Bank Default Risk in the Eurozone: The Role of Politico-Economic Factors

by

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Abstract:
We study the impact of politico-economic factors on default risk of banks in the eurozone as measured by the stock market-based Distance to Default. We find that the default risk of eurozone banks may be reduced by implementing more stringent diversification and capital requirements, by improving overall regulatory quality, and by lowering public debt levels. Moreover, we show that national political factors, such as electoral cycles, the political power (i.e. parliament majority and fractionalization) of the government, and political affiliation of the government significantly affect the stability of banks in the eurozone.

Keywords: Bank default risk; Politico-economic factors; Eurozone; Stock market; Distance to Default

JEL classification: G21; G28; G18; G13

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1. Introduction

The recent financial crisis has led to first supranational measures aimed at dampening the negative impact of (bad) national policies on bank stability in the euro area. Failures in national banking regulation and supervision policies have triggered an agreement between eurozone member states to establish a banking union based on a single bank supervision and bank resolution mechanism. Eurozone-wide bailout funds (such as the European Financial Stability Facility and the European Stability Mechanism) have been created to reduce the default risk of banks by making them less sensitive to the deteriorating solvency of the national governments. Policy makers believe that making eurozone banks more independent from policies in their domestic countries will lower the risk of further bank bailouts, deteriorations of public solvency or even withdrawals from the euro area. This paper analyses empirically to what extend national politico-economic factors influence the default risk of individual banks in the eurozone.

We contribute to the growing literature on financial fragility in the euro area. Based on our findings, valuable implications may be derived as to how the eurozone policy makers and national governments may improve the stability of banks by addressing issues related to banking regulation and supervision, the quality of governance, government ownership, or sovereign solvency. Motivated by recent discussions on the need for stronger political integration (political union) in the eurozone, we also analyze to what extent national political aspects (such as electoral cycles, government power and political ideology) affect the fragility of banks in the euro area.

Several interesting papers have examined single aspects of how the government can influence the fragility of individual banks, such as banking regulation and supervision (Laeven and Levine, 2009; Delis and Kouretas, 2011; Delis and Staikouras, 2011; Demirgüç-Kunt and Detragiache, 2011; Forssbæck, 2011), the quality of governance (Arena, 2008),

government ownership of banks (Berger et al., 2005; Iannotta et al., 2007; Männasoo and Mayes, 2009; Iannotta et al., 2013), sovereign solvency (Demirgüç-Kunt and Huizinga, 2010; Acharya et al., 2011; Demirgüç-Kunt and Detragiache, 2011), and the political environment (Bongini et al., 2001; Brown and Dinç 2005; Imai, 2009; Iannotta et al., 2013). However, the usability of their results as a benchmark for designing new eurozone-wide bank policies may be limited for at least two reasons.

Firstly, with the exception of Delis and Kouretas (2011) and Acharya et al. (2011) those papers do not focus on the eurozone but rather use worldwide, emerging markets or single country bank samples. This study focuses on the eurozone because of its unique institutional and economic environment for banks. On the one side, as a consequence of de-nationalization of monetary policies, banks in the euro area face common monetary shocks, may have to rely on the support of a supranational central bank (lender of last resort) in distress situations, and operate in highly integrated financial markets. On the other side, the eurozone banks are still confronted with heterogeneous national economic policies and regulations. Secondly, previous studies use very diverse bank default risk measures, such as bank default dummies, accounting based indicators (non-performing loans and the z-score), credit ratings or credit default swap (CDS) spreads. Since these studies examine *particular* politico-economic factors by using different bank default risk measures, the comparability of their results is clearly limited. Applying single default risk measure for the aforementioned factors should provide a representative and consistent view about the role of the state in (de)stabilizing banks in the eurozone.

From methodological point of view, our study differs from previous works of this strand of literature by using a stock market-based Distance to Default (DtD) to assess bank default risk. This Merton (1974) model based indicator measures the number of standard deviations of banking assets the bank is away from the default point as expected by bank equity holders. According to the design of our study, DtD has several important advantages

relative to bank fragility indicators used in previous papers. It relies solely on the risk assessment of profit-seeking equity investors who, unlike other investors, have the strongest incentive to accurately assess bank default risk because of their residual claim on bank assets. Therefore, the DtD is relatively objective as well as comparable among banks in diverse countries. Alternative bank fragility indicators (such as accounting based measures) have the disadvantage of limited comparability across countries due to country-specific differences in the regulatory, legislative and political environment. Default dummies or ratings are also problematic as they rely on subjective risk assessments (for example, leading rating agencies have been frequently criticized for downgrading companies too late during the recent crisis). Compared to other market-based fragility indicators (such as bank CDS or bank bond spreads) the equity market is generally perceived to be more liquid. Thus, the accuracy of bank default risk assessment derived from equity market data should be much less affected by disruptions in market trading compared to other market information sources.[1]

In order to quantify the impact of politico-economic factors on bank default risk in the eurozone, we use a panel of 115 stock exchange listed banks of 11 eurozone member countries in the period 1999-2010. Our results suggest that the governments of euro area member countries can reduce the default risk of their banks by implementing more stringent banking regulation standards (i.e. more stringent diversification and capital requirements for banks), by improving overall regulatory quality, and by reducing public debt levels (which should increase the credibility of national safety nets). What is more, we find that the political environment significantly affects the fragility of eurozone banks. We find that greater political power of the government (such as in the case of government coalitions which consist of few parties and are supported by large majorities in the parliament) is associated with a

[1] The DtD also has some limitations related mainly to the general assumptions of the Merton model (normal distribution of asset returns, for example) or its empirical estimation (such as simplistic assumptions about the company`s debt value and maturity). However, according to the existing empirical evidence, the DtD tends to outperform bond spreads, accounting based risk measures as well as supervisory and agencies' ratings used as indicators of bank fragility (see, for example, Bongini et al., 2002; Gropp et al. 2004, 2006).

higher degree of bank stability. This result suggests that powerful governments are better able to manage situations of bank distress in a timely and efficient way, for example by approving extra bail-out packages. Furthermore, we find that eurozone banks tend to be more fragile during pre-election and election years. Election periods may lead to uncertainties associated with the goals and competence of a new government after a potential regime change. The incumbent government may also delay necessary bank bailouts of distressed banks in order to minimize costs to taxpayers before elections. Moreover, our results demonstrate that banks located in countries with center party governments tend to be more fragile than these in countries governed by left or right wing parties. A possible explanation for this result is that banking and economic policies may be more predictable in countries with clear (left or right) political orientation of the ruling party, which lowers political uncertainty and bank fragility. All in all, our results suggest that the national political environment strongly matters for bank stability in the eurozone. Consequently, depoliticizing the management of distressed banks including bail-out policies via supranational bank resolution mechanism should have a positive effect on bank stability in the euro area in the future.

2. Literature

Existing papers have examined several aspects of how the government may influence the fragility of banks. Most of these papers focus on a particular politico-economic determinant and use bank default dummies, balance sheet based variables, ratings, or CDS spreads to measure the fragility of banks. The following review presents the key findings.

Banking regulation and supervision

Many authors argue that more stringent banking regulation and supervision would make banks less fragile by reducing risk taking and by enabling effective regulatory intervention in order to fix possible solvency problems in time. Using a sample of emerging and developed

economies, Laeven and Levine (2009) find that less stringent capital requirements and more stringent activity restrictions reduce the solvency of banks as measured by the z-score. Demirgüç-Kunt and Detragiache (2011) study the role of compliance with the Basel Core Principles for effective banking supervision in emerging and developed economies, arguing that not only the legal standards but also the actual implementation of supervisory measures should be of importance for bank soundness. Surprisingly, however, they do not find a robust link between bank's z-score and compliance with the Basel Core Principles. Delis and Kouretas (2011) find robust evidence that higher disclosure requirements reduce the fragility of banks in the eurozone, as measured by ratios of non-performing loans to total loans and risky assets to total assets, while weak evidence is found that more stringent capital requirements and higher levels of supervisory power lower bank risk. Delis and Staikouras (2011) examine the impact of de facto measures of banking regulation and supervision, e.g. on-site audits and sanctions, on bank risk in developed and developing countries. Using balance sheet indicators to measure bank fragility (such as z-score) they find an inverted U-shaped relation between on-site audits and bank default risk, whereas the impact of sanctions on bank fragility is found to be linear and negative.

Previous research shows that the existence of deposit insurance schemes may increase the probability of systemic banking crisis, especially in countries with weak institutional environments, suggesting that deposit insurance schemes may create moral hazard behavior of bank mangers (Demirgüç-Kunt and Detragiache, 1998, 2002). Bank-level studies largely confirm these results. Using a world-wide bank sample, Laeven and Levine (2009) find that the existence of an explicit deposit insurance scheme reduces the solvency of individual banks as measured by a lower z-score. Using the z-score and non-performing loan levels on a global bank sample, Forssbæck (2011) demonstrates that more generous deposit insurance schemes increase bank default risk and that this effect is more pronounced for banks with a larger degree of inside financing.

Quality of governance

Evidence on the impact of the quality of governance on bank default risk is scarce. Using a default dummy approach, Arena (2008) finds that banks in emerging markets with better developed legal systems are less likely to fail.

Government ownership of banks

Several studies provide evidence that government ownership deteriorates the stability of banks. In the case of Argentina, Berger et al. (2005) find that publicly owned banks tend to have higher levels of non-performing loans to total loans than private ones. Cornett et al. (2010) generally confirm this result, analyzing the behavior of privately and publicly owned banks in Eastern Asia around the Asian financial crisis. For a sample of EU banks, Iannotta et al. (2007) highlight that governmental ownership increases bank fragility as measured by higher levels of loan loss provisions and a lower z-score. Using a bank distress dummy, Männasoo and Mayes (2009) find that publicly-owned banks in Eastern European countries are more likely to fail than private banks. Based on issuer and individual ratings of large Western European banks, Iannotta et al. (2013) find that government-owned banks are less likely to default on their debt. At the same time, however, they tend to have more risky profiles, as reflected in their worse financial conditions relative to privately-owned institutions. Thus, government-owned banks seem to have higher governmental protection, which induces higher risk taking (moral hazard).

Sovereign solvency

The recent crisis in the eurozone has shown that sovereign solvency is a cornerstone for safeguarding the stability of banks, mainly due to its relevance for the government's ability to bail out distressed domestic banks. Using a sample dominated by banks from developed

countries, Demirgüç-Kunt and Huizinga (2010) point out that higher sovereign default risk increases the fragility of individual banks, as measured by the equity market to book ratio. Using a broader international bank sample Demirgüç-Kunt and Detragiache (2011) show that a better sovereign rating is associated with a lower fragility of banks, as indicated by a higher z-score. In the case of the Eurozone, Acharya et al. (2011) find that higher sovereign default risk increases individual bank default risk, as measured by higher CDS spreads. These results suggest that higher sovereign default risk may reduce the value of government guarantees, which makes the bank bailouts less probable and, in turn, increases the default risk of banks.

Political environment

Some papers study the role of the political environment for the risk of bank failure mainly using bank default dummies. Bongini et al. (2001) examine the role of political connections in banking distress during the East Asian crisis. They find that banks with connections to influential families or industrial groups (which supposedly have good political connections) are more likely to become distressed, suggesting that political connections do not help to prevent bank failures. Brown and Dinç (2005) investigate the role of electoral cycles for the implementation of bank bailout programs. They show that governments close or take over failed banks typically after elections in order to delay politically costly resolutions. Imai (2009) provides evidence for political pressure on the supervisory agency in Japan finding that banks in prefectures ruled by the Liberal Democratic Party survive longer than banks located in prefectures supporting the Democratic Party. Using issuer and individual ratings of large Western European banks, Iannotta et al. (2013) demonstrate that operating risk (defined as the likelihood of negative equity) and governmental protection of state-owned banks increase in election years, suggesting that state-owned banks may be subject to political pressures, having a negative impact on their stability.

3. Hypotheses and measurement of politico-economic determinants of bank default risk

Based on the findings of previous studies on bank fragility as well as the recent economic and political developments in the eurozone, we identify five main groups of potential politico-economic bank default risk determinants: banking regulation and supervision, the quality of governance, government ownership of banks, sovereign solvency, and the political environment.

The following four sub sections describe the theoretical link between bank default risk and the respective variable as well as the empirical indicators used. The definitions and sources of the empirical variables used to measure the hypothesized determinants are presented in Table A1 in the Appendix. The summary statistics of the variables are reported in Table A2 in the Appendix.

Banking regulation and supervision

We expect that higher *diversification requirements*, more stringent *capital regulatory requirements*, greater *supervisory power* and *supervisory independence* as well as higher *disclosure requirements* should decrease default risk of individual banks. Better diversified banks with larger capital buffers should be less likely to fail due to credit defaults in certain regions or industries. Supervisory agencies need sufficient power and independence from the government to timely take specific actions intended to force bank managers to cut back on exposure or to better diversify their business. Moreover, disclosure of specific information, such as off-balance sheet items and risk management procedures, are crucial for regulators to detect and correct problems which may lead to bank default.

The impact of *entry into banking requirements*, *activity restrictions*, and the *deposit insurance coverage ratio* may be ambiguous. On the one hand, more *entry restrictions* may result in a lower number of banks, which could dampen innovation and efficiency in the domestic banking sector, suggesting higher bank fragility. On the other hand, more selective

license granting could lead to a higher soundness of institutions entering the domestic banking sector. The impact of *activity restrictions* on bank default risk is also unclear. Low restrictions on bank activities (such as in universal banking systems) broaden risk-taking opportunities for banks with negative implications for bank solvency, but universal banks are better able to diversify their business and thus may be more resistant to shocks. A higher *deposit insurance coverage ratio* may also increase or decrease bank fragility. As suggested by Diamond and Dybvig (1983), deposit insurance may be an effective way to prevent bank runs, thereby increasing the stability of banks. However, the existence of an explicit deposit insurance scheme may increase bank default risk by reducing the effectiveness of market discipline and increasing incentives for moral-hazard behavior of financial institutions (Demirgüç-Kunt and Detragiache, 2002; Hoggarth et al., 2005). Anginer et al. (2014) show, for example, that deposit insurance tends to have a stabilizing effect on banks in times of crisis, while in tranquil periods it may lead to moral hazard and consequently higher bank default risk. Nevertheless, they find that the overall effect of deposit insurance on bank stability (when considering calm and turbulent periods together) remains negative.

The intensity of banking regulation and supervision is measured using index variables taken from the Database on Bank Regulation and Supervision (Barth et al. 2001, 2004, 2008). Higher values indicate more regulatory restrictions imposed on banks. The extent of deposit insurance is measured using the deposit insurance limit relative to average deposits per capita.

Quality of governance

We expect a higher quality of national governance (as characterized by more *effective legal system*, a higher *regulatory quality*, more *effective government policies* and less *corruption*) to reduce bank default risk. More *effective government policies* and a higher *regulatory quality* should spur economic growth, stabilize financial environment and therefore improve the solvency of banks. A more effective legal system (as indicated by higher values of *rule of*

law) should reduce riskiness of credit contracts, for example. Less *corruption* should ease the environment of doing bank business in the domestic economy in general, grant a higher level of predictability and limit the opportunities for corruption in bank lending.

Quality of governance is measured based on World Bank's Worldwide Governance Indicators developed by Kaufmann et al. (2010). Each governance index ranges from –2.5 to +2.5, with higher scores corresponding to better quality of governance.

Government ownership of banks

We expect that a larger share of *government ownership* (i.e. a larger share of a bank's equity held by the government) increases bank default risk. State-owned banks tend to be characterized by a lack of efficiency, leading to lower profitability and asset quality compared to privately owned banks (see, for example, La Porta et al., 2002; Berger et al., 2005; Cornett et al., 2010). Another explanation for the negative impact of government ownership on banks may be that public stakes increase moral hazard incentives of bank managers, who anticipate to be bailed out in the case of insolvency and may thus engage in riskier lending and investment (Iannotta et al., 2013). Moreover, government owned banks may be used by politicians to further their own political goals. As showed by Dinç (2005), government owned banks are likely to increase their lending in election years relative to private banks suggesting that politicians may use their control on banks to maximize the probability of re-election. Micco et al. (2007) confirm these results and show that the performance of government owned banks deteriorates in election periods because their lending activity is affected by political concerns.

In order to analyze the influence of government ownership on bank default risk, we use the share of bank's equity held by the government taken from Datastream, as an independent variable. Thus, our approach differs from previous papers which mostly use ownership dummies indicating as to whether the bank is fully controlled by the government.

However, a larger government minority stake should be also associated with higher levels of bank default risk. For example, banks with large government minority stakes may suffer more under moral hazard problems as a public bailout in times of distress is more probable (with a considerable injection of public capital in order to reach the majority control of a failed bank). Moreover, given the voting right at general shareholders meeting, strategic decisions of banks with large government minority stakes are likely to be influenced by the government (and may lead to higher inefficiencies) as opposed to those with low or no government stakes.

Sovereign solvency

We expect lower level of sovereign solvency, as indicated by higher levels of *public debt to GDP* ratio taken from Eurostat, to increase the default risk of domestic banks. High public debt levels may lower the ability of the government to recapitalize troubled financial institutions or to bail out already insolvent banks. Moreover, lower levels of public debt generally make the government more credible as a lender of last resort and thus may prevent bank runs in distress situations (Demirgüç-Kunt and Huizinga, 2010; Acharya et al., 2011).

We measure the government`s ability to bail out distressed banks by using the public debt to GDP ratio taken from Eurostat. In order to address the problem of potential reverse causality between sovereign and bank default risk during the last crisis we use the 2006 and the average 1999-2006 public debt to GDP ratio as a robustness check.

Political environment

We consider several aspects of the political environment which may affect bank default risk. First, we examine electoral cycles by using a *pre-election dummy* and an *election dummy* which equal 1 prior to or during the legislative election year and 0 otherwise. We expect that prior and during election years banks are more fragile due to the higher overall political uncertainty (associated with legislative, economic or regulatory consequences of a possible

administration change, for example), a catalyst of many financial crises in the past (Vaugirard, 2007). Moreover, the electoral cycle may also have direct effects on the willingness of the government to bail out distressed banks. As showed by Brown and Dinç (2005), governments in emerging markets tend to take over failed institutions after elections in order to delay the costs of nationalization to the post-election period in order to increase their re-election probability. Dam and Koetter (2012) document that bailouts are significantly less likely during election periods in Germany. Diminished willingness of the government to make costly interventions in distressed financial institutions would suggest higher levels of bank default risk in election periods. Furthermore, Baum et al. (2010) find that the efficiency of banks is significantly lower around elections in Turkey.

A crucial prerequisite for the government to bail out troubled banks is a sufficient degree of political power. Larger *government majority in the parliament* increase the government's ability to get bailout packages passed through the parliament. A lower degree of *government fractionalization* (i.e. a lower number of parties in a government coalition) makes it easier to find a consensus over the "right" bailout plan within the government, facilitating a timely implementation of such rescue packages and reducing the overall political uncertainty and thus lowering the fragility of banks.

In order to test for the impact of *political ideology* on bank fragility we consider dummies for right and left wing governments (with center governments as the reference category). The effect of the political alignment of the government parties on bank default risk is ambiguous. On the one hand, clear (right or left) political alignment of the government parties may have a positive influence on the stability of banks due to a higher predictability of political decisions in legislative and economic issues being relevant for banking activities. On the other hand, central governments may react more flexibly and pragmatically to problems occurring in the banking sector or the whole economy since they are not strictly dependent on a (left or right) political ideology.

Control variables

We include various bank-specific, macroeconomic and structural control variables, which have been frequently shown to influence bank defaults. In line with the CAMEL approach, we expect larger *capital endowment* (C), better *asset quality* (A), and *management quality* (M), as well as higher *earning*s (E), and *liquidity* (L) to decrease bank default risk (see Table A1 for the ratios used to measure the CAMELs).

We control for *bank size* and expect larger banks to be less fragile mainly because of their higher degree of diversification and higher systemic relevance (the too big to fail argument), suggesting more intense monitoring by supervisory agencies and greater probability of governmental support in times of distress.

We use two standard macroeconomic factors describing the overall condition of the domestic economy: *economic growth* and *inflation*. We expect that lower economic growth leads to higher bank default risk since in recession periods credit default rates increase substantially. Higher inflation lowers real profits and thus the bank's resistance to external shocks. Moreover, Boyd et al. (2003) argue that an inflationary environment is more attractive for low quality borrowers having a deteriorating impact on bank.

We also account for the *concentration of the country's banking sector* as a possible driver of bank default risk. Greater banking sector concentration may have a positive influence on bank stability (the concentration stability view) via economies of scale and quasi monopolistic market structure, guarantying banks higher profits and making them more immune to external shocks. Moreover, concentrated banking sectors should be easier to monitor because of a lower number of institutions. Nonetheless, a negative impact of banking sector concentration on bank stability (the concentration fragility view) is also possible. More concentrated banking sectors are likely to be less competitive and thus less efficient and innovative, which makes them more fragile (Uhde and Heimeshoff, 2009). According to these

conflicting results greater banking sector concentration creates an ambiguous prediction of the bank default risk in the eurozone.

4. Empirical analysis

4.1 The Distance to Default (DtD) as a bank default risk measure

In order to test the impact of the supposed politico-economic determinants on bank default risk we use a panel estimation approach. The dependent variable is the DtD of the bank, which is defined as follows:

$$DtD_t = \frac{ln\left(\frac{V_t}{B_T}\right) + \left(\mu_V - \frac{1}{2}\sigma_V^2\right)(T-t)}{\sigma_V\sqrt{(T-t)}} . \quad (1)$$

The Distance to Default (*DtD*) measures the number of standard deviations (σ_v) of banking assets (V) the bank is away from the default point (B_T) at maturity date T, as expected by stock market investors at time point t. Lower DtD indicates higher probability of default of the bank in the perception of equity market investors.

We calculate the *DtD* in accordance with the KMV approach (Crosbie and Bohn, 2003), which is the standard estimation method in the literature to quantify Merton-type default indicators. The amount of debt B_T is calculated as the sum of the book value of the entire short-term debt (including deposits) plus one half of the long term debt of the bank and its time to maturity T is assumed to be one year. Using the standard assumption of risk neutral investors, the excepted rate of return on banking assets μ_V equals the risk free rate in the economy r. The value of banking assets V_t as well its volatility σ_V are not directly observable. In order to estimate unknown quantities, KMV applies the basic idea of the Merton (1974) model that equity can be interpreted as a call option on a company's assets with the face value

of the debt as the strike price. The value of a bank's equity, E_t, can then be valued using the Black and Scholes (1973) option pricing formula outlined in Eq. (2):

$$E_t = V_t N(d + \sigma_V \sqrt{T-t,}) - B_T e^{-r(T-t)} N(d), \text{ where} \tag{2}$$

$$d = \frac{\ln(V_t / B_T) + (r - \frac{1}{2}\sigma_V^2)(T-t)}{\sigma_V \sqrt{T-t}} \left(= DtD_t\right). \tag{2'}$$

Since the market value of a bank's equity is easily observable on the stock market, we can use the already specified data on debt and the risk free interest rate to calculate the two unknown variables: market value of assets and its volatility. However, in order to estimate them we need an additional equation relating those two unknown variables with observable data. The KMV method uses the following relation between the volatilities of equity and assets of the bank:[2]

$$\sigma_E = \frac{\partial E}{\partial V}\frac{V}{E}\sigma_V = \frac{V}{E} N(d + \sigma_V \sqrt{T-t})\sigma_V. \tag{3}$$

Since equity volatility can be easily calculated from historical data, we have a system of two equations (2) and (3) with two unknown variables.

The results of the DtD estimations are presented in Figure 1 included in the Appendix. As expected, during the main crisis period 2008-2009 the entire distribution of bank DtD shifts sharply to the left, which reflects the increasing default risk of banks in the eurozone. At the end of 2008, for example, the median value of the bank DtD in the eurozone equals 2.00

[2] Eq. (7) can be derived by taking in to account that, according to Ito's Lemma, the equity value (the function of time and the stochastic asset value) is a variable following an Ito-Process.

as compared to 5.56 at the end of 2006, just before the outbreak of the subprime crisis in the U.S.

4.2 Dataset and regression design

We use annual unbalanced panel data for the period 1999-2010. Our analysis is restricted to yearly data, which is the highest frequency at which most bank-specific and state-related variables are available. Our sample includes 115 listed banks of 11 eurozone member countries (number of considered banks in parentheses): Austria (4), Belgium (3), Finland (2), France (24), Germany (10), Greece (12), Italy (32), Ireland (4), Netherlands (4), Portugal (5), and Spain (15).[3]

Since the calculation of the DtD relies on stock prices, only banks traded on a stock exchange are considered in our study. This may lead to a selection bias making our results representative only for listed banks but possibly not for the entire banking sector in the eurozone. However, listed banks dominate the eurozone banking sector. Moreover, since the majority of largest, systemically relevant banks in the euro area is publicly traded, our results are still of very high importance for policymakers and regulators in the euro area. What is more, being quoted on the stock exchange requires a much higher degree of transparency to the public, for example in the form of more reliable and detailed balance-sheet and income statement reporting. This allows for more adequate measuring of several bank-specific factors relevant to our study.

In order to account for unobserved heterogeneity among banks, we use a fixed effects model.[4] The t-values are based on robust standard errors clustered on the bank level in order to account for heteroskedasticity and intra-group correlations. Our baseline models in Table 1

[3] A list of the included banks is available upon request.

[4] We used the Hausman (1978) specification test in order to test for the appropriate panel estimation method. The results suggest that the fixed effects estimator is preferred. Note that for the case of the banking regulation variables (Table 1) and the regressions using the 2006 and the average 1999-2006 values of public debt to GDP (Table 4) we have to resort to the random effects estimator since these variables have no time variation.

to 5 are based on the full dataset of banks. Large banks are typically considered to be systemically relevant and are therefore more in the focus of the government and its supervisory agencies (the "too-big-to-fail" argument). Thus, we also analyze possible differences of the impact of the politico-economic variables on default risk for small and large banks. We present sample split results reported in Table 6. In order to split the dataset into large and small banks, we calculate the median of assets (in natural logs) for each bank, and classify a bank to be large (small) if the median of its value of assets (in natural logs) is above (below) the median of the medians of all banks in the sample.

4.3. Results

Banking regulation and supervision

The results for the banking regulation and supervision variables suggest that more stringent *diversification* and *capital requirements* significantly reduce the bank default risk in the eurozone. Thus, more explicit and better quantifiable and verifiable guidelines for banks' asset diversification lower bank fragility, probably via reduced opportunities for moral hazard behavior of bank managers and via a better resistance against shocks in particular regions or segments of bank lending. Moreover, in line with our expectations and previous research (Laeven and Levine, 2009; Delis and Kouretas, 2011), higher capital stringency, as characterized by capital requirements taking a broad range of bank risk sources into account, has a positive impact on the stability of banks in the euro area. On the contrary, the bank-specific capital adequacy variable has no significant impact on banks' DtD. This suggests that a high equity endowment of a bank in general does not necessarily have a strong effect on bank fragility but a well risk-adjusted equity level resulting from more stringent capital requirements enforced by banking supervisory agencies.

The results for small versus large banks reported in Table 6 demonstrate that the impact of diversification requirements is more pronounced for small banks. This seems

sensible as small banks are generally less diversified and may therefore be made less risky (as compared to large banks) by enforcing higher diversification standards. Moreover, the results for large versus small banks reveal that more stringent *disclosure requirements* deteriorate the solvency of small banks whereas no significant effect is detected for large banks (which typically opt for transparent disclosure practices by their own choice). This suggests that the potentially higher idiosyncratic risk associated with the business model of small banks (and the possible markup in default risk) is more likely to be revealed in banking regulation schemes enforcing higher levels of transparency. For *entry restrictions*, *activity restrictions*, and the *deposit insurance* we find no significant effects on bank default risk in the eurozone. Thus, the pros and cons of more restrictive entry and activity regulations and higher deposit insurance coverage may balance each other out. The insignificance of the *power* and *independence of the supervisory agency* shows that it is not the lack in power of implementing regulatory measures but the potentially ill-suited design of regulatory measures that drives the default risk of banks.

Quality of governance

The results for the quality of governance reported in Table 2 suggest that banks in eurozone member countries with higher *regulatory quality* are less risky, which is in line with our predictions. We do not find significant effects for the quality of the *legal system (rule of law)*, *government effectiveness*, and the extent of *corruption*, which may be more relevant as bank risk determinates for developing countries having deficits in these areas.

Government ownership

We find significant evidence for the supposed negative impact of *government ownership* (as measured by the proportion of bank shares held by the government) on the stability of banks only for the large banks sub-sample (see Table 6). This suggests that a larger government

share in equity of big banks may create the risk-enhancing moral hazard incentives for bank managers. This result is in line with the recent study of Iannotta et al. (2013), who find for a sample of large Western European banks that a higher share of governmental equity holding is associated with higher bank risk probably as a result of greater governmental protection leading to extensive risk taking.

Sovereign solvency

Our results (see Table 4) largely confirm the hypothesized negative link between a country's *public debt to GDP* and banks' Distance to Default. This suggests that excessive creation of public debt may lower the government's ability to finance bank bailouts and reduce the value of overall public guarantees with negative implications for bank soundness. Safeguarding the solvency of sovereigns in the eurozone should therefore help to stabilize banks. Moreover, the sample split regressions in Table 6 suggest that higher levels of public debt to GDP have a significant negative impact only on the stability of large banks. This finding is in line with the suspicion that only large banks are too big to fail. Smaller, not systemically relevant banks are not considered as potential beneficiaries of state bail-out packages in the case of distress. Consequently, sovereign solvency has no impact on their DtD.

Political environment

We find robust evidence that various aspects of the political environment have an impact on bank default risk in the eurozone. For the full sample (see Table 5), we find that in *pre-election* and *election years* the DtD of banks in the eurozone is 0.4 and 0.66 units lower than in non-election periods. This result is in line with the emerging markets study of Brown and Dinç (2005), as well as the study of Iannotta et al. (2013) for Western European banks. Both studies suggest that banks become more fragile in election periods. For example, the government's willingness to bail out troubled institutions may be lower in election years in

order to avoid high costs to taxpayers. Moreover, the political risk associated with a possible government change may increase default risk of banks by increasing the uncertainty concerning the competence and willingness of a new government to implement economic or regulatory reforms.

Our results demonstrate that a larger degree of political power, i.e. a larger *government majority* in the parliament and a lower degree of *government fractionalization*, significantly increases the stability of banks. That is, government coalitions consisting of few parties and backed by a large majority in the parliament are particularly helpful when finding a consensus about economic reforms and a bailout plan and in order to implement these measures quickly, which may reduce bank default risk.

The results testing political ideology show that both *right* and *left wing governments* are associated with significantly lower levels of bank default risk than center governments. A possible explanation for this finding is that banking and economic policies may be more predictable in countries with clear (left or right) political orientation of the ruling party, which lowers political uncertainty and bank fragility.

Control variables

Overall, for many control variables our results confirm theoretical predictions (see Tables 1 to 5). Regarding the CAMEL variables, we find that asset quality (as indicated by lower provisions for loan losses to total loans) and management quality (as indicated by a low cost to income ratio) are significant determinants of bank stability. In contrast to the standard predictions arguing with risk-dampening diversification and size effects, we find no significant evidence suggesting that bigger banks are less fragile. This may be explained by the overall risker investment strategies of large eurozone banks (derivative investments, lending to the sovereigns in the eurozone periphery) which became apparent during the last financial turmoil and possibly neutralized benefits from economies of scale. A higher degree

of banking sector concentration has a significant negative effect on bank solvency, which supports the concentration fragility view. Moreover, we find that higher GDP growth increases stability of individual banks in the euro area.

5. Policy implications

In this paper, we analyzed the impact of several politico-economic variables on bank default risk in the euro area. Using stock market based Distance to Defaults (DtD) of 115 listed banks from 11 eurozone member countries in the period 1999-2010, we identified possible ways how eurozone member countries may reduce the fragility of their banks. We found that more stringent diversification and capital requirements for banks, better overall regulatory quality, and lower public debt levels may significantly increase bank stability in the euro area. Moreover, the political environment, i.e. the power and political alignment of the government as well as electoral cycles, was found to significantly affect the default risk of eurozone banks.

These results may be useful in the context of the recent discussions about changes in the general regulatory framework in the eurozone. For example, our results show that banks in eurozone member countries with more stringent diversification and capital requirements have significantly lower default risk than banks in countries with relatively lax standards. Plans to transfer banking regulation and supervision to eurozone-wide regulatory bodies should therefore focus on strengthening regulation standards in order to safeguard the stability of banks. Our results also suggest that a deterioration of the solvency of the sovereign increases bank default risk, probably by making bailouts less likely. Disentangling sovereign and bank solvency by providing emergency liquidity using eurozone-wide bailout funds (such as the ESM) may therefore be a viable way to make banks more stable by making them independent from the solvency of their domestic government. Moreover, general efforts

aimed at lowering public debt levels in the future (induced by the fiscal pact, for example) should have positive effects on bank stability in the long run.

We also demonstrate that the national political environment significantly affects the fragility of eurozone banks. For example, our results suggest that uncertainty about the timely implementation of effective stability measures associated with elections or a weak government increase the bank default risk in the euro area member states. A possible implication of our findings is that depoliticizing the management of distressed banks via supranational, eurozone-wide bank resolution mechanisms should positively influence bank stability in the eurozone in the future.

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Table 1: Results for banking regulation and supervision

(C) Equity to assets	0.034		0.035		-0.008		0.001		0.058		0.033		0.047		0.027	
	(0.72)		(0.73)		(-0.16)		(0.01)		(1.16)		(0.72)		(0.98)		(0.56)	
(A) Provisions for loan losses	-0.411	***	-0.409	**	-0.371	**	-0.390	**	-0.435	***	-0.410	**	-0.449	***	-0.405	**
to total loans	(-2.58)		(-2.47)		(-2.23)		(-2.41)		(-2.75)		(-2.51)		(-2.87)		(-2.51)	
(M) Cost to income ratio	-0.048	***	-0.049	***	-0.057	***	-0.053	***	-0.048	***	-0.048	***	-0.049	***	-0.050	***
	(-5.88)		(-5.73)		(-6.23)		(-6.58)		(-6.02)		(-6.15)		(-5.86)		(-6.20)	
(E) Return on assets	0.034		0.039		0.037		0.036		-0.018		0.035		-0.004		0.019	
	(0.23)		(0.25)		(0.24)		(0.24)		(-0.12)		(0.24)		(-0.03)		(0.13)	
(L) Cash & securities to total	-2.1E-05		-4.7E-05		1.7E-04		-4.5E-05		4.6E-05		-3.0E-05		1.7E-04		-7E-05	
assets	(-0.03)		(-0.06)		(0.20)		(-0.05)		(0.06)		(-0.04)		(0.22)		(-0.08)	
Bank size	-0.041		-0.045		-0.082		-0.035		-0.047		-0.040		-0.084		-0.068	
	(-0.45)		(-0.50)		(-0.88)		(-0.39)		(-0.52)		(-0.45)		(-0.81)		(-0.75)	
GDP growth	0.278	***	0.274	***	0.277	***	0.279	***	0.266	***	0.278	***	0.268	***	0.267	***
	(7.71)		(7.21)		(7.49)		(8.11)		(7.38)		(7.61)		(6.81)		(6.97)	
Inflation	-0.130		-0.132		-0.066		-0.110		-0.112		-0.130		-0.125		-0.136	
	(-1.41)		(-1.43)		(-0.79)		(-1.22)		(-1.20)		(-1.50)		(-1.51)		(-1.50)	
Banking sector concentration	-0.024	***	-0.027	**	-0.024	***	-0.023	**	-0.038	***	-0.024	**	-0.027	**	-0.032	***
	(-2.75)		(-2.45)		(-2.71)		(-2.40)		(-3.24)		(-2.55)		(-2.55)		(-3.55)	
Entry requirements	0.020															
	(0.06)															
Restrictions on bank activities			-0.055													
			(-0.45)													
Diversification requirements					1.003	***										
					(2.90)											
Capital regulatory requirements							0.217	***								
							(3.33)									
Supervisory power									0.152							
									(1.43)							
Supervisory independence											-0.004					
											(-0.03)					
Disclosure requirements													-1.115			
													(-0.82)			
Deposit insurance coverage															-0.001	

ratio																	(-1.37)	
Constant	9.002	***	9.892	***	9.203	***	8.200	***	8.325	***	9.173	***	15.451	*	10.489	***		
	(3.53)		(3.44)		(4.62)		(3.96)		(3.84)		(4.63)		(1.87)		(4.80)			
R2 (within)	0.134		0.135		0.137		0.136		0.135		0.134		0.135		0.136			
R2 (between)	0.102		0.102		0.155		0.138		0.114		0.102		0.140		0.110			
R2 (overall)	0.118		0.118		0.144		0.128		0.123		0.117		0.144		0.123			
Wald Chi2	208.06	***	212.92	***	189.74	***	255.06	***	194.93	***	210.43	***	214.3	***	193.45	***		
No. of observations	992		992		992		992		972		992		992		992			
No. of banks	115		115		115		115		113		115		115		115			

Note: t-values in parentheses are based on robust standard errors clustered by country. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

Table 2: Results for quality of governance

(C) Equity to assets	-0.004		-0.002		0.020		0.007	
	(-0.05)		(-0.02)		(0.26)		(0.09)	
(A) Provisions for loan losses	-0.384	**	-0.374	**	-0.399	**	-0.399	**
to total loans	(-2.24)		(-1.99)		(-2.25)		(-2.27)	
(M) Cost to income ratio	-0.068	***	-0.058	***	-0.064	***	-0.069	***
	(-5.65)		(-4.34)		(-5.08)		(-5.39)	
(E) Return on assets	0.004		-0.011		-0.009		-0.008	
	(0.02)		(-0.06)		(-0.05)		(-0.05)	
(L) Cash & securities to total	-1.6E-05		-5.9E-04		-3.6E-04		-3.6E-04	
assets	(-0.13)		(-0.46)		(-0.29)		(-0.30)	
Bank size	0.132		0.245		0.615		0.295	
	(0.29)		(0.58)		(1.32)		(0.61)	
GDP growth	0.281	***	0.270	***	0.272	***	0.275	***
	(7.10)		(6.84)		(6.94)		(6.91)	
Inflation	-0.017		-0.111		-0.033		-0.013	
	(-0.21)		(-1.48)		(-0.40)		(-0.16)	
Banking sector concentration	-0.084	**	-0.093	**	-0.096	**	-0.084	**
	(-1.99)		(-2.24)		(-2.20)		(-2.07)	
Rule of law	-0.798							
	(-0.79)							
Regulatory quality			3.797	***				
			(2.71)					
Government effectiveness					1.053			
					(1.33)			
Freedom from corruption							0.234	
							(0.27)	
Constant	8.664	***	7.868	***	8.132	***	8.586	***
	(4.51)		(3.89)		(4.29)		(4.41)	
R2 (within)	0.143		0.154		0.145		0.142	
R2 (between)	0.044		0.041		0.030		0.050	
R2 (overall)	0.064		0.078		0.057		0.074	
F-test	17.93	***	16.81	***	19.7	***	18.14	***
No. of observations	992		992		992		992	
No. of banks	115		115		115		115	

Note: t-values in parentheses are based on robust standard errors clustered by country. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

Table 3: Results for government ownership

(C) Equity to assets	-0.006	
	(-0.05)	
(A) Provisions for loan losses	-0.477	**
to total loans	(-2.41)	
(M) Cost to income ratio	-0.033	**
	(-2.43)	
(E) Return on assets	-0.199	
	(-1.00)	
(L) Cash & securities to total	4.1E-04	
assets	(0.31)	
Bank size	-2.301	***
	(-3.65)	
GDP growth	0.241	***
	(6.94)	
Inflation	-0.131	
	(-1.30)	
Banking sector concentration	-0.099	*
	(-1.92)	
Government share of bank	-0.048	
	(-1.26)	
Constant	51.938	***
	(4.95)	
R2 (within)	0.243	
R2 (between)	0.038	
R2 (overall)	0.056	
F-test	16.53	***
No. of observations	647	
No. of banks	103	

Note: t-values in parentheses are based on robust standard errors clustered by country. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

Table 4: Results for sovereign solvency

(C) Equity to assets	0.004		0.030		0.028	
	(0.05)		(0.64)		(0.59)	
(A) Provisions for loan losses	-0.370	**	-0.415	**	-0.411	**
to total loans	(-2.14)		(-2.53)		(-2.51)	
(M) Cost to income ratio	-0.073	***	-0.051	***	-0.052	***
	(-6.07)		(-6.22)		(-6.18)	
(E) Return on assets	-0.080		0.011		0.018	
	(-0.42)		(0.07)		(0.12)	
(L) Cash & securities to total	0.000		0.000		0.000	
assets	(-0.24)		(-0.01)		(-0.04)	
Bank size	0.197		-0.042		-0.037	
	(0.46)		(-0.47)		(-0.41)	
GDP growth	0.248	***	0.271	***	0.271	***
	(6.05)		(7.55)		(7.54)	
Inflation	-0.101		-0.123		-0.118	
	(-1.11)		(-1.39)		(-1.34)	
Banking sector concentration	-0.066		-0.027	***	-0.028	***
	(-1.52)		(-2.92)		(-2.92)	
Public debt to GDP	-0.030	**				
	(-2.23)					
Public debt to GDP (2006)			-0.011	*		
			(-1.74)			
Public debt to GDP (Ø1999-2006)					-0.012	*
					(-1.82)	
Constant	6.276	***	10.333	***	10.472	***
	(0.08)		(4.75)		(4.75)	
R2 (within)	0.147		0.136		0.136	
R2 (between)	0.088		0.1136		0.112	
R2 (overall)	0.102		0.123		0.123	
F test	16.43	***	193.31	***	192.21	***
No. of observations	992		992		992	
No. of banks	115		115		115	

Note: t-values in parentheses are based on robust standard errors clustered by country. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

Table 5: Results for political environment

(C) Equity to assets	-0.038		0.035		-0.054		-0.066		-0.038	
	(-0.51)		(0.44)		(-0.68)		(-0.84)		(-0.48)	
(A) Provisions for loan losses	-0.429	**	-0.388	**	-0.453	***	-0.466	***	-0.471	***
to total loans	(-2.58)		(-2.11)		(-2.82)		(-2.90)		(-2.84)	
(M) Cost to income ratio	-0.057	***	-0.061	***	-0.084	***	-0.081	***	-0.089	***
	(-4.65)		(-5.20)		(-5.43)		(-6.35)		(-6.61)	
(E) Return on assets	-0.085		0.043		0.035		0.036		0.008	
	(-0.50)		(0.24)		(0.18)		(0.18)		(0.04)	
(L) Cash & securities to total	-5.5E-04		-2.0E-04		-3.6E-04		-8.2E.-05		-8.6E-04	
assets	(-0.41)		(-0.16)		(-0.32)		(-0.07)		(-0.76)	
Bank size	0.481		0.243		0.639		0.662		0.659	
	(1.12)		(0.57)		(1.57)		(1.57)		(1.55)	
GDP growth	0.260	***	0.275	***	0.387	***	0.368	***	0.348	***
	(6.88)		(6.99)		(6.66)		(6.78)		(6.50)	
Inflation	-0.045		-0.015		-0.123		-0.164	*	-0.086	
	(-0.60)		(-0.19)		(-1.47)		(-1.86)		(-0.99)	
Banking sector concentration	-0.095	**	-0.094	**	-0.042		-0.047		-0.029	
	(-2.32)		(-2.16)		(-1.09)		(-1.09)		(-0.74)	
Pre-election dummy			-0.404	*						
			(-1.95)							
Election dummy			-0.656	***						
			(-3.15)							
Right government					0.858	**				
					(2.30)					
Left government					0.795	**				
					(2.23)					
Government majority							5.737	**		
							(2.37)			
Government fractionalization									-2.320	*
									(-1.93)	
Constant	5.182	**	8.174		0.105		-2.462		0.534	
	(2.39)		(1.31)		(0.02)		(-0.39)		(0.08)	
R2 (within)	0.170		0.152		0.162		0.166		0.163	

R2 (between)	0.022		0.050		0.017		0.01		0.011	
R2 (overall)	0.067		0.070		0.062		0.055		0.052	
F-test	20.01	***	18.26	***	17.31	***	20.71	***	19.91	***
No. of observations	992		992		920		920		920	
No. of banks	115		115		115		115		115	

Note: t-values in parentheses are based on robust standard errors clustered by country. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

Table 6: Results for small and large banks

	Large banks		Small banks	
Restrictions on bank activities	0.087		-0.349	
	(0.89)		(-1.29)	
Entry into banking requirements	-0.139		-0.345	
	(-0.52)		(-0.51)	
Capital regulatory requirements	0.256	***	0.237	**
	(3.53)		(2.05)	
Official supervisory power	0.108		0.304	
	(0.94)		(1.26)	
Diversification requirements	0.562	**	1.385	**
	(1.97)		(2.24)	
Supervisory independence	-0.134		-0.015	
	(-1.01)		(-0.06)	
Disclosure requirements	0.436		-5.380	***
	(1.36)		(-3.64)	
Deposit insurance coverage ratio	-0.002		-0.001	
	(-1.25)		(-0.71)	
Rule of law	-2.314		1.050	
	(-1.46)		(0.88)	
Regulatory quality	2.716		4.524	***
	(1.21)		(2.84)	
Government effectiveness	0.404		1.211	
	(0.30)		(1.41)	
Freedom from corruption	-0.619		1.536	
	(-0.48)		(1.63)	
Government share of bank	-0.165	***	-0.002	
	(-5.20)		(-0.25)	
Public debt to GDP	-0.047	**	-0.014	
	(-2.63)		(-0.77)	
Pre-election dummy	0.040		-0.987	***
	(0.18)		(-2.90)	
Election dummy	-0.730	***	-0.653	**
	(-2.77)		(-2.11)	
Right government	1.270	***	0.677	
	(3.11)		(1.22)	
Left government	1.399	***	0.767	
	(2.90)		(1.33)	
Government majority	4.904	*	9.084	***
	(1.71)		(2.80)	
Government fractionalization	-3.026		-3.383	**
	(-1.55)		(-2.25)	

Note: t-values in parentheses are based on robust standard errors clustered by country.
*, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively

Appendix

Table A1: Sources and definitions of the variables

Variable	Definition	Source
Banking regulation and supervision		
Entry into banking requirements index	Index measures legal submissions required to obtain a bank license (such as draft by laws, intended organization chart, financial projects for next three years, background/ experience of future directors, managers); higher values indicate higher legal standards necessary to obtain a bank license	Revised values of the 2007 Database on Bank Regulation and Supervision, Barth et al. (2001, 2004, 2008)
Restrictions on bank activities index	Index measures the extent to which banks are restricted in engaging in securities, insurance, and real estate activities as well as in holding non-financial firms; higher values indicate greater activity restrictions	Revised values of the 2007 Database on Bank Regulation and Supervision, Barth et al. (2001, 2004, 2008)
Diversification requirements index	Index measures whether there are explicit, quantifiable, and verifiable guidelines for banks' asset diversification, and whether banks are allowed to make loans abroad; higher values indicate greater diversification requirements	Revised values of the 2007 Database on Bank Regulation and Supervision, Barth et al. (2001, 2004, 2008)
Capital regulatory index	Index measures the stringency of capital requirements for banks (for example, whether capital requirements reflect certain sources of risk, whether certain losses in the market value of banks' asset holdings are deducted from capital before minimum capital adequacy is determined, and the legal standards for funds used to initially capitalize the bank); higher values indicate greater capital stringency	Revised values of the 2007 Database on Bank Regulation and Supervision, Barth et al. (2001, 2004, 2008)
Supervisory power index	Index measures whether supervisory agency has the authority to take specific actions in order to prevent and correct problems (such as the authority to supersede the ownership rights of shareholders, suspend bank directors' decisions to distribute bonuses, dividends or fees, force a change in the organizational structure of the bank); higher values indicate greater supervisory power	Revised values of the 2007 Database on Bank Regulation and Supervision, Barth et al. (2001, 2004, 2008)

Supervisory independence index	Index indicates the degree of independence of the supervisory agency from the government and the banking industry; higher values indicate greater independence	Revised values of the 2007 Database on Bank Regulation and Supervision, Barth et al. (2001, 2004, 2008)
Disclosure requirements index	Index measure the extent to which the bank has to disclose certain accounting items to the supervisory agency and/or the public (such as off-balance sheet items, risk managements procedures); higher values indicate greater disclosure requirements	Revised values of the 2007 Database on Bank Regulation and Supervision, Barth et al. (2001, 2004, 2008)
Deposit insurance coverage ratio	Deposit insurance limit (considering coinsurance) to average deposits per capita	Deposit insurance limit: Deposit insurance database, World Bank; Revised values of the 2007 Database on Bank Regulation and Supervision, Barth et al. (2001, 2004, 2008); European Commission Joint Research Centre (2010): JRC Report under Article 12 of Directive 94/19/EC as amended by Directive 2009/14/EC Average deposits per capital: European Central Bank
Quality of governance		
Rule of law	Index captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence; higher values indicate more effective legal system	Worldwide Governance Indicators, World Bank, Kaufmann et al. (2010)
Regulatory quality	Index captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development; higher values indicate better regulatory quality	Worldwide Governance Indicators, World Bank, Kaufmann et al. (2010)

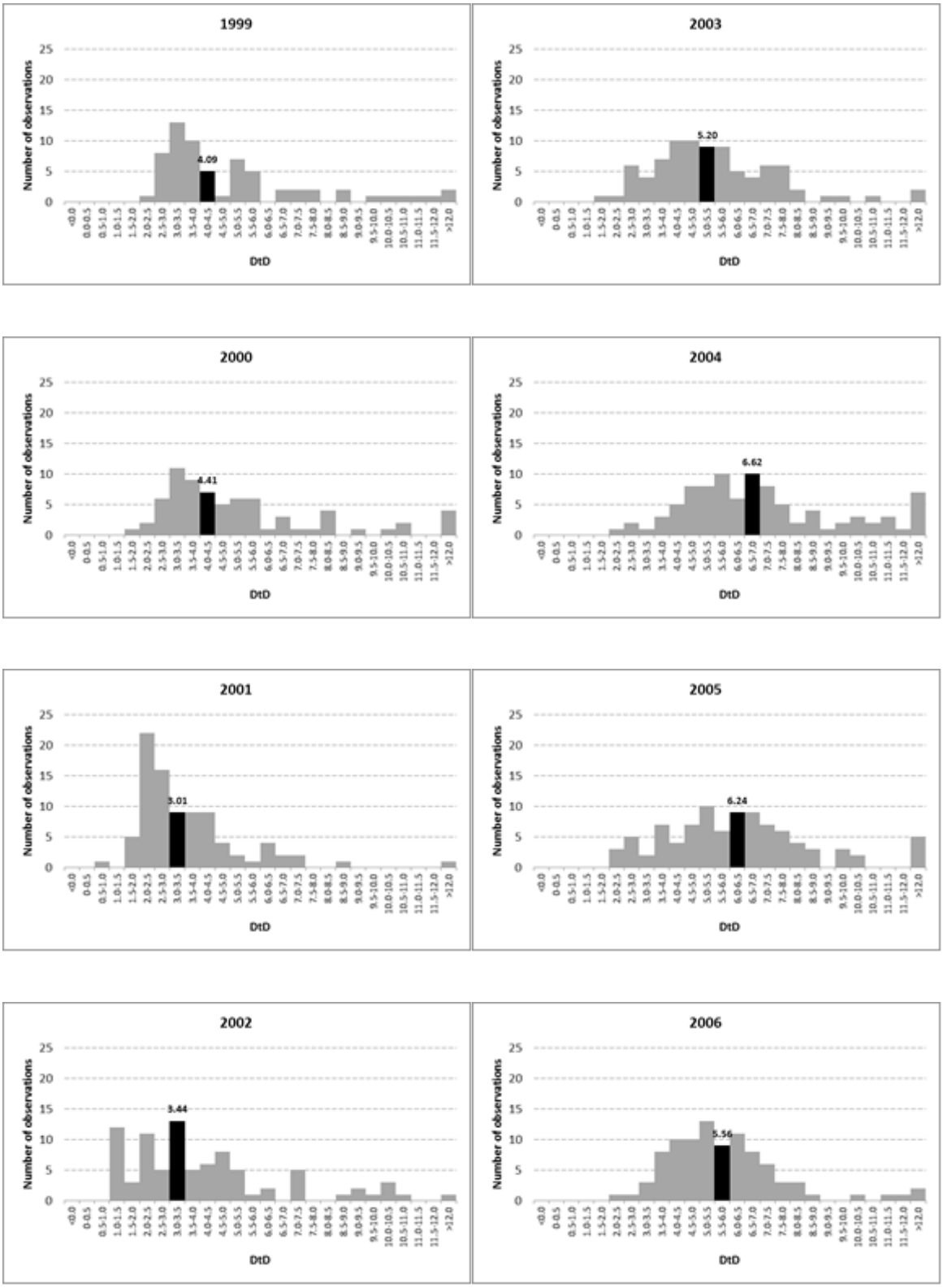
Government effectiveness	Index captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies; higher values indicate more effective government policies	Worldwide Governance Indicators, World Bank, Kaufmann et al. (2010)
Freedom from corruption	Index captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests; higher values indicate less corruption	Worldwide Governance Indicators, World Bank, Kaufmann et al. (2010)
Government ownership		
Government share	Share of bank's equity held by the government	Datastream
Sovereign solvency		
Public debt to GDP	Public debt/gross domestic product	Eurostat
Public debt to GDP (1999)	Public debt/gross domestic product for year 1999	Eurostat
Public debt to GDP (Ø1999-2006)	Public debt/gross domestic product, average in period 1999-2006	Eurostat
Political environment		
Pre-election dummy	Dummy variable indicating year prior to legislative election year (1) or otherwise (0)	Database of Political Institutions, World Bank, Beck et al. (2001)
Election dummy	Dummy variable indicating legislative election year (1) or otherwise (0)	Database of Political Institutions, World Bank, Beck et al. (2001)
Right government	Dummy variable indicating whether the government's party orientation is right (1) or otherwise (0); Party orientation with respect to economic policy, coded based on the description of the party in the sources, using the following criteria: Right: for parties that are defined as conservative, Christian democratic, or right-wing	Database of Political Institutions, World Bank, Beck et al. (2001)
Left government	Dummy variable indicating whether the government's party orientation is left (1) or otherwise (0); Left: for parties that are defined as communist, socialist, social democratic, or left-wing	Database of Political Institutions, World Bank, Beck et al. (2001)
Government majority	Fraction of seats in the parliament held by the government. It is	Database of Political

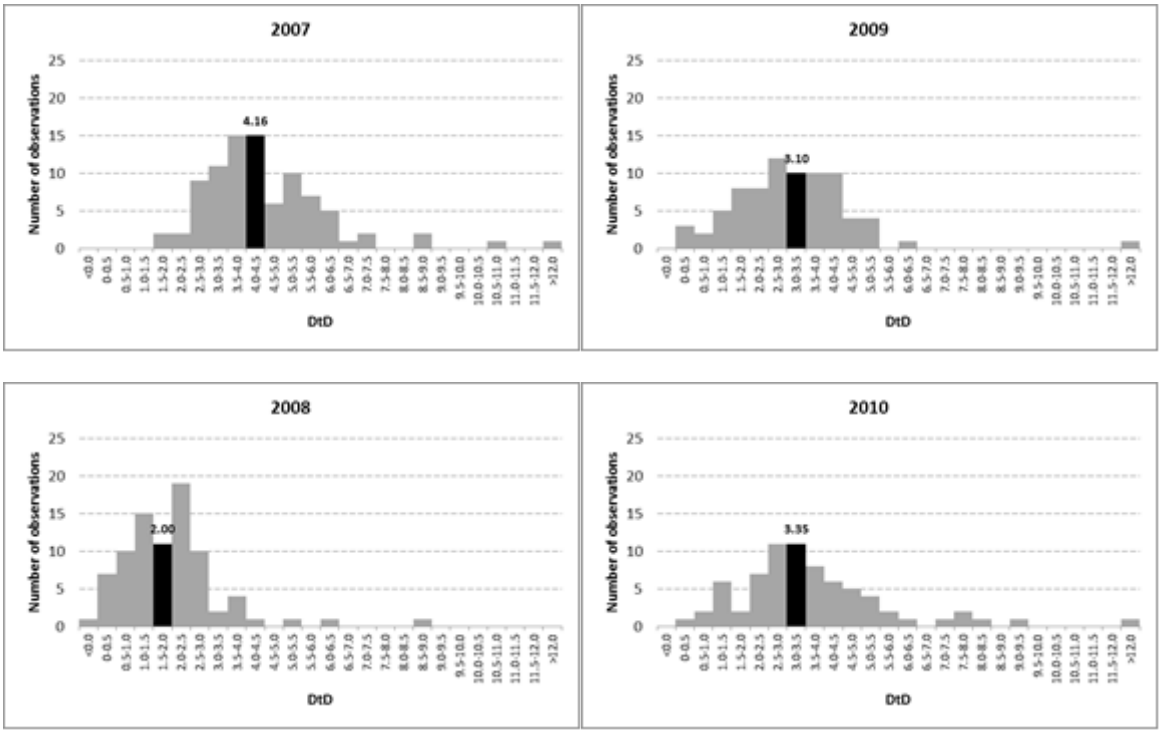
	calculated by dividing the number of government seats by total (government plus opposition plus non-aligned) seats	Institutions, World Bank, Beck et al. (2001)
Government fractionalization	Sum of squared seat shares of all parties in the government	Database of Political Institutions, World Bank, Beck et al. (2001)
Control variables		
(C)Equity to assets	Total equity/total assets	Datastream
(A)Provision for loan losses to total loans	Provisions for loan losses/total loans	Datastream
(M)Cost to income ratio	Interest expenses/interest income received from all earning assets such as loans and investment securities	Datastream
(E)Return on assets	(Net Income – Bottom Line + ((Interest Expense on Debt-Interest Capitalized) * (1-Tax Rate)))/Average of Last Year's (Total Assets - Customer Liabilities on Acceptances) and Current Year's (Total Assets - Customer Liabilities on Acceptances); Customer Liabilities on Acceptances only subtracted when included in Total Assets	Datastream
(L)Cash & securities to deposits	(Cash and Due from Banks + Total Investments)/Total Deposits	Datastream
Bank size	Total assets; in natural logarithm	Datastream
GDP growth	Year-over-year growth of gross domestic product (in constant 2000 euros)	Eurostat
Inflation	Year-over-year growth of harmonized consumer price index	Eurostat
Banking sector concentration	Asset share of a country's five largest banks to total assets of domestic banking sector	European Central Bank

Table A2: Descriptive statistics

	Mean	Std. dev.	Minimum	Maximum
Distance to Default (DtD)	4.935	3.466	-0.311	43.543
(C) Equity to assets	6.844	3.461	0.605	24.352
(A) Provisions for loan losses to total loans	0.650	0.704	-0.310	9.510
(M) Cost to income ratio	54.400	15.072	14.900	97.015
(E) Return on assets	0.995	0.830	-9.000	3.880
(L) Cash & securities to total assets	65.119	107.550	2.320	1916.6
Assets (ln)	17.116	1.769	13.272	21.509
GDP growth	1.580	2.606	-7.900	14.600
Inflation	2.337	1.026	-1.770	5.170
Banking sector concentration	44.980	17.342	18.946	86.973
Entry into banking requirements	7.330	0.592	6	8
Restrictions on bank activities	9.270	2.152	6	12
Diversification requirements	1.223	0.625	0	2
Capital regulatory requirements	5.497	2.056	2	8
Supervisory power	9.094	2.009	7	14
Supervisory independence	3.090	1.522	1	5
Disclosure requirements	4.874	0.420	3	5
Deposit insurance coverage ratio	237.236	187.332	16.095	675.960
Rule of law	1.085	0.456	0.279	1.975
Regulatory quality	1.165	0.282	0.653	2.058
Government effectiveness	1.200	0.525	0.302	2.241
Freedom from corruption	1.022	0.629	-0.121	2.591
Government ownership	1.329	9.537	0	84.000
Public debt to GDP	80.542	27.104	24.6	148.3
Public debt to GDP (1999)	80.654	25.494	45.7	113.6
Public debt to GDP (Ø1999-2006)	77.657	24.998	32.7	106.9
Pre-election dummy	0.253	0.435	0	1
Election dummy	0.248	0.432	0	1
Right government	0.585	0.493	0	1
Left government	0.315	0.465	0	1
Government majority	0.556	0.066	0.365	0.732
Government fractionalization	0.150	0.211	0	0.828

Figure 1: Distributions of bank DtD in the eurozone in 1999-2010





Note: The black bar represents DtD range including the median bank DtD for the given year. The exact value of the median bank DtD is given on the top of the corresponding bar.