How does Corporate Culture affect Banks' Risk-Taking?

Evidence from the European Banking Sector

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Abstract

This paper is the first to empirically study the effects of different types of corporate culture on the risk-taking behavior of European banks. Based on a text analysis approach following the competing values framework (CVF), we analyze a unique set of hand-collected data from 167 European banks between 2005 and 2015 and find collaborate- and control-oriented cultures to be significantly related to lower risk-taking. Considering the impact of the global financial and European debt crises, our results also indicate the presence of a moderating effect for these cultures on banks' risk. In addition, we find a second moderating effect for collaborate- and control-oriented cultures on the impact of corporate governance mechanisms on banks' risk-taking.

EFM-*Classification*: 150, 510

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1. Introduction

> *"Poor cultural foundations and significant cultural failures were major drivers of the recent financial crisis, and continue to be factors in the scandals since then." (Group of Thirty 2015)*

The opening quotation exemplifies the widespread conviction that aspects of corporate culture in banks are to be held responsible for their (excessive) risk-taking, its corresponding (adverse) consequences during the global financial crisis 2007-2009 as well as for the emergence of other industry scandals like interest rate manipulation or tax evasion affairs. As an example, Thomas Hayes, a former UBS and Citigroup yen derivative trader, ascribed the LIBOR and forex fixings to the prevalent attitudes of culture carriers that made him believe that manipulation was reasonable as managers knew what he was doing and the practice was widespread within the bank (Reuters 2015). Accordingly, the growing belief that the underlying practices by bank managers are the results of a multitude of cultural failures like dishonesty, short-termism, missing or inadequate and thus exploited checks and balances, and the (resulting) possibility to increase leverage and trading activities to systemically relevant levels, has led to an increasing call for a change of corporate culture in the banking sector (Group of Thirty 2015).

Meanwhile, the industry has realized this need and banks start declaring cultural change as essential part of their strategy.[1] Likewise, policy makers and regulators increasingly recognize that trigger events for the emergence of financial crises or scandals may not just be outcomes

[1] See, e.g., the website on corporate culture of Deutsche Bank: "The impact of the economic crisis has made a long-term change of corporate culture in the financial sector absolutely imperative and cultural change is needed. […] We have set ourselves the goal of taking on a pioneering role in the change that is indispensable in the business sector: Cultural change was therefore an essential part of our Strategy 2015+ and corporate culture remains one of the key levers in our Strategy 2020." Available at: https://www.db.com/company/en/our-culture.htm

of individual misconduct but the reflection of systemic weaknesses (Thakor 2016). That is why, under the objective of restoring public trust in the banking system and enhancing financial stability, corporate culture in banking comes to the fore when developing a catalogue of measures guiding appropriate risk-taking decisions by banks in the future (Barth et al. 2013), making corporate culture an issue of broad economic interest (Dudley 2014). This is in line with banking supervisory authorities increasingly emphasizing qualitative factors to shape banks' risk-taking including banks' culture (Financial Stability Board 2013; Basel Committee on Banking Supervision 2016).

While corporate culture has been discussed as a potential determinant of bank risk-taking in theory, sound empirical evidence on this relation is scarce. Yet, the academic literature mainly focuses on organizational effectiveness, leadership, and national culture (Schneider et al. 2013), leaving corporate culture's as a potential trigger for socially questionable behavior (Morrison and Shapiro 2016) – including excessive risk-taking – widely unattended. As an exception, Cohn et al. (2014) conclude that in parts of the banking industry prevails a problematic, dishonest business culture that tends to tolerate or promote dishonest behavior. However, sweepingly ascribing behavioral problems to *the* culture in banking might be far too general. According to the competing values framework (CVF) originating from organizational research, one can distinguish between four types of culture on a corporate level with each one having unique characteristics that are able to either encourage or discourage certain behaviors of managers or employees (Quinn and Rohrbaugh 1983; Cameron and Quinn 2006). Consequently, there may be some types of corporate culture that tend to promote risk-taking and others that tend to diminish risk-taking. While there are two studies with a focus on US banks supporting the notion of certain types of corporate culture influencing banks' credit risk (Barth 2015; Nguyen et al. 2017), the literature lacks empirical evidence for the European banking sector comprehensively assessing banks' risk-taking.

This paper attempts to fill this research gap by providing empirical evidence regarding the influence of corporate culture on banks' risk-taking. More specifically, we examine four research questions: first, we analyze whether a bank's corporate culture influences its risk-taking behavior on a general basis. Second, we identify the specific type of corporate culture for each bank in the sample and examine whether there are culture types that encourage (discourage) risk-taking. Third, considering the exceptional market conditions during the last decade, we study whether certain types of corporate culture are able to develop a stabilizing effect for banks in times of crisis and thus mitigate the impact of the crises on banks' default and credit risk. Fourth, we analyze a potential moderating role of different types of corporate culture on the efficacy of corporate governance mechanisms for banks' risk-taking.

These research questions are addressed by simultaneously advancing the research design commonly applied in prior studies: first, we study a large sample of 92 listed and 75 unlisted European banks (167 in total) over the period from 2005 to 2015. Hence, this paper is the first to focus on the European banking sector and to include the periods of the recent global financial and European debt crisis, enabling analyses of regional and time-dependent differences as well as moderating effects for the crisis' impact. Second, we follow the recent literature on corporate culture (Fiordelisi and Ricci 2014; Cerqueti et al. 2016; Nguyen et al. 2017) and identify a bank's type of corporate culture by using a text analysis approach based on relevant parts of banks' annual reports (1368 in total), linking pre-defined sets of representative keywords to four dimensions of corporate culture according to the CVF (Nguyen et al. (2017). Thus, instead of analyzing the effects of *the* banking culture (e.g., Cohn et al. 2014), our research design is innovated by differentiating between different types of corporate culture. Third, we are able to examine a moderating role of certain types of corporate culture on the efficacy of corporate governance mechanisms for banks' risk-taking, thus contributing empirical evidence on a topic that has up to now been discussed in theory only (Stulz 2016; Thakor 2016).

The empirical results indicate statistically significant effects of different types of corporate culture on European banks' risk-taking with regard to both insolvency risk and credit risk. First, concerning collaborate- and control-oriented cultures, results indicate a mitigating effect on banks' risk-taking. Additionally, described as the first moderating role, banks with a collaborate- or control-oriented culture appear to be less affected regarding the impact of the crisis on those banks' default risk. Furthermore, both types of culture exhibit a second moderating effect regarding the impact of corporate governance mechanisms on banks' risk-taking. More specifically, results suggest that in case a risk-mitigating collaborate- or control-oriented culture prevails in a bank, a high corporate governance score is associated with a higher default risk. Second, concerning compete-oriented cultures, results indicate lower risk-taking by banks with this type of culture. However, the reverse holds for the moderating role of the compete-oriented culture with regard to the impact of a crisis on bank risk.

The remainder of this paper is organized as follows: Section 2 discusses existing definitions and concepts of corporate culture as well as the different types of corporate culture based on the CVF and their according characteristics. Section 3 presents a literature review highlighting the research gaps addressed and deducing the hypotheses to be tested. Section 4 outlines the data and the research design. Section 5 assesses the empirical results on the relation between banks' risk taking and corporate culture. Section 6 concludes and derives implications for bank managers, policy makers and further academic research.

2. Conceptualization of Corporate Culture

2.1. Definitions of Corporate Culture

Up to this date, there is no broadly accepted definition of corporate culture in general and banking culture in particular. Instead, there seem to be a variety of meanings and connotations about corporate culture in the organizational behavior, economics, and finance literature (see also Fiordelisi et al. 2016; Ostroff et al. 2003).

Representing the organizational behavior literature, O'Reilly and Chatman (1996) define corporate culture as "a system of shared values and norms that define appropriate attitudes and behaviors for organizational members". According to their view, corporate culture serves as a social control mechanism. This is in line with Hofstede (1991) who describes corporate culture as "collective programming of the mind" of people in an organization.

Kreps (1990) defines organizational culture as coordinating mechanisms that enable dealing with unforeseen contingencies. While a strong corporate culture can be more powerful than formal compensation contracts, its absence on the contrary can lead to undesired action and behavior of employees, possibly encouraging excessive risk-taking (see also Thakor 2016).

Marshak (2006) takes a more psychological view. He associates culture with covert processes causing hidden dynamics that routinely impact human interactions and actions taken to accomplish certain goals. Every culture contains unspoken beliefs and assumptions that influence people's behavior. Referring to Marshak (2006), Schein (2010) compares the role of culture in a group to the personality of an individual. In this sense, corporate culture guides and constrains the behavior of members of a group through shared norms and beliefs. It is seen as a powerful concept with regard to its impact, although invisible and to a considerable degree unconscious in its origin.

Following the economic literature, corporate culture represents implicit and explicit contracts that govern behavior (Benabou and Tirole 2002, 2011; Tabellini 2008). It comprises shared beliefs, values and preferences of individuals in an organization (Crémer 1993; Lazear 1995; van den Steen 2010). According to this perspective, corporate culture provides a common language, shared knowledge of facts and behavior rules, thereby partially acting as a substitute for explicit communication. However, the larger and more complex the company, the bigger is the challenge to develop a uniform culture that serves as a guiding mechanism for the behavior of all employees (Crémer 1993; Thakor 2016).

In the finance literature, corporate culture is defined as "principles and values that should inform the behavior of all the firm's employees" (Guiso et al. 2015) or "the collective assumptions, expectations, and values that reflect the explicit and implicit rules determining how people think and behave within the organization" (Thakor 2016), respectively. Understanding corporate culture as a two-level collective, Barth (2015) decomposes corporate culture into shared values as less clearly visible and constant component on the one hand, and the image and behavioral pattern and norms of the organization as more visible and more easily changeable component on the other hand.

As an interim conclusion, although the different literatures may look at corporate culture from a different angle or pay varying attention to its individual aspects, a manifested common core understanding of corporate culture can be summarized as follows: Corporate culture represents the implicit and explicit rules that are based on common values and beliefs in an organization and determine the interactions and actions within an organization to accomplish certain goals. For our purposes, we concentrate on this comprehensive definition and refer to it by using the term "corporate culture" throughout the rest of the paper in order to ensure conceptual consistency.

2.2. Determination and Implication of Corporate Culture

According to both theoretical models and empirical evidence, culture is determined from the top and employees respond to the organization's culture (Cohn et al. 2014; Guiso et al. 2015; Song and Thakor 2015; Graham et al. 2017). In particular, corporate culture can shape an employee's identity and influence its behavior and decisions. This is not only in line with the upper echelon theory (Hambrick and Phyllis 1984), but has also been experimentally demonstrated by Cohn et al. (2014): They show that employees of a large international bank behave, on average, honestly in a control condition but become dishonest when they are reminded of their professional identity as bank employees.

This finding accuses the banking culture, specified as "the unwritten and informal norms that prevail in the banking industry", to tolerate or promote dishonest behavior. Although this is in line with the public perception of the prevailing business culture in banks that is held responsible for many cases of fraud and excessive risk-taking, it must be questioned whether all banks really can be characterized by one and the same (undesired) specification of corporate culture influencing employees' behavior in the same direction in every single bank. Organizational theory but also recent finance research rather highlights the individuality of corporate culture (Quinn and Rohrbaugh 1983; Cameron et al. 2014; Fiordelisi and Ricci 2014; Thakor 2016; Graham et al. 2017), suggesting that in every single bank may prevail an individual culture setting individual incentives for behaviors, either encouraging or discouraging excessive risk-taking.

2.3. Clusters of Corporate Culture

Despite the individuality of corporate culture, certain clusters of corporate culture with similar characteristics can be identified. According to the Competing Values Framework (CVF) developed by Quinn and Rohrbaugh (1983) and Cameron et al. (2014) which represents an organizational culture taxonomy widely used in the literature (see, e.g., meta-studies of Ostroff et al.

2003; Hartnell et al. 2011; Schneider et al. 2013), four different types of corporate culture can be distinguished.

Based on the premise of different priorities or values that compete for a company's limited resources, corporate culture is determined by how managers respond to this tension. While Cameron and Quinn (2006) termed the four culture types as Clan, Adhocracy, Market and Hierarchy, it is rather the according action verb originally describing the orientation of a certain cultural type that is applied in economic and finance research to name the four types of corporate culture. The respective notations are collaborate, create, control and compete.

The identification of these four types is based on two sets of competing values with bipolar dimensions, namely the degree of internal versus external orientation, and the degree of flexibility versus stability in structure. Adopting the concept proposed by Cameron et al. (2014) and Thakor (2016), the four types of corporate culture can be characterized as follows:

The *Collaborate* culture focuses on its employees, aims at building consensus, developing cooperation and encouraging participation of employees in corporate decisions. According to Cameron et al. (2014), this internally oriented culture can be best described with the mantra "human development, human empowerment, and human commitment". Correspondingly, commitment, communication and development are seen as value drivers. Organizational effectiveness is assumed to be best reached via human capital development and a high level of employee commitment.

The second internally focused culture is the *Control* culture. A mantra for this culture is "better, cheaper, and surer" (Cameron et al. 2014) as companies with this culture focus on creating value by consistency, timeliness and through improvements on effectiveness and efficiency of internal processes. Corporations embodying this culture place emphasis on risk management, planning and auditing processes, statistical process control and other techniques to become more smooth, efficient, and predictable.

The first culture with external focus is the *Create* culture. It encourages entrepreneurial thinking, idea-sharing, and vision-building among employees. According to Cameron et al. (2014), the main mantra is “create, innovate, and envision the future”. Preferring constant change and allowing for freedom of thought and action among their employees, this culture is often characterized by rule breaking and reaching beyond barriers. Agility, transformation, and innovative outputs are seen as value drivers.

The second externally focused culture is the C*ompete* culture. Companies representing this orientation can be characterized by an aggressive and competitive behavior in pursuing financially motivated goals, putting the customer at the highest priority and placing importance to fast response and organizational effectiveness. The according mantra is “compete hard, move fast, and play to win” (Cameron et al. 2014). Market share, profitability, and goal achievement act as value-drivers. This is reached by monitoring market signals and emphasizing interactions with external stakeholders, customers, and competitors.

Although it can be assumed that the corporate culture of most banks includes several individual aspects from all four types of corporate culture, there may typically be one type that can be regarded as dominant for a given bank. This dominant type of corporate culture can be characterized as being most powerful and influencing the bank’s operations the most.

3. Literature Review and Hypotheses Development

3.1. Literature Review

While research on the role of corporate culture has been underrepresented in the finance literature to this date (Guiso et al. 2015), recent studies now examine the link between corporate culture and diverse corporate actions, outcomes, or economic phenomena using diverse and partly innovative measures for determining corporate culture (see, e.g., Schneider et al. 2013 for an overview). As an example, Guiso et al. (2015) measure corporate culture based on employee surveys conducted by the Great Place to Work Institute to study the dimensions of corporate culture that are related to firm performance.

However, the majority of finance papers that analyze the effects of corporate culture, by contrast, draw on organization behavior research. In order to determine a company's type of corporate culture according to the CVF, these studies follow the common practice in this field of research and use a text analysis approach, screening the company's official documents:

Fiordelisi and Ricci (2014) study the effect of corporate culture on the relationship between firm performance and CEO turnover. They find that (i) the probability of a CEO change increases in compete- and create-oriented cultures, and (ii) the negative relationship between firm specific performance and CEO turnover is reinforced by the control-oriented culture and reduced by the create-oriented culture. Furthermore, corporate culture influences the probability of insider and outsider succession. Stentella-Lopes (2015) finds that firms with a create-oriented corporate culture are associated with both higher innovation activity and higher firm value. Concerning banks, Fiordelisi and Martelli (2011) and Fiordelisi et al. (2016) show that specific combinations of corporate culture significantly affect M&A results. Focusing more on behavioral effects, Cerqueti et al. (2016) find that banks with a create- and collaborate-oriented culture react stronger to an enforcement action performed by the FDIC, the OCC, and the FRS.

Surprisingly, despite the importance of corporate culture for corporate and economic outcomes, the link between corporate culture and risk-taking has received relatively little attention, especially on a firm-level.

Although Fahlenbrach et al. (2012) do not use a direct measure of corporate culture, they show that a bank's impairment by a crisis can at least partly be ascribed to their culture. Sørensen (2002) describes culture as a control mechanism by showing that a strong culture correlates with less unexpected volatility in performance and to more consistency, accordingly. However, the study does not allow drawing implications for banks as the focus lies with non-financial firms. Additionally, both studies do not distinguish between different types of corporate culture.

More specifically, there are only two papers addressing the latter aspect by analyzing the role of banks' corporate culture on risk-taking, more precisely for credit risk and lending practices, respectively. Running a text analysis on banks' 10-K reports to identify their cultural orientation according to the CVF, Barth (2015) finds that banks with a strong competition-oriented corporate culture (i) use a compensation scheme with higher cash bonus payments and a larger share of variable compensation to attract CEOs with similar attitudes, (ii) are associated with higher credit risk, and (iii) yield a higher buy-and-hold stock market return. The first finding dilutes once the author controlled for corporate culture, suggesting that not incentives arising from CEO compensation schemes but corporate culture is responsible for the risk-taking of banks. However, as the study only includes 86 banks from the US and, most importantly, only focuses on credit risk, the results cannot be seen as the final word on the influence of different types of corporate culture on banks' risk-taking. In particular, proof is needed on (i) how the results change when focusing European banks, especially against the background of a more complex environment with two different financial crises potentially influencing the effect of a bank's corporate culture on its risk-taking, and (ii) how corporate culture influences other risk-taking measures aside from credit risk.

Nguyen et al. (2017) focus on bank's risk-taking in the process of approving and setting-up loan contracts. Likewise using text analysis on 10-K reports to identify corporate culture according to the CVF, they find that compete-oriented banks are associated with riskier lending practices reflected by higher approval rates, lower borrower quality, and fewer covenant requirements. Additionally, they find banks with a compete-oriented corporate culture to exhibit higher loan growth, but to incur larger loan losses as well. The higher level of growth comes at the expense of a significantly higher fraction of bad loans, consequently. The opposite results are found among control-dominant banks. Their findings are robust when controlling for traditional characteristics of a bank's business model (e.g., size or leverage), CEO compensation incentives (e.g., equity or bonus payments), and CEO characteristics (e.g., demographic, education or career history). Although the authors conclude that the corporate culture of banks indeed plays an important role in influencing bank behavior and stability, the same open issues remain as in the previously mentioned study: first, the sample studied is based on 79 US-listed banks. Therefore, again clarification is needed on how corporate culture influences risk-taking in the European banking market with two relevant financial crises to consider. Second, the study only covers the period from 1993 until 2007. Consequently, research should address whether and how the effects of corporate culture change or even strengthen in times of crisis. Third, the analysis solely focuses on risk-taking related to lending practices instead of taking a more holistic view on a bank's risk-taking.

In summary, there is very little (empirical) evidence on how different types of corporate culture influence the risk-taking of banks. As pointed out above, Cohn et al. (2014) assign one single "problematic business culture" to parts of the banking industry but do not distinguish between different types of corporate culture, thus not being able to identify certain types of corporate culture rather promoting or preventing excessive risk-taking and dishonest behavior. The same holds for Fahlenbrach et al. (2012) and Sørensen (2002), both in a broader sense referring to

risk-taking by focusing on the effects of *the* corporate culture or the strength of an organization's culture on the impairment by or performance during a crisis, but not differentiating between different types of corporate culture. These research gaps provide the basis for the following hypotheses development.

3.2. Hypotheses Development

As a starting point, we follow Guiso et al. (2015) and propose that first, corporations have the ability to shape their own culture by hiring and firing employees and, second, the prevailing corporate culture in an individual bank may have an even greater influence on the degree to which the bank engages in risk-taking. In consistence with the indicative results of prior research by Fahlenbrach et al. (2012) and Cohn et al. (2014), we formulate our first hypothesis as follows:

H1: A bank's corporate culture has an influence on its risk-taking.

Cerqueti et al. (2016) have shown that banks with a more flexible corporate culture (create- and collaborate-oriented types) react stronger to an enforcement action. This may indicate that these cultures are more risk averse and therefore characterized by a lower risk-taking than banks with a more stable corporate culture (control- and competition-oriented types). While companies that embody a compete-oriented culture are often referred to as aggressive in behavior, companies with a control-oriented corporate culture are often associated with the mantra "better, cheaper, and surer" (Cameron et al. 2014). Consequently, a control-oriented corporate culture would rather be associated with a comparatively low risk-taking. First evidence of this assumption is provided by Nguyen et al. (2017) showing that banks with a control-oriented culture focus on safety and engage in less risky lending activities. Unlike Cerqueti et al. (2016), we therefore hypothesize that banks with a control-oriented corporate culture have the lowest risk-taking among the four culture types.

H2a: Banks with a control-oriented corporate culture are associated with the lowest risk-taking.

Concerning compete-oriented corporate cultures, however, we follow the implications derived from Cerqueti et al. (2016) combined with the characteristics of compete cultures as described within the CVF and assume high risk-taking for banks that embody this culture. Initial empirical evidence is provided by both Barth (2015) and Nguyen et al. (2017). These studies find a higher credit risk and riskier lending practices, respectively, in competition-oriented banks in the US. Additionally, as also mentioned by Barth (2015), the strong internal competition within this corporate culture type might induce workers to take excessive risks in order to outperform their competitors. Therefore, we derive the following hypothesis:

H2b: Banks with a competition-oriented corporate culture are associated with the highest risk-taking.

Furthermore, the empirical evidence provided by Fahlenbrach et al. (2012) suggests that knowledge of the corporate culture of a bank may be a helpful factor in explaining the degree to which the bank has been affected by the financial crises as well as the bank's corresponding reactions. More specifically, non-fundamental aspects of banks' practices and behavior appear to have caused some banks to remain susceptible to the crisis, even after controlling for shocks that might have increased their resistance to crises in other ways. In this context, Beltratti and Stulz (2012) and Erkens et al. (2012) provide evidence in support of corporate governance having an important impact on bank performance during the crisis through influencing firms' risk-taking and financing policies. In both studies, the reason to focus on corporate governance aspects is because of the supposed relation of governance to unobserved bank characteristics. However, these characteristics might be more accurately reflected by a bank's corporate culture since it covers those factors that influence a bank's operations but are mostly unobservable, like for instance underlying assumptions, shared values or common beliefs.

Especially in volatile environments, the effects of a certain type of corporate culture might become more intense and visible. This is in line with the finding of Burt et al.'s (1994) reanalysis of Kotter and Heskett (1992) showing that the performance benefits of strong cultures depend on market context. Yet, there is no study that examines the role of different types of corporate culture as a moderating factor on the impairment by the recent financial crisis.

There are three potential ways of a moderating influence: on the one hand, banks with a focus on stability, safety and internal maintenance as ascribed especially to control-oriented corporate culture might be better shielded from crises. On the other hand, in case the crisis affected banks adversely, banks with a collaborate- or create-oriented corporate culture might have handled the crisis more effectively due to a better ability of adapting to changing environments compared to banks belonging to cultures with a focus on stability and consistency. The third channel through which corporate culture could have affected performance during the crisis is that banks with a create-oriented culture encouraging employees to reach beyond barriers and to look for innovative outcomes might have taken risks prior to the crisis. These, in turn, may have manifested themselves during the crisis, resulting in adverse impacts on banks. In addition, banks with a create-oriented culture might be more likely to lever their risk-taking in a "gamble for resurrection" (Goodhart 2008; Milne 2014), Thus, transferring the governance related argumentation of Beltratti and Stulz (2012) on culture, a create-oriented culture might have led to value-creating decisions (e.g., concerning innovative products) before the crisis that were associated with unforeseeable adverse outcomes during the crisis.

Therefore, we hypothesize that the type of a bank's corporate culture influences the bank's impairment by the crisis but refrain from predicting the direction due to the different lines of argumentation.

H3: Corporate culture has a moderating impact on the relation of the financial crisis to banks' risk-taking.

Furthermore, several studies have examined how the risk-taking behaviors of banks are affected by corporate governance mechanisms. The results are mixed (for an overview, see Chen and Lin 2016). According to the argumentation by Stulz (2016), this may partly be ascribed to corporate culture. He argues that governance mechanisms encounter several limits. In his view, the ability of a firm to manage risk properly by implementing corporate governance mechanisms therefore depends on its corporate culture which represents the implicit contracts that govern behavior. This is supported by Song and Thakor (2015) and Thakor (2016) who similarly argue that different types of corporate culture can lead to different behavioral outcomes of, e.g., the same compensation-scheme in two banks.

In addition to banks' corporate culture, weaknesses in corporate governance mechanisms are made responsible for the large fallout from the recent financial crisis as well (e.g., Bebchuk and Spamann 2010; Diamond and Rajan 2009; Kirkpatrick 2009). Banks with poor governance are accused for having engaged in excessive risk-taking which caused them to make larger losses during the crisis. As mentioned above, this suggestion is supported by Erkens et al. (2012) showing that corporate governance had an important impact on the performance of financial firms during the crisis through their risk-taking and financing policies. Interestingly, Beltratti and Stulz (2012) find no evidence in support of a positive impact of bank governance during the crisis as they show that better governed banks fared worse during the crisis.

We therefore hypothesize that corporate culture moderates the efficacy of corporate governance mechanisms on banks' risk-taking, but again refrain from predicting the effect's direction.

H4: A bank's corporate culture has a moderating impact on the relation of the efficacy of corporate governance mechanisms to banks' risk-taking.

4. Methodology

The objective of this study is to investigate the relevance of corporate culture for the risk taking of European banks and to identify potential moderating effects of this relationship. This section outlines the data studied and the econometric methodology applied.

4.1. Data and Sources

4.1.1. Corporate Culture Measures

In analogy to the recent literature on corporate culture (Fiordelisi and Ricci 2014; Thakor 2016; Cerqueti et al. 2016; Nguyen et al. 2017), we use the Competing Values Framework developed by Cameron et al. (2014) to determine a bank's corporate culture. It draws on the CVF initially developed in organizational behavior research by Quinn and Rohrbaugh (1983) which has become the dominant model in the quantitative research on organizational culture (Kwan and Walker 2004) with a large amount of empirical studies having proven the reliability and validity of the CVF (see, e.g., the meta-study of Yu and Wu 2009).

Nevertheless, the absence of a standard approach has led to difficulties in measuring corporate culture for a longtime. We overcome this problem by assessing corporate culture through text analysis – a technique that is applied in an emerging strand of literature (see, e.g., the meta-study of Loughran and McDonald 2016). The underlying premise of our approach that corporate culture is mirrored in the annual reports of an organization results from: (i) the fact that linguistic content captures otherwise hard-to-quantify aspects of firms' fundamentals (Tetlock 2007); (ii) that corporate culture represents the unspoken code of communication among members of an organization (Crémer 1993); (iii) that it is reflected by the words and expressions used by the members of an organization (Levinson 2003).

Recently, automated text analysis has become a widely accepted instrument in accounting and investor relations research. The use of quantitative and automated methods instead of hand collection increases reproducibility and allows harvesting information from large bodies of text. While also involving external sources (e.g., Antweiler and Frank 2004; Tetlock 2007; Blankespoor et al. 2014; Huang et al. 2014), research predominantly focuses firm originated disclosures such as 10-K or annual reports (Loughran and McDonald 2011; Li et al. 2013; Lang and Stice-Lawrence 2015) and specific segments from 10-K or annual reports, respectively (Hoberg and Phillips 2010; Li 2010; Brown and Tucker 2011).

In accordance to the upper echelons theory that traces an organizations' inner characteristics back to the strong influence of top managers (Hambrick and Phyllis 1984; Bertrand and Schoar 2003), our analysis focuses on the chairman's letters to the shareholders. This probably least standardized, most narrative and thus most individual section of the banks' annual reports is commonly used in the management literature (Short et al. 2010; Dikolli et al. 2012). By using these specific sections, we also overcome the problem of the little standardization of annual reports of European banks.

Our methodology is as follows: We start the sample selection procedure by considering the ten nationally biggest banks (based on total assets for the last available business year) in each EU country and Switzerland between 2005 and 2015.[2] In a second step, we exclude those banks for which (i) we find less than three published and accessible annual reports are available; (ii) the annual reports are not published in English language; and (iii) the annual reports do not contain an individual section written by the CEO, President, Managing Director or Chairman of the

[2] As we analyze listed and unlisted banks alike, we need bank specific accounting data taken from Fitch's Bankscope database for the construction of the risk taking variables which were mostly unavailable prior to 2005.

Management Board[3] which, in most of the cases, is represented by a letter to the shareholders.[4] As a third step, we manually extract these segments and measure the specific manifestation of the four cultural dimensions for each bank in a given year by the number of (cultural-)specific words in each letter in comparison to its total number of words. As a result, data on corporate culture is retrieved from 167 banking institutions from 29 countries.

The bag of words underlying our text analysis approach to determine a bank's type of corporate culture by Fiordelisi and Martelli (2011) who provide a conceptual base for all following research studies using this approach (Fiordelisi and Ricci 2014; Barth 2015; Cerqueti et al. 2016; Nguyen et al. 2017). The keywords' identification is based on synonyms according to the Harvard IV-4 psychosocial dictionary for the four types of corporate culture as described and defined by Cameron and Quinn (2006), thus decreasing the impact of the researchers own subjectivity in the construction of the word lists (Loughran and McDonald 2011). This procedure yields the bag of words presented in table 1, containing one distinct word list for each cultural dimensions.

[Insert table 1 about here]

In order to overcome potential biases in the resulting culture scores due to different number of words within each word lists as well as within each bank document analyzed, we normalized the word counts of each culture type with both the number of words of its own word list and the total number of words of the respective letter to the shareholders (or the respective similar document).

[3] Following the theoretical considerations of the upper echelons theory, we exclude letters from the Chairman of the supervisory board and instead focus on letters written by the top management of the banks.

[4] Similar documents are, e.g., a foreword or message by the CEO, President, Chairman of the Management Board or Managing Director

Furthermore, external events affecting the banking system as a whole may exert a transitory effect on our culture scores. Since our sample period contains at least two such events, the global financial crisis and the European sovereign debt crisis, the culture scores might fluctuate over time due to specific expressions related to these external events. Thus, we refrain from using the year-individual culture scores, but measure a bank's dominant culture instead. Thus, in a second step, we follow Nguyen et al. (2017) and compare the culture scores for each bank in a given year to those of the other banks in the same year. On that account, we first identify whether a bank has a strong culture in one year. This is given in case the culture score belongs to one of the highest as defined by the 90 percent quantile among all banks in that year. Second, in consequence of the long term nature of a dominant corporate culture (Fahlenbrach et al. 2012; Graham et al. 2017), we again follow Nguyen et al. (2017) and define that a dominant culture can be ascribed to a bank in case the same strong culture exists for at least 50 percent of its sample observations.

4.1.2. Risk-taking Variables

While the literature on banks' risk-taking usually focuses on listed banks (Altunbas et al. 2011; Demirgüç-Kunt and Huizinga 2010), we also include unlisted banks which represent the majority of banks in Europe. As a consequence, we use risk taking measures based on balance-sheet data provided by Fitch's bankscope database.

In line with a large body of empirical literature (Beck et al. 2006; Boyd and Nicoló 2005; Demirgüç-Kunt and Huizinga 2010; Foos et al. 2010; Köhler 2015; Schaeck and Cihák 2012; Uhde 2016; Uhde and Heimeshoff 2009, Stiroh 2004a, 2004b; Stiroh and Rumble 2006), we measure bank risk taking using the z-score derived from the original measure proposed by Altman (1968). The z-score is defined as

$$z - score_{it} = \frac{ROAA_{it} + CAR_{it}}{SD(ROAA_{it})}$$

where $ROAA_{it}$ is the return-on-average-assets and CAR_{it} the ratio of total equity over total assets of bank i in year t and $SD(ROAA_{it})$ denotes each bank's standard deviation of the ROAA. It is calculated over the whole sample period T. The z-score can be interpreted as the inverse of the probability of insolvency. As such, a higher z-score indicates that a bank incurs fewer risks and is more stable. Moreover, it denotes the number of standard deviations below the expected value of a bank's asset returns at which its equity is depleted and the bank becomes insolvent (Boyd et al. 1993), i.e. indicating the distance to default. Lepetit and Strobel (2015) have shown that the z-score tends to overestimate the insolvency probability for lower z-scores which is very likely to be the case for the z-scores of our sample within the crisis periods. Therefore, we use the natural logarithm of the z-score to correct for potential upward bias and high skewness of the z-scores.

Alongside the z-score as a measure of overall bank stability, we separately examine the credit risk of the institution as additional risk taking variable. We follow Foos et al. (2010) and define the credit risk as

$$credit\ risk_{it} = \frac{LLP_{it}}{TL_{it-1}}$$

where LLP_{it} represents the loan loss provisions of bank i at year t and TL_{it-1} the total loans of bank i at year $t-1$. The lag of total loans has been included in order to match the loan loss provision with existing loans instead of newly granted loans. At last, we use the natural logarithm of the variable to remove negative values from the distribution as these do not constitute negative risk taking but rather a form of earnings management by the respective bank (Foos et al. 2010).

4.1.3. Further control Variables

Considering the importance of controlling for various variables on the bank level that might influence the relationship between the corporate culture and banks' risk-taking, we control for

(i) bank size, calculated as the natural logarithm of total assets; (ii) business model, represented by the ratio of non-interest income and total operating income; (iii) leverage; (iv) liquidity ratio, calculated by ratio of banks' liquid assets and banks' liquid liabilities; and (v) bank performance measured as the return on equity (ROE). The balance sheet data again are retrieved from Fitch's bankscope database.

We also control for various variables on the institutional and macroeconomic level. At the institutional level, we control for variables related to bank regulation laid out by the Basel committee as banking regulation is generally recognized as one of the key influential factors of banks' risk taking. Using the indicator Capital Stringency by Barth et al. (2013), we control for the heterogeneity in the national regulatory policies concerning the formal level of capital requirements and the quality of regulatory oversight in the context of capital regulation. Furthermore, we also control for creditor rights in each country via the credit rights index developed by Djankov et al. (2007) and the countries' private credit to GDP ratio as a measure of the importance of banks in the national financial systems (Levine 2002) retrieved from the World Development Indicators database of the Worldbank. On the macroeconomic level, we control for the aggregate economic development by including the per capita income for each country which is also retrieved from the World Development Indicators.

4.2. Empirical model

For the investigation of the relationship between the banks' risk-taking and their type of corporate culture, we assume an additive linear relationship so that we can test our first two hypotheses by estimating the following regression model:

$$y_{it} = \beta_0 + \beta_1 DCOL_i + \beta_2 DCOM_i + \beta_3 DCON_i + \beta_4 DCRE_i + \beta_k Bank_{it-1,k} + \beta_l IT_{it,l} + \beta_m MA_{it,m} + \varepsilon_{it-1} \quad (1)$$

where y_{it} is either the natural logarithm of the z-score or the credit risk of bank i in year t, $DCOL_i, DCOM_i, DCON_i, DCRE_i$ are the dominant culture dummy variables of bank i set to unity if any cultural dimension turns out to be dominant for the respective bank, and to zero if otherwise; $Bank_{it-1,k}$ is a vector of the mentioned bank level controls of bank i in year $t-1$, $IT_{it,l}$ is a vector of the institutional controls, and $MA_{it,m}$ is a vector of the macroeconomic controls. We include the bank level control variables with one lag to exclude reverse causation issues and simultaneity bias as a source for possible endogeneity of our model.

Testing the first hypothesis examining whether different types of corporate culture have a general influence on banks' risk taking, we would expect statistical significance of the estimators referring to our dominant culture scores, i.e. $\beta_1 - \beta_4$. Empirical support for our second hypothesis referring to the specific effect of different types of corporate culture on risk-taking would in case of the z-score (credit risk) result from a statistically significantly negative (positive) β_2 and statistically significantly positive (negative) β_3. Thus, banks with a more compete-oriented culture engage in higher risk-taking, whereas banks with control-oriented cultures refrain from high risk activities and therefore have a lower risk-taking.

As a next step, we analyze whether certain types of corporate culture moderate the effects of a financial crisis on banks' risk-taking and risk, respectively. To test this hypothesis, we use the baseline model (I) and add a crisis dummy, which is set to unity for the years 2008 to 2013, and zero for the remaining years, and include its interaction terms with the different types of corporate culture. In line with H3, the estimates of the interaction terms are predicted to be statistically significantly different from zero.

Finally, H4 tests whether certain types of corporate culture moderate the efficacy of corporate governance mechanisms with respect to banks' risk-taking. Although advantageous for the underlying research question, the unique sample involving non-listed banks comes along with a disadvantage concerning data on corporate governance. Due to this lack of sufficient data on

specific corporate governance characteristics for the banks in our sample, we assess this hypothesis by using the Thomson Reuters Corporate Governance Score as a yearly aggregate measure for the governance mechanisms in place. The Thomson Reuters Corporate Governance Score is built on Thomson Reuters' ASSET4 ESG database which is based on more than 750 non-financial data points on environmental, social and governance (ESG) aspects for each firm collected from publicly available sources such as firm websites, reports, filings and approximately 10,000 global news sources that are screened daily with LexisNexis (Thomson Reuters 2015). The Corporate Governance Score assesses a bank's commitment towards following best practice corporate governance principles mainly concerning the four pillars Board Structure, Compensation Policy, Board Functions, and Shareholder Rights. We add this Corporate Governance Score (with one lag to account for endogeneity in the model) and its interaction with the different types of corporate culture for the empirical test of our last hypothesis. In case at least one of the interaction terms of the different types of corporate culture and the Corporate Governance Score are statistically significantly different from zero, this would indicate empirical support for H4.

All models presented are estimated based on OLS with bank fixed effects and clustered standard errors on the bank level. To account for heteroscedasticity and autocorrelation in the residuals' variance which also are robust to general forms of spatial and temporal dependence, we calculate standard errors originally proposed by Driscoll and Kraay (1998). As a robustness check, we also estimate all models as panel fixed effect models with robust standard errors and separately address the issue of endogeneity of our models by (re)estimating the models using two-step System GMM as proposed by Arellano and Bover (1995) and Blundell and Bond (1998) with Windmeijer's (2005) finite sample correction in Section 5.3 of this paper.

5. Empirical results

5.1. Descriptive Statistics

Panel A in Table 2 presents descriptive statistics on the total sample. It comprises 1639 bank-year observations from 167 banks covering the period from 2005 to 2015. Panel B in Table 2 presents descriptive statistics on a sub-sample for which we could retrieve Corporate Governance data. It comprises up to 441 bank-year observations from 45 banks equally covering the period from 2005 to 2015. The descriptive statistics of Panel A show an average (median) of 0.33 (0.51) for the z-score and 0.91 (1.15) for credit risk, respectively. Thus, compared to prior results in the literature (Laeven and Levine 2009; Uhde 2016; Foos et al. 2010), banks' risk is moderately higher in our sample. However, as our sample period covers two financial crises affecting bank stability and therefore banks' risk in general, this result is in line with expectations. For the sub-sample, banks' level of risk is comparable to the total sample.

[Insert table 2 about here]

The dominant culture scores indicate that our sample include more banks with collaborate- (0.04) and compete-oriented (0.03) rather than create- (0.02) and control-oriented (0.02) cultures. Prior findings for US banks indicate that the compete-oriented culture is the most prominent culture in the US banking system (Fiordelisi and Ricci 2014; Barth 2015; Nguyen et al. 2017). However, the documented regional difference may be explained in two ways: first, prior studies (Fiordelisi and Ricci 2014; Fiordelisi and Martelli 2011; Barth 2015) have mostly just calculated the normalized word counts as their culture measures without considering externally caused variations on a yearly basis. When using this measure, we also find the compete-oriented culture to be the most prominent type of corporate culture. Second, on the basis of dominant culture scores, Nguyen et al. (2017) also find that dominant compete-oriented cultures are most prevailing in their sample, however, their study does not include a financial crisis period.

Due to the fact that the sample studied covers unlisted as well as listed banks in order to represent the ten largest banks of every European country, the average (median) log total assets 7.49 (7.48) is smaller than presented by Laeven and Levine (2009), who focus on worldwide listed banks. However, they are slightly higher than reported by Köhler (2015), referring to a broad sample of European banks. Similarly, the non-interest income share of banks in our sample is comparable to those banks covered by Köhler (2015). Because of the fact that panel B comprises listed banks only, we find banks in our sub-sample to be on average larger in terms of total assets, higher leveraged, holding a higher non-interest income share and less liquidity.

[Insert table 3 about here]

Table 3 reports correlation coefficients for the all explanatory variables. First, we find credit risk to be inversely related to the z-score with a significant correlation of -0.22. This is consistent with the idea that an increase in the insolvency probability of a bank is reflected by a decreasing z-score while an increasing credit risk in the balance sheet is determined by an increase in the loan loss provision ratio. Second, we find a negative correlation of total assets and credit risk, indicating that larger banks hold less credit risks in their books. However, the relationship between bank size and the z-score is positive but statistically insignificant.

Supporting H2, the dominant control-oriented culture appears to be significantly negatively correlated with credit risk. However, its correlation with the z-score is positive but insignificant. As expected, the Corporate Governance Score significantly correlates with banks' credit risk in a negative direction, indicating that the higher the rating of a bank's Corporate Governance mechanisms in place, the lower the credit risk. All other correlations show the expected sign. Finally, the substantial correlation between total assets and the Corporate Governance score (0.70) may cause multicollinearity problems. However, all variance inflation factors (VIFs) appear to be within the prescribed range of [0;10] proposed by (Hair Jr et al. 2010), indicating that multicollinearity may not be a serious issue with regard to the interpretation of our results.

5.2. Regression results

As a first step, we examine whether different types of corporate culture influence bank risk-taking in a general manner (H1) and if so, whether the direction of that influence is in line with our expectations (H2). The results of estimating equation 1 are reported by Table 4.

[Insert table 4 about here]

Regarding the bank-specific control variables, the coefficients of the return on equity appears to be statistically significantly related to both the z-score and the banks' credit risk indicating a risk-mitigating effect of a sound past operating performance for both risk measures. Interestingly, no other bank-specific control variable has a statistically significant effect on the z-score. With regard to banks' credit risk, bank size is positively related to banks' credit risk while bank liquidity has a negative relation to banks' credit risk. Thus, banks in our sample that are smaller and hold more liquidity are associated with lower credit risk. Finally, the coefficient of bank leverage is negatively related to banks' credit risk. This negative impact of the debt to equity ratio on bank stability might result from decreasing risk taking incentives due to lower capitalization. Except the ladder, these findings are consistent with prior studies dealing with banks' risk taking (Laeven and Levine 2009; Köhler 2015; Uhde 2016).

Regarding the effects of the different types of corporate culture, first, testing for an influence of the different types of corporate culture on banks' risk-taking in a general manner, we find three out of the four estimated coefficients to be significantly related to the z-score, and two out of the four to be related to credit risk. In particular, there is a statistically significant relationship between collaborate-, compete- and control-oriented cultures and the z-score, and between collaborate- and control-oriented cultures and banks' credit risk. Regarding a create-oriented culture, the estimated coefficient is statistically insignificant for both risk measures, indicating no statistical relationship. Overall, these results document evidence in support of H1, indicating that corporate culture has an influence on banks' risk-taking. Depending on the risk measure,

influences differ in their scope: focusing on the z-score as a proxy for the total risk-taking of a bank that materializes in its overall default risk, results indicate a strong influence of collaborate-, compete- and control-oriented cultures (statistically significant at the 1% and 5% level, respectively). Regarding banks' credit risk, the influence is strongest for a control-oriented culture (statistically significant at the 1% level) and slightly less for a collaborate-oriented culture (statistically significant at the 10% level).

Second, concerning H2a and H2b, focusing on the direction of influence, three important findings can be reported:

First, for the control-oriented culture (H2a), we document the coefficient estimate for its influence on both the z-score and credit risk to be highly statistically significant and to show the expected sign. Thus, a control-oriented culture is associated with a lower risk-taking in banks which is in line with the expectations developed by the CVF. Concerning credit risk, the result supports the findings of Nguyen et al. (2017). Thus, results strongly indicate a risk-mitigating effect of a control-oriented culture. Furthermore, as the coefficients for a control-oriented culture regarding both the z-score and credit risk are largest in absolute terms compared to the other types of corporate culture, the results can be interpreted as evidence in support of H2a predicting the strongest risk-mitigating effect for a control-oriented culture.

Second, while we expected estimators for the compete-oriented culture to be significantly negatively (positively) related to the z-score (credit risk), the results evidence a significantly positive relation to the z-score and an insignificant relation to banks' credit risk instead. Concerning credit risk, the statistical insignificance indicates that the compete-oriented culture is not associated with riskier lending practices. Regarding the z-score, however, results not only indicate that a compete-oriented culture does not correlate with higher risk-taking, but instead suggest an even lower risk-taking for banks with a compete-oriented culture. Thus, H2b has to be rejected. This is an important implication since it indicates that results reported by Barth (2015)

and Nguyen et al. (2017) either do not hold for European banks or are not valid in turbulent market times as our period covers two financial crises.[5] However, when explicitly controlling for the crisis years, results remain the same in significance and altitude for all coefficient estimates (see columns 3 and 4 in Table 4) indicating that the crisis does not influence these results.

Third, we find coefficients for a collaborate-oriented culture to be significantly positively related to the z-score and significantly negatively to credit risk. Thus, banks with a collaborate-oriented culture are associated with a significantly lower risk-taking. This finding is unique in the sense that, up to now, there has been no empirical evidence of any significant relation between this type of corporate culture and banks' risk-taking. Since prior studies focused on US banks, these findings indicate a higher relevance for collaborate cultures in the European banking sector.

Furthermore, in line with Barth (2015) and Nguyen et al. (2017), coefficient estimates for the create-oriented culture are statistically insignificant for both the z-score and credit risk, indicating that there is no relationship between a create-oriented culture and banks' risk-taking.

Assuming that a bank's risk-taking especially materializes in a crisis, as a next step, we analyze the influence of different types of corporate culture on the crisis effects on banks' risks. The results reported by Table 5 are interpreted as follows:

[Insert table 5 about here]

First, three out of four estimated coefficients for the interaction terms are statistically significantly related to the z-score, indicating a significantly moderating role of collaborate-, compete- and control-oriented cultures on the impact of the crisis on banks' overall risk.

[5] One further explanation for this result is discussed in more detail in our robustness tests in Section 5.3.

Second, most importantly, we find different moderating effects for different types of corporate culture: first, the interaction terms' coefficients for control- and collaborate-oriented cultures are significantly positively related to the z-score. This indicates an enforcement of the aforementioned risk-mitigating effect of these types of corporate culture which is in line with H3. Second, on the contrary, we find the interaction term's coefficient for a compete-oriented culture to be significantly negatively related to the z-score and significantly positively related to the credit risk. This is an important finding as the interaction effect makes the overall effect of the compete-oriented culture on risk-taking positive. While our previous results indicated a risk-mitigating effect of a compete-oriented culture, this seems to reverse for its moderating role for the crisis impact on banks' risk. As the overall effect on the z-score is even negative, banks with a compete-oriented culture not only do not benefit from the risk-mitigating effect of a compete-oriented culture anymore, but are affected by an even enforcing effect of the crisis impact on banks' risks.

Finally, we analyze the influence of different types of corporate culture on the efficacy of corporate governance mechanisms for banks' risk-taking. Results are presented in Table 5.

[Insert table 6 about here]

First, the coefficient for the Corporate Governance score is insignificantly related to the z-score, and significantly negatively related to banks' credit risk, indicating that banks with a higher corporate governance score show a lower credit risk, but do not differ regarding the z-score. Second, we find the estimated coefficients for the collaborate- and control-oriented culture to be statistically significantly positively related to the z-score, showing that banks with collaborate- and control-oriented cultures are characterized by a lower risk-taking. The estimated coefficients for the corresponding interaction terms, however, are significantly negatively related to the z-score. This evidences that for banks with a prevailing collaborate- or control-oriented culture, a high corporate governance score has a negative effect on the z-score and is associated

with a higher risk-taking, eventually. Third, concerning credit risk, we find the presence of the control-oriented culture to be associated with a lower risk-taking. As none of the interaction terms is significantly different from zero for this risk measure, no interaction effect between any of the four types of corporate culture and corporate governance on banks' credit risk is documented.

Finally, focusing on the z-score, collaborate- and control-oriented corporate cultures themselves are significantly related to a lower risk-taking, while corporate governance itself has no statistically significant effect. In case one of these two types of corporate culture prevails in a bank, however, a high corporate governance score has a negative effect on a bank's z-score, and thus seems to lead to a higher risk-taking. In line with the theoretical argumentation of Song and Thakor (2015), Thakor (2016) and Stulz (2016), these results provide first empirical evidence for the idea that the prevailing type of corporate culture influences the mode of action of implemented corporate governance mechanisms concerning banks' risk-taking. In particular, our results indicate that for banks with an intrinsically risk-mitigating type of culture (i.e. collaborate- and control-oriented cultures), the presence of highly rated corporate governance mechanisms (on average) may increase banks' risk-taking.

5.3. Additional robustness tests

Several robustness tests are conducted to control whether our main results are sensitive to additional country-specific institutional control variables which in theory are likely to shape the banks' risk-taking. These variable include: (1) a dummy variable for the existence of a deposit insurance scheme as calculated by Demirgüç-Kunt et al. (2008); (2) the revised Anti Director Rights Index by Spamann (2010); (3) the supervisory power Index by Barth et al. (2013); and (4) the national market capitalization to GDP ratio. Furthermore, one natural concern may be that the effects of corporate culture on corporate risk-taking are driven by cultural values in the national context as enduring norms or guidelines that are widely shared within nations (Li et al.

2013). In order to exclude a potential omitted variable bias, we additionally consider individualism and uncertainty avoidance as defined by Hofstede (2001; 2011) and harmony by Schwartz (1994; 2004) as variables reflecting national culture values, documented to be significantly associated with corporate risk-taking in prior studies. (Re-)Estimating all regression models including these additional controls provide evidence in support of the robustness of all main conclusions presented earlier.

Another natural concern lies with the issue of endogeneity. Though already addressing this problem in our estimation by using one period lagged values of all bank-specific controls, we need to test for endogeneity problems in a more rigorous manner these might be critical during periods of crises. In fact, as bank managers may take (rebalancing) actions after realizing the potential for upcoming market turbulences, it seems plausible that these responses alter bank-specific accounting data included in our regression models. Moreover, as the culture variables are determined by analyzing text written by bank managers, behavioral changes of the top management responding to crisis might bias our (dominant) culture scores. Accordingly, we treat all bank-specific regression variables as potentially endogenous. We test these endogeneity issues by estimating our model using two-step System GMM (Arellano and Bover 1995; Blundell and Bond 1998) which is able to appropriately deal with small T and large N panels like the one studied in this paper. Additionally, System GMM is capable to deal with a large number of potentially endogenous variables and allows to instrument these variables with their own lags. In this context, this is particularly useful as it is difficult to find instruments for all of our endogenous variables. Furthermore, the models allow to model bank risk dynamically as it might be persistent over time due to intertemporal risk smoothing, competition, banking regulations or relationship banking with risky customers (Delis and Kouretas, 2011). The GMM regression results for the baseline model are reported by Table 7.

[Insert table 7 about here]

The results confirm our previous findings. The coefficients of collaborate- and control-oriented cultures keep their indicated risk-mitigating effects though losing some statistical significance which might be due to endogeneity. In contrast, the coefficients for a compete-oriented culture remain insignificant for both risk-taking measures. Hence, the indicated risk-mitigating effect of a compete-oriented culture might have been driven by model endogeneity. The results for the other bank controls are similar to the results presented in Table 4 but are less significant in general. This effect is most prominent for the return on equity which is highly significant in Table 4 but insignificant in the GMM regression of table 7 thus revealing an endogenous relationship between bank risk and the return of equity. Finally, the lagged dependent variables are also significant indicating that bank risk is persistent. Note that we include a second lag in the regression for the z-score (column 1) and credit risk (column 2), since the Arellano-Bond test indicates second-order serial correlation in the residuals if only the first lag of the dependent variable is included. The test is reported at the bottom of Table 7. We also test the validity of our instruments using Hansen's J test statistic of over-identifying restrictions. In all cases, the test statistic accepts the null hypothesis that the instruments are exogenous. Overall, the results in this section confirm the indication of our findings that banks with a collaborate- or control-oriented corporate culture are more stable.

6. Conclusions and Discussion

While the recognition that the effects of corporate culture are at least as important as formal rules for the effectiveness and soundness of the banking sector has become widespread on a theoretical level (Group of Thirty 2015; Thakor 2016; Stulz 2016), empirical evidence for the European banking sector was still missing. Thus, additionally motivated by the public and regulatory discourse around the financial crisis about a risk-increasing effect of banks' corporate culture, this is the first paper to study the effects of different types of corporate culture on the risk-taking of European banks.

Contrarily to the perception of a risk-enhancing effect of (certain types of) corporate culture, we find a strong risk-mitigating effect of two types of corporate culture. In particular, results indicate that banks with a prevailing dominant collaborate- or control-oriented corporate culture are more stable as they are related to a significantly lower risk-taking both based on the measure for the overall default risk as well as on the credit risk. Furthermore, these two types act as a moderator in a crisis, shielding banks from the negative crisis impact. This may be either due to a lower risk-taking in advance or due to a better ability to cope with unstable and changing environments. In accordance with the characteristics ascribed to these two types of corporate culture within the CVF, we assume that the moderating effect for collaborate-oriented culture, sharing a focus of flexibility, might result from a better ability to adapt to changing environments, while for control-oriented cultures the effect might result from a lower risk-taking prior to a crisis. However, these explanations need to be addressed by further research. Aside from the underlying reasons, our results have important implications as they declare these two types of corporate culture to be intangible assets that may contribute to a lower risk-taking and thus more stability.

For compete-oriented cultures, we find banks with this type of corporate culture to be more stable in general. However, this effect reverses for the impact of a crisis. In such a case, a

compete-oriented culture develops an enforcing effect for the negative crisis impact resulting in a far higher default risk for banks with a compete-oriented culture. This may suggest that banks with a compete-oriented culture are greatly exposed to risks when it hits financial stability the most, namely in a crisis, and should thus be strongly monitored by the responsible authorities. However, this effect may be due to model endogeneity as our robustness test show that there is no significant effect when controlling for model endogeneity using GMM. Thus, results concerning compete-oriented cultures have to be interpreted with caution. This, however, does not hold for collaborate- and control-oriented cultures as these results are robust to endogeneity.

Additionally, we provide a first empirical basis for the interaction effects between corporate culture and corporate governance. While on a theoretical level, researchers suggest that the same regulation can have different effects on a bank's risk-taking depending on its corporate culture (Song and Thakor 2015; Stulz 2016; Thakor 2016), empirical evidence on this interaction was still missing. Although we can only provide a first insight due to data availability issues concerning a comprehensive coverage of corporate governance data for European banks, our results actually indicate a moderating role of collaborate- and control-oriented cultures for the effect of corporate governance mechanisms on banks' risk-taking based on the default risk. For banks with a prevailing collaborate- or control-oriented culture, results indicate that a high corporate governance score is associated with a higher z-score. This might indicate that the desired positive impact of corporate governance mechanisms on banks' risk-taking instead is covered by the effects of collaborate- and control-oriented cultures. Thus, ensuring financial stability might not only require to extend the regulatory focus to a bank's corporate culture additional to corporate governance mechanisms in place, but also to consider interaction effects between these qualitative factors. This is quite important as the findings provide a first indication that for banks with a prevailing intrinsically risk-mitigating culture, formal rules and mechanisms

as established by corporate governance mechanisms lead to a higher risk-taking. Thus, the effect of corporate governance mechanisms on banks' risk-taking seems to depend on the prevailing type of corporate culture. These results may also provide a first explanation for the partially contradictory results of studies examining the influence of corporate governance mechanisms on banks' risk-taking (for an overview, see Chen and Lin 2016). Thus, the findings of Beltratti and Stulz (2012) and Erkens et al. (2012) that better governed banks fared worse during the crisis, might result from the missing control for banks' type of corporate culture.

Further detailed research on these interaction effects is needed. In particular, further research should especially analyze these interactions on a broader basis, and, secondly, provide a more differentiated view on the interaction effects by distinguishing between different corporate governance mechanisms instead of using a generalized corporate governance score. Additional research should also validate our findings against the use of other classifications of corporate culture. Though our results are based on the widespread CVF, further research could use other classification systems like the culture dimensions by Cartwright and Cooper (1993) or other major organizational culture models as, e.g., described by Yu and Wu (2009).

This study is subject to several limitations. First, the sample is unbalanced in that the number of banks per type of corporate culture varies. Second, due to data availability, the sample used does only contain an excerpt of European banks, especially for the examination of interaction effects between different types of corporate culture and corporate governance mechanisms. Additionally, the same problem applies to the availability of data for specific corporate governance mechanisms in place. Third, though controlling for reverse causation, one should be cautious in the interpretation of our results as causal relations between different types of corporate culture and banks' risk-taking. Future empirical research should overcome these limitations by expanding the sample and applying econometric models able to consider causal relations.

Our findings stress the high importance of corporate culture for the financial system. Contrarily to economic theories, banks' risk-taking decisions are not only determined by financial and economic considerations or formal rules and mechanisms, but also by the type of corporate culture. This enforces the importance of considering these effects in banking regulation and supervision on the one hand, and banks' (risk) management on the other hand. While the role of risk management and banking supervision is not to reduce the bank's risk per se, the underlying effects and influences which result from corporate culture have to be considered and integrated in practices and processes in order to manage risks properly and to develop a stable banking system. Thus, we conclude with the following citation of Schein, emphasizing the importance of understanding the effects of corporate culture and aiming at motivating further research to focus on this relevant topic:

"Culture is an abstraction, yet the forces that are created in social and organizational situations deriving from culture are powerful. If we don't understand the operation of these forces, we become victim to them." (Schein 2010, p. 7)

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Table 1: Bag of words for the identification of the different types of corporate culture

Bag of Words
Collaborate
capab*, co-*, cohes*, collab*, collectiv*, commit*, competenc*, conflict*, consens*, cooperat*, coordin*, cultur*, decentr*, employ*, empower*, engag*, expectat*, facilitator*, help*, hir*, human*, interpers*, involv*, life*, long-term*, loyal*, mentor*, mutual*, norm*, parent*, partic*, partner*, people*, relation*, retain*, reten*, skill*, social*, team*, teamwork*, tension*, train*, value*, workgroup*
Compete
achiev*, acqui*, aggress*, agreem*, attack*, budget*, challeng*, charg*, client*, compet*, customer*, deliver*, direct*, driv*, excellen*, expand*, fast*, goal*, growth*, hard*, initiat*, invest*, market*, monit*, mov*, outsourc*, performanc*, position*, pressur*, profit*, rapid*, reputation*, result*, revenue*, satisf*, scan*, share*, signal*, speed*, strong*, superior*, target*, win*
Control
boss*, burocr*, cautio*, certain*, chief*, conservat*, control*, detail*, document*, efficien*, error*, fail*, inform*, logic*, method*, outcom*, predictab*, procedur*, productiv*, qualit*, regular*, solv*, standard*, uniform*
Create
adapt*, begin*, chang*, creat*, discontin*, dream*, elabor*, entrepre*, envis*, experim*, fantas*, freedom*, futuri*, idea*, init*, innovat*, intellec*, learn*, new*, origin*, pioneer*, predict*, radic*, risk*, start*, thought*, trend*, unafra*, ventur*, vision*

Comment: Words ending with an "*" mean that we accept all suffixes for those words in order to count as many words as possible with a close meaning without reporting all of them.

Table 2: Descriptive statistics for the total sample

Variables	Mean	Median	Sd	Min	Max	N
Panel A: Total Sample						
Z-Score	0.33	0.51	1.04	-2.69	2.28	1432
Credit Risk	0.91	1.15	1.36	-3.48	3.23	1420
Total Assets	7.49	7.48	0.96	5.47	9.28	1639
NII/Total OI	33.90	35.58	26.20	-93.75	97.35	1629
Liquidity Ratio	0.73	0.26	2.90	0.01	25.76	1557
Leverage	10.87	9.92	6.14	0.24	37.30	1639
ROE	6.41	8.45	16.54	-81.16	37.75	1639
Dominant Collaborate	0.04	0.00	0.20	0.00	1.00	1368
Dominant Compete	0.03	0.00	0.18	0.00	1.00	1368
Dominant Control	0.02	0.00	0.16	0.00	1.00	1368
Dominant Create	0.02	0.00	0.12	0.00	1.00	1368
Panel B: Sample with Corporate Governance Score						
Z-Score	0.33	0.46	1.03	-2.69	2.28	380
Credit Risk	0.84	1.05	1.07	-1.82	3.23	411
Total Assets	8.39	8.51	0.62	6.71	9.28	441
NII/Total OI	40.67	40.29	20.98	-93.75	97.35	441
Liquidity Ratio	0.39	0.28	0.46	0.02	3.74	437
Leverage	11.94	11.21	6.18	0.24	37.30	441
ROE	7.83	9.76	14.55	-81.16	37.75	441
Dominant Collaborate	0.02	0.00	0.12	0.00	1.00	379
Dominant Compete	0.03	0.00	0.17	0.00	1.00	379
Dominant Control	0.02	0.00	0.15	0.00	1.00	379
Dominant Create	0.00	0.00	0.00	0.00	0.00	379

Comment: In Panel A, the table presents descriptive statistics on the total sample of banks. Panel B presents the descriptive statistics on the sample of listed banks with data on the Corporate Governance Score. Table A1 (Appendix) outlines the definitions of the variables. All variables are winsorized at the 1- and 99-percentile level.

Table 3: Pearson correlation coefficients for selected regression variables on the total sample

	Z-Score	Credit Risk	Total Assets	NII/Total OI	Liquidity Ratio	Leverage	ROE	Dominant Collaborate	Dominant Compete	Dominant Control	Dominant Create	CG-Score
Z-Score	1.00											
Credit Risk	-0.22*	1.00										
Total Assets	0.05	-0.30*	1.00									
NII/Total OI	0.00	0.08	0.02	1.00								
Liquidity Ratio	0.04	-0.17*	-0.02	-0.07	1.00							
Leverage	-0.11	0.12*	0.25*	-0.09	-0.16*	1.00						
ROE	0.44*	-0.21*	0.02	0.13*	-0.01	-0.20*	1.00					
Dominant Collaborate	0.06	-0.04	0.00	0.01	-0.02	-0.04	0.03	1.00				
Dominant Compete	0.02	0.02	-0.07	0.11*	-0.02	-0.03	0.11*	0.15*	1.00			
Dominant Control	0.11	-0.16*	0.07	0.08	-0.01	-0.04	0.04	-0.03	0.03	1.00		
Dominant Create	0.05	-0.04	-0.02	-0.00	-0.02	-0.05	0.04	0.09	-0.02	-0.02	1.00	
CG-Score	-0.05	-0.30	0.70*	0.15	-0.03	0.14	-0.05	-0.10	0.11	-0.24*	.	1.00

Comment: The table presents Pearson correlation coefficients for all regression variables on the total sample. Table A.1 (Appendix) outlines the definitions of the variables.

*, **, *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively.

Table 4: Baseline regression of risk-taking on dominant culture scores

	Z-Score	Credit Risk	Z-Score	Credit Risk
	(1)	(2)	(3)	(4)
Total Assets (t-1)	-0.0673	0.241*	-0.077	0.247*
	(0.0543)	(0.108)	(0.0542)	(0.109)
NII/Total OI (t-1)	-0.00141	0.00355	-0.00207	0.00392
	(0.00218)	(0.00235)	(0.00201)	(0.00240)
Liquidity Ratio (t-1)	0.00139	-0.102***	-0.000979	-0.101***
	(0.0158)	(0.0189)	(0.0157)	(0.0192)
Leverage (t-1)	-0.00618	-0.0383***	-0.00645	-0.0384***
	(0.0131)	(0.0112)	(0.0140)	(0.0108)
ROE (t-1)	0.0305***	-0.0187***	0.0295***	-0.0182***
	(0.00254)	(0.00405)	(0.00146)	(0.00338)
DCOL	0.372***	-0.406*	0.361***	-0.400*
	(0.0966)	(0.183)	(0.0918)	(0.183)
DCOM	0.247**	0.0434	0.248*	0.0477
	(0.106)	(0.138)	(0.111)	(0.131)
DCON	0.770***	-1.212***	0.785***	-1.218***
	(0.116)	(0.313)	(0.115)	(0.312)
DCRE	0.274	0.0590	0.239	0.0729
	(0.297)	(0.241)	(0.322)	(0.257)
Crisis	-	-	-0.255***	0.168
			(0.0676)	(0.157)
Constant	-3.516***	9.399***	-3.309***	9.276***
	(0.711)	(1.323)	(0.622)	(1.351)
Observations	812	908	812	908
Adjusted R-squared	0.2064	0.4637	0.203	0.458
Bank FE	Yes	Yes	Yes	Yes
F	22826.1 (p<0.01)	9694.5 (p<0.01)	1373.2 (p<0.01)	1955.7 (p<0.01)

Comment: The table presents results of the baseline regression model which involves panel data and is estimated using OLS with bank-specific fixed effects. Model 1 and 2 regress the banks' risk-taking variables on the dominant culture scores as well as bank- and country-specific control variables. Model 3 and 4 also control for potential time effects resulting from the crisis period 2008 to 2013. Driscoll-Kraay robust standard errors (Driscoll and Kraay 1998) are reported in parentheses. *, **, *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively. Table A.1 (Appendix) outlines definitions of the variables. For the purpose of brevity we do not report the estimates of the country-specific control variables. However, estimation results on these control variables are in line with expectations and available upon request.

Table 5: Crisis Effect: Regression of risk-taking on dominant culture scores and crisis period

	Z-Score	Credit Risk
	(1)	(2)
Total Assets (t-1)	-0.0709	0.243**
	(0.0562)	(0.105)
NII/Total OI (t-1)	-0.00195	0.00381
	(0.00207)	(0.00239)
Liquidity Ratio (t-1)	-0.000703	-0.102***
	(0.0159)	(0.0193)
Leverage (t-1)	-0.00639	-0.0387***
	(0.0140)	(0.0108)
ROE (t-1)	0.0295***	-0.0182***
	(0.00139)	(0.00337)
DCOL	0.162**	-0.346
	(0.0502)	(0.237)
DCOM	0.438***	-0.224**
	(0.131)	(0.0868)
DCON	0.644***	-0.786
	(0.163)	(0.568)
DCRE	0.0607	0.109
	(0.375)	(0.405)
Crisis	-0.255***	0.168
	(0.0676)	(0.157)
DCOL×Crisis	0.376***	-0.0839
	(0.0564)	(0.177)
DCOM×Crisis	-0.352*	0.497***
	(0.158)	(0.104)
DCON×Crisis	0.236*	-0.744
	(0.126)	(0.538)
DCRE×Crisis	0.557	-0.0923
	(0.387)	(0.381)
Constant	-3.263***	9.244***
	(0.622)	(1.381)
Observations	812	908
Adjusted R-squared	0.202	0.459
Bank FE	Yes	Yes
F	1661.1 (p<0.01)	1515.0 (p<0.01)

Comment: The table presents results of the regression of bank risk-taking variables on the dominant culture scores, a crisis dummy set to unity for the years 2008 to 2013, an interaction term with dominant culture scores as well as bank- and country-specific control variables. All models involve panel data and are estimated using OLS with bank-specific fixed effects. Driscoll-Kraay robust standard errors (Driscoll and Kraay 1998) are reported in parentheses. *, **, *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively. Table A.1 (Appendix) outlines definitions of the variables. For the purpose of brevity we do not report the estimates of the country specific control variables. However, estimation results on these control variables are in line with expectations and available upon request.

Table 6: Regression of risk-taking on dominant culture scores and corporate governance

	Z-Score	Credit Risk
	(1)	(2)
Total Assets (t-1)	-0.0428	0.695***
	(0.232)	(0.131)
NII/Total OI (t-1)	0.0103**	-0.00491
	(0.00355)	(0.00494)
Liquidity Ratio (t-1)	-0.173	-0.372***
	(0.211)	(0.0942)
Leverage (t-1)	-0.00603	-0.0388***
	(0.0115)	(0.00653)
ROE (t-1)	0.0251***	-0.0136***
	(0.00639)	(0.00417)
CG (t-1)	0.00434	-0.00823*
	(0.00582)	(0.00427)
DCOL	3.973*	-1.456
	(1.858)	(1.671)
DCOM	1.016	0.0584
	(1.276)	(0.965)
DCON	0.704***	-1.215*
	(0.177)	(0.562)
DCOLL×CG	-0.0811*	0.0311
	(0.0425)	(0.0401)
DCOM×CG	-0.00696	-0.00361
	(0.0149)	(0.0108)
DCON×CG	-0.0319**	0.0162
	(0.0100)	(0.0349)
Constant	3.437	15.45***
	(2.784)	(0.976)
Observations	256	309
Adjusted R-squared	0.162	0.638
Bank FE	YES	YES
F	179.8 (p-value < 0.01)	944.1 (p-value < 0.01)

Comment: The table presents results of the regression of bank risk-taking variables on the dominant culture scores, the Thomson Reuters Governance score, an interaction term with dominant culture scores as well as bank- and country-specific control variables. All models involve panel data and are estimated using OLS with bank-specific fixed effects. Driscoll-Kraay robust standard errors (Driscoll and Kraay 1998) are reported in parentheses. *, **, *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively. Table A.1 (Appendix) outlines definitions of the variables. For the purpose of brevity we do not report the estimates of the country-specific control variables. However, estimation results on these control variables are in line with expectations and available upon request.

Table 7: System GMM Regression of risk-taking on dominant culture scores

	Z-Score	Credit Risk
	(1)	(2)
Lag Z-Score	0.533***	
	(0.0954)	
Lag2 Z-Score	0.102*	
	(0.0525)	
Lag Credit Risk		0.699***
		(0.159)
Lag2 Credit Risk		0.145
		(0.144)
Total Assets (t-1)	-0.168*	-0.0995
	(0.0861)	(0.0702)
NII/Total OI (t-1)	-0.00166	-0.00189*
	(0.00222)	(0.00114)
Liquidity Ratio (t-1)	0.00301	-0.0392***
	(0.00737)	(0.0147)
Leverage (t-1)	-0.00142	0.000470
	(0.00947)	(0.00519)
ROE (t-1)	-0.00483	-0.00252
	(0.00969)	(0.00179)
DCOL	0.330*	-0.768*
	(0.185)	(0.462)
DCOM	-0.124	-0.485
	(0.475)	(0.449)
DCON	0.446*	-0.930*
	(0.272)	(0.493)
DCRE	-0.0745	0.128
	(0.652)	(0.669)
GDP per capita	0.332***	-0.166*
	(0.0714)	(0.0856)
Private Credit	-0.00245**	0.00106
	(0.00102)	(0.00100)
Credit Rights	0.0360	-0.0796*
	(0.0478)	(0.0410)
Capital Stringency	-0.00650	-0.00368
	(0.0206)	(0.0128)
Constant	-1.760***	2.966***
	(0.660)	(0.810)
Observations	613	750
Hansen Test (p-value)	120.1	115.7
Test of AR(1)(p-value)	0.000452	0.0668
Test of AR(2) (p-value)	0.796	0.248

Comment: The table presents the results of the baseline model of bank risk-taking variables on dominant culture scores estimated using two-step system GMM as proposed by Arellano and Bover (1995) and Blundell and Bond (1998) with Windmeijer's (2005) finite sample correction. All bank variables are treated as endogenous. The country-specific variables are treated as exogenous. The first lag of the predetermined variables and the second lag of the endogenous variable are used as instruments. The validity of the instruments is tested using the Hansen's J test statistic. Furthermore, we test for first-, second-order autocorrelation in the residuals. All test statistics are reported at the bottom of the regression table. Robust standard errors are reported in parentheses. Note that we winsorize all bank variables at the 1- and 99-percentile level to mitigate the impact of outliers.
*, **, *** indicate statistical significance at the 0.1, 0.05 and 0.01 levels, respectively.

8. Appendix

Table A1: Variable Definitions

Name	Definition	Source
Z-Score	Natural log of the ratio of the sum of equity capital to total assets and the return on average assets before taxes (ROAA) to the standard deviation of ROAA per bank and year. The standard deviation of ROAA is calculated over the whole sample period.	BankScope, own calculations
Credit Risk	Natural log of the ratio of the sum of loan loss provisions in time t to total loans in time t-1 per bank	BankScope, own calculations
Total assets	Natural log of total assets in million EUR per bank and year	BankScope, own calculations
Non-Interest Income share	Ratio of the Non-Interest-Income to total operating income per bank and year	BankScope, own calculations
Liquidity Ratio	Ratio of the liquid assets to liquid liabilities per bank and year	BankScope, own calculations
Leverage	Ratio of total debt to total equity per bank and year	BankScope, own calculations
ROE	Ratio of net income to total equity per bank and year	BankScope, own calculations
DCOL	Indicator variable set to unity if the normalized culture-specific word count is in the 90 percent quantile for at least 50 percent of the bank-year observations.	Banks' annual reports, own calculations
DCOM	Indicator variable set to unity if the normalized culture-specific word count is in the 90 percent quantile for at least 50 percent of the bank-year observations.	Banks' annual reports, own calculations
DCON	Indicator variable set to unity if the normalized culture-specific word count is in the 90 percent quantile for at least 50 percent of the bank-year observations.	Banks' annual reports, own calculations
DCRE	Indicator variable set to unity if the normalized culture-specific word count is in the 90 percent quantile for at least 50 percent of the bank-year observations.	Banks' annual reports, own calculations

Crisis	Crisis Dummy that takes on the value of 1 for the years 2008-2013, and zero otherwise.	own calculations
GDP per capita	Natural log of a country's GDP per capita in constant EUR per year.	World Bank's WDI
Creditor Rights	Index built by adding 1 when: (1) there are restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization. (2) secured creditors are able to seize their collateral after the reor-ganization petition is approved, i.e., there is no automatic stay or asset freeze. (3) secured creditors are paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers. (4) if management does not retain administration of its property pending the resolution of the reorganization. The index ranges from 0 to 4.	Djankov (2007)
Private Credit	Ratio of private credit granted by financial intermediaries to GDP per country and year	World Bank's WDI
Capital Stringency	Index built by adding 1 if different survey questions had been answered with Yes. The questions reflect if the capital requirement reflects certain risk elements and deducts certain market value losses from capital before minimum capital adequacy is determined. The index ranges from 0 to 7.	Barth et al. (2013)
Corporate Governance Score	The Corporate Governance score measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value. Higher score values indicate better Corporate Governance mechanisms.	Datastream