	**T**	**P>t**	**[95% Conf. Interval]**	
L.LLPratio	.5315967*	.0722739	7.36	0.000	.3899424	.673251
Ceotenure	-8.41e-06	.000078	-0.11	0.914	-.0001613	.0001445
Co-option ratio	-.0015766*	.000795	-1.98	0.047	-.0031347	-.0000185
BankSize	.3096892*	.081707	3.79	0.000	.1495463	.4698321
Leverage	-6.912749	15.40238	-0.45	0.654	-37.10086	23.27537
Tier1	-.0000984	.0001374	-0.72	0.474	-.0003677	.0001708
Largeshareholder	.0031685	.0019347	1.64	0.101	-.0006233	.0069604
2004	-.0123666*	.0054549	-2.27	0.023	-.023058	-.0016752
2005	-.0116155*	.0051214	-2.27	0.023	-.0216533	-.0015777
2006	-.0131362*	.0053741	-2.44	0.015	-.0236694	-.0026031
2007	-.0081765	.0057849	-1.41	0.158	-.0195148	.0031617
2008	-.0041255	.0069541	-0.59	0.553	-.0177553	.0095043
2009	-.0025912	.0068694	-0.38	0.706	-.0160551	.0108727
2010	-.0067689	.0068665	-0.99	0.324	-.0202269	.0066891
2011	-.0071052	.0072324	-0.98	0.326	-.0212805	.0070701
2012	-.0076026	.0065344	-1.16	0.245	-.0204098	.0052046
2013	-.00914	.0064561	-1.42	0.157	-.0217936	.0035137
2014	-.010952	.0067528	-1.62	0.105	-.0241872	.0022832
2015	-.0118034	.0066146	-1.78	0.074	-.0247678	.0011609
2016	-.0114275	.0066227	-1.73	0.084	-.0244078	.0015527
2017	-.011354	.0066448	-1.71	0.088	-.0243776	.0016696
2018	-.0115249	.0066269	-1.74	0.082	-.0245134	.0014637
2019	-.0114422	.0066152	-1.73	0.084	-.0244077	.0015234
Wald chi2(21)	496.13					
Prob > chi2	0.000					

Number of Observations = 748

Notes: The dummy variables for year 2001-2003 and the dummy variable Country are dropped because of collinearity

Appendix E: Regression analysis NPL ratio fixed effects

Dependent Variable: NPL ratio

Variable	**Coefficient**	**Robust Std. Err.**	**z**	**P>z**	**[95% Conf. Interval]**	
Ceotenure	-.0001491	.0005047	-0.30	0.768	-.0011418	.0008436
Co-option ratio	-.0049262	.0032374	-1.52	0.129	-.011294	.0014415
Interaction term (tenurexco-option)	.0004955	.0006911	0.72	0.474	-.0008638	.0018549
BankSize	.0090462	.0939841	0.10	0.923	-.1758116	.193904
Leverage	-119.0833	47.7243	-2.50	0.013	-212.9525	-25.2142
Tier1	.0004499	.0004226	1.06	0.288	-.0003812	.0012811
Largeshareholder	-.0068205	.0048298	-1.41	0.159	-.0163203	.0026793
2003	-.004174	.0041678	-1.00	0.317	-.0123716	.0040236
2004	-.0076929	.003451	-2.23	0.026	-.0144806	-.000905
2005	-.0066918	.0038165	-1.75	0.080	-.0141986	.0008149
2006	-.0099874	.0041394	-2.41	0.016	-.0181293	-.001845
2007	-.0045635	.0042108	-1.08	0.279	-.0128456	.0037187
2008	.0110903	.0076818	1.44	0.150	-.0040191	.0261996

2009	.0230533	.0059997	3.84	0.000	.0112524	.0348541
2010	.0241317	.0052107	4.63	0.000	.0138827	.0343806
2011	.0186081	.0065058	2.86	0.004	.0058118	.0314044
2012	.0083467	.0057182	1.46	0.145	-.0029004	.0195938
2013	.0064737	.0054424	1.19	0.235	-.0042311	.0171784
2014	.0053032	.0052977	1.00	0.318	-.0051168	.0157233
2015	.0056154	.0052705	1.07	0.287	-.0047512	.0159819
2016	.0065658	.0052636	1.25	0.213	-.0037872	.0169188
2017	.0037452	.0052447	0.71	0.476	-.0065706	.014061
2018	.0028211	.0054115	0.52	0.602	-.0078228	.0134651
2019	-.0013122	.0056069	-0.23	0.815	-.0123404	.009716
Country 2	0 (omitted)					
Country 3	0 (omitted)					
Country 4	0 (omitted)					
Country 5	0 (omitted)					
Country 6	0 (omitted)					
Country 7	0 (omitted)					
Country 8	0 (omitted)					
Country 9	0 (omitted)					
Country 10	0 (omitted)					
Country 11	0 (omitted)					
Country 12	0 (omitted)					
Country 13	0 (omitted)					
Country 14	0 (omitted)					
Country 15	0 (omitted)					
Country 16	0 (omitted)					
Country 17	0 (omitted)					
Country 18	0 (omitted)					
Country 19	0 (omitted)					
Country 20	0 (omitted)					
Country 21	0 (omitted)					
Country 22	0 (omitted)					
Country 23	0 (omitted)					
Country 24	0 (omitted)					
Country 25	0 (omitted)					
Country 26	0 (omitted)					
Country 27	0 (omitted)					
Country 28	0 (omitted)					
Country 29	0 (omitted)					
Country 30	0 (omitted)					
Country 31	0 (omitted)					
Country 32	0 (omitted)					
Country 33	0 (omitted)					
Country 34	0 (omitted)					
Country 35	0 (omitted)					
Country 36	0 (omitted)					
Country 37	0 (omitted)					
Country 38	0 (omitted)					
Country 39	0 (omitted)					
Country 40	0 (omitted)					
Country 41	0 (omitted)					
Country 42	0 (omitted)					
Country 43	0 (omitted)					
Country 44	0 (omitted)					
Country 45	0 (omitted)					

Country 46	0 (omitted)					
Country 47	0 (omitted)					
Country 48	0 (omitted)					
Country 49	0 (omitted)					
Country 50	0 (omitted)					
Country 51	0 (omitted)					
Country 52	0 (omitted)					
Country 53	0 (omitted)					
Country 54	0 (omitted)					
Country 55	0 (omitted)					
Country 56	0 (omitted)					
Country 57	0 (omitted)					
Country 58	0 (omitted)					
Country 59	0 (omitted)					
Country 60	0 (omitted)					
Country 61	0 (omitted)					
Country 62	0 (omitted)					
Country 63	0 (omitted)					
Country 64	0 (omitted)					
Country 65	0 (omitted)					
Country 66	0 (omitted)					
Country 67	0 (omitted)					
Country 68	0 (omitted)					
Country 69	0 (omitted)					
Country 70	0 (omitted)					
Country 71	0 (omitted)					
Country 72	0 (omitted)					
Country 73	0 (omitted)					
Country 74	0 (omitted)					
_cons	.5092556	.1967506	2.59	0.010	.1222659	.8962453
sigma_u	.02654813					
sigma_e	.01402567					
Rho	.78179208	(fraction of variance due to u_i)				

Number of Observations = 1,216
R-squared within = 0.1269 between = 0.0007 overall = 0.0165
Corr(u_i, Xb) = -0.0604