

Köhler, Matthias

**Doctoral Thesis**

## Integration, Regulation, and Corporate Governance in the EU Banking Sector

*Suggested Citation:* Köhler, Matthias (2010) : Integration, Regulation, and Corporate Governance in the EU Banking Sector, ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft, Kiel, Hamburg,  
<https://nbn-resolving.de/urn:nbn:de:101:1-201010041046>

This Version is available at:

<https://hdl.handle.net/10419/40690>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

EUROPEAN BUSINESS SCHOOL  
International University Schloss Reichartshausen

**Thesis**

To obtain the academic degree

Dr. rer. pol.

**Integration, Regulation, and  
Corporate Governance in the EU Banking Sector**

Name: Matthias Köhler  
Address: Marstallstr. 49f, 68723 Schwetzingen  
Submitted to: Prof. Reint Gropp, PhD and Prof. Dr. Falko Fecht  
Submission Date: 09.03.2010



## **Acknowledgement**

First of all, I am sincerely grateful to Reint Gropp. I would like to thank him for spending a part of his time on issues related to my thesis and for being available for numerous meetings. It is fair to say that he put me on the right track to research and writing. Second, I would like to thank Falko Fecht for being the second supervisor of my thesis and for making it possible to join the doctoral programme at the European Business School (EBS). I am also thankful to Mrs. Zapp-Roussel. She immediately answered numerous questions on the doctoral programme and organizational issues at the EBS. Furthermore, I would like to thank Claudia Buch for supervising me at the first stage of my dissertation. I am also thankful to Michael Schröder for always supporting my work and for encouraging me to present it at conferences and workshops. Together with my other colleagues he has created a friendly and supportive atmosphere at the ZEW. I also highly appreciate the comments of several seminar and conference participants. Finally and most importantly, I would like to thank my parents for their love and for always supporting me at all of my decision I made during my life.

Matthias Köhler



# **Integration, Regulation, and Corporate Governance in the EU Banking Sector**

Matthias Köhler



# Content

---

## CHAPTER 1

### *Introduction*

## CHAPTER 2

### *International Capital Mobility and Current Account Targeting in Central and Eastern European Countries*

<b>1</b>	<b>Introduction</b>	<b>9</b>
<b>2</b>	<b>Measuring Financial Integration</b>	<b>10</b>
<b>3</b>	<b>Saving Rates, Investment Rates, and the Current Account</b>	<b>13</b>
<b>4</b>	<b>Savings and Investment Correlations in the CEEC-5</b>	<b>15</b>
<b>5</b>	<b>International Capital Mobility in the CEEC-5: The Feldstein-Horioka Approach</b>	<b>16</b>
<b>6</b>	<b>The Feldstein-Horioka Approach and Current Account Targeting</b>	<b>21</b>
<b>7</b>	<b>Current Account Targeting in the CEEC-5</b>	<b>26</b>
<b>8</b>	<b>Conclusions</b>	<b>28</b>

## CHAPTER 3

### *Merger Control as Barrier to Integration: Transparency of Regulation and Cross-Border Bank Mergers*

<b>1</b>	<b>Introduction</b>	<b>30</b>
<b>2</b>	<b>The Integration of EU Banking Markets</b>	<b>33</b>
<b>3</b>	<b>Motives and Barriers to Consolidation in the EU Banking Sector</b>	<b>35</b>
<b>4</b>	<b>Merger Control in the EU Banking Sector</b>	<b>39</b>



4.1	<i>Prudential Assessment of M&amp;A in the EU Banking Sector</i>	40
4.2	<i>Directive Proposal of the EU Commission</i>	41
<b>5</b>	<b>Indices on Merger Control</b>	<b>42</b>
5.1	<i>Independence of the Supervisory Authority Index</i>	44
5.2	<i>Transparency of Merger Control Index</i>	46
5.3	<i>Frequency of Merger Control Index</i>	49
<b>6</b>	<b>Merger Control and Cross-Border Consolidation in the EU Banking Sector</b>	<b>52</b>
<b>7</b>	<b>Data and Econometric Model</b>	<b>58</b>
7.1	<i>Data</i>	58
7.2	<i>Econometric Model</i>	59
<b>8</b>	<b>Determinants of M&amp;A in the EU Banking Sector</b>	<b>61</b>
8.1	<i>Bank Characteristics</i>	61
8.2	<i>Explicit and Implicit Barriers to M&amp;A in the Banking Sector</i>	65
8.3	<i>Other Country Characteristics</i>	67
<b>9</b>	<b>Results</b>	<b>69</b>
<b>10</b>	<b>Robustness Checks</b>	<b>75</b>
<b>11</b>	<b>Conclusions</b>	<b>76</b>

#### CHAPTER 4

#### *Ownership Structure, Regulation, and the Market for Corporate Control in the EU Banking Sector*

<b>1</b>	<b>Introduction</b>	<b>78</b>
<b>2</b>	<b>Ownership Structures in the EU Banking Sector</b>	<b>81</b>
<b>3</b>	<b>Corporate Governance Regulation in the EU</b>	<b>86</b>
3.1	<i>Transparency Directive</i>	87
3.2	<i>Takeover Directive</i>	89
3.2.1	<i>The Mandatory Bid Rule</i>	89
3.2.2	<i>The Board Neutrality Rule</i>	91
3.2.3	<i>The Breakthrough Rule</i>	92
3.2.4	<i>The Squeeze-Out Rule and Sell-Out Rule</i>	94

<b>4</b>	<b>Conclusions</b>	<b>97</b>
----------	--------------------	-----------

## **CHAPTER 5**

### ***Bank Owners or Bank Managers: Who is Keen on Risk? Evidence From the Financial Crisis***

<b>1</b>	<b>Introduction</b>	<b>100</b>
<b>2</b>	<b>Data and Econometric Model</b>	<b>105</b>
	<i>2.1. Data</i>	<i>105</i>
	<i>2.2. Econometric Model and Main Variables</i>	<i>107</i>
<b>3</b>	<b>Descriptive Statistics</b>	<b>110</b>
	<i>3.1 Ownership Concentration in the OECD Banking Sector</i>	<i>110</i>
	<i>3.2. Bank Performance and Bank Risk-Taking</i>	<i>113</i>
<b>4</b>	<b>Baseline Results</b>	<b>115</b>
<b>5</b>	<b>Bank Characteristics</b>	<b>119</b>
<b>6</b>	<b>Banking Regulation and Supervision</b>	<b>123</b>
<b>7</b>	<b>Other Country Characteristics</b>	<b>126</b>
<b>8</b>	<b>Profit Smoothing and Bail-Outs</b>	<b>128</b>
<b>9</b>	<b>Conclusions</b>	<b>131</b>
	<b>References</b>	<b>133</b>
	<b>Appendix</b>	<b>152</b>

# List of Tables

---

Table 1: Correlation Coefficients between Domestic Savings and Investment Rates	16
Table 2: Domestic Savings and Investment Correlations	18
Table 3: Private and Public Savings and Investment Correlations	24
Table 4: ADF Tests of the Current Account	26
Table 5: Summary Statistics for the Independence of the Supervisory Authority Index	46
Table 6: Summary Statistics for the Transparency of Merger Control Index	49
Table 7: Summary Statistics for the Frequency of Merger Control Index	52
Table 8: Total Number of Deals and Total Deal Value of Domestic and Cross-Border M&A in the EU Banking Sector	53
Table 9: Average Deal Size of Domestic and Cross-Border M&A in the EU Banking Sector	54
Table 10: Market Share of Foreign Banks in the EU Banking Sector	55
Table 11: Correlation Analysis	57
Table 12: Banks and Deals by Country	60
Table 13: Deals by Year of Completion	60
Table 14: Summary Statistics	64
Table 15: Logit Regression	70

Table 16: Multinomial Logit Regression	72
Table 17: Logit and Multinomial Logit Regression with Interaction Terms	74
Table 18: Banks and Shareholders by Country	82
Table 19: Banks and Shareholders by Bank Type	82
Table 20: Largest Blockholdings	83
Table 21: Disclosure Thresholds	88
Table 22: Mandatory-Bid, Squeeze-Out, and Sell-Out Thresholds	90
Table 23: Adoption of the Board Neutrality and Breakthrough Rule	96
Table 24: Effect of EU Directives on Takeovers and Investor Protection in the EU Banking Sector	99
Table 25: Bank Sample	106
Table 26: Banks by Specialization	106
Table 27: Ownership Concentration by Specialization	111
Table 28: Ownership Concentration and Shareholder Rights by Country	112
Table 29: Summary Statistics for Bank Performance ( $\overline{RoE}_i$ )	113
Table 30: Summary Statistics for Bank Risk (DROE)	114
Table 31: Baseline Results	116
Table 32: Bank Characteristics	120
Table 33: Banking Regulation and Supervision	124

Table 34: Other Country Characteristics	127
Table 35: Further Robustness Checks and Model Extensions	130
Table A1: The Questionnaire	153
Table A2: Data Sources	156
Table A3: T-Test on the Sample Mean	159
Table A4: Correlation Analysis	160
Table A5: Variables	161
Table A6: Bank Sample	162
Table A7: Description of Variables	167
Table A8: Summary Statistics	170

## List of Figures

---

Figure 1: Independence of the Supervisory Authority Index	45
Figure 2: Transparency of Merger Control Index	48
Figure 3: Frequency of Merger Control Index	51
Figure 4: Distribution of the Largest Blockholding in the EU Banking Sector	84
Figure 5: Distribution of the Largest Blockholding in the Banking Sector of Individual EU Member Countries	85
Figure A1: Saving Rates, Investment Rates, and the Current Account	171

## List of Abbreviations

---

e.g. for example

i.e. that is

p. paragraph

s. sentence



# ***1*** ***Introduction***

Financial integration has increased over the past decades following the liberalization of capital flows.<sup>1</sup> In Europe, the introduction of the euro and the harmonization of financial regulations have accelerated financial integration further (Hartmann, Maddaloni, & Manganelli, 2003 and Baele, Ferrando, Hördahl, Krylova, & Monnet, 2004). There are, however, still differences in the degree of integration across the EU financial sector. While wholesale markets are already highly integrated, EU retail-banking markets are still fragmented along national lines (Baele et al., 2004). One reason for the lack of integration in EU retail-banking markets is that retail markets are, in contrast, to wholesale markets still local and cross-border business limited (European Commission, 2009). This suggests that the most effective way for foreign banks to get access to local retail-banking markets is the acquisition of or the merger with a local bank (Cabral, Dierck, & Vesala, 2002). Data from the *European Central Bank* (ECB), however, indicates that cross-border consolidation is still limited in the EU banking sector. The cross-border dimension is particularly unimportant in Western Europe, while cross-border consolidation is more advanced in Central and Eastern Europe (Cabral et al., 2002).

---

<sup>1</sup>Economists have studied financial integration from several angles. Prasad, Rogoff, Wei, & Kose (2006) and Lane & Milesi-Ferretti (2003) examine current controls on capital flows as a measure of financial integration, while Obstfeld and Taylor (2004) measure financial integration by looking at differences in interest rates among the United States, United Kingdom, France, and Germany. Adam, Jappelli, Menichini, Padula, & Pagano (2002) use several indicators to measure the degree of financial integration in Europe. All authors find that financial markets have become more integrated as a result of financial liberalization.



*International Capital Mobility and Current Account Targeting in Central and Eastern European Countries*

The differences in the degree of financial integration between Western Europe and Central and Eastern Europe are analyzed in *Chapter 2* of this thesis. In chapter 2, I introduce the Feldstein-Horioka Test as indicator for financial integration in Europe. This test measures the degree of financial integration based on savings-investment correlations. I show that the countries in Central and Eastern Europe have according to the Feldstein-Horioka Test already reached a higher degree of financial integration than the member countries of the European Monetary Union (EMU). The results are robust to current account targeting policies. Since the standard Feldstein-Horioka Test is not suitable for detecting such policies, I test the statistical properties of the current account series to find out whether the governments in Central and Eastern Europe have targeted the current account. These tests suggest that in particular those Central and Eastern European countries targeted the current account that adopted savings programmes in the 1990s.

The higher degree of international capital mobility in Central and Eastern Europe might be explained by the liberalization of international capital flows and the underdevelopment of the financial markets in these countries. It may, however, also reflect the fact that many banks in Central and Eastern Europe have been taken over by foreign credit institutions, while cross-border M&A are less important in Western Europe. These differences are reflected in the market share of foreign banks. While foreign banks had, on average, a market share of almost 68 percent - measured by total bank assets - in Central and Eastern Europe in 2007, foreign credit institutions reported an average market share of less than 28 percent in Western Europe (ECB, 2008). In large Western European countries, the market share of foreign banks is even lower. For example, in Germany, foreign banks accounted for only 11, in Spain for 12, and in France only for 13 percent of the local banking market in 2007. In *Chapter 3*, I analyze why the cross-border dimension is less important in Western Europe than in Central and Eastern Europe.

*Merger Control as Barrier to Integration: Transparency of Regulation and Cross-Border Bank Mergers*

Chapter 3 shows that cross-border consolidation in the EU banking sector is mainly limited by political interference. Using a unique dataset on the transparency of merger control in the EU banking sector I demonstrate that banks are significantly less likely to be taken over by a foreign bank if the merger review process in the banking sector is not transparent. This gives supervisors and politicians the scope to block cross-border M&A for other than prudential reasons. Particularly large banks are less likely to be acquired, while domestic M&A are not affected. The results confirm anecdotal evidence from Italy where the *Bank of Italy* blocked the acquisition of *Banca Antonveneta* and *Banca Nazionale de Lavoro* by the Dutch *ABN Amro* and the Spanish *Banco Bilbao Vizcaya Argentaria* in 2005 during merger control for reasons that were not related to the soundness and prudence of the proposed acquirers. The small number of the cross-border M&A in some Western European countries can, hence, be attributed to high implicit barriers to consolidation. Explicit barriers like, for instance, restrictions on capital flows and financial activities, in contrast, do not seem to matter for cross-border M&A. Such barriers have been lowered over time through liberalization and regulatory harmonization.

I also show that cross-border consolidation is limited by efficiency barriers to integration. Such barriers reduce the efficiency gains that can be generated from takeovers. Since efficiency gains are a key driver for consolidation in the banking sector, cross-border consolidation will likely be limited in Western Europe as long as efficiency barriers exist that offset most of the potential efficiency gains from M&A. This suggests that the small number of cross-border M&A in Western Europe relative to Central and Eastern Europe is primarily the result of a combination of net comparative disadvantages of foreign banks in these countries and relatively high implicit barriers to consolidation.

*Ownership Structure, Regulation, and the Market for Corporate Control in the EU Banking Sector*

Cross-border consolidation is not only important for the integration of EU retail-banking markets. A large number of cross-border M&A is also an indicator for an active market for corporate control. The takeover market is an external corporate governance mechanism to discipline bank managers, since managers are more likely to act in the interest of shareholders if the threat of a takeover is high. To increase the power of the market for corporate control the EU Commission adopted several directives in the past. *Chapter 4* analyzes the effect of these directives on the market for corporate control in the EU banking sector. I illustrate that the effect of EU corporate governance regulations depends on the ownership structures of banks. These widely differ. While ownership is usually concentrated in Continental Europe, ownership is widely dispersed in the United Kingdom. I show that owing to these differences EU corporate governance regulations have a different impact on the market for corporate control in the EU banking sector. While regulations to increase the power of the market for corporate control have almost no effect in the United Kingdom, they have even reduced the efficiency of the takeover market in Continental Europe. The “one-size-fits-all” approach to harmonize the existing legal and regulatory framework, hence, seems to be inappropriate for the EU banking sector. Chapter 4 also shows that there is a trade-off between better a higher level of investor protection and a higher efficiency of the market for corporate control.

An active market for corporate control is not only important for the corporate governance of banks, as argued by Gropp & Kasyhap (2009), it is also an important determinant for financial integration. This suggests that regulations that improve the market for corporate control also lead to a higher degree of financial integration in the EU. Politicians have for a long time promoted the integration of EU financial markets through liberalization and harmonization to generate the benefits that are attributed to integrated markets. These are improved risk-sharing,

allocative efficiency, and economic diversification.<sup>2</sup> This should not only lead to higher economic growth, but also increase stability.

Because of the financial crisis, the focus has recently shifted from the benefits to the risks that are associated with integration. Owing to the greater interconnectedness of financial institutions and markets and more highly correlated financial risks financial integration has also increased the risk of transmitting financial shocks across borders (Claessens, Dell’Ariccia, Igan, & Laeven, 2010). This suggests that financial integration also exposes domestic financial systems to the risk of instability (Fecht, Grüner, Hartmann, & Lo Duca, 2009). The shocks are not only limited to the financial sector.<sup>3</sup> As demonstrated by the crisis, shocks in the financial sector also affect the real economy.<sup>4</sup>

*Bank Owners or Bank Managers: Who is Keen on Risk? Evidence From the Financial Crisis*

Given the importance of banks in mobilizing and allocating funds and risks, it is important to have corporate governance mechanisms that prevent banks from taking “excessive” risks, which are transmitted via the international financial market to other financial institutions and finally also to the real economy. The recent crisis suggests that such mechanisms have failed in the banking sector. The OECD, for example, argues that “*a massive failure in corporate governance [of banks]... and ‘godsmacking’ weaknesses in the way banks are regulated led to the current crisis*” (Hosking, 2009). The OECD (2009) particularly criticizes the governance of remuneration systems which failed because managers took

---

<sup>2</sup>Bekaert, Harvey, & Lundblad (2006), for example, find that financial integration reduces the volatility of consumption growth, suggesting improved risk-sharing. This allows countries to specialize in their most productive sectors, thereby leading to increased economic efficiency (Kalemli-Ozcan, Sorensen, & Yosha, 2003). Financial integration also improves allocative efficiency and economic diversification. Giannetti & Ongena (2009), for instance, show that cross-border banking tends to improve overall economic performance by ensuring that productive capital is channelled towards the most efficient firms. This also reduces the risk of crises stemming from the mispricing of investment risk (Giannetti & Ongena, 2009).

<sup>3</sup>Furthermore, it is argued that financial integration may widen the wealth gap between rich and poor countries (Fecht et al., 2009).

<sup>4</sup>Popov and Udell (2010), for example, show that a shock to a cross-border bank’s capital results in a reduction in lending to firms and consumers in countries which were not the origins of the shock.

advantage of insufficient control by shareholders to obtain compensation packages that disproportionately reward short-term risk-taking. This suggests that bank managers wanted to increase risk to increase their short-term profits.

In *Chapter 5* of this thesis, Reint Gropp and I analyze whether this hypothesis is true or whether the shareholders forced the management to engage in “excessive” risk-taking to increase their return on investment. We show that banks operating in countries with better shareholder rights and banks with a controlling shareholder recorded larger losses during the crisis than banks operating in countries with poor shareholder rights and banks without a controlling shareholder. In the period before the crisis, however, the owner-controlled banks show superior performance. Both imply that owner-controlled banks incurred greater risks compared to manager-controlled banks in the pre-crisis period.

We also find that the probability of owner-controlled banks to receive government assistance during the crisis is significantly higher than that of manager-controlled banks. The results contradict the popular sentiment that managers wanted to increase risk-taking to raise their salary. They also do not support the idea that aligning the interests of management better with shareholders will reduce risk-taking of banks. Instead they suggest the opposite. If the management is better controlled by shareholders, banks may increase their risk-taking. Indeed, one may be able to interpret the observed compensation schemes before the crisis as attempts by shareholders to induce bank managers to increase their risk-taking in line with the preferences of shareholders. At the same time, weakening the control of shareholders over the management would not only reduce risk, but may also entail significant efficiency costs for banks.

This thesis contributes to the existing literature in that it focuses on the interaction between integration, regulation, and corporate governance in the EU banking sector. It is structured as follows. In the next chapter, I measure the degree of financial integration in Europe and analyze whether the Central and Eastern European member countries of the EU have used current account targeting policies to balance the current account. Chapter 3 focuses on the integration of the

EU banking sector and identifies the merger review process in the banking sector as important barrier to cross-border consolidation. In Chapter 4, I analyze the impact of EU corporate governance regulations on investor protection and the market for corporate control in the EU banking sector against the background of differences in the ownership structures of banks. Finally, in Chapter 5, Reint Gropp and I concentrate on the reasons for the recent crisis and analyze whether bank owners or bank managers wanted to increase risk-taking to improve performance.



# 2

## *International Capital Mobility and Current Account Targeting in Central and Eastern European Countries*

### **1 Introduction**

In May 2004, the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia (hereafter: *CEEC-5*) joined the European Union (EU). Since a condition for accession to the EU was the adoption of the *acquis communautaire*, the CEEC-5 have to join the euro area in the following years. Since monetary policy in a monetary union is made by a single central bank, differences in the financial structure and the degree of financial integration across member countries cannot be taken into account. These differences may lead to an asymmetric transmission of monetary shocks if the CEEC-5 join the euro area. This has already been a topic of research. The papers of Cecchetti (2001) and Jarocinsk (2009), however, only focus on the effect of different financial structures on monetary transmission, while the effect of different degrees of financial integration have not yet been analyzed.

This chapter attempts to fill this gap. To find out whether differences in the degree of financial integration may lead to an asymmetric transmission of monetary shocks in an enlarged European Monetary Union (EMU), I compare the degree of financial integration in the CEEC-5 with the euro area. I show that the countries in Central and Eastern Europe have already reached a higher degree of integration in terms of savings and investment correlations than the eleven EMU member countries. This suggests that asymmetries in the transmission of monetary shocks will not arise from a lower degree of financial integration in the CEEC-5. I do not



find evidence that my results are biased by current account targeting policies, although statistical tests indicate that some governments in the CEEC-5 successfully targeted the current account between 1980 and 2003.

The chapter is organized as follows. In the next section, I present the *Feldstein-Horioka Test* as indicator for the degree of financial integration in Europe. Section 3 and 4 descriptively analyze the degree of capital mobility in the CEEC-5 based on the development of savings rates, investment rates, and the current account. In Section 5, I use the Feldstein-Horioka Test to measure the degree of capital mobility in the CEEC-5 and in the euro area. Since some governments in Central and Eastern Europe have adopted savings programmes to balance the current account, I test whether these policies have biased the degree of capital mobility in the CEEC-5 in Section 6 and 7. Section 8 concludes.

## **2 Measuring Financial Integration**

Financial integration implies that there are no frictions that discriminate between economic agents in their access to and the investment of capital on the basis of their location (Hartmann et al., 2003 and Baele et al., 2004). Based on this definition for integration three concepts can be distinguished that measure the degree of financial integration in Europe.

Quantity indicators measure the degree of financial integration based on the volume of cross-border capital flows. Since cross-border capital flows may be triggered by currency or financial crises, a large amount of cross-border capital flows does not necessarily indicate a high degree of financial integration. For this reason, quantity indicators are complemented by price indicators. Price indicators are based upon the law of one price. According to price indicators, financial markets are perfectly integrated in the world capital market if the nominal and real interest rate parity holds. The Feldstein-Horioka Test combines quantity and price indicators of integration. This test is named after Feldstein & Horioka (1980), who used it to measure the degree of international capital mobility in 16 OECD countries. The idea behind the Feldstein-Horioka Test is that in a closed economy domestic investments are limited by domestic savings. Domestic savings and

investment rates are, hence, expected to be highly correlated if the domestic financial market is separated from the world capital market. In order to test their hypothesis, Feldstein & Horioka (1980) regress the domestic savings rate on the domestic investment rate averaged over period between 1960 and 1974 for a sample of 16 OECD countries:

$$(I/Y)_i = \alpha + \beta (S/Y)_i + \varepsilon_i, \quad (1)$$

where  $i$  is a country index,  $(I/Y)$  the domestic investment, and  $(S/Y)$  the domestic savings rate.  $\varepsilon$  is a random error term with zero mean and constant variance. The beta coefficient measures the degree of capital mobility and is called *Feldstein-Horioka coefficient*. According to Feldstein and Horioka financial markets are perfectly integrated in the world capital market if the Feldstein-Horioka coefficient is not significantly different from zero. In this case, domestic investments do not depend on domestic savings, since they are completely financed by the worldwide pool of capital. If the Feldstein-Horioka coefficient is one, financial markets are, in contrast, perfectly separated from the world capital market. In this case, domestic investments are completely financed by domestic savings and a drop of the domestic savings rate leads to a proportional decline of the domestic investment rate. A low Feldstein-Horioka coefficient, hence, indicates a high degree of international capital mobility. Since Feldstein & Horioka (1980) find savings retention coefficients of 0.87 for gross and 0.93 for net savings rates, they reject the hypothesis of perfect capital mobility and conclude that

*“the evidence strongly contradicts the hypothesis of perfect capital mobility and indicates that most of incremental saving tends to remain in the country in which the saving is done”* (Feldstein & Horioka, 1980, p. 321).

This conclusion has triggered a discussion about the validity of the Feldstein-Horioka Test as indicator for the degree of financial integration. Critics of the econometric approach argue that the degree of international capital mobility is

biased downward because of the endogeneity of the savings rate (Feldstein & Horioka, 1980, Harberger, 1980, and Murphy, 1984). Critics of the interpretation of the Feldstein-Horioka coefficient as indicator for the degree of financial integration question that it measures the degree of capital mobility, since savings and investment rates are highly correlated even in case of perfectly integrated capital markets because of productivity effects, population effects, the existence of an intertemporal budget constraint, and current account targeting policies (Artis & Bayoumi, 1991, Bayoumi, 1990, Coakley, Kulasi, & Smith, 1996 and 1999, Feldstein & Horioka, 1980, Sinn, 1992, and Summers, 1989). Taking this criticism into account and applying the Feldstein-Horioka Test to other countries and time periods, however, has not yet solved the *Feldstein-Horioka Paradox*.

Buch (1999) uses the Feldstein-Horioka Test to measure the degree of international capital mobility in Central and Eastern Europe. In her paper on capital mobility and EU enlargement, she estimates the degree of financial integration for a panel of Central and Eastern European countries (Czech Republic, Estonia, Hungary, Poland, and Slovenia). Three Southern European countries (Greece, Portugal, and Spain) are used as benchmark. Buch (1999) concludes that the Central and Eastern European countries have reached almost the same degree of capital mobility as the three Southern European countries and, hence,

*“that membership in the EU was unlikely to boost capital market integration to a significant degree and to trigger huge capital inflows”* (Buch, 1999, p. 28).

This paper extends the approach by Buch (1999) in three ways. First, I extend the sample by the Slovak Republic and the 11 EMU member countries (hereafter: *EMU-11*) to compare the degree of capital mobility in Central and Eastern Europe with the euro area. The advantage of this approach is that I can analyze if the CEEC-5 countries have to further integrate into the world capital market to ensure an efficient monetary policy in an enlarged EMU. Second, I increase the sample size by the period from 1998 to 2003. This allows me to test the hypothesis of Buch (1999) that EU membership will likely increase the degree of capital

mobility in the CEEC-5 further. Third and last, I analyze the effect of current account targeting policies on the degree of international capital mobility in the CEEC-5. These policies might have biased the degree of capital mobility in Central and Eastern Europe, since many governments in this region targeted the current account during their transformation to prevent large current account deficits.

### **3 Saving Rates, Investment Rates, and the Current Account**

Because of a recession at the beginning of the transformation savings rates and investment rates decreased in Central Eastern Europe in the early 1990s. Since savings rates dropped stronger than investment rates, the CEEC-5 faced a lack of capital. To finance domestic investment projects, the CEEC-5 imported foreign capital, which was attracted by stable exchange rates and a large number of investment opportunities. Further capital was imported as investment rates began to rise following higher economy growth in Central and Eastern Europe in the mid-1990s. This capital was withdrawn as the countries in Central and Eastern Europe slipped into recession, and the confidence of international investors in their investments and the sustainability of the exchange rate regime diminished. In particular, countries that had attracted high volumes of short-term portfolio investments in the past were vulnerable to capital outflows and had to devalue their currency following high pressure on the exchange rate target of the central bank. These currency crises often went hand in hand with severe economic and financial crises.

The Central and Eastern European countries reacted differently to these shocks. While some countries adopted even harder exchange rate regimes, others let the exchange rate float without interventions. Almost similar to all countries was the adoption of government savings programmes that were targeted at reducing the current account deficit.

**Czech Republic:** Following the recovery of the Czech economy in 1992 and 1993, investment rates and savings rates increased (see Figure A1 in the

appendix). Since savings rates did not rise as fast as investment rates, domestic investments had to be financed by foreign capital. Due to the import of foreign capital, the Czech Republic recorded large current account deficits in the mid-1990s. They peaked in 1996 and 1997 at a deficit of more than 12 percent. As these deficits became unsustainable, foreign investors launched a speculative attack against the Czech Koruna. The attack led to a banking crisis and forced the Czech central bank to abandon its exchange rate target. As a result of a savings programme of the Czech government, a higher private savings rate, and a lower investment rate, the current account deficit dropped to six percent in 1998 and 1999.

**Hungary:** The transition of Hungary into a market-based economy started with a recession, which led to the decline of savings and investment rates. Since the savings rate dropped stronger than the investment rate, Hungary had to import foreign capital. The import of foreign capital led to a current account deficit of 10 percent in 1993 and 1994. The deficit dropped to almost five percent after the Hungarian government launched a savings programme in May 1995. Following lower savings rates in the succeeding years, but constantly high investment rates the current account deficit temporarily increased again to more than eight percent in 2000.

**Poland:** Because of a recession the savings rate and the investment rate dropped in Poland in the early 1990s. Since the investment rate started to rise earlier than the savings rate, Poland had to imported foreign capital. The import of foreign capital led to a current account deficit of more than six percent in 1993. This deficit dropped to less than five percent in 1995, before it started to increase again. Between 1997 and 1999 the current account deficit rose to more than 12 percent. Owing to lower investment rates the Polish current account deficit decreased in the following years and stabilized at a level of less than seven percent in 2002.

**Slovak Republic:** After a large current account deficit in 1993, a lower investment rate and a higher savings rate led to an almost balanced current

account in 1994. In the mid-1990s, the investment rate started to increase again, while the savings rate remained relatively stable. This led to a current account deficit of 13 percent in 1996 and 14 percent in 1998. Since the deficit was mainly financed by short-term foreign debt, international investors launched a speculative attack against the Slovak Koruna in 1998. The attack led to a currency crisis and forced the central bank to give up its exchange rate target. After the crisis, the Slovak government launched a programme to increase public savings. However, owing to a lower private savings rate aggregate savings decreased further. In 2000, the current account deficit dropped owing to a lower investment rate to almost seven percent. Because of an investment boom the deficit rose again to more than 13 percent in 2001, before it stabilized at a level of five percent in 2003.

**Slovenia:** The savings rate and the investment rate remained relatively stable in Slovenia compared to the other CEEC-5 countries. In 1991, Slovenia even recorded a current account surplus. Because of a lower savings rate and a higher investment rate the surplus, however, soon evolved into a current account deficit. At the peak of an investment boom in 1999 and 2000, the deficit reached a level of almost eight percent. Because of an economic downturn the investment rate declined in the following years and led to a current account deficit of less than four percent in 2003. In contrast to most other Central and Eastern European countries, the Slovenian government did not launch a savings programme between 1990 and 2003 to increase public savings and to balance the current account.

#### **4 Savings and Investment Correlations in the CEEC-5**

Because the CEEC-5 imported foreign capital the domestic investment rate did not depend on the domestic savings rate between 1993 and 2003. This suggests that the Central and Eastern European countries are integrated in the world capital market according to the Feldstein-Horioka Test. To measure to what extent they are integrated into the world capital market, I calculate correlation coefficients between the savings rate and the investment rate in the CEEC-5. If capital is not mobile, domestic investments are completely financed by domestic savings. In

this case, savings rates and investment rates are perfectly correlated and the correlation between the savings rate and the investment rate is one. In contrast, if countries are perfectly integrated in the world capital market, domestic investments are completely financed by the worldwide pool of capital. In this case, the correlation between the domestic savings and the domestic investment rate is zero. Table 1 presents the correlation coefficients between the savings rate and the investment rate in the CEEC-5 for the period between 1980 and 2003.

**Table 1: Correlation Coefficients between Domestic Savings and Investment Rates**

	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia
(S/Y) and (I/Y)	-0.02	0.68	0.86	0.29	0.42

Source: International Monetary Fund (2005) and own calculations (2005). Table 1 reports the correlation between annual savings (S/Y) and investment rates (I/Y) in the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia for the period between 1980 and 2003. The investment rate (I/Y) is the ratio of gross fixed capital formation and changes in inventories divided by the Gross Domestic Product (GDP). The savings rate (S/Y) is equal to the sum of gross investments and the balance of the current account divided by GDP.

Based on savings-investment correlations the Czech Republic is almost perfectly integrated in the world capital market, since the correlation between the savings rate and the investment rate is almost zero. Poland, Hungary, the Slovak Republic, and Slovenia report higher correlation coefficients. This suggests that they are not integrated in the world capital market in terms of the Feldstein-Horioka Test. The degree of international capital mobility seems to be particularly low in Poland. The correlation coefficient between the Polish savings rate and investment rate is 0.86 indicating that 86 percent of domestic investments were financed by domestic savings between 1980 and 2003.

## **5 International Capital Mobility in the CEEC-5: The Feldstein-Horioka Approach**

I use the Feldstein-Horioka approach to measure the degree of international capital mobility in the CEEC-5. Because of a lack of long time-series data the degree of capital mobility is estimated only for the group of countries and not for each country separately. The advantage of this panel approach is that information from cross-sectional and time-series data is used to estimate the relationship between domestic savings and investments in the CEEC-5. The time-series

properties can then be interpreted as capturing the short-run dynamics of savings and investments, while the cross-sectional estimates reflect the long-run relationship between savings and investment rates (Obstfeld, 1995). The panel is estimated with Ordinary Least Squares (OLS).

To compare the degree of capital mobility of the CEEC-5 with the euro area, I estimate savings-investment correlations for Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, and Spain (EMU-11) as well.<sup>5</sup> If the Feldstein-Horioka coefficient is significantly smaller in the euro area than in Central and Eastern Europe, the EMU-11 are more integrated into the world capital market in terms of the Feldstein-Horioka criterion than the CEEC-5. This may lead to an asymmetric transmission of monetary shocks in the CEEC-5 if they join the EMU.

Equation (1) is estimated for annual data for the *reform period* (1989 to 2003) and for the *entire period* (1980 to 2003) (hereafter: *aggregate savings regression*). To control for serial correlation, I include first- and second-order autoregressive terms. To account for unobserved time-invariant heterogeneity across cross-sectional units, the equation is additionally estimated with country dummies. The results are presented in the left columns of Table 2.

The regressions confirm the results of correlation analysis in Section 4. The Feldstein-Horioka coefficient is 0.41 (with a standard error of 0.05) over the entire period and 0.32 (0.06) over the reform period. This indicates that the CEEC-5 are neither perfectly integrated into nor perfectly separated from the world capital market. A Feldstein-Horioka coefficient of 0.41 means that 41 percent of

---

<sup>5</sup>Luxembourg is excluded from the sample because it is an outlier due to its characteristics as a small country with a huge financial market place. The investment rates ( $I/Y$ ) is the ratio of gross fixed capital formation and changes in inventories divided by GDP. Saving rates ( $S/Y$ ) are calculated according to the current account identity by dividing the sum of gross investment and the balance of the current account by GDP. Because of a lack of data for the Czech Republic and the Slovak Republic savings and investment rates could only be calculated for the period between 1993 and 2002 and 1993 and 2003, respectively, and for Slovenia only for the period between 1990 and 2003. Data on the Polish and Hungarian savings and investment rates are available for the entire period. All data are from the International Monetary Fund (2005).



**Table 2: Domestic Savings and Investment Correlations**

	CEEC-5		EMU-11	
	1980-2003 <sup>1</sup>	1989-2003	1980-2003 <sup>2</sup>	1989-2003
<b>Levels</b>				
S/Y	0.41*** (0.05)	0.32*** (0.06)	0.55*** (0.05)	0.47*** (0.05)
CZ	0.21*** (0.01)	0.23*** (0.01)		
HU	0.16*** (0.01)	0.18*** (0.01)		
PL	0.15*** (0.01)	0.16*** (0.01)		
SLK	0.21*** (0.02)	0.23*** (0.02)		
SL	0.16*** (0.01)	0.18*** (0.01)		
AR(1)	0.69*** (0.10)	0.81*** (0.12)	1.03*** (0.05)	1.12*** (0.08)
AR(2)	-0.18** (0.10)	-0.31*** (0.11)	-0.25*** (0.06)	-0.41*** (0.08)
H <sub>0</sub> : (S/Y) = 1	127.77***	105.24***	73.09***	98.41***
Obs.	72	58	240	163
R <sup>2</sup>	0.80	0.82	0.88	0.88
Durbin-Watson Stat.	1.83	2.08	1.77	1.85
<b>First Difference</b>				
D(S/Y)	0.41*** (0.05)	0.36*** (0.06)	0.56*** (0.05)	0.52*** (0.05)
H <sub>0</sub> : (S/Y) = 1	96.75***	85.60***	61.83***	65.47***
Obs.	67	55	229	163
R <sup>2</sup>	0.41	0.44	0.52	0.44
Durbin-Watson Stat.	2.00	2.21	1.70	1.90

Source: Own calculations (2005). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Standard errors are reported in parenthesis. Table 2 reports the results of OLS panel regressions for Equation (1). The dependent variable is the domestic investment rate. (S/Y) is the aggregate savings retention coefficient. The regression is estimated with first- and second-order autoregressive terms (AR) and cross-section weights control for serial correlation and groupwise heteroscedasticity. Country-specific intercepts are used to control for time-invariant unobserved heterogeneity across cross-sectional units. CZ, HU, PL, SLK, and SL are the individual country intercepts for the Czech Republic (CZ), Hungary (HU), Poland (PL), the Slovak Republic (SLK), and Slovenia (SL). The intercepts for the EMU-11 are not reported. They are available from the author upon request.

domestic investments is financed by domestic savings. I use a Wald test to find out whether the degree of capital mobility is higher in the reform period than over the entire period. The Wald test does not reject the hypothesis that the coefficients are significantly different. This indicates that the degree of international capital mobility in the CEEC-5 has increased over the reform period.<sup>6</sup>

To compare the degree of international capital mobility in the CEEC-5 with the euro area, I estimate equation (1) for the EMU-11 as well. The regression results are presented in the right columns of Table 2. The Feldstein-Horioka coefficient for the EMU-11 is 0.55 (with a standard error of 0.05) for the entire period and 0.47 (0.05) for the reform period. The coefficients are close to the coefficients of Buch (1999). I use a Wald test to find out whether the degree of capital mobility in the reform period is different from the degree of capital mobility over the entire period. As in case for the CEEC-5, the test does not reject the hypothesis that the coefficients are significantly different. The degree of capital mobility, hence, seems to have increased in the EMU-11 over the reform period as well. To find out whether the CEEC-5 are more integrated in the world capital market than the EMU-11, I next test the hypothesis that the Feldstein-Horioka coefficient is significantly lower in the CEEC-5 than in the EMU-11. The Wald test does not reject this hypothesis. This indicates that the degree of international capital mobility is higher in Central and Eastern Europe than in the 11 EMU member countries.<sup>7</sup>

---

<sup>6</sup>The test results are available from the authors upon request.

<sup>7</sup>To find out whether the common market and the euro have changed the relationship between savings and investments in the EMU-11, I use intercept and slope dummies. These dummies take a value of one in the period of the Common Market (1992-2003) and after the introduction of the euro (1999-2003), respectively, and zero in all the other years. The Common Market slope dummy turns out to be highly significant in the aggregate savings regression indicating that the degree of capital mobility has increased after 1992. The Feldstein-Horioka coefficient is, however, still higher than in the CEEC-5. Probably due to the small number of observations, the euro dummy variable turns out to be insignificant. I find no evidence that saving and investment rates are not significantly correlated as observed by Adam et al. (2002) for the period between 1995 and 2000. The results are available from the author upon request.

A problem with panel regressions is that the time-series used may be non-stationary, since the regression of a non-stationary variable on another non-stationary variable leads to spurious results when the series are not co-integrated (Granger & Newbold, 1974). In this case, the results are biased, and any inference about the degree of financial integration meaningless. Following Buch (1999), I, hence, estimate equation (1) in first differences as well. Since differencing eliminates the time-invariant unobserved heterogeneity, the first difference regressions do not include country dummies. The regression results are presented at the bottom of Table 2. As expected, taking differences worsens the fit of the regression. The Feldstein-Horioka coefficient for the CEEC-5 is, however, still significant and insignificantly different from the coefficients of the regression in levels. For comparison purposes, I estimate equation (1) for the EMU-11 in first differences as well. The Feldstein-Horioka coefficient of the first-difference regression is slightly higher than in the regression in levels. Wald tests, however, reject the hypothesis that the coefficients are significantly different from each other.

To summarize, the results indicate that the degree of capital mobility increased between 1980 and 2003 in the CEEC-5 and in the EMU-11. Hypotheses tests, furthermore, indicate that according to the Feldstein-Horioka Test the degree of international capital mobility is already higher in the CEEC-5 than in the EMU-11. This may reflect the removal of capital controls and other barriers that limit the import and export of capital following the accession of the CEEC-5 to the OECD and the preparation of these countries for EU accession. Another reason is the need for external capital to finance their transformation from centrally-planned into market-based economies. Owing to the under-development of the capital markets and the small capital stock the CEEC-5 have to import foreign capital to finance domestic investment projects. The EMU-11, in contrast, have well-developed capital markets and a large capital stock and, hence, rely less on the

import of foreign capital than the CEEC-5.<sup>8</sup> The results are in line with the hypothesis of Buch (1999) that

*“the Central and Eastern European countries have already reached the same degree of integration into the world capital market like the member states of the EU and that the accession process would likely not boost capital market integration to a large extent and to trigger huge capital inflows”* (Buch, 1999, p. 28).

## **6 The Feldstein-Horioka Approach and Current Account Targeting**

The Feldstein-Horioka approach is criticized, since the degree of capital mobility may be biased by current account targeting policies (Artis & Bayoumi, 1991, Coakley et al., 1996 and 1999). To make the relationship between fiscal policies and the current account clear, I start with the current account identity according to which the current account balance is equal to the difference between domestic savings and investments:

$$CA = S - I, \quad (2)$$

where CA is the current account balance, S domestic savings, and I domestic investments. Since domestic savings can be decomposed into private and public savings, the identity above can be re-written as:

$$CA = S_G + S_P - I, \quad (3)$$

---

<sup>8</sup>This corresponds to findings in Harberger (1980) and Murphy (1984). They analyze the effect of country size on the degree of international capital mobility. They divide the sample of Feldstein & Horioka (1980) according to country size into two different groups to find out whether the degree of capital mobility is related to country size. Their results indicate that smaller countries have a significantly lower Feldstein-Horioka coefficient than larger countries. They interpret this as evidence for the existence of a “*country effect*” that biases the degree of international capital mobility.

where  $I$  is private investment,  $S_P$  private, and  $S_G$  public savings. Since the amount of public savings depends on the amount of public revenues and public expenditures, equation (3) can be rearranged to:

$$CA = (T - G) + (S_P - I), \quad (4)$$

where  $T$  denotes public revenues and  $G$  public expenditures. Equation (4) illustrates that the fiscal budget may work as an adjustment variable, since the government can balance the current account by adjusting its budget to the difference between private savings and investments. If the investment rate is larger than the private savings rate, the government has to reduce government expenditures and/or to raise taxes to reduce the current account deficit. In contrast, if domestic savings exceed domestic investments, the government has to increase its debt to reduce the current account surplus. Hence, I expect the correlation of the difference between private savings and investments ( $S_P - I$ ) and the fiscal budget ( $T - G$ ) to be negative if the government targets the current account.<sup>9</sup>

The correlation between the fiscal budget and the difference between private savings and investment may, however, also be negative, even if the government has not targeted the current account. Feldstein & Bachetta (1989) argue that the negative correlation might also be caused by the crowding out or crowding in of private investments in a world of immobile capital. If capital is not mobile, the domestic interest rate is completely determined by the domestic demand for and the supply of capital. An increase of public expenditures then causes the domestic interest rate to rise and to crowd out private investments, whereas a reduction causes the interest rate to decrease and to crowd in private investments. Thus, even in a world of immobile capital, the fiscal budget ( $T - G$ ) can be negatively correlated with the difference between private savings and investments ( $S_P - I$ ).

---

<sup>9</sup>Summers (1986) regresses the difference between domestic savings and investments on the government deficit to find out whether the Feldstein and Horioka paradox can be explained by current account targeting. He finds evidence that current account targeting policies influence the Feldstein-Horioka coefficient and criticizes the interpretation of the Feldstein-Horioka coefficient as an indicator for the degree of capital mobility.

To find out whether my results are biased by fiscal policies, I follow Feldstein & Bachetta (1989) and regress the domestic investment rate on the private and the public savings rate for the period between 1980 and 2003 (hereafter: *private savings regression*).

$$(I/Y)_{it} = \alpha_i + \beta_1 (S_P/Y)_{it} + \beta_2 (S_G/Y)_{it} + \varepsilon_{it}, \quad (5)$$

where  $i$  is a country and  $t$  a time index.  $(S_P/Y)$  is the private and  $(S_G/Y)$  the public savings rate.  $\beta_1$  is the private and  $\beta_2$  the public savings retention coefficient.  $\varepsilon$  is a random error term with zero mean and constant variance. To allow for time-invariant heterogeneity across cross-section units, equation (5) is estimated with country-specific dummy variables. Autoregressive terms are used to control for serial correlation. Since some of the CEEC-5 countries launched government savings programmes between 1993 and 2003 to reduce the current account deficit, I expect the public savings retention coefficient to be significant and the private savings retention coefficient to be significantly lower in the private savings regression than in the regression with aggregate savings rates. In this case, fiscal policies have biased the degree of capital mobility in the CEEC-5 in the previous regressions downward. The results with private and public savings rates are presented in Table 3.

The regression model fits the data well and all variables are significant. The private savings retention coefficient is 0.35 (with a standard error of 0.06) for the entire period and 0.32 (0.14) for the reform period. The public savings retention coefficient is 0.45 and 0.66 (0.24), respectively. Since the private savings retention coefficients are smaller in the private savings regression, the degree of capital mobility in the CEEC-5 seems to be biased by fiscal policies in the aggregate savings regression. However, a Wald test rejects the hypothesis that the aggregate and the private savings retention coefficient are significantly different. The degree of international capital mobility, thus, does not seem to be significantly biased by current account targeting policies in the CEEC-5. The results for the EMU-11 indicate that the degree of capital mobility is downward

**Table 3: Private and Public Savings and Investment Correlations**

	CEEC-5		EMU-11	
	1980 to 2003 <sup>1</sup>	1989 to 2003	1980 to 2003 <sup>2</sup>	1989 to 2003
<b>Levels</b>				
$S_p/Y$	0.35*** (0.06)	0.32** (0.14)	0.52*** (0.05)	0.44*** (0.05)
$S_G/Y$	0.45*** (0.12)	0.66*** (0.24)	0.59*** (0.07)	0.48*** (0.06)
CZ	0.22*** (0.01)	0.24*** (0.03)		
HU	0.17*** (0.01)	0.19*** (0.03)		
PL	0.19*** (0.01)	0.20*** (0.02)		
SLK	0.21*** (0.02)	0.23*** (0.03)		
SL	0.17*** (0.01)	0.18*** (0.02)		
AR(1)	0.80*** (0.14)	0.81*** (0.15)	1.01*** (0.06)	1.09*** (0.09)
AR(2)	-0.41*** (0.13)	-0.44*** (0.13)	0.23*** (0.06)	-0.38*** (0.08)
$H_0: (S_p/Y) = 1$	105.79***	21.96***	70.66***	97.62***
Obs.	53	44	209	132
$R^2$	0.74	0.72	0.88	0.89
Durbin-Watson Stat.	1.99	2.23	1.86	1.97
<b>First Difference</b>				
$D(S_p/Y)$	0.23* (0.11)	0.21 (0.13)	0.55*** (0.05)	0.49*** (0.06)
$D(S_G/Y)$	0.40** (0.15)	0.53** (0.21)	0.64*** (0.07)	0.57*** (0.06)
$H_0: D(S_p/Y) = 1$	41.25***	34.27***	56.26***	66.15***
Obs.	59	48	198	132
$R^2$	0.13	0.12	0.55	0.49
Durbin-Watson Stat.	1.79	1.89	1.82	2.14

Source: Own calculations (2005). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Standard errors are reported in parenthesis. Table 3 reports the results of OLS panel regressions for Equation (5). The dependent variable is the domestic investment rate. ( $S_p/Y$ ) is the private and ( $S_G/Y$ ) the public saving rate. The public savings rate is the difference of public revenues and public expenditures divided by the GDP. Data on public savings is not available for Austria, France, Germany, Greece, and Portugal for the period between 1999 and 2003. The regression is estimated with first- and second-order autoregressive terms (AR) and cross-section weights to control for serial correlation and groupwise heteroscedasticity. Country-specific intercepts are used to control for time-invariant unobserved heterogeneity across cross-sectional units. CZ, HU, PL, SLK, and SL are the individual country intercepts for the Czech Republic (CZ), Hungary (HU), Poland (PL), the Slovak Republic (SLK), and Slovenia (SL). The intercepts for the EMU-11 are not reported. They are available from the author upon request.

biased as well. The private savings retention coefficients is 0.52 (with a standard error of 0.05) for the entire period and 0.44 (0.05) for the reform period. The public savings retention coefficients are 0.59 (0.07) and 0.48 (0.06), respectively. Wald tests reject the hypothesis that the coefficients in the private savings regression are significantly different from the coefficients in the aggregate savings regression, however. This indicates that the degree of capital mobility in the EMU-11 is significantly not biased by current account targeting policies either.

To control for non-stationarity, I estimate equation (5) in first differences as well. The results are presented at the bottom of Table 3. As for the aggregate savings regressions, taking differences worsens the fit of the regression. The Feldstein-Horioka coefficients for the CEEC-5 and the EMU-11 are, however, still (weakly) significant over both periods. Moreover, Wald tests reject the hypothesis that the coefficients for the private and public savings retention coefficients in the first-difference regression are significantly different from the coefficients in the regression in levels.

To summarize, the private savings regressions suggest that the degree of international capital mobility in the CEEC-5 and the EMU-11 was not biased by fiscal policies between 1980 and 2003. The results also indicate that the public savings rate is correlated with the investment rate. However, this cannot be taken as evidence for current account targeting policies in the CEEC-5 and the EMU-11, since a significant public savings retention coefficient is consistent with a crowding out of private investments in the case of low capital mobility and current account policies in the case of high capital mobility. The private savings approach is, hence, appropriate to control for the influence of fiscal policies on the degree of international capital mobility, but inappropriate to find out if the governments in the CEEC-5 have targeted the current account. Hence, I have to use other econometric techniques to determine whether the governments in Central and Eastern Europe have used fiscal policies to balance the current account.



## 7 Current Account Targeting in the CEEC-5

If the government systematically adjusts public revenues and expenditures to the difference between private savings and investments to balance the current account, a country cannot infinitely run current account deficits or current account surpluses. For this reason, if the governments in the CEEC-5 successfully targeted the current account between 1980 and 2003, the current account time series cannot be non-stationary. This hypothesis can be tested by analyzing the statistical properties of the current account time series for the CEEC-5. To do the test, I first generate the current account series according to equation (2) as the difference between the domestic savings and the domestic investment rate. Then, I perform *Augmented Dickey-Fuller* (ADF) tests of the current account series to test for the existence of a unit root (Dickey & Fuller, 1979). I assume that the government did not (successfully) target the current account if these tests indicate that the current account is non-stationary.

**Table 4: ADF Tests of the Current Account**

	Level		First Difference		Degree of Integration
	Specification <sup>1</sup>	t-value	Specification	t-value	
Czech Republic	0C1	-3.33**	0C1	-2.84*	I(0)
Hungary	0C0	-1.66	0C0	-4.82***	I(1)
Poland	0C0	-1,51	0C0	-4.27***	I(1)
Slovak Republic	0C1	-3.36**	0C1	-2.83*	I(0)
Slovenia	0C0	-2.73*	0C0	-7.86***	I(0)

Source: Own calculations (2005). Trend, constant, lag length. \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 4 reports the results of Augmented Dickey-Fuller Tests (ADF) for the current account of the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia. The current account series is the difference between the savings rate and the investment rate. The sample period is 1993 to 2002 for the Czech Republic, 1980 to 2003 for Hungary and Poland, 1993 to 2003 for Slovakia, and 1991 to 2003 for Slovenia.

Table 4 presents the results of the ADF tests. They come to different conclusions about influence of the governments in the CEEC-5 on the current account. While the Polish and the Hungarian current account are non-stationary, the current account series for the Czech Republic, the Slovak Republic, and Slovenia are stationary. These results have two different implications: First, the non-

stationarity of the Polish and the Hungarian current account series indicates that the governments in these countries did not (successfully) target the current account between 1980 and 2003. Second, the stationarity of the current account series in the Czech Republic, the Slovak Republic, and Slovenia suggests that the governments in these countries might have adopted current account targeting policies.

It has, however, to be noted that the current account can also be stationary due to changes in the private savings and investment rate. Hence, the stationarity of the current account cannot be taken as evidence for current account targeting in these countries. However, the ADF results indicate that such policies might have been used in these countries to prevent large current account deficits. The results, furthermore, do not contradict the observations I made in Section 3, since the governments in the Czech Republic and Slovak Republic launched saving programmes after they experienced currency crises in 1997 and 1998 to reduce the current account deficit. The test results for Hungary and Slovenia are more difficult to interpret, since the Slovenian current account is stationary although no government savings programmes were observed. The stationarity of the current account might, however, also been caused by changes in the private savings and investment rate. The ADF result for the Slovenian current account series, hence, does not contradict my observations in Section 3. Only the test result for Hungary is contradicting. Since the Hungarian government adopted savings programmes in 1995 to reduce the current account deficit, I expect the Hungarian current account series to be stationary. The ADF test results, however, indicate the opposite. This suggests that the Hungarian government did not (successfully) target the current account.

To test the robustness of the ADF test results, I additionally do *Kwiatkowski, Phillips, Schmidt, and Shin* (KPSS) tests (Kwiatkowski, Phillips, Schmidt, & Shin, 1992). The KPSS test tests the null hypothesis that the current account series is stationary, whereas the ADF test assumes that the series is non-stationary. The test results confirm the ADF test results for the Czech Republic, the Slovak Republic, and for Slovenia. However, the KPSS test comes to different

conclusions regarding the stationarity of the current account in Hungary and Poland. This may indicate that the unit root test results are not robust. They, hence, have to be interpreted with caution. The small sample period may be a reason for this. It may also explain the conflicting results I got for the Hungarian current account.

## 8 Conclusions

The motivation of this chapter was to compare the degree of financial integration in the CEEC-5 with the euro area to find out whether differences in the degree of financial integration may cause asymmetric responses to monetary shocks if these countries join the EMU.

According to the analysis of saving and investment correlations neither the CEEC-5 nor the EMU-11 are perfectly integrated in the world capital market. However, both country groups have become more integrated over time. The empirical analysis, furthermore, shows that asymmetric responses to monetary shocks cannot be expected in an enlarged EMU because of a lower degree of financial integration in Central and Eastern Europe, since the CEEC-5 have according to the Feldstein & Horioka (1980) already reached a higher degree of international capital mobility than the eleven EMU member countries. This might be explained with the removal of capital controls and other barriers that limit the import and export of capital following the accession of the CEEC-5 to the OECD and the preparation of these countries for EU accession. Another reason is the need for external capital to finance their transformation from centrally-planned to market-based economies.

Since the CEEC-5 experienced large current account deficits in the 1990s, many governments adopted savings programmes to balance the current account. To find out whether such policies have biased the degree of international capital mobility, I estimate the Feldstein-Horioka equation with private and public savings rates. The results indicate that the degree of capital mobility is not biased by fiscal policies. They, however, also reveal that public savings are significantly correlated with the domestic investment rate. Since the standard Feldstein-

Horioka approach is not suitable for detecting current account targeting policies in the CEEC-5, I test the statistical properties of the current account time series on the basis of unit root tests. These tests suggest that, in particular, those CEEC-5 countries targeted the current account that adopted government savings programmes between 1980 and 2003. However, robustness checks and the small sample period suggest that the results of these tests should be taken with caution and not be interpreted as evidence, but rather as indication for the adoption of current account targeting policies in some Central and Eastern European countries.

# 3

## *Merger Control as Barrier to Integration: Transparency of Regulation and Cross-Border Bank Mergers*

*“Every time there is an attack on the banking system, every government in Europe is active, they intervene... France is just like the others.”*

Henri Guaino, close advisor of French President Nicolas Sarkozy<sup>10</sup>

### **1 Introduction**

Although the EU has removed barriers to cross-border banking through regulatory harmonization and liberalization, the number of cross-border M&A in the EU banking sector is still small compared to cross-border M&A in other sectors of the economy (European Commission, 2005a). The cross-border dimension is particularly unimportant in Western European banking markets, while cross-border consolidation is more advanced in Central and Eastern Europe (Cabral et. al., 2002). This suggests there are still barriers to cross-border M&A in some EU member countries.

This chapter shows that cross-border consolidation in the EU banking sector is mainly limited by political interference. Using a unique dataset on the transparency of merger control in the EU banking sector I demonstrate that banks are significantly less likely to be taken over by a foreign bank if the merger review process in the banking sector is not transparent. This gives supervisors and politicians scope to block cross-border M&A for other than prudential reasons. Particularly large banks are less likely to be acquired. Domestic M&A are not

---

<sup>10</sup>Quote from an article on speculations that the French bank Société Générale becomes the target of a cross-border takeover (BNP Weighing Bids for Crisis-Hit Société Générale, 2008).

affected. The results confirm anecdotal evidence from Italy where the Bank of Italy blocked the acquisition of Banca Antonveneta and Banca Nazionale del Lavoro by the Dutch ABN Amro and the Spanish Banco Bilbao Vizcaya Argentaria in 2005 during merger control. Because it became later public that both deals were not blocked for prudential reasons, but to protect local banks from foreign investors, the EU Commission brought actions against Italy for infringement of the principle of the free movement of capital and the freedom of establishment. Furthermore, the Commission complained that the merger review process of the Bank of Italy creates legal uncertainty and lacks transparency. This may lead to a situation in which the supervisor can block M&A based on opaque concerns (European Commission, 2005b).

Political interference is not only a barrier to cross-border M&A in Italy. For example, in 2008, the French Prime Minister Francois Filion warned that the government “*will not allow Société Générale to be the target of hostile raids by other companies*” (Société Générale Shares Rise on Takeover Report, 2008). This was not the first time that French politicians intervened in the acquisition of a domestic bank. The case of *Crédit Lyonnais* is another example. *Crédit Lyonnais* was privatized in 1999 with the government retaining 10 percent of ownership shares until the end of 2000. This made the acquisition of *Crédit Lyonnais* more difficult, since government officials repeatedly stated they would oppose a takeover by a foreign bank. This is reflected by a statement of Sir Brian Pitman, the chairman of *Lloyds TSB* at that time. In an interview with the French newspaper *Le Figaro*, he said that *Lloyds* would like to take over *Crédit Lyonnais*, but was put off by the political climate in France (Paterson, 1999).<sup>11</sup> According to French politicians, political interference is not a new phenomenon in the EU banking sector.<sup>12</sup> “*Every time there is an attack on the banking system, every government in Europe is active, they intervene. France is just like the*

---

<sup>11</sup>Political influence also played a role in the bidding war for *Crédit Industriel et Commercial* (CIC) in 1998 (Boot, 1999). Although ABN Amro was favoured because of its excellent track record vis-à-vis competing French bidders, CIC was sold to *Crédit Mutuel*.

<sup>12</sup>Political interference also plays a role in other EU countries. For example, Portuguese politicians blocked the acquisition of the financial group *Champlinaud* by the Spanish *Banco Santander Central Hispanio* in 1999 (European Commission, 1999a and 1999b).

*others*”, said a close advisor of French President Nicolas Sarkozy (BNP Weighing Bids for Crisis-Hit Société Générale, 2008).

Although these examples demonstrate that political interference makes cross-border M&A more difficult, systematic empirical evidence is missing. This chapter aims to fill this gap. Its first main contribution is that it introduces indices that measure the scope of politicians and supervisors to block M&A for reasons that are not related to the soundness and prudence of the proposed investor. The indices are constructed based on a questionnaire that was sent to the supervisory authorities in the 25 EU member countries between November 2006 and March 2007. The second main contribution is that the indices are used in an econometric model to find out whether merger control constitutes a systematic barrier to M&A in the EU banking sector.

To my knowledge this is the first study that analyzes the probability that a bank is taken over as a function of bank characteristics, country characteristics, and the transparency of merger control. The results indicate that cross-border bank mergers are systematically more likely if merger control is transparent. In particular, large banks are more likely to be taken over by if the merger review process is transparent. This supports the hypothesis that politicians, supervisors, and local banks operate in close concert to keep the largest banks in their country in domestic hands (Boot, 1999). Domestic M&A are, in contrast, not affected.

The results do not only have implications for consolidation in the EU banking sector, but also for efficiency. Since government intervention is usually not driven by efficiency considerations, political interference should not only make cross-border M&A less likely, but also decrease the efficiency and valuation of banks. This corresponds to findings in Carletti, Hartmann, & Ongena (2007). They find that M&A in the EU banking sector generate larger announcement effects if merger control is more transparent and the supervisor more independent. Both reduces the discretion of the regulatory process and enhances the efficiency of envisioned M&A (Carletti et al., 2007). Efficiency enhancements may also arise from greater pressure on managers to maximize shareholder value. Since the

incumbent bank managers may lose their job and perquisites after a takeover, they have larger incentives to manage the company in the interest of the shareholders if banks are more likely to be taken over. The results are, hence, important for corporate governance in the EU banking sector as well. This may be particularly relevant in the moment, since the crisis cast doubt on whether internal corporate governance mechanisms like the supervisory board are able to discipline bank managers.<sup>13</sup>

The chapter proceeds as follows. The next section provides a brief overview over the current state of integration in the EU banking sector. Section 3 concentrates on the motives and the barriers to M&A in the banking sector. In Section 4, I focus on merger control as barrier to integration. I show that the current regulatory framework in the EU gives supervisors considerable latitude in discouraging or rejecting a proposed acquisition. To measure the scope for supervisors and politicians to block M&A during the merger review process, I construct indices that measure different aspects of merger control in the banking sector in Section 6. In Section 7, these indices are used to descriptively analyze whether merger control constitutes a barrier to cross-border consolidation in the EU banking sector.

## **2 The Integration of EU Banking Markets**

Financial markets are integrated if domestic and foreign financial institutions face the same set of rules and are treated in a non-discriminatory manner when they operate in the market (Hartmann et al., 2003 and Baele et al., 2004). The most accurate and direct way to measure the degree of integration in the EU banking sector would, hence, be to list all frictions and regulations and to check if they apply differently to domestic and foreign banks. This is, however, impossible (Baele et al., 2004). For this reason, the integration of EU banking markets can only be measured indirectly by price and quantity indicators of integration.

---

<sup>13</sup>The OECD, for instance, writes that the “*boards of financial companies were ineffective and not capable of objective and independent judgement*” (OECD, 2009).



Quantity indicators measure the degree of banking integration based on quantities like, for example, the volume of cross-border retail operations (Baele et al., 2004 and Gual, 2004). These data suggest that cross-border retail flows are generally much less important than wholesale or money market flows in the euro area. Data from the European Central Bank (ECB), for example, suggests that wholesale and money market flows are large across borders within the euro area. Cross-border retail flows are, in contrast, less than six percent (ECB, 2009). This not necessarily indicates that there is a lack of integration in EU retail-banking markets if retail business is local and cross-border business limited. For this reason, the number of cross-border M&A is often used as an additional indicator for integration in the retail field and the absence of such deals is often taken as evidence for the fragmentation of EU retail-banking markets (Cabral et al., 2002).

A problem with quantity indicators is that a large number of cross-border M&A does not indicate a higher degree of banking integration if the acquired banks continue to operate as before in the local market so that the pricing conditions do not converge across markets (Cabral et al., 2002). For this reason, quantity indicators are often supplemented by price indicators. The idea behind price indicators is that identical products should cost the same price in perfectly integrated markets. If this is not the case, customers will move from the high-price country to the low-price country and drive down price differentials. Persistent price differentials, hence, indicate that financial integration is still incomplete. Price indicators suggest that prices still differ in the EU retail-banking market, while wholesale prices show a high degree of convergence (Adam et al., 2002, Baele et al., 2004, and European Commission, 2009).

Problematic is that the price of retail-banking products often consists of different components like the interest rate and a fixed service charge (European Commission, 2009). Moreover, some products can often only be bought as a package. Certain products may, hence, be under-priced to attract new clients, while other products are over-priced (European Commission, 2009). The bundling of services is particularly widespread in EU retail-banking markets (European Commission, 2009). Because data on interest rates is often highly aggregated and

not broken down into its components, products differ and the prices of retail-banking products are not easily comparable across countries (Cabral et al., 2002). Prices may also continue to differ owing to differences in tax systems, preferences, risk characteristics, or other demand characteristics (Gropp & Kashyap, 2009). For this reason, Gropp & Kashyap (2009) argue that perfect price convergence is neither necessary nor sufficient for integration. They propose a new test of financial integration that is based on the convergence in banks' profitability. Their test emphasises the role of an active market for corporate control and competition in banking integration. Gropp and Kashyap (2009) demonstrate that the profitability of listed European banks appears to converge to a common level. There is also weak evidence that competition eliminates high profits for these banks, while underperforming banks tend to show improved profitability. Unlisted banks differ markedly. Their profits show no tendency to revert to a common target rate of profitability that indicates that markets are integrated. This suggests that EU banking markets are still far from being integrated (Gropp & Kashyap, 2009).

### **3 Motives and Barriers to Consolidation in the EU Banking Sector**

The fragmentation of EU retail-banking markets may be explained by the fact that retail markets are, in contrast, to wholesale markets still local and cross-border business limited (European Commission, 2009). This indicates that the most effective way to get access to foreign retail-banking markets is the acquisition of or the merger with a local bank (Cabral et al., 2002). However, M&A in the non-financial sector still outnumber cross-border M&A in the banking sector (European Commission, 2009). This suggests that there is a link between the fragmentation of EU retail-banking markets and the small number of cross-border M&A. This section analyzes the motives and barriers to consolidation in the EU banking sector.

M&A are undertaken for motives that can broadly be distinguished into value-maximizing and non-value maximizing ones (Berger, Demsetz, & Strahan, 1999).

Managers may engage in M&A that are not driven by value maximization if they derive utility from empire building. Takeovers can then be viewed as a manifestation of the potential conflict of interest between shareholders and managers. In line with that Allen & Cebenoyan (1991) and Banning (1999) find that banks with a widely dispersed ownership structure and considerable power of the management are more likely to make acquisitions that increase size than credit institutions that are dominated by a large shareholder that monitors the management.

If managers maximize shareholder value, M&A are undertaken to increase profits. One way is to generate economies of scale and scope from takeovers (Berger et al., 1999 and Berger, DeYoung, & Udell, 2001). Despite the potential to generate cost synergies cross-border consolidation is limited in the EU banking sector. Berger et al. (2001) explain the absence of cross-border M&A with the existence of barriers that reduce the efficiency gains that can be generated from takeovers. Examples for efficiency barriers are differences in the regulation and supervision of banks. Since foreign banks have to comply with regulations at home and abroad, domestic banks have cost advantages because complying with two different sets of regulations imposes additional costs on foreign credit institutions.<sup>14</sup>

M&A also generate X-efficiency gains if the acquiring institution increases the efficiency of the acquired bank up to its own level (Berger et al., 1999 and Berger et al., 2001). Owing to cultural diversity, different languages, and corporate cultures X-efficiency gains are likely to be limited in cross-border M&A. Cross-border M&A are also less attractive as compared to domestic M&A due to problems in monitoring managers at distance (Buch & De Long, 2003, Buch,

---

<sup>14</sup>Differences in regulations also limit the degree to which products can be standardized across borders. This has recently been confirmed by a survey of the EU Commission (2005a). The survey indicates that differences in product regulation and consumer protection are an important barrier to cross-border consolidation in the EU financial sector. This makes cross-border takeovers less attractive relative to domestic M&A, since cost synergies are a key driver for consolidation in the financial sector (Berger, Buch, DeLong, & DeYoung, 2004a).

2005, and Berger et al., 2004a). Buch & DeLong (2004), for instance, explain the relative absence of cross-border deals in the banking sector by regulatory barriers and information costs related to distance and cultural factors.

The empirical literature on the efficiency effects of M&A in the banking sector suggests that efficiency barriers exist. Beitel & Schierenbeck (2006), for example, find that the changes of the combined value of the bidder and the target are zero or even negative in case of cross-border M&A, while the values of the combined institution is positive for domestic M&A. Studies that compare the efficiency of foreign and domestic banks do not find much evidence for efficiency gains through cross-border M&A either. Vander Venet (1996), for instance, concludes that foreign banks in Europe had about the same cost efficiency as domestic banks, while Bonin, Hasan, & Wachtel (2005) find that foreign banks are more cost efficient than domestic banks in Central and Eastern Europe. This indicates that foreign banks have advantages over local banks in developing countries (Berger, 2007). In contrast, the research for developed countries suggests that foreign banks are less efficient than local institutions in industrial countries (Berger, 2007).

M&A also generate efficiency gains if a more diverse scope of or mix of financial services, or a better geographical diversification of risks allows banks to improve the trade-off between risk and return (Berger et al., 2001). Takeovers may also be undertaken to increase the market share (Berger et al., 1999) or to get access to foreign banking markets (Berger et al., 2001). Market access is particularly relevant for banks that have a large market share in their home country and that are restricted in acquiring local banks for antitrust concerns. Furthermore, cross-border M&A are considered the most effective way to enter foreign retail-banking markets (Cabral et al., 2002).<sup>15</sup> In particular, banks with a large branch network and a large market share are attractive targets. Despite the benefits of acquiring

---

<sup>15</sup>This is consistent with the literature that analyzes foreign bank expansion. It usually finds that subsidiaries are the dominant entry mode for banks that operate with local clients, while branches are more often chosen to provide financial services to local clients when they operate abroad (Foccarelli & Pozzolo, 2005 and Cerutti, Dell'Arricca, & Soledad Martinez Peria, 2007). Subsidiaries are usually established via the acquisition of local banks.

such banks, large cross-border deals are limited in some Western European countries (see e.g. Table 9 in Section 6). Banks mainly enter these countries via branches or via the acquisition of small banks. In the EU banking sector, market entry via branches is easier than via subsidiaries, since branches of banks from other EU countries do not need prior approval by the supervisor in the host country (“single passport”). The acquisition of small banks, in contrast, is less likely to be blocked if politicians and supervisors only want the largest banks in domestic hands.

Boot (1999) argues that central banks, ministries of finance, and domestic banks operate in close concert to block cross-border and to promote domestic M&A. For Berger (2007) implicit government barriers are one of the main reasons for the small market share of foreign banks in Western Europe relative to Central and Eastern Europe. These include delaying or denying cross-border takeovers and encouraging domestic banks to merge with each other to become larger and more difficult to acquire (Berger, 2007). Merger control is an implicit barrier to consolidation. In contrast to explicit barriers like, for example, restrictions on capital flows and foreign ownership, implicit barriers do not single out foreign banks in a formal way. Since many explicit barriers have been lowered over time through liberalization and regulatory harmonization, implicit barriers may be more important to cross-border M&A in the EU banking sector at present (Berger, 2007). Implicit barriers also arise from differences in the rules and regulations that govern banks and their market environment (Berger, 2007). State ownership and subsidy of banks by the state constitutes an implicit barrier as well (Berger, 2007). Banks that are subsidized often have mandates to make loans at below-market rates to targeted customers like specific firms, industries, or regions. State-owned banks may also have lower credit standards than private banks. In some countries, state banks also have a large market share. This may crowd out private banks and make foreign bank entry less attractive (Berger, 2007).

To identify the motives for and the barriers to consolidation, several empirical studies have analyzed the determinants of domestic and cross-border M&A in the banking sector. Foccarelli & Pozzolo (2001) focus on the acquirer. They find that

large and efficient banks are more likely to be the acquirer in cross-border M&A in the OECD. Banks with a larger share of non-interest income are also more likely to engage in cross-border M&A. This is consistent with the hypothesis that efficient banks are more likely to overcome efficiency barriers and to generate a sufficient return on investment from takeovers. Pasiouras, Tanna, & Gaganis (2007) focus on acquirer and targets in 15 EU countries. Their results indicate that targets are larger in size, less capitalized, less liquid, and less efficient compared to banks that were not involved in M&A. This is consistent with findings in Hernando, Nieto, & Wall (2009). They distinguish between cross-border and domestic M&A and find that poorly managed banks are more likely to be acquired in the EU banking sector. Large banks are also more likely to be taken over in case of domestic M&A. Banks operating in more concentrated markets are, in contrast, less likely to be acquired by domestic, but are more likely to be taken over by foreign credit institutions. This suggests that the likelihood that a bank is taken over not only depends on the characteristics of the bank, but also on the characteristics of the country where the bank is located. The effect of these characteristics may, furthermore, differ for domestic and cross-border takeovers.

#### **4 Merger Control in the EU Banking Sector**

The next sections focus on merger control as implicit barrier to cross-border M&A in the EU banking sector. The main objective of merger control is to maintain competition in the market. In the EU, merger control is regulated in decree No. 4064/1989. It determines that the EU Commission is responsible for the control of cross-border M&A if the transaction reaches certain turnover thresholds (also called “community dimension”). Furthermore, it requires that all M&A that create or strengthen a dominant position which impedes effective competition shall be declared incompatible with the common market (Art. 2, p. 2). M&A between foreign and domestic firms whose turnover exceeds the predetermined thresholds and which do not restrict competition in the single market should, hence, be approved by the EU Commission. This is, however, not the case for M&A that involve banks, because Article 21 of decree No. 4064/1989 grants member states the right “*to take appropriate measures to protect legitimate*

*interests*” (Article 21, p. 3). Legitimate interests are defined as public security, plurality of the media, and prudential rules (Article 21, p. 3, s. 3). Since prudential rules relate, in particular, to financial services (European Commission, 1998), Article 21 grants member countries the right to block cross-border M&A on prudential grounds if the supervisor is not satisfied with the soundness and prudence of the potential investor.<sup>16</sup> , merger control in the banking sector usually focuses on the financial solidity of the new entity and M&A are primarily approved based on a prudential assessment.

#### **4.1 Prudential Assessment of M&A in the EU Banking Sector**

Because M&A in the banking sector are subject to a prudential assessment, M&A can be blocked by national regulators if they deem the potential investor as not suitable to ensure the sound and prudent management of the acquired credit institution. This allows member countries to block certain acquisitions in the banking sector even if they reach “community dimension”. This is also regulated by the existing legal framework. It grants supervisors the right to veto ownership transfers in the banking sector, if they are “*in view of the need to ensure sound and prudent management of the credit institution, [...] not satisfied as to the suitability [of the potential investor]*” (Article 19, p. 1, s. 2 of directive 2006/48/EC).

Problematic is that the current regulatory framework in the EU does not provide specific criteria that supervisory authorities have to use for assessing the suitability of potential investors. Regulators, hence, have considerable latitude in accepting, discouraging, or rejecting a proposed acquisition. This could lead to undue interference by the member states that frustrates investors and makes cross-border M&A impractical. This has recently been confirmed by a survey of the EU Commission on the obstacles to cross-border consolidation in the EU financial sector (EU Commission, 2005a). According to market participants with previous

---

<sup>16</sup> Dewatripont & Tirole (1994), Goodhart, Hartmann, Llewellyn, Rojas-Suarez, & Weisbrod (1998), and Herring & Litan (1995) list the potential instability and the key role the financial sector plays in the economy as reasons for the special regulatory treatment of banks.

experience in M&A, the supervisory approval process, the misuse of supervisory powers, and political interference are important barriers to cross-border consolidation in the EU financial sector (European Commission, 2005a).

Besides this survey evidence, there were also cases in the past in which regulators tried to block cross-border M&A for other than prudential reasons. The first case that became public was the acquisition of the Portuguese financial group Champlinaud by the Spanish Banco Santander Central Hispanio in 1999. The acquisition was vetoed by the Portuguese government. The grounds for opposing the deal included not only “*late and incomplete notification*” and the “*absence of a transparent structure*” in the new group, but also the “*necessity to protect the national interest*” (European Commission, 1999a). The veto was overruled by the EU Commission, since it was not justified on prudential grounds (European Commission, 1999b). A more recent example is the acquisition of Banca Antonveneta and Banca Nazionale de Lavoro in 2005 by ABN Amro and Banco Bilbao Vizcaya Argentaria, respectively. Together with the results from the survey these examples demonstrate that the merger control has the potential to restrict cross-border consolidation and to prevent efficiency enhancing M&A in the EU banking sector.

#### **4.2 Directive Proposal of the EU Commission**

Initiated by the events in Italy in 2005 and the survey the EU Commission proposed to change Article 16 of the *EU Banking Directive* (2000/12/EC) in September 2006 (European Commission, 2006a). Article 16 regulates the transfer of ownership in the EU banking sector. The proposal’s aim at improving the legal certainty, clarity, and transparency of the merger review process in the EU banking sector (European Commission, 2006a). The proposal modifies the existing framework with regard to the criteria and the procedure used by the supervisory authorities to assess the suitability of the proposed investor.

The directive proposal sets a list of non-discriminatory criteria according to which supervisors have to assess the soundness and prudence of proposed investors. The criteria proposed are (1) the *reputation* of the investor, (2) the *experience* of the



future management, (3) the *financial soundness* of the proposed acquirer, (4) the ongoing *compliance* with EU directives, and (5) no connection to *money laundering* and *terrorism finance* (European Commission, 2006b). These criteria should allow courts to decide on the legality and correct application of the merger review process in case of the refusal of an application (European Commission, 2006b). To control if the supervisory authorities fulfil their obligations, they should additionally provide the EU Commission with all relevant documents on which they have based the prudential assessment. This should reduce the scope for supervisors to block M&A for reasons that are not justified on prudential grounds. Moreover, the EU Commission proposed that the reasons that led to the denial of an acquisition should be made public (European Commission, 2006b).

To decrease legal uncertainty and risk, the directive proposal, furthermore, aims at reducing the time period supervisory authorities have to veto an acquisition. Under the current directive, regulators have three months to veto an acquisition (Article 19, p. 1, s. 2). According to the proposal, the EU Commission plans to reduce the assessment period to 30 working days for intra-EU mergers (European Commission, 2006b). If the supervisor requests additional information to assess the soundness and prudence of the potential investor, this period shall be extended only once and shall not exceed ten working days. M&A involving banks from third countries shall be assessed within a period of maximum 50 working days (European Commission, 2006b). If the supervisory authorities do not oppose the proposed acquisition within this period, the transaction shall be deemed to be approved. The reform proposal was implemented in 2007 by directive 2007/44/EC.

## **5 Indices on Merger Control**

I made a survey among the supervisory authorities in the EU between November 2006 and March 2007 to measure the degree of transparency of merger control in the EU banking sector. The regulators were asked to provide detailed information on ownership limits, reporting and approval requirements for ownership transfers in the banking sector, and on the criteria that are used by the supervisor to assess

the suitability of potential investors. The questionnaire is presented in Table A1 in the appendix. The questionnaire was filled out by the supervisors in the Czech Republic, Italy, Germany, Greece, Latvia, Lithuania, Luxembourg, Malta, Portugal, the Slovak Republic, and Sweden. In case that regulators did not fill out the questionnaire, I use other sources of information like, for example, national banking laws and various reports of the *International Monetary Fund* to assess the transparency of merger control. I also use these sources of information to cross-check the information obtained from the questionnaire. Additional information comes from the *Banking and Supervision Database* of the *World Bank* (Barth, Caprio, & Levine, 2001 and 2006). For a complete list of data sources see Table A2.

Based on these sources I have constructed three indices that measure the scope for supervisors and politicians to block M&A in the banking sector for reasons that are not related to the soundness and prudence of the proposed investor. The indices are available for the following 20 EU countries for the period between 1997 and 2005: Austria, Finland, Germany, Greece, Portugal, Sweden, Spain, the Netherlands, Luxembourg, France, and Italy (hereafter: *Western Europe*), as well as Malta, the Czech Republic, the Slovak Republic, Slovenia, Estonia, Latvia, Lithuania, Hungary, and Poland (hereafter: *Central and Eastern Europe*).

The indices constructed are:

- *Independence of the Supervisory Authority Index*
- *Transparency of Merger Control Index*
- *Frequency of Merger Control Index*

Each of these indices measures different aspects of merger control in the EU banking sector. The Independence of the Supervisory Authority Index measures the independence of the supervisor from banks and politicians. If supervisors are more independent, politicians and local banks are less able to put pressure on the regulator to block M&A for reasons that are not justified on prudential grounds. The Transparency of Merger Control Index measures the transparency of the

merger review process. I assume that regulators have more scope to block cross-border M&A if merger control lacks transparency. The Frequency of Merger Control Index focuses on how often ownership transfers require approval by the supervisor. The index, hence, measures how often regulators have the chance to block ownership transfers for other than prudential reasons.

### **5.1 Independence of the Supervisory Authority Index**

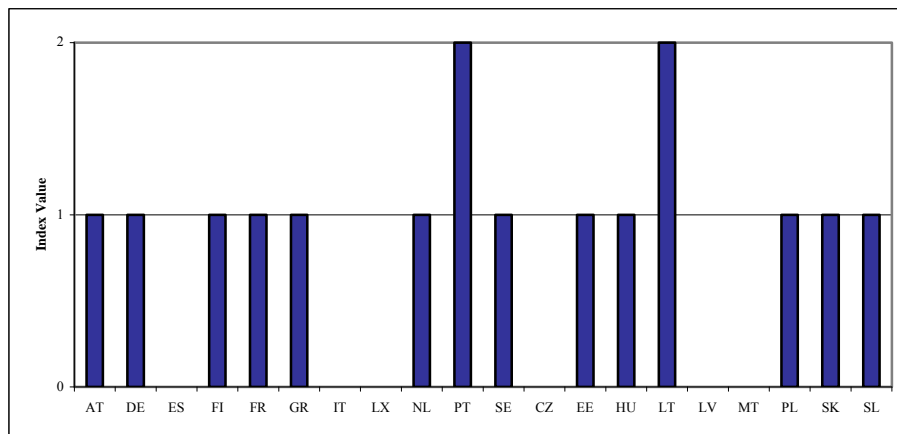
The Independence of the Supervisory Authority Index measures the degree of independence of the supervisory authority. The index is constructed based on data from the Banking and Supervision Database of the World Bank (Barth et al., 2001 and 2006). Additional information comes from national banking laws and other sources. Additional sources are necessary, since data from the Banking and Supervision Database are only available for the years 1998, 1999, 2000, 2003, and 2008. The Independence of the Supervisory Authority Index consists of two components.

The first component measures the degree to which the supervisory authority is independent from the government.

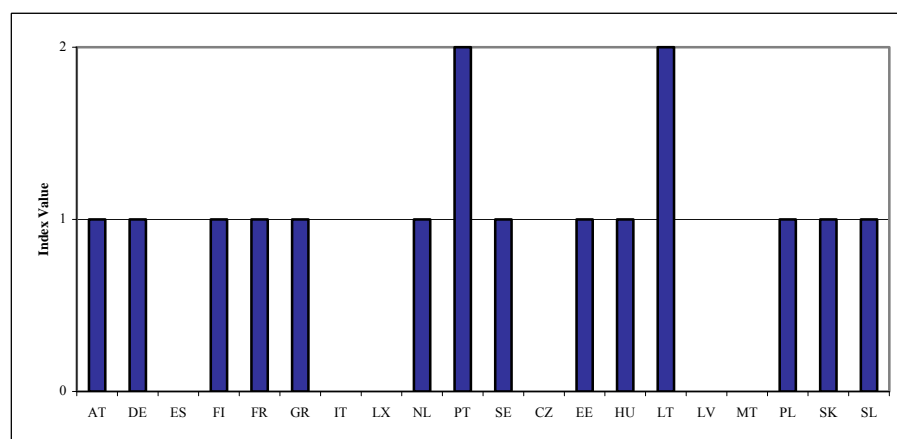
- If the head of the supervisory authority is only accountable to the Prime Minister, the Minister of Finance, or any other member of the cabinet, the index gets a value of zero.
- If the head of the supervisory authority is accountable to a legislative body, such as parliament or congress, the index gets a value of one.

This corresponds to the *Independence of the Supervisory Authority Index-Political* (Barth et al., 2006). The second component is the *Independence of the Supervisory Authority Index-Banks* (Barth et al., 2006). This index measures whether supervisors are legally liable for damages to a bank caused by its actions. It, hence, measures the degree to which the supervisor is independent from banks. Both indices are used by Carletti et al. (2007) as well.

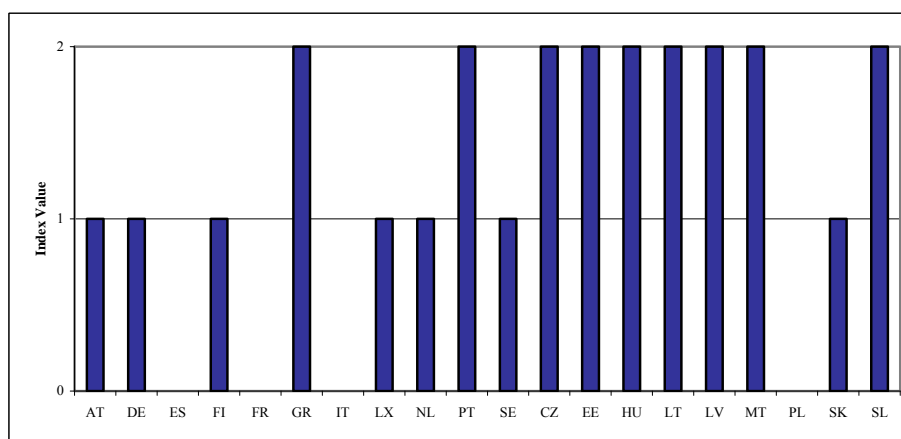
**Figure 1: Independence of the Supervisory Authority Index  
1997**



**2001**



**2005**



Source: Own calculations (2007). Figure 1 shows the Independence of the Supervisory Authority Index for the years 1997, 2001, and 2005. The countries for which index values are available are Austria (AT), the Czech Republic (CZ), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Latvia (LV), Lithuania (LI), Luxembourg (LU), Malta (MT), Poland (PL), Portugal (PT), the Slovak Republic (SK), Slovenia (SL), Spain (ES), and Sweden (SE).

**Table 5: Summary Statistics for the Independence of the Supervisory Authority Index**

	Obs.	Mean	Median	Max	Min	Std. Dev.
All Countries	180	1.10	1.00	2.00	0.00	0.35
Western Europe	99	0.95	1.00	1.00	0.00	0.22
Central and Eastern Europe	81	1.29	1.50	2.00	0.00	0.39

T-test statistic on the sample mean: Western Europe vs. Central and Eastern Europe: -6.9417\*\*\*

Source: Own calculations (2009). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 5 shows descriptive statistics for the Independence of the Supervisory Authority Index. Descriptive statistics are calculated for the period between 1997 and 2005. Western Europe includes Austria, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal, Spain, and Sweden. Central and Eastern Europe comprises the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic, and Slovenia.

- If the supervisory authority can be held liable for damages to a bank caused by its actions, the index gets a value of zero.
- If the supervisory authority *cannot* be held liable for damages to a bank caused by its actions, the index gets a value of one.

The Independence of the Supervisory Authority Index is calculated as the sum of the first and the second component. The index, hence, ranges from zero to two with higher values indicating greater independence. Figure 1 shows the index for the years 1997, 2001, and 2005. Descriptive statistics are presented in Table 5. The independence of the supervisory authority varies across countries and years. In general, the regulators have become more independent over time. In particular, the supervisors in Central and Eastern Europe are more independent. The only exception is Poland where the regulator has lost some of its independence. On average, however, the supervisory authorities are significantly more independent in Central and Eastern Europe than in Western Europe (with a T-test statistic of -6.9). The lowest degree of independence is reported in France, Italy, and Spain. In these countries, the supervisor is accountable to the government and the banks supervised.

## 5.2 Transparency of Merger Control Index

The Transparency of Merger Control Index measures the transparency of the merger review process in the EU banking sector. The degree of transparency is measured based on the idea that merger control is more transparent if regulators have to assess the soundness and prudence of potential investors based on criteria

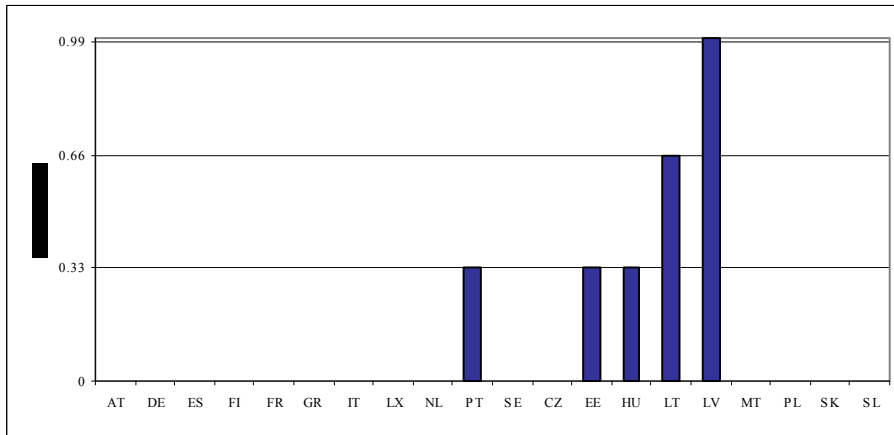
like the reputation or the financial soundness of the proposed investor. This is in line with the proposal of the EU Commission (2006b). The proposal aims at increasing the transparency and legal certainty of the merger review process in the EU banking sector by introducing a list of non-discriminatory criteria which are known in advance and according to which the supervisory authority has to assess the soundness and prudence of the proposed investor. This should allow courts to decide on the legality and correct application of the merger review process in case of the refusal of an application (EU Commission, 2006b).

The index is constructed as follows:

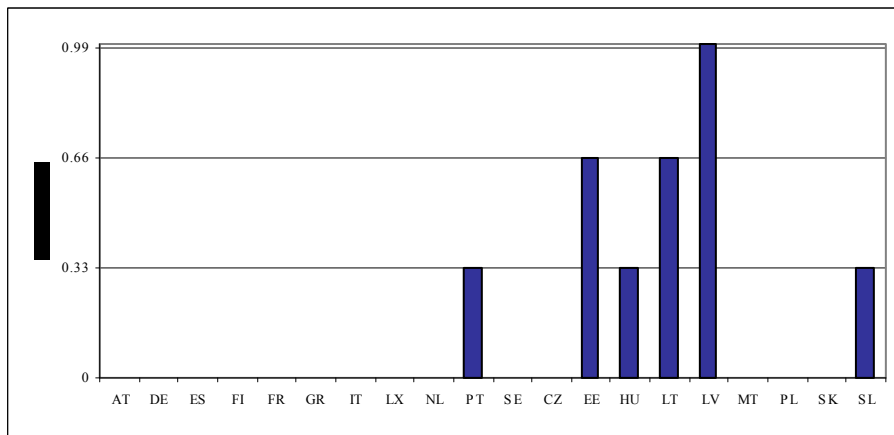
- The index gets a value of zero if no specific criteria are listed in national banking laws according to which the supervisory authority has to assess the soundness and prudence of a proposed investor. In this case, merger control lacks procedural transparency and supervisors are able to refuse authorization based on opaque concerns.
- If the supervisor assesses the soundness and prudence of a proposed investor based on either (1) the reputation, (2) the financial soundness of the proposed investor, or (3) the experience and skills of future managers and directors, the index value is 0.33. Each of these criteria has been proposed by the EU Commission (2006a) in its reform proposal.
- If the supervisory authority uses two of these criteria, the index gets a value of 0.67.
- If all of these criteria are listed in banking laws, the index gets a value of one.

The index, hence, ranges from zero to one with higher values indicating that merger control is more transparent. Figure 2 shows the Transparency of Merger Control Index for the years 1997, 2001, and 2005. Descriptive statistics are presented in Table 6. In most countries, merger control lacks transparency. This could lead to a situation in which the supervisors can refuse authorization based

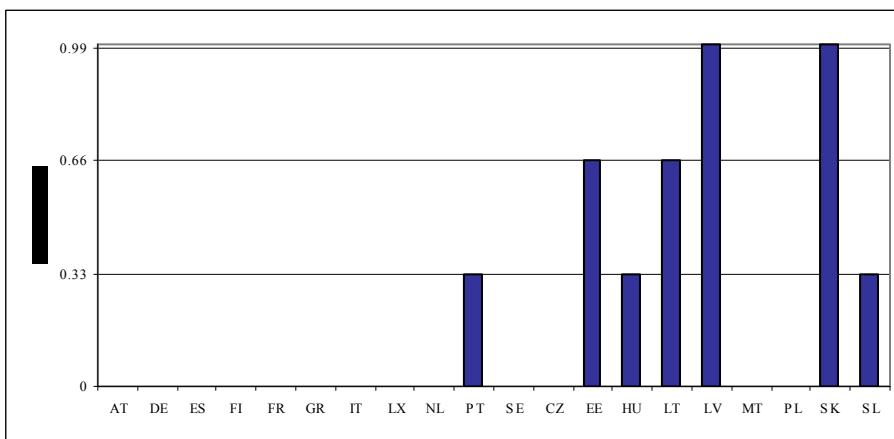
**Figure 2: Transparency of Merger Control Index  
1997**



**2001**



**2005**



Source: Own calculations (2007). Figure 2 shows the Transparency of Merger Control Index for the years 1997, 2001, and 2005. The countries for which index values are available are Austria (AT), the Czech Republic (CZ), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Latvia (LV), Lithuania (LI), Luxembourg (LU), Malta (MT), Poland (PL), Portugal (PT), the Slovak Republic (SK), Slovenia (SL), Spain (ES), and Sweden (SE).

**Table 6: Summary Statistics for the Transparency of Merger Control Index**

	Obs.	Mean	Median	Max	Min	Std. Dev.
All Countries	180	0.18	0.00	1.00	0.00	0.31
Western Europe	99	0.03	0.00	0.33	0.00	0.95
Central and Eastern Europe	81	0.37	0.33	1.00	0.00	0.38

T-test statistic on the sample mean: Western Europe vs. Central and Eastern Europe: -7.8523\*\*\*

Source: Own calculations (2009). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 6 shows descriptive statistics for the Transparency of Merger Control Index. Descriptive statistics are calculated for the period between 1997 and 2005. Western Europe includes Austria, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal, Spain, and Sweden. Central and Eastern Europe comprises the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic, and Slovenia.

on opaque concerns (European Commission, 2005b). The reform proposal of the EU Commission (2006b) intends to change this. It requires the member countries to provide specific criteria in national banking laws according to which the regulator has to assess the soundness and prudence of the proposed investor. This should increase transparency and reduce the scope for supervisors to block certain acquisitions. If the proposal is implemented, all member states should have an index value of one. Some countries already use part of the proposed criteria. These countries are mainly located in Central and Eastern Europe. The most frequently used criterion is the financial solidity of the proposed investor. The only countries in Central and Eastern Europe that do not provide any public criteria in their banking laws are the Czech Republic and Poland. On average, however, merger control is significantly more transparent in Central and Eastern Europe than in Western Europe (with a T-test statistic of -7.8). This gives supervisors more latitude in discouraging or rejecting a proposed acquisition in Western Europe.

### 5.3 Frequency of Merger Control Index

The Frequency of Merger Control Index measures how frequently ownership transfers in the banking sector have to be approved by the supervisory authority. The first component of the index measures how large the initial shareholding (in banking laws mostly referred to as "*qualified holding*") has to be to become subject to approval by the regulator.

- If the initial shareholding that requires supervisory approval is less than five percent, the index value is zero.



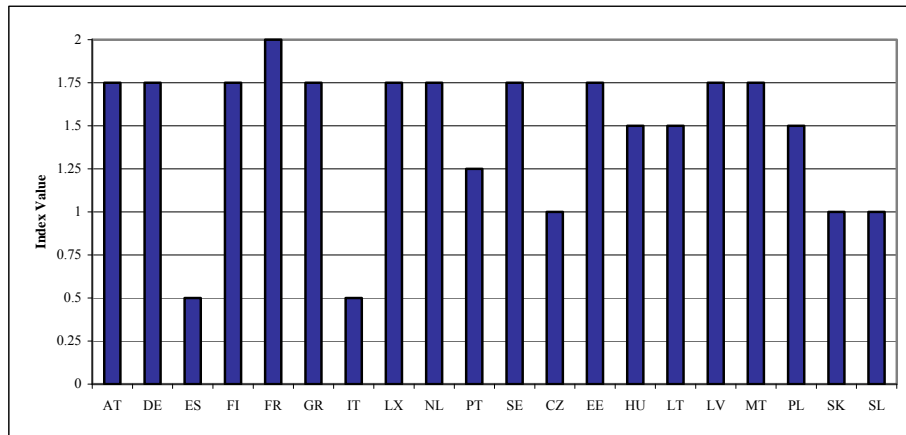
- If the initial shareholding is equal to or larger than five percent, but less than ten percent, the index gets a value of 0.5.
- If the initial shareholding that requires approval is equal to or larger than ten percent, the index value is one.

The 10-percent threshold is consistent with the EU norm (Article 4, p. 11 of directive 2006/48/EC). The EU member countries are, however, allowed to set lower limits, since the 10-percent threshold is only a minimum requirement. Because the scope for regulators to block ownership transfers decreases as the size of the initial holding that does not require approval increases, a larger value indicates fewer opportunities for supervisors to block ownership transfers in the banking sector. More important than the size of the qualified holding may be how often the increase of an existing shareholding has to be approved. The EU norm is that every ownership transfer that leads to an increase of a qualified holding so that the shareholding exceeds 20, 33, and 50 percent requires additional approval (Article 19, p. 1 of directive 2006/48/EC). The same holds if investors want to reduce their shareholding below these thresholds. The EU member states are, however, free to set more than three thresholds. The second component of the Frequency of Merger Control Index measures which the member countries have used this option.

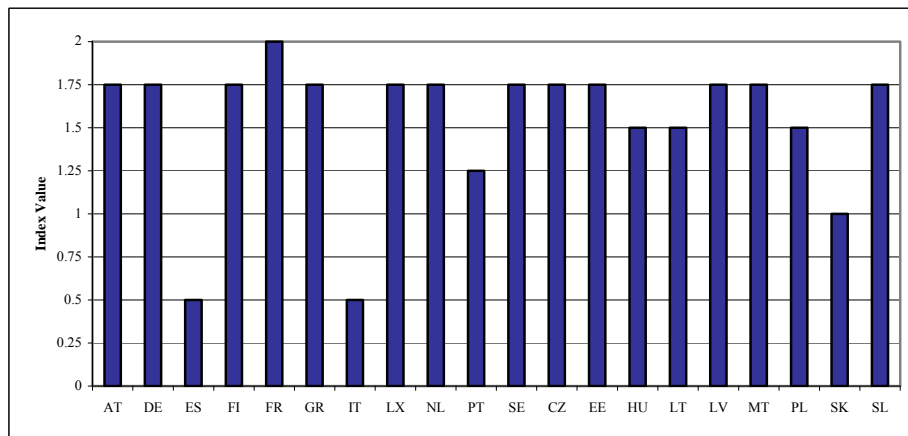
- If there are more than or equal to six thresholds that require additional approval by the regulator, the index gets a value of zero.
- If there are 5/4/3 or less than three thresholds, the index has a value of 0.25/0.5/0.75/1, respectively.

The Frequency of Merger Control Index is calculated as the sum of the first and the second component. The index, hence, ranges from zero to two with higher values indicating fewer opportunities for supervisors to block certain acquisition. Figure 3 shows the index for the years 1997, 2001, and 2005. Descriptive statistics are presented in Table 7. The Spanish supervisory authority has the most

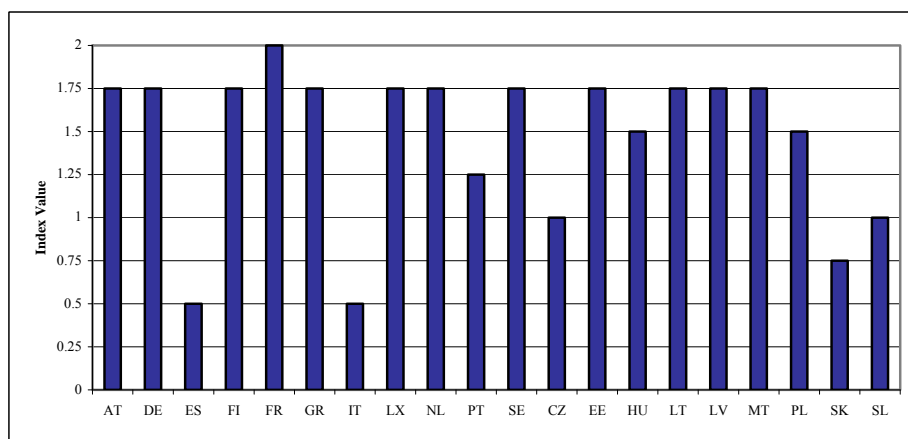
**Figure 3: Frequency of Merger Control Index  
1997**



**2001**



**2005**



Source: Own calculations (2007). Figure 3 shows the Frequency of Merger Control Index for the years 1997, 2001, and 2005. The countries for which index values are available are Austria (AT), the Czech Republic (CZ), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Latvia (LV), Lithuania (LI), Luxembourg (LU), Malta (MT), Poland (PL), Portugal (PT), the Slovak Republic (SK), Slovenia (SL), Spain (ES), and Sweden (SE).

**Table 7: Summary Statistics for the Frequency of Merger Control Index**

	Obs.	Mean	Median	Max	Min	Std. Dev.
All Countries	180	1.52	1.75	2.00	0.50	0.40
Western Europe	99	1.51	1.75	2.00	0.50	0.47
Central and Eastern Europe	81	1.54	1.75	1.75	0.75	0.30

T-test statistic on the sample mean: Western Europe vs. Central and Eastern Europe: -0.4354

Source: Own calculations (2009). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 7 shows descriptive statistics for the Frequency of Merger Control Index. Descriptive statistics are calculated for the period between 1997 and 2005. Western Europe includes Austria, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal, Spain, and Sweden. Central and Eastern Europe comprises the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic, and Slovenia.

opportunities to accept, discourage, or reject a takeover, since it not only has to approve every ownership transfer that exceeds five percent, but also every ownership transfer that increases an existing shareholding above the 10-, 15-, 20-, 25-, 33-, 40-, 50-, 66-, and 75-percent threshold. Italy, Portugal, the Czech Republic, Poland, the Slovak Republic, and Slovenia report low index values as well. The Frequency of Merger Control Index does not indicate significant differences in approval requirements between Central and Eastern Europe and Western Europe.

## **6 Merger Control and Cross-Border Consolidation in the EU Banking Sector**

To find out whether merger control constitutes a systematic barrier to cross-border consolidation in the EU banking sector, I analyze the relationship between my indices and different indicators of banking market integration. The first indicator is the total number and the total deal value of domestic and cross-border M&A in the EU banking sector. Table 8 indicates that domestic deals outnumber cross-border deals in Western Europe. The largest number of domestic M&A is reported in the United Kingdom, Italy, Germany, and France. These countries also record the largest number of cross-border M&A. However, relative to domestic deals cross-border deals are less important.

Table 9 indicates that Central and Eastern Europe and Western Europe also differ in terms of the average deal size. While domestic and cross-border deals are of almost equal size in Western Europe, cross-border deals are much larger than

**Table 8: Total Number of Deals and Total Deal Value of Domestic and Cross-Border M&A in the EU Banking Sector**

	Domestic M&A		Cross-Border M&A	
	Number of Deals	Deal Value (Mio. Euro)	Number of Deals	Deal Value (Mio. Euro)
Austria	23	7,826	13	9,997
Belgium	73	26,912	26	12,065
Denmark	38	9,001	20	4,890
Finland	73	3,372	11	17
France	162	76,384	67	15,801
Germany	190	42,586	52	21,864
Greece	47	2,357	4	429
Ireland	18	1,625	19	3,670
Italy	259	51,491	34	5,295
Luxembourg	19	129	31	5,405
Netherlands	43	8,054	43	4,543
Portugal	32	8,097	15	4,105
Spain	58	30,196	39	1,041
Sweden	37	1,730	17	485
United Kingdom	563	106,917	184	43,382
<i>Western Europe</i>	<i>1,635</i>	<i>376,677</i>	<i>575</i>	<i>132,989</i>
Cyprus	6	29	6	115
Czech Republic	17	309	34	4,946
Estonia	8	0	27	2,062
Hungary	39	106	30	602
Latvia	4	0	27	53
Lithuania	9	86	15	285
Malta	0	0	1	205
Poland	45	1,256	54	4,430
Slovak Republic	5	37	14	1,003
Slovenia	6	3	4	350
<i>Central and Eastern Europe</i>	<i>139</i>	<i>1,826</i>	<i>212</i>	<i>14,051</i>

Source: Zephyr (2009). Table 8 shows the total number and the total deal value of domestic and cross-border M&A in the EU banking sector between 1997 and 2005.

domestic deals in Central and Eastern Europe. There are, however, large differences across countries. While cross-border M&A are, on average, always larger in Central and Eastern Europe, cross-border M&A are larger only in the smaller Western European countries (e.g. Austria, Belgium, and Ireland). In the larger Western European countries (e.g. France, Germany, and Italy), in contrast, domestic deals are much larger than cross-border M&A. Boot (1999) argues that in some EU countries central banks, ministries of finance, and domestic credit institutions operate in close concert to promote domestic and to block cross-border M&A because they want the largest banks in their country to be in domestic hands.

**Table 9: Average Deal Size of Domestic and Cross-Border M&A in the EU Banking Sector**

	Domestic M&A		Cross-Border M&A	
	Number of Deals	Average Deal Size (Mio. Euro)	Number of Deals	Average Deal Size (Mio. Euro)
Austria	23	340	13	769
Belgium	73	369	26	464
Denmark	38	237	20	245
Finland	73	46	11	2
France	162	472	67	236
Germany	190	224	52	420
Greece	47	50	4	107
Ireland	18	90	19	193
Italy	259	199	34	156
Luxembourg	19	7	31	174
Netherlands	43	187	43	106
Portugal	32	253	15	274
Spain	58	521	39	27
Sweden	37	47	17	29
United Kingdom	563	190	184	236
<i>Western Europe</i>	<i>1,635</i>	<i>230</i>	<i>575</i>	<i>231</i>
Cyprus	6	5	6	19
Czech Republic	17	18	34	145
Estonia	8	0	27	76
Hungary	39	3	30	20
Latvia	4	0	27	2
Lithuania	9	10	15	19
Malta	0	.	1	205
Poland	45	28	54	82
Slovak Republic	5	7	14	72
Slovenia	6	1	4	88
<i>Central and Eastern Europe</i>	<i>139</i>	<i>13</i>	<i>212</i>	<i>66</i>

Source: Zephyr (2009) and own calculations (2009). Table 9 shows the total number and the average deal size of domestic and cross-border M&A in the EU banking sector between 1997 and 2005. The average deal size is calculated by dividing the total deal value by the total number of deals.

Another indicator for the degree of banking market integration is the market share of foreign branches and subsidiaries. Subsidiaries are usually established via the acquisition of local banks and are the dominant entry mode for banks that operate with local clients (Foccarelli & Pozzolo, 2005 and Cerutti et al., 2007). Table 10 indicates that foreign subsidiaries while having a large market share in Central and Eastern Europe usually only have a small market share in Western Europe. Notable exceptions are Luxembourg and Ireland reflecting their position as international financial centres. The large market share of foreign subsidiaries in Finland is the result of a consolidation process in the Nordic countries (EU

**Table 10: Market Share of Foreign Banks in the EU Banking Sector**

	Total Assets of Credit Institutions (Mio. Euro)	Total Assets of Foreign Branches (Mio. Euro)	Total Assets of Foreign Subsidiaries (Mio. Euro)	Market Share of Foreign Branches	Market Share of Foreign Subsidiaries
Austria	720,534	6,427	137,729	0.01	0.19
Belgium	1,055,305	49,583	196,620	0.05	0.19
Denmark	722,096	34,932	114,310	0.05	0.16
Finland	234,520	12,781	124,175	0.05	0.53
France	5,090,058	145,951	445,360	0.03	0.09
Germany	6,826,558	103,346	623,494	0.02	0.09
Greece	281,066	28,489	49,401	0.10	0.18
Ireland	941,909	94,974	314,093	0.10	0.33
Italy	2,509,436	138,996	99,343	0.06	0.04
Luxembourg	792,418	145,477	603,701	0.18	0.76
Netherlands	1,697,708	15,827	23,345	0.01	0.01
Portugal	360,190	19,542	62,009	0.05	0.17
Spain	2,150,650	159,862	87,319	0.07	0.04
Sweden	653,178	55,034	3,677	0.08	0.01
United Kingdom	8,320,254	3,260,000	1,049,000	0.39	0.13
<i>Western Europe</i>	32,355,880	427,1221	3,933,576	0.13	0.12
Cyprus	60,366	4,319	12,338	0.07	0.20
Czech Republic	104,950	9,694	88,336	0.09	0.84
Estonia	11,830	1,161	10,573	0.10	0.89
Hungary	74,653	112	43,871	0.00	0.59
Latvia	15,570	0	8,276	0.00	0.53
Lithuania	13,099	0	9,797	0.00	0.75
Malta	27,195	0	8,802	0.00	0.32
Poland	152,086	1,385	100,674	0.01	0.66
Slovak Republic	36,399	8,055	27,383	0.22	0.75
Slovenia	30,049	523	6,234	0.02	0.21
<i>Central and Eastern Europe</i>	526,197	25,249	316,284	0.05	0.60

Source: ECB (2009) and own calculations (2009). Table 10 shows the total assets and the market share of foreign branches and subsidiaries in the EU banking sector in the year 2005. The market share is calculated by dividing the total assets of foreign branches and subsidiaries, respectively, by total banking sector assets.

Commission, 2005a). The main outcome of this regional consolidation process is the emergence of a large financial services group operating in the Nordic and Baltic Sea region. Since Sweden is the home base of the group, the market share of foreign subsidiaries is zero in this country. This suggests that the small market share of foreign subsidiaries can in some EU countries be attributed to the fact that these countries serve as home base for large internationally active banking groups (ECB, 2006). Since branches are the main entry mode for banks that enter foreign banking markets to provide financial services to local clients when they operate abroad, they usually have a smaller market share than foreign subsidiaries (Foccarelli and Pozzolo, 2005 and Cerutti et al., 2007). They only exceptions are Italy, Spain, Sweden, and the United Kingdom. In these countries, foreign

branches have a larger market share than foreign subsidiaries. In the EU, market entry via branches is easier than via subsidiaries, since EU branches do not need prior approval by the supervisor in the host country.

To find out whether merger control constitutes a systematic barrier to cross-border consolidation in the EU banking sector, I calculate piecewise correlation coefficients between different indicators of banking market integration and my indices. Since the indices are ordinal-scaled, Spearman rank correlation coefficients are used. Rank correlations require at least one ordinal-scaled variable. An additional advantage is that Spearman rank correlation coefficients do not require normally distributed variables. The results of the correlation analysis are reported in Table 11. The correlation analysis suggests that degree of political independence of the supervisory authority and the transparency of merger control matter for the level of integration in the EU banking sector. The correlation between the proportion of domestic and cross-border M&A and the Independence of the Supervisory Authority Index and Transparency of Merger Control Index is positive and significant both in terms of deal number (0.46 and 0.65, respectively) and deal value (0.49 and 0.68, respectively). Both indices are also positive and significantly correlated with the market share of foreign subsidiaries (0.31 and 0.56, respectively). This might have been expected, since subsidiaries are usually established via the acquisition of or the merger with a foreign credit institution. This is also reflected by the significant and positive correlation between the market share of foreign subsidiaries and the proportion of cross-border deals (0.63 in terms of deal number and 0.67 in terms of deal volume). Interesting is that the market share of foreign branches is negatively correlated with the Independence of the Supervisory Authority Index and the Transparency of Merger Control Index (-0.10 and -0.20, respectively). Although the coefficients are not significant, the negative correlation indicates that banks choose branches as entry mode in countries where the supervisor is less independent and merger control less transparent. Politicians and supervisors cannot block foreign bank entry via branches, since EU branches do not need prior approval by the supervisor in the host country. The frequency of approval

**Table 11: Correlation Analysis**

	<b>Independence of the Supervisory Authority Index</b>	<b>Transparency of Merger Control Index</b>	<b>Frequency of Merger Control Index</b>	<b>Proportion of Domestic Deals (Number)</b>	<b>Proportion of Cross-Border Deals (Number)</b>	<b>Proportion of Domestic Deals (Deal Value)</b>	<b>Proportion of Cross-Border Deals (Deal Value)</b>	<b>Market Share of Foreign Branches (Assets)</b>	<b>Market Share of Foreign Subsidiaries (Assets)</b>
<b>Independence of the Supervisory Authority Index</b>	1.0000								
<b>Transparency of Merger Control Index</b>	0.7917*	1.0000							
<b>Frequency of Merger Control Index</b>	-0.0419	-0.1852	1.0000						
<b>Proportion of Domestic Deals (Number)</b>	-0.4651*	-0.6522*	0.1628	1.0000					
<b>Proportion of Cross-Border Deals (Number)</b>	0.4651*	0.6522*	-0.1628	-1.0000*	1.0000				
<b>Proportion of Domestic Deals (Deal Value)</b>	-0.4960*	-0.6873*	0.0070	0.8403*	-0.8403*	1.0000			
<b>Proportion of Cross-Border Deals (Deal Value)</b>	0.4960*	0.6873*	-0.0070	-0.8403*	0.8403*	-1.0000*	1.0000		
<b>Market Share of Foreign Branches (Assets)</b>	-0.1077	-0.2050	-0.1006	0.1677	-0.1677	0.1979	-0.1979	1.0000	
<b>Market Share of Foreign Subsidiaries (Assets)</b>	0.3174	0.5641*	-0.1219	-0.6392*	0.6392*	-0.6722*	0.6722*	0.0198	1.0000

Source: Own calculations (2009). \* indicates significance at the 10-% level. Table 11 reports Spearman rank correlation coefficients between the Independence of the Supervisory Authority Index, the Transparency of Merger Control Index, the Frequency of Merger Control Index and different indicators for the integration of the EU banking sector. The indices are average values for the period between 1997 and 2005. Statistics on domestic and cross-border M&A are based on data on takeover activity in the EU banking sector between 1997 and 2005. The market share of foreign branches and subsidiaries is calculated for the year 2005.



requirements, in contrast, does not seem to matter for the level of consolidation in the EU banking sector. The correlation coefficient, between the Frequency of Merger Control Index and the proportion of domestic and cross-border M&A is zero. The correlation between the Frequency of Merger Control Index and the market share of foreign branches and subsidiaries is not significant as well. The correlation analysis confirms the picture that a more independent supervisor and a more transparent merger review process promote cross-border M&A in the EU banking sector. This suggests that the proposal of the EU Commission to increase the legal certainty and transparency of merger control should facilitate cross-border consolidation. However, the low importance of the cross-border M&A in some Western European countries may also be the result of comparatively higher efficiency barriers in Western Europe than in Central and Eastern Europe. This suggests that a more thorough empirical analysis is necessary to find out which barriers restrict cross-border M&A.

This is done in the following sections. The next section presents the model that is used to determine which barriers limit the degree of cross-border consolidation in the EU banking sector. The dataset and the econometric model is described in Section 7. The determinants that affect the decision to take over domestic or foreign banks are presented in Section 8. In Section 9, I use logit and multinomial logit regressions to estimate the probability that a bank is taken over as a function of bank characteristics, country characteristics, and the transparency of merger control. The robustness of the results is tested in Section 10. Section 11 concludes.

## **7 Data and Econometric Model**

### **7.1 Data**

The dataset includes data on banks and M&A in the EU banking sector for the period between 1997 and 2005. The countries included are Austria, Belgium, the Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Latvia, Lithuania, the Netherlands, Poland, Portugal, the Slovak Republic, Slovenia, Sweden, and the United Kingdom. Information on M&A comes from *Zephyr* (2008). Bank balance-sheet data is taken from

*Bankscope* (2008). I use consolidated balance sheets whenever possible and focus on commercial banks. The geographical distribution of banks and deals is reported in Table 12. The dataset includes 1,407 banks. The largest number of banks is located in Germany (256), France (246), Italy (158), and the United Kingdom (153). All other countries have fewer than 100 banks. The dataset comprises 150 M&A of which 77 were domestic and 73 cross-border. Table 12 indicates that there are differences in takeover activity across EU countries. While domestic takeovers outnumber cross-border M&A in most Western European countries, cross-border deals are more important in Central and Eastern Europe. The distribution of deals across years is reported in Table 13.

## 7.2 Econometric Model

To find out which banks are more likely to be taken over, I estimate a logistic model:

$$P_{jt} = \frac{\exp(X_j \beta)}{1 + \exp(X_j \beta)}$$

where  $P_{jt}$  is the probability that bank  $j$  is taken over in period  $t$ .  $X$  is a matrix of bank- and country-specific variables that are relevant for a bank becoming a target.  $\beta$  is the coefficient vector.

Problematic is that the effect of the explanatory variables may differ for domestic and cross-border M&A. Banks may, for example, be less likely to be acquired by foreign banks if supervisors and politicians block cross-border takeovers. Domestic M&A may, in contrast, be more likely if politicians promote M&A among local credit institutions to make them larger and more difficult to acquire. Hence, I additionally estimate a multinomial logit model that allows multiple choices. The probability that a bank is taken over is then described as follows:

$$P_{jt}^D = \frac{\exp(X_j \beta^D)}{1 + \exp(X_j \beta^D) + \exp(X_j \beta^{CB})}$$

**Table 12: Banks and Deals by Country**

Country	Number of Banks	Number of M&A	of which: Domestic M&A	of which: Cross-Border M&A
Austria	57	2	1	1
Belgium	36	1	1	0
Cyprus	18	0	0	0
Czech Republic	27	7	1	6
Denmark	60	3	3	0
Estonia	6	11	0	11
Finland	7	0	0	0
France	246	13	7	6
Germany	256	27	20	7
Greece	25	3	1	2
Hungary	21	8	2	6
Ireland	39	1	0	1
Italy	158	22	21	1
Latvia	25	9	1	8
Lithuania	11	5	1	4
Netherlands	49	2	0	2
Poland	51	10	8	2
Portugal	10	1	1	0
Slovak Republic	21	11	1	10
Slovenia	25	4	2	2
Spain	87	4	3	1
Sweden	19	2	2	0
United Kingdom	153	4	1	3
Total	1,407	150	77	73

Source: Zephyr (2008) and Bankscope (2008). Table 12 shows the geographical distribution of banks and M&A included in the sample.

**Table 13: Deals by Year of Completion**

Year	Number of M&A	of which: Domestic M&A	of which: Cross-Border M&A
1997	4	1	3
1998	3	1	2
1999	15	10	5
2000	20	11	9
2001	22	14	8
2002	26	15	11
2003	16	7	9
2004	15	8	7
2005	29	10	19
Total	150	77	73

Source: Zephyr (2008). Table 13 shows the annual number of domestic and cross-border M&A in the EU banking sector that took place between 1997 and 2005.

and

$$P_{jt}^{CB} = \frac{\exp(X_{jt}\beta^{CB})}{(1 + \exp(X_{jt}\beta^D) \exp(X_{jt}\beta^{CB}))}$$

where  $P_{jt}^D$  and  $P_{jt}^{CB}$  is the probability that a bank is taken over by a domestic and a foreign bank, respectively.  $\beta^D$  is the coefficient vector for domestic and  $\beta^{CB}$  for cross-border targets. The effect of the explanatory variables is, hence, allowed to differ for domestic and cross-border M&A.

## 8 Determinants of M&A in the EU Banking Sector

### 8.1 Bank Characteristics

To find out which banks are more likely to be taken over, I control for bank assets (SIZE), the return-on-assets (ROA), the ratio of net-interest revenue to total revenue (NIREV), the ratio of total equity to total bank assets (CAPITAL), and the ratio of liquid assets to customer and short-term funding (LIQUID). All variables are winsorized at the 1- and 99-percent level.

**ROA** – The return-on-assets controls for the motive to generate X-efficiency gains from takeovers. Since X-efficiency gains are more likely to be achieved if the target is inefficient, I expect that banks with a low ROA are more likely to be acquired. Underperforming banks may not only offer greater opportunities for efficiency enhancement. They may also be more risky if the source of the underperformance is a high level of bad loans. In such a case, a domestic acquirer may be in a better position to reduce the amount of bad loans and to improve performance than a foreign acquirer (Hernando et al., 2009). This suggests that efficiency enhancement should a priori be more relevant for domestic than for cross-border M&A.

**SIZE** – The logarithm of total bank assets measures bank size. SIZE controls for the motive to generate economies of scale and scope. Since economies of scale and scope increase with bank size, large banks are more attractive targets.

However, organizational complexity also increases with SIZE (Berger, Saunders, Scalise, & Udell, 1998). This may reduce the potential to generate cost synergies from takeovers and lower the probability that a bank is taken over. The acquisition of large banks may also be more likely to raise problems with the antitrust authority. This should be particularly relevant for domestic M&A, since foreign credit institutions usually do not have any or only a small market share in the host country. This suggests that the effect of SIZE may differ for domestic and cross-border M&A.

**NIREV** – I use the ratio of net-interest revenue to total revenue to control for the business model of a bank. A large proportion of interest income indicates that a bank is more active in retail-banking. This may be relevant for banks that take over foreign banks to get access to retail-banking markets. Since foreign retail-banking markets are not easily conquerable from distance, the most effective way to get access to such markets seems to be the merger with or the acquisition of an existing local credit institution (Cabral et al., 2002). Retail-banking has become more attractive because it provides a more stable source of income than investment banking. Retail-banks also face lower refinancing costs, since refinancing via deposits is cheaper than via interbank borrowing. Both has become visible in the recent crisis. However, retail-banking is often regarded as more costly in terms of the required branch network and staff (Demirgüç-Kunt & Huizinga, 2000). Non-interest-earning activities are also often considered as having a larger growth potential than interest-earning activities. For this reason, NIREV is often regarded as measuring bank inefficiency as well (Foccarelli & Pozzolo, 2001). Banks with higher values for NIREV may, hence, not only have a stronger focus on retail-banking activities, but may also be less efficient. Both suggest that banks are more likely to be acquired if they focus on interest-earning activities. Since market access is more important for foreign than for domestic banks, I expect NIREV to be more relevant for cross-border than for domestic M&A.

**CAPITAL** – I include the ratio of total equity to total bank assets to control for the level of bank capital. The effect of CAPITAL is not clear a priori. On the one

hand, a higher level of capital may raise the probability that a bank is acquired if highly capitalized banks are less diversified. Such banks are attractive for acquirers that are more diversified, since they can free capital if they transfer their knowledge on risk diversification on the target (Hernando et al., 2009). However, a high level of capital may also indicate better management skills (Hernando et al., 2009). This may reduce the likelihood that a bank is acquired, since X-efficiency gains are expected to be smaller. Moreover, Hannan & Pilloff (2009) point out that acquirers prefer highly leveraged (low capitalized) targets because it enables them to maximize the magnitude of post-merger performance gains relative to the cost of achieving those gains.

**LIQUID** – The ratio of liquid assets to customer and short-term funding is included to find out whether liquidity affects that likelihood that a bank is taken over. The effect of LIQUID is unclear. On the one hand, banks are more likely to be acquired if they are close to illiquidity and need external support (Pasiouras, et al., 2007). Hence, a low level of liquidity should raise the likelihood that a bank is taken over. On the other hand, a high level of liquidity may also indicate a lack of investment opportunities and managerial inefficiency (Pasiouras, et al., 2007). This should increase the likelihood that a bank is acquired.

Table 14 present summary statistics for the bank-specific variables. T-tests on the sample mean are reported in Table A3 and piecewise correlation coefficients in Table A4 in the appendix. The numbers are broadly consistent with the hypotheses put forward. Large banks (SIZE) are more likely to be taken over than small credit institutions consistent with the hypothesis that banks are acquired to obtain market power and to generate economies of scale and scope. Measured by the cost-income ratio (CIR) and the return-on-assets (ROA) targets are also less efficient than banks that were not acquired. This supports the hypothesis that banks tend to take over less efficient credit institutions to generate X-efficiency gains from better management and organization. Particularly domestic M&A seem to be driven by the motive to improve X-efficiency. Banks that were not taken over are, in contrast, better capitalized (CAPITAL) and more liquid

**Table 14: Summary Statistics**

<b>All Banks</b>	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Max.</b>	<b>Min.</b>	<b>Std. Dev.</b>
Log(Total Bank Assets) (SIZE)	5,815	13.55	13.39	19.60	9.49	1.91
Cost-Income Ratio (CIR)	5,724	71.33	66.56	273.55	7.69	35.84
Return-on-Assets (ROA)	5,815	0.65	0.58	9.19	-9.08	1.88
Total Equity/Total Assets (CAPITAL)	5,815	12.46	8.47	88.50	1.00	12.96
Liquid Assets/Customer and Short-Term Funding (LIQUID)	5,815	37.32	22.63	271.43	0.00	45.54
Net-Interest Revenue/Total Revenue (NIREV)	5,815	32.82	32.45	92.86	-6.55	18.28
<b>Domestic and Cross-Border Targets</b>	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Max.</b>	<b>Min.</b>	<b>Std. Dev.</b>
Log(Total Bank Assets) (SIZE)	150	14.30	14.13	19.60	9.49	2.01
Cost-Income Ratio (CIR)	149	82.51	75.52	250.00	19.97	33.50
Return-on-Assets (ROA)	150	0.21	0.59	8.13	-9.08	2.16
Total Equity/Total Assets (CAPITAL)	150	10.54	8.24	73.30	1.00	9.69
Liquid Assets/Customer and Short-Term Funding (LIQUID)	150	25.86	20.03	180.19	0.02	25.37
Net-Interest Revenue/Total Revenue (NIREV)	150	35.44	35.25	78.54	-0.32	14.94
<b>Domestic Targets</b>	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Max.</b>	<b>Min.</b>	<b>Std. Dev.</b>
Log(Total Bank Assets) (SIZE)	77	14.44	14.21	19.60	9.49	2.20
Cost-Income Ratio (CIR)	76	87.64	76.85	250.00	34.49	40.12
Return-on-Assets (ROA)	77	0.07	0.31	8.13	-9.08	2.26
Total Equity/Total Assets (CAPITAL)	77	10.56	7.60	73.30	1.00	11.01
Liquid Assets/Customer and Short-Term Funding (LIQUID)	77	26.32	25.80	105.80	0.15	21.67
Net-Interest Revenue/Total Revenue (NIREV)	77	32.84	32.59	78.54	3.94	14.78
<b>Cross-Border Targets</b>	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Max.</b>	<b>Min.</b>	<b>Std. Dev.</b>
Log(Total Bank Assets) (SIZE)	73	14.15	14.08	19.60	10.49	1.79
Cost-Income Ratio (CIR)	73	77.18	73.89	173.26	19.97	23.96
Return-on-Assets (ROA)	73	0.35	0.81	3.02	-9.08	2.05
Total Equity/Total Assets (CAPITAL)	73	10.53	8.58	53.61	1.00	8.16
Liquid Assets/Customer and Short-Term Funding (LIQUID)	73	25.38	15.12	180.19	0.02	28.91
Net-Interest Revenue/Total Revenue (NIREV)	73	38.19	39.51	77.77	-0.32	14.72
<b>Banks that were not taken over</b>	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Max.</b>	<b>Min.</b>	<b>Std. Dev.</b>
Log(Total Bank Assets) (SIZE)	5,665	13.53	13.37	19.60	9.49	1.90
Cost-Income Ratio (CIR)	5,575	71.03	66.26	273.55	7.69	35.86
Return-on-Assets (ROA)	5,665	0.66	0.58	9.19	-9.08	1.87
Total Equity/Total Assets (CAPITAL)	5,665	12.51	8.47	88.50	1.00	13.03
Liquid Assets/Customer and Short-Term Funding (LIQUID)	5,665	37.62	22.69	271.43	0.00	45.91
Net-Interest Revenue/Total Revenue (NIREV)	5,665	32.75	32.22	92.86	-6.55	18.35

Source: Bankscope (2008). Table 14 shows descriptive statistics for the bank variables included in the regression model. To eliminate outliers, all bank variables are winsorized at the 1- and 99-% level.

(LIQUID) consistent with the hypothesis that less capitalized and less liquid banks are more likely to be acquired. The proportion of net interest revenue to total revenue (NIREV), in contrast, is significantly higher for targets than for banks that were not acquired. This indicates that targets are more active in retail-banking. In particular, cross-border targets derive a large proportion of their income from interest-earning activities. This supports the hypothesis that foreign banks take over domestic credit institutions to get access to local retail-banking markets.

## **8.2 Explicit and Implicit Barriers to M&A in the Banking Sector**

The likelihood that a bank is taken over also depends on the extent of explicit and implicit barriers to consolidation (Berger, 2007). Such barriers arise from the legal and regulatory environment in the country where the bank is located. Berger et al. (2004b) show that banks are more likely to be taken over by foreign credit institutions if restrictions on financial activities are low and supervisory authorities more reliable. Pasiouras et al. (2007) find that the level of banking regulations affects the decision of a bank to acquire a credit institution in the EU-25 as well. In particular, more stringent capital and disclosure requirements raise the likelihood that a bank is acquired. This is consistent with Buch & DeLong (2004). They find that financial institutions appreciate strict regulatory standards and do not engage in regulatory arbitrage. Their overall results, however, suggest that banking regulation and supervision only plays a relatively modest role in explaining cross-border M&A.

It may be more relevant whether capital flows and ownership in the banking sector are restricted, however. To find out whether such explicit government barriers limit consolidation in the EU banking market, I include an *Index on Investment Freedom* (INVFREE). The likelihood that a bank is taken over may also depend on whether banks are restricted in their business activities. Cross-border consolidation may also be limited by government ownership and subsidy of banks by the state (Berger, 2007). To find out whether government ownership and restrictions on financial activities reduce the probability that a bank is taken over, I use an *Index on Financial Freedom* (FINFREE). Both indices are from the



Heritage Foundation (2008). Since a larger value for FINFREE and INVFREE indicates fewer restrictions on capital flows and greater financial freedom, I expect that both indices are positively related with the likelihood that a bank is taken over. In particular, cross-border M&A should be more likely if investment and financial freedom is high.

Consolidation may also be limited by merger control if supervisors block certain acquisitions during merger control to protect local banks. This was demonstrated in Italy in 2005 in case of Banca Antonveneta and Banca Nazionale de Lavoro. For Berger (2007), such implicit government barriers are one of the main reasons for the small market share of foreign banks in Western Europe relative to Central and Eastern Europe. To find out whether merger control constitutes an implicit barrier to consolidation, I include the Independence of the Supervisory Authority Index (INDEPENDENCE) and the Transparency of Merger Control Index (TRANSPARENCY).

**INDEPENDENCE** – The Independence of the Supervisory Authority Index measures the degree of independence of the supervisory authorities in the EU banking sector. The index ranges from zero to two with higher values indicating that the supervisor is more independent. I assume that politicians are less able to put pressure on the supervisor to block cross-border M&A if the supervisory authority is more independent. Hence, it should be easier for foreign credit institutions to take over domestic banks if the supervisor is more independent. Domestic M&A may, in contrast, be less likely. This suggests that the effect of INDEPENDENCE may differ for domestic and cross-border takeovers.

**TRANSPARENCY** – The Transparency of Merger Control Index measures the degree of transparency of the merger review process in the EU banking sector. The index ranges from zero to one with higher values indicating a greater degree of transparency. I assume that regulators have more scope to block cross-border M&A if the merger review process lacks transparency. This is emphasized by the EU Commission (2005b). The Commission argues that the supervisory authority has more scope to block certain acquisitions if merger control lacks transparency.

This suggests that it should be easier for foreign banks to take over domestic credit institutions if merger control is more transparent. If politicians promote mergers among local banks, domestic M&A may, in contrast, be less likely. This suggests that the effect of TRANSPARENCY may differ for domestic and cross-border M&A.

### 8.3 Other Country Characteristics

To find out whether the likelihood that a bank is taken over depends on other country variables as well, I include the ratio of aggregate imports to GDP (IMGDP), the size of the banking sector (DBAGDP), the level of stock market capitalization (STKMCA), and the degree of banking market concentration (C3).

**IMGDP** – The ratio of ratio of aggregate imports to GDP measures the degree of trade openness. IMGDP should be relevant for banks that want to provide trade-related services to local clients when they operate abroad (Heinkel & Levi, 1992, Ter Wengel, 1995, and Yamori, 1998). Hence, banks located in countries that are more open to trade should be more likely to be acquired. However, the empirical evidence suggest that banks that pursue a follow-your-customer strategy often use branches as main entry mode, while subsidiaries are more often chosen in order to operate with local clients (Foccarelli & Pozzolo, 2005 and Cerutti et al., 2007). The follow-your-customer strategy may, thus, not be the dominant motivation behind cross-border M&A. IMGDP may also matter for domestic banks if they provide services to foreign customers and want to increase their market share. However, a priori IMGDP should be more relevant for cross-border takeovers.

**DBAGDP** – The size of the banking sector is measured by the ratio of total banking sector assets to GDP. The effect of DBAGDP is not clear a priori. A large banking sector may raise the probability that a bank is taken over, since it offers greater opportunities to generate economies of scale and scope (Buch and DeLong, 2004). It also has a larger market potential than a small banking sector. This makes a country more attractive for cross-border M&A. Domestic takeovers may also become more likely if greater expansion opportunities reduce the need of local banks to expand abroad. However, a larger banking sector may also

reduce the likelihood that a bank is acquired if larger and more developed banking markets are less profitable (Buch & DeLong, 2004 and Demirgüç-Kunt & Huizinga, 1999 and 2000).

**STKM CAP** – The ratio of stock market capitalization to GDP measures the size of the local stock market. The effect of STKM CAP is not clear. On the one hand, a higher level of stock market capitalization may reduce the probability that a bank is taken over, since competition is greater in larger and more developed financial systems (Demirgüç-Kunt & Huizinga, 2000). However, a larger stock market may allow firms to be better capitalized. This should reduce the risk of loan default (Demirgüç-Kunt & Huizinga, 2000). Furthermore, at a higher level of stock market capitalization more information on publicly traded firms is available. This enables banks to better evaluate credit risk (Demirgüç-Kunt & Huizinga, 2000). This should increase profits and increase the likelihood that a bank is acquired.

**C3** – The level of banking market concentration is measured by the market share of the three largest banks. The effect of C3 is not clear a priori (Hannan & Rhoades, 1987 and Hannan & Pilloff, 2009). On the one hand, a higher level of banking market concentration may raise the probability that a bank is taken over by a domestic bank, since market power can be enhanced by the acquisition. On the other hand, domestic M&A may be less likely if antitrust authorities fear that the merger reduces the level of competition in the banking sector. Cross-border M&A are less likely to be challenged for antitrust concerns, because a foreign acquirer likely has only a small or no market share in the target's domestic market. Cross-border M&A may also be more likely if concentrated banking markets are more profitable owing to lower competition between local credit institutions. This suggests that C3 may affect domestic and cross-border takeovers differently.

Finally, I include a dummy variable that is one for EMU member countries (EMU) and zero otherwise. EMU membership may increase the probability that a bank is taken over by a foreign credit institution, since a common currency

eliminates exchange-rate risks. This should facilitate cross-border consolidation in the euro area. If banks are afraid of being taken over by foreign credit institutions, EMU may also raise the pressure for domestic consolidation. For a list of the variables used in the regression analysis see Table A5.

## 9 Results

### 9.1 Logit Regression

The regression analysis proceeds in different steps. First, I include the bank and the country variables separately in the regression. Then both types of variables are put together in the same regression. This model constitutes my *baseline*. In the next step, I add one legal and regulatory variable after the other to the baseline model. Finally, I estimate a model with all regulatory variables together in a single regression. The results of the logit regressions are reported in Table 15. To control for time-fixed effects, I use time dummies. The regression coefficients reported are to be interpreted as affecting the odds ratio with respect to the baseline case and not as marginal probability.

The results are in line with the hypotheses put forward. Consistent with Pasiouras et al. (2007), I find that large banks are more likely to be taken over as indicated by the significant and positive coefficient for SIZE. Less efficient banks are also more likely to be acquired. ROA is significant and has a negative sign. This suggests that M&A in the EU banking sector are driven by the motive to generate efficiency gains from economies of scale and scope and higher X-efficiency. To test the robustness of the result, I replace ROA by the cost-income ratio (CIR). CIR is significant and negative indicating that banks with a lower level of cost-efficiency are more likely to be taken over. NIREV is significant as well. The positive coefficient suggests that banks with stronger focus on retail-banking activities are more likely to be acquired. The degree of liquidity and the level of capitalization, in contrast, do not matter. Both LIQUID and CAPITAL are insignificant.

**Table 15: Logit Regression**

	Model 1 <i>Bank Characteristics</i>	Model 2 <i>Country Characteristics</i>	Model 3 <i>Baseline</i>	Model 4 <i>Investment Freedom</i>	Model 5 <i>Financial Freedom</i>	Model 6 <i>Independence of the Supervisor</i>	Model 7 <i>Transparency of Merger Control</i>	Model 8
SIZE	0.233*** (4.05)		0.417*** (6.34)	0.412*** (6.40)	0.416*** (6.31)	0.430*** (6.40)	0.446*** (6.77)	0.442*** (6.89)
ROA	-0.173*** (-3.59)		-0.196*** (-4.10)	-0.198*** (-4.01)	-0.201*** (-4.15)	-0.174*** (-3.45)	-0.182*** (-3.60)	-0.184*** (-3.51)
NIREV	0.0152*** (2.97)		0.0210*** (3.32)	0.0205*** (3.19)	0.0206*** (3.24)	0.0201*** (3.05)	0.0190*** (2.84)	0.0172** (2.49)
CAPITAL	0.00346 (0.38)		0.00292 (0.29)	0.00264 (0.26)	0.00248 (0.24)	0.00397 (0.38)	0.00647 (0.63)	0.00684 (0.66)
LIQUID	-0.00676*** (-2.66)		-0.0000312 (-0.01)	-0.000737 (-0.31)	-0.000273 (-0.12)	0.00194 (0.78)	0.00165 (0.66)	0.000822 (0.32)
EMU		0.205 (0.75)	0.0339 (0.12)	-0.000434 (-0.00)	0.171 (0.56)	0.358 (0.75)	0.289 (0.60)	0.436 (0.95)
IMGDP		1.628** (1.99)	1.584* (1.94)	1.306* (1.66)	1.159 (1.38)	2.359** (2.00)	1.807 (1.43)	1.385 (1.10)
STKMCAPI		-1.105*** (-3.38)	-1.463*** (-3.92)	-1.255*** (-3.51)	-1.617*** (-4.29)	-1.309*** (-2.78)	-1.185** (-2.51)	-0.943** (-2.07)
DBAGDP		-1.091*** (-2.88)	-1.364*** (-3.71)	-1.793*** (-4.65)	-1.433*** (-3.86)	-1.543*** (-3.42)	-1.240*** (-2.76)	-1.843*** (-3.80)
C3		0.115 (0.12)	0.277 (0.31)	-0.208 (-0.26)	0.524 (0.60)	0.547 (0.58)	0.256 (0.27)	-0.226 (-0.24)
INVFREE				0.0290*** (2.66)				0.0275** (2.08)
FINFREE					0.0106 (1.36)			0.00921 (0.93)
INDEPENDENCE						0.0240 (0.06)		-0.514 (-1.18)
TRANSPARENCY							1.001** (2.48)	1.194** (2.37)
Observations	5,815	5,815	5,815	5,815	5,815	4,537	4,537	4,537
Pseudo R <sup>2</sup>	0.063	0.104	0.164	0.173	0.165	0.163	0.168	0.180
Log Likelihood	-652.7	-624.1	-582.5	-576.3	-581.4	-526.0	-522.5	-515.4

Source: Own calculations (2009). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 15 reports the results of logistic regressions. Robust standard-errors clustered on bank-level are reported in parentheses. The time-dummies and the constant term are not reported. The dependent variable is a binary variable that is one if a bank was taken over between 1997 and 2005 and zero otherwise. The regression coefficients reported are to be interpreted as affecting the odds ratio with respect to the baseline case and not as marginal probability. To eliminate outliers, all bank-specific explanatory variables are winsorized at the 1- and 99-% level. The full sample includes 1,407 commercial banks and 150 deals of which 77 are domestic and 73 cross-border M&A. Since INDEPENDENCE and TRANSPARENCY are not available for all countries, the number of observation drops from 5,815 to 4,537. The smaller sample includes 1,103 banks and 141 deals of which 72 were domestic and 69 cross-border. For a list of the variables used in the regression analysis see Table A5.

The probability that a bank is taken over also depends on the characteristics of the country where the bank is located. I find that banks from countries with a larger stock market (STKM CAP) and a larger banking sector (DBAGDP) are less likely to be taken over. This is consistent with Buch & DeLong (2004), Pasiouras et al. (2007), and Pozzolo (2009). Demirgüç-Kunt & Huizinga (1999) argue that profit opportunities are lower in countries with a larger and more developed financial system. Since profits are one of the main drivers for consolidation, banks are less likely to be taken over if a bank is located in a country with more competitive financial sector. The degree of banking market concentration (C3), in contrast, does not matter. IMGDP and EMU are not significant either.

The probability that a bank is taken over also depends on the extent of explicit and implicit government barriers to consolidation. The results for INVFREE suggest that banks are more likely to be acquired if capital flows and ownership in the banking sector are not restricted. However, there is no evidence that greater financial freedom (FINFREE) makes M&A more likely. The transparency of the merger review process also matters. TRANSPARENCY is significant and has a positive sign consistent with the hypothesis that banks are more likely to be acquired if merger control is transparent. The independence of the supervisor, in contrast, does not matter. INDEPENDENCE is insignificant.

## **9.2 Multinomial Logit Regression**

A problem is that the effect of the explanatory variables may differ for domestic and cross-border M&A. Hence, I additionally estimate a multinomial logit model that allows the effect of the explanatory variables to differ for domestic and cross-border M&A. The results are reported in Table 16. They confirm the results of the logistic regressions. SIZE increases the probability that a bank is taken over. Inefficient banks are also more likely to be acquired. Both is consistent with previous studies on domestic and cross-border M&A in the EU banking sector (Lanine & Vander Vennet, 2007, Pasiouras et al., 2007, and Hernando et al., 2009). NIREV is significant and positive for cross-border M&A in line with the hypothesis that banks take over foreign credit institutions to get access to local

**Table 16: Multinomial Logit Regression**

	Model 9 <i>Bank Characteristics</i>		Model 10 <i>Country Characteristics</i>		Model 11 <i>Baseline</i>		Model 12 <i>Investment Freedom</i>		Model 13 <i>Financial Freedom</i>		Model 14 <i>Independence of the Supervisor</i>		Model 15 <i>Transparency of Merger Control</i>		Model 16	
	Domestic M&A	Cross- Border M&A	Domestic M&A	Cross- Border M&A	Domestic M&A	Cross- Border M&A	Domestic M&A	Cross- Border M&A	Domestic M&A	Cross- Border M&A	Domestic M&A	Cross- Border M&A	Domestic M&A	Cross- Border M&A	Domestic M&A	Cross- Border M&A
SIZE	0.284*** (3.49)	0.177** (2.31)			0.359*** (4.40)	0.482*** (4.97)	0.353*** (4.38)	0.485*** (5.12)	0.360*** (4.39)	0.480*** (4.98)	0.366*** (4.33)	0.503*** (5.05)	0.368*** (4.37)	0.533*** (5.47)	0.367*** (4.38)	0.537*** (5.62)
ROA	-0.195*** (-3.20)	-0.147** (-2.13)			-0.18*** (-3.06)	-0.213*** (-3.30)	-0.18*** (-2.98)	-0.216*** (-3.21)	-0.18*** (-3.07)	-0.217*** (-3.34)	-0.17*** (-2.73)	-0.182*** (-2.59)	-0.17*** (-2.76)	-0.192*** (-2.79)	-0.177*** (-2.69)	-0.195*** (-2.75)
NIREV	0.00822 (1.18)	0.0227*** (3.39)			0.00808 (1.07)	0.0347*** (3.45)	0.00771 (1.01)	0.0341*** (3.35)	0.00739 (0.98)	0.0344*** (3.40)	0.00781 (0.98)	0.0352*** (3.28)	0.00725 (0.92)	0.0330*** (3.01)	0.00554 (0.68)	0.0322*** (2.88)
CAPITAL	0.00996 (0.75)	-0.00412 (-0.37)			0.00933 (0.71)	-0.00368 (-0.26)	0.00944 (0.72)	-0.00399 (-0.30)	0.00919 (0.69)	-0.00407 (-0.29)	0.0109 (0.83)	-0.00362 (-0.25)	0.0120 (0.92)	0.00129 (0.09)	0.0123 (0.92)	0.00116 (0.08)
LIQUID	-0.00782** (-2.41)	-0.00570 (-1.48)			-0.00443 (-1.41)	0.00325 (0.93)	-0.00507 (-1.63)	0.00278 (0.79)	-0.00460 (-1.46)	0.00295 (0.84)	-0.00295 (-0.90)	0.00579 (1.50)	-0.00325 (-0.99)	0.00540 (1.37)	-0.00375 (-1.16)	0.00499 (1.24)
EMU			0.229 (0.64)	-0.416 (-0.99)	0.0256 (0.07)	-0.528 (-1.21)	0.109 (0.27)	-0.682 (-1.48)	0.149 (0.38)	-0.395 (-0.89)	-0.433 (-0.76)	0.134 (0.22)	-0.475 (-0.82)	0.0578 (0.09)	-0.299 (-0.57)	0.155 (0.26)
IMGDP			-3.489* (-1.72)	3.666*** (4.13)	-3.517* (-1.83)	3.855*** (4.40)	-3.517* (-1.90)	3.457*** (4.05)	-4.064* (-1.91)	3.610*** (3.96)	-3.638* (-1.78)	4.916*** (3.56)	-4.322** (-2.10)	4.279*** (2.94)	-5.058** (-2.27)	4.153*** (2.84)
STKMCA			-1.994*** (-3.95)	-0.778 (-1.51)	-2.28*** (-4.19)	-1.110* (-1.83)	-1.84*** (-3.64)	-1.212* (-1.88)	-2.38*** (-4.41)	-1.245* (-1.94)	-1.98*** (-2.86)	-1.052 (-1.36)	-2.02*** (-2.87)	-0.885 (-1.22)	-1.417** (-2.01)	-0.937 (-1.17)
DBAGDP			-0.577 (-1.26)	-1.262** (-2.48)	-0.693 (-1.54)	-1.704*** (-3.42)	-1.161** (-2.27)	-2.000*** (-4.01)	-0.793* (-1.66)	-1.745*** (-3.50)	-0.443 (-0.86)	-1.702*** (-2.68)	-0.276 (-0.54)	-1.468** (-2.26)	-0.979* (-1.68)	-1.736*** (-2.63)
C3			-1.181 (-0.88)	1.510 (1.23)	-0.943 (-0.72)	1.326 (1.17)	-1.018 (-0.82)	0.470 (0.44)	-0.505 (-0.38)	1.376 (1.23)	-1.377 (-0.94)	2.049* (1.82)	-1.460 (-1.00)	1.705 (1.53)	-1.183 (-0.83)	1.138 (0.94)
INVFREE							0.0210 (1.51)	0.0348** (2.07)							0.0223 (1.25)	0.0201 (1.19)
FINFREE									0.00955 (0.81)	0.00890 (0.87)					0.0134 (0.95)	0.00564 (0.40)
INDEPENDENCE											-0.327 (-0.63)	0.552 (0.90)			-0.910 (-1.17)	0.0803 (0.13)
TRANSPARENCY													0.448 (0.76)	1.302** (2.44)	1.232 (1.11)	1.135** (2.02)
Observations	5,815		5,815		5,815		5,815		5,815		4,537		4,537		4,537	
Pseudo R <sup>2</sup>	0.064		0.141		0.196		0.203		0.197		0.204		0.208		0.214	
Log Likelihood	-749.8		-687.5		-643.5		-638.3		-642.8		-578.1		-575.2		-570.9	

Source: Own calculations (2009). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 16 reports the results of multinomial logit regressions. Robust standard-errors clustered on bank-level are reported in parentheses. The time-dummies and the constant term are not reported. Standard errors are reported in parenthesis. The dependent variable is a polytomous variable that is zero if a bank was not taken over, one if it was taken by a domestic and two if it was acquired by a foreign bank between 1997 and 2005. The regression coefficients reported are to be interpreted as affecting the odds ratio with respect to the baseline case and not as marginal probability. To eliminate outliers, all bank-specific explanatory variables are winsorized at the 1- and 99-% level. The full sample includes 1,407 banks and 150 deals of which 77 are domestic and 73 cross-border M&A. Since INDEPENDENCE and TRANSPARENCY are not available for all countries, the number of observation drops from 5,815 to 4,537. The smaller sample includes 1,103 banks and 141 deals of which 72 were domestic and 69 cross-border. For a list of the variables used in the regression analysis see Table A5.

banking markets. However, NIREV is not significant for domestic M&A. LIQUID and CAPITAL remain insignificant for both domestic and cross-border M&A.

I also find significant differences for IMGDP. The significant and positive coefficient of IMGDP for cross-border M&A is consistent with the follow-your-customer strategy according to which banks expand into countries where customers from the home country are located in order to provide services related to their business. Domestic takeovers, in contrast, seem to be less likely in countries that are more open to trade. The effect of STKMCA and DBAGDP does not differ for domestic and cross-border M&A. Both variables remain significant and negative. As in case of the logit regressions, the degree of banking market concentration (C3) and EMU are insignificant.

The effect of INVFREE differs for domestic and cross-border M&A as well. While domestic M&A are not affected by restrictions on international capital flows, cross-border M&A are. The positive and significant coefficient for FINFREE suggests that banks are more likely to be taken over by foreign credit institutions if capital flows and ownership in the banking sector are not restricted. However, if I include FINFREE, INDEPENDENCE, and TRANSPARENCY as additional explanatory variables, INVFREE becomes insignificant. FINFREE is not significant either. This may indicate problems with multicollinearity. The overall results, however, do not provide strong evidence that explicit government barriers limit M&A in the EU banking sector. Since many explicit barriers have been lowered over time, implicit barriers may be more important to cross-border consolidation in the EU banking sector at present (Berger, 2007).

### **9.3 Merger Control as Barrier to Consolidation in the EU Banking Sector**

The logit regressions indicate that banks in the EU are more likely to be acquired if the merger review process is more transparent. To find whether the effect differs for domestic and cross-border M&A, I next include INDEPENDENCE and TRANSPARENCY to the multinomial logit model. The results are reported in Model 14 to 16 of Table 16.



**Table 17: Logit and Multinomial Logit Regression with Interaction Terms**

	Model 17	Model 18	
	<i>Logit Regression</i>	<i>Multinomial Logit Regression</i>	
	Domestic and Cross-Border M&A	Domestic M&A	Cross-Border M&A
SIZE	0.413*** (6.05)	0.363*** (4.20)	0.497*** (4.74)
ROA	-0.188*** (-3.86)	-0.180*** (-2.81)	-0.195*** (-2.96)
NIREV	0.0178*** (2.69)	0.00738 (0.93)	0.0317*** (2.84)
CAPITAL	0.00648 (0.63)	0.0124 (0.95)	-0.000589 (-0.04)
LIQUID	0.00117 (0.46)	-0.00342 (-1.04)	0.00536 (1.33)
EMU	0.249 (0.52)	-0.461 (-0.78)	0.0170 (0.03)
IMGDP	1.399 (1.15)	-4.453** (-2.20)	4.026*** (2.81)
STKMCAPI	-1.184** (-2.46)	-2.037*** (-2.87)	-0.858 (-1.17)
DBAGDP	-1.211*** (-2.74)	-0.288 (-0.56)	-1.449** (-2.22)
C3	0.165 (0.18)	-1.406 (-0.95)	1.628 (1.48)
TRANSPARENCY*SMALL	0.737 (1.19)	-0.254 (-0.29)	1.299* (1.78)
TRANSPARENCY*MEDIUM	1.029** (2.22)	0.908 (1.28)	1.140* (1.93)
TRANSPARENCY*LARGE	2.431** (2.56)	0.169 (0.06)	2.272** (2.31)
Observations	4,537	4,537	
Pseudo R <sup>2</sup>	0.172	0.210	
Log Likelihood	-520.4	-573.8	

Source: Own calculations (2009). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 17 reports the results of logistic and multinomial logit regressions with interaction terms for TRANSPARENCY. The regression coefficients reported are to be interpreted as affecting the odds ratio with respect to the baseline case and not as marginal probability. Robust standard-errors clustered on bank-level are reported in parentheses. Time-dummies and the constant term are not reported. The time-dummies and the constant term are not reported. To eliminate outliers, all bank-specific explanatory variables are winsorized at the 1- and 99-% level. The sample includes 1,097 commercial banks and 141 deals of which 72 were domestic and 69 cross-border. For a list of the variables used in the regression analysis see Table A5.

The results differ for domestic and cross-border M&A. While INDEPENDENCE remains insignificant, TRANSPARENCY is significant for cross-border, but insignificant for domestic M&A. The positive coefficient indicates that banks are significantly less likely to be taken over by foreign banks if merger control lacks transparency. In this case, supervisors have more scope to block cross-border M&A. This indicates that merger control constitutes a systematic barrier to cross-

border M&A in the EU banking sector. Boot (1999) argues that politicians particularly protect national flagships.

This suggests that large banks are less likely to be acquired than small banks if merger control lacks transparency. To test this hypothesis, I create three dummy variables each representing a different bank size. Banks are considered as small if their assets are below the 25-percentile (SMALL), medium-sized if their assets lie within the 25- and 75-percentile (MEDIUM), and large if their assets exceed the 75-percentile (LARGE). Since I multiply these dummies with the TRANSPARENCY, each coefficient measures the effect of TRANSPARENCY for a different size of banks. The results are presented in Table 17. The interaction terms turn out to be insignificant for domestic, but significant for cross-border M&A. For cross-border M&A, tests show that the coefficient of the interaction term is significantly higher for large (2.27) than for small and medium-sized banks (1.29 and 1.14, respectively). This supports the anecdotal evidence that supervisors and politicians use merger control to protect “*national champions*”.

## 10 Robustness Checks

To test the robustness of the regression results, I perform several robustness tests. First, to control for the fact that many Central and Eastern European countries opened their banking sectors to foreign investors during their transformation, I include a dummy variable which is equal to one for countries that are located in Central and Eastern Europe (CEEC) and zero otherwise. Second, I estimate my model only for the countries located in Central and Eastern Europe. Third, I include a set of country dummies. Country dummies control for omitted variables that do not vary over time and that are specific to each country. Examples for such time-invariant determinants of M&A are culture or language. Country dummies also control for the attitude of the government toward foreign investment in the banking sector as long as it does not change over time. Fourth, to test the robustness of the multinomial logit regressions, I run separate logit regressions for domestic and cross-border M&A. Furthermore, I estimate my model using multinomial probit instead of multinomial logit regression. The results, however,

do not change: TRANSPARENCY remains significant and positive for cross-border, but not significant for domestic M&A. The results are not reported for the sake of brevity.

## **11 Conclusions**

Although the EU has removed barriers to cross-border banking through the harmonization of regulations and liberalization, the number of cross-border M&A in the EU banking sector is still small compared to cross-border M&A in other sectors (European Commission, 2005a). The level of cross-border consolidation is particularly low in Western Europe, while cross-border M&A are more frequent in Central and Eastern Europe (Cabral et. al., 2002).

This chapter has shown that cross-border consolidation in the EU banking sector is mainly limited by implicit government barriers. Implicit barriers arise from merger control if politicians and supervisors block cross-border M&A during the merger review process for other than prudential reasons. In particular, large banks are less likely to be taken over by foreign credit institutions if merger control lacks transparency. Explicit barriers like, for example, restrictions on capital flows and ownership, in contrast, do not seem to matter. Such barriers have been lowered over time through liberalization and regulatory harmonization.

The results also have implications for the efficiency of the EU banking sector. Since government intervention is usually not driven by efficiency considerations, a greater degree of transparency of merger control should not only make cross-border M&A more likely, but also improve the efficiency and valuation of banks in the EU. A higher degree of transparency of the merger review process should also improve corporate governance in banking sector, since the market for corporate control becomes more powerful if takeovers are less likely to be blocked by supervisors and politicians.

The results, furthermore, suggest that consolidation in the EU banking sector is driven by the desire to generate economies of scale and scope. X-efficiency gains through better management techniques and organization influence the decision to

take over a bank as well. Efficiency gains are usually found to be easier to achieve in developing countries in which foreign banks have relative advantages over local banks. In developed countries, in contrast, foreign banks are less efficient than local institutions (Berger, 2007). This suggests that the efficiency gains generated from cross-border M&A may not be sufficient to outweigh the relative disadvantages of foreign banks in Western Europe. Since efficiency gains are a key driver for consolidation in the banking sector, cross-border consolidation will, hence, likely to be limited in Western Europe as long as efficiency barriers exist that offset most of the potential efficiency gains from M&A. This indicates that the small number of cross-border M&A in Western Europe relative to Central and Eastern Europe is primarily the result of a combination of net comparative disadvantages of foreign banks in these countries and relatively high implicit barriers to cross-border M&A.

# 4

## *Ownership Structure, Regulation, and the Market for Corporate Control in the EU Banking Sector*

### **1 Introduction**

Ownership structures widely differ across the EU. While large blockholdings dominate in the banking sector in Continental Europe, ownership is usually widely dispersed in the United Kingdom. These differences have consequences for corporate governance in the EU banking sector. In the United Kingdom, minority shareholders are more likely to be expropriated by the management as a result of the dispersed ownership structure. In Continental Europe, ownership is usually concentrated and agency problems arise between minority shareholders and large blockholders. Corporate governance deals with these problems.

The corporate governance of banks is particularly important in the moment, since the financial crisis has led to the failure of several credit institutions and considerably reduced bank valuations. According to the OECD, “*a massive failure in corporate governance [of banks]... and ‘godsmacking’ weaknesses in the way banks are regulated led to the current crisis*” (Hosking, 2009). Efficient corporate governance systems and an effective regulation of credit institutions are not only relevant for bank shareholders and bank customers, however. As the crisis has shown owing to the importance of banks in mobilizing and allocating funds and risks, efficient corporate governance systems in the banking sector are also an important determinant for economic growth (Claessens, 2006).

This chapter analyzes the existing corporate governance structures in the EU banking sector and the impact of EU regulations on investor protection and the

market for corporate control. Using a new dataset on ownership of listed banks in the EU banking sector I show that regulations that aim at improving corporate governance may have the opposite effect depending on the ownership structure of banks. I also show that there is a trade-off in EU regulations between a higher level of investor protection and a more efficient market for corporate control. The results are important for current and future regulation that aims at improving the corporate governance of banks, since they indicate that the “*one-size-fits-all*” approach of the EU Commission to harmonize the existing legal and regulatory framework is inappropriate for the EU banking sector and may instead of improving corporate governance even further worsen the governance problems in banks.

Corporate governance deals with principal-agent problems. Such problems arise because managers and shareholders have the incentive to maximize their personal utility (Jensen & Meckling, 1976). Since contracts cannot completely specify a priori what the manager has to do with the money and how the returns are divided between him and the shareholders, the manager has considerable scope to increase his utility to the detriment of the shareholder (Shleifer & Vishny, 1997). The shareholder can limit this by monitoring the management. However, given the information asymmetries between the management and the shareholders, each shareholder has to incur monitoring costs. For this reason, every shareholder free-rides in the hope that other shareholders do the monitoring (Jensen & Meckling, 1976). This leaves the management with considerable discretion to divert corporate resources for their private benefit (Jensen & Meckling, 1976).<sup>17</sup>

The most direct way to align the interests of managers and shareholders is to concentrate ownership in the hands of a large shareholder. Large shareholders have more voting rights and larger incentives to monitor the management than

---

<sup>17</sup>Managers may, for example, engage in takeovers if they derive utility from empire building. Takeovers can then be viewed as a manifestation of the potential conflict of interest between shareholders and managers. In line with that Allen and Cebenoyan (1991) find that banks with a widely dispersed ownership structure and considerable power of the management are more likely to make acquisitions that increase size than banks that are dominated by a large shareholder that monitors the management. Similar results are provided by Banning (1999).

minority shareholders (Shleifer & Vishny, 1986). However, ownership concentration also comes with some costs, since large shareholders may represent their own interests which do not need to coincide with the interests of the minority shareholders (Shleifer and Vishny, 1997). Hence, if ownership is concentrated principal-agent problems arise between the large shareholders and the minority shareholders, while agency problems between managers and minority shareholders dominate if ownership is widely dispersed.

Concentrated ownership is only one way to align the incentives of managers and shareholders. Another way is to improve investor protection, since a better protection of shareholder rights reduces the need for the emergence of a large investor to control the management (La Porta, Lopez-de-Silanes, & Shleifer, 1998, 1999). Investor protection can be improved on various ways. One way is to strengthen the rights of shareholders to participate in shareholders' meetings, to call extraordinary shareholders' meetings or by giving shareholders the right to sue directors or the majority for suspected expropriation (La Porta, Lopez-de-Silanes, & Shleifer, 2000). Another way is to increase the efficiency of the market for corporate control. Manne (1965) argues that the takeover market increases the power and the protection of minority shareholders. The reason is that firms that are not managed to increase shareholder value, but to raise the wealth or reputation of its managers should perform poorly. This should depress the share price of the firm relative to the shares of other companies in the same market and make it attractive for takeovers for those who believe that they can manage the company more efficiently (Manne, 1965). Since the incumbent managers lose their job and perquisites after the takeover, they have larger incentives to manage the company in the interest of the shareholders.<sup>18</sup>

Efficient corporate governance systems are particularly important in the banking sector, since agency problems are more severe in banks than in non-financial

---

<sup>18</sup>Better investor protection and the market for corporate control are external mechanisms that assure minority shareholders of getting a return on their investment. Internal governance mechanisms include incentive contracts and the implementation of a supervisory board that controls the management in the interest of the minority shareholders. The latter mechanisms are not covered by this study. For a survey see Shleifer & Vishny (1997).

firms. The reason is that information asymmetries are larger in the banking sector than in the non-financial sector (Morgan, 2002 and Levine, 2004). This makes monitoring more difficult and increases the free-riding problem, since minority shareholders have to incur larger monitoring costs to overcome their informational disadvantage. Banking regulations exacerbate agency problems further. Deposit insurance, for example, removes any incentive that insured depositors have to monitor the management because their funds are protected regardless of the outcomes of the investment strategies the bank selects (Macey & O'Hara, 2003), while regulations on entry, mergers, takeovers, and administrative rules restrict the power of the market for corporate control to discipline bank managers (Prowse, 1995).

Although agency problems are more severe in the banking sector, the corporate governance literature usually focuses on the non-financial sector.<sup>19</sup> The aim of this chapter is to fill this gap and to analyze the existing corporate governance systems in the EU banking sector against the background of the regulatory environment and differences in the ownership structure of banks. The chapter proceeds as follows. In the next section, I present descriptive statistics on ownership structures in the EU banking sector. Based on the findings in this section, Section 3 analyzes the impact of EU corporate governance regulations on investor protection and the market for corporate control. Section 4 concludes.

## **2 Ownership Structures in the EU Banking Sector**

The study is based on a new dataset on the ownership structure of listed banks in the EU banking sector. Information on bank shareholders comes from Bankscope (2008). Virtually all of the data are for 2007 and 2008 though I also have a few observations where the data comes from the earlier years. However, since ownership patterns tend to be relatively stable and determined by the legal and

---

<sup>19</sup>A large part of this literature has been contributed by the *European Corporate Governance Network*. Becht & Röell (1999) provide a summary of the main findings of this network. For individual country studies see Becht & Böhmer (1999), Becht, Chapelle, & Renneboog (1999), Bianchi, Bianco, & Enriques (1999), Bloch & Kremp (1999), Crespí-Cladera & Garcia-Cestona (1999), De Jong, Kabir, Marra, & Röell (1999), Goergen & Renneborg (1999), and Gugler, Kalss, Stomper, & Zechner (1999).



regulatory environment, the fact that the ownership data do not all come from the same year is not a big problem (La Porta et al., 1998 and 1999).

**Table 18: Banks and Shareholders by Country**

Country	Number of Banks	Number of Shareholders	Average Number of Shareholders per Bank
Germany	36	491	13.64
France	40	487	12.18
Spain	14	788	56.29
Italy	35	927	26.49
United Kingdom	53	2,558	48.26
Total	178	5,251	29.50

Source: Bankscope (2008). Table 18 shows the total number of banks and bank shareholders by country. The average number of shareholders per bank is the ratio of the total number of banks divided by the total number of bank shareholders.

**Table 19: Banks and Shareholders by Bank Type**

Type of Bank	Number of Banks	Number of Shareholders	Average Number of Shareholders per Bank
Bank Holding & Holding Company	17	1,133	66.65
Commercial Bank	62	1,886	30.42
Cooperative Bank	23	259	11.26
Investment Bank/ Securities House	27	781	28.93
Islamic Bank	1	22	22.00
Medium & Long Term Credit Bank	4	137	34.25
Non-Banking Credit Institution	39	947	24.28
Real Estate/ Mortgage Bank	5	86	17.20
Total	178	5,251	29.50

Source: Bankscope (2008). Table 19 shows the total number of banks and bank shareholders by bank type. The average number of shareholders per bank is the ratio of the total number of banks divided by the total number of bank shareholders.

The dataset includes 178 listed banks from France (40), Germany (36), Italy (35), Spain (14), and the United Kingdom (53). The distribution of banks and shareholders is shown in Table 18 and according to bank type in Table 19. The dataset includes commercial banks (62), bank holding companies (17), cooperative banks (23), investment banks (27), Islamic banks (1), medium and long term credit banks (4), non-banking credit institution (39), as well as real estate, and mortgage banks (5). The United Kingdom records 2,558 shareholders in listed banks. This is considerably larger than in France (487), Germany (491), Italy (927), and Spain (927) and indicates that ownership is more dispersed in the United Kingdom than in Continental Europe. This is also reflected by the average

number of shareholders per credit institution. The United Kingdom records, on average, 48.26 shareholders per bank (see Table 18). This is lower than in Spain where 56.29 shareholders per bank are reported, but considerably larger than in France (12.18), Italy (26.49), and Germany (13.64). A detailed list of the banks included in the sample and the number of shareholders per bank is presented in Table A6 in the appendix.

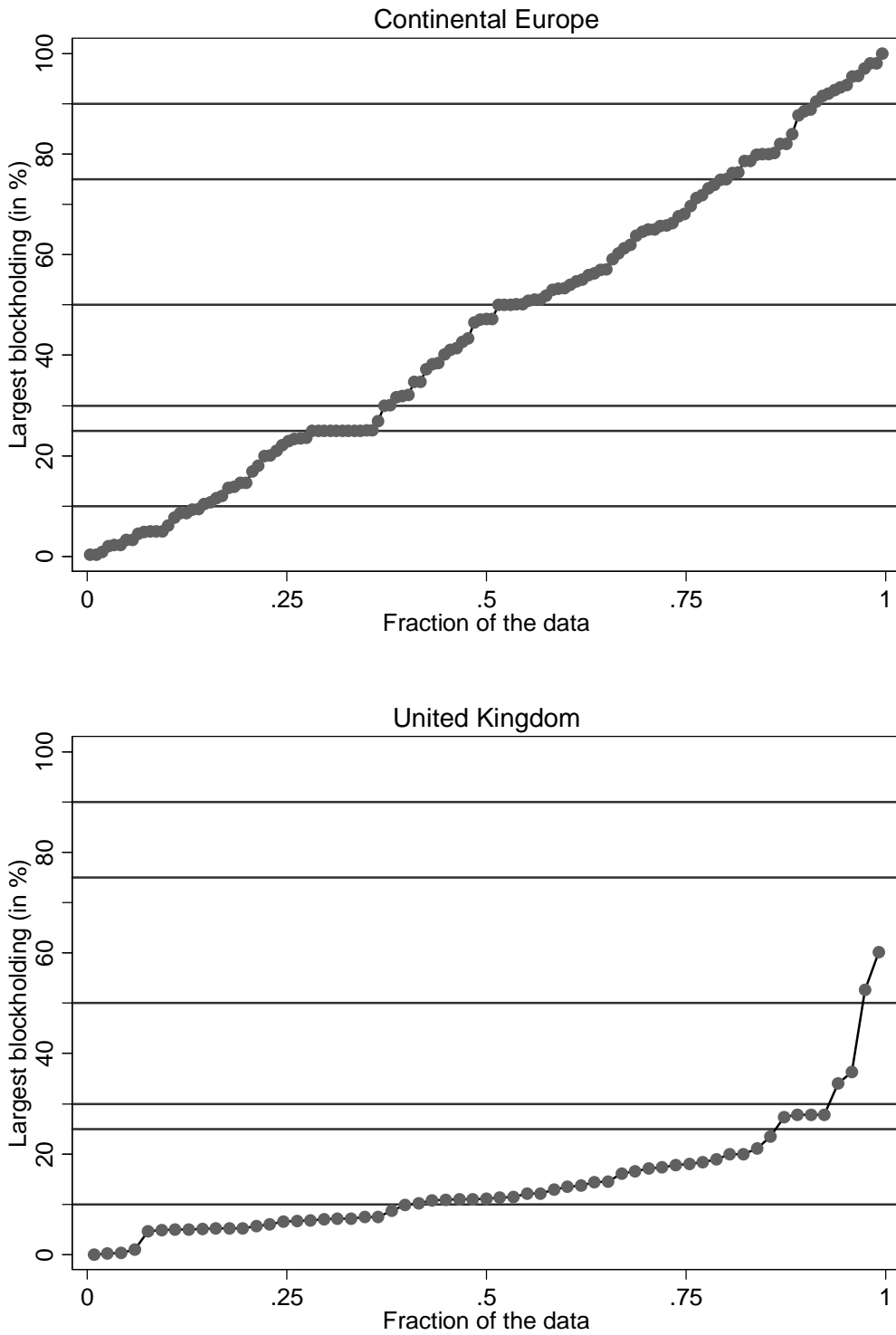
**Table 20: Largest Blockholdings**

<b>Continental Europe</b>	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>
Largest blockholding	133	45.62	47.23	29.08
2nd largest blockholding	125	15.62	10.00	17.60
3rd largest blockholding	115	7.33	5.10	8.55
4th largest blockholding	108	4.39	3.01	4.43
5th largest blockholding	99	3.18	2.29	3.36
<b>United Kingdom</b>	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>
Largest blockholding	59	14.03	11.09	11.45
2nd largest blockholding	52	9.89	7.80	6.44
3rd largest blockholding	54	7.56	5.85	4.09
4th largest blockholding	50	6.18	5.08	3.19
5th largest blockholding	57	4.49	4.70	2.71

Source: Bankscope (2008). Table 20 reports descriptive statistics for different blockholdings in the EU banking sector. Continental Europe includes France, Germany, Italy, and Spain.

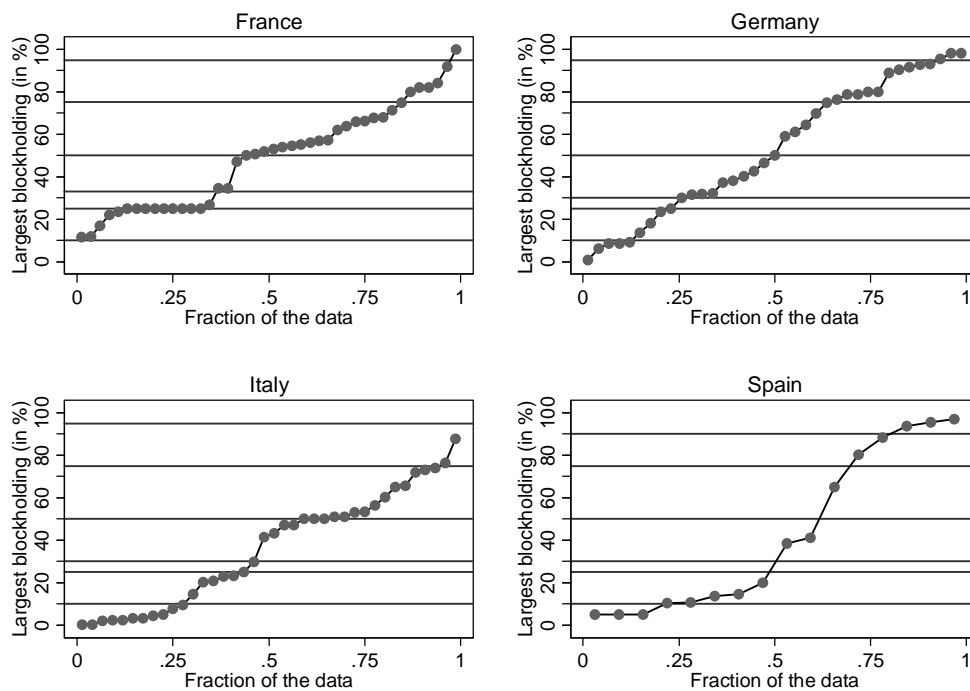
Ownership concentration is usually measured by the size of the largest blockholding (see, for example, Becht & Röell, 1999 and other studies of the European Corporate Governance Network). The largest blockholding is defined as the largest direct or indirect stake of an individual shareholder or a group of shareholders. Table 20 shows descriptive statistics for the largest shareholdings in EU banks. Since some banks have more than one dominant shareholder, the number of largest blockholdings is larger than the number of banks in the sample. Table 20 indicates significant differences in the degree of ownership concentration between the United Kingdom and Continental Europe. While the median largest blockholding is 11.09 percent in the United Kingdom, it is 47.23 percent in Continental Europe. This means that in France, Germany, Italy, and Spain every second bank is dominated by a blockholder that has almost outright

**Figure 4: Distribution of the Largest Blockholding in the EU Banking Sector**



Source: Bankscope (2008). Figure 4 shows the distribution of the largest shareholding in the banking sector of Continental Europe and the United Kingdom. Continental Europe includes France, Germany, Italy, and Spain. The horizontal lines indicate the 10- (qualified holding), 25- (blocking minority), 30- (mandatory bid), 50- (simple majority), 75- (super majority), and 90-percent (squeeze-out) threshold.

**Figure 5: Distribution of the Largest Blockholding in the Banking Sector of Individual EU Member Countries**



Source: Bankscope (2008). Figure 5 shows the distribution of the largest shareholding in the banking sector of individual EU member countries. The horizontal lines indicate the 10- (qualified holding), 25- (blocking minority), 30- (mandatory bid), 50- (simple majority), 75- (super majority), and 90-percent (squeeze-out) threshold.

control. In the United Kingdom, ownership is much less concentrated and the largest blockholder needs the second, third, and fourth largest shareholder to have at least a blocking minority of 25 percent. The same differences in ownership structure are found for the non-financial sector in Europe (Becht & Röell, 1999). La Porta et al. (1998, 1999) and Djankov, La Porta, Lopez-de-Silanes, & Shleifer (2008) argue that these differences are caused by different degrees of investor protection. Since shareholder rights are better protected in common law countries (United Kingdom), shareholders do not need to have large blockholdings to exert some degree of control over the management and to avoid being expropriated. In civil law countries (Continental Europe), in contrast, ownership concentration substitutes for weak shareholder rights.

Figure 4 und Figure 5 give a more detailed picture of the distribution of the largest blockholdings in Continental Europe and the United Kingdom. The plots confirm

the previous conclusions regarding the degree of ownership concentration in the EU banking sector. Although there are some differences in ownership concentration across countries, ownership is usually concentrated in Continental Europe. In the United Kingdom, in contrast, ownership is widely dispersed with the blockholder usually having a stake of less than 25 percent. Figure 4 and Figure 5 illustrate the impact of regulations on the ownership structure of banks. In Continental Europe, for example, a clustering of blockholdings is visible at the 25- and 50-percent level. Such blockholdings are necessary to have a blocking minority and a simple majority, respectively. In the United Kingdom, the largest blockholding is usually lower than the 30-percent threshold that requires a mandatory bid to all shareholders. The mandatory bid rule, hence, effectively ensures that the growth of blockholdings stops short of the 30-percent threshold.

The different degrees of ownership concentration in Continental Europe and the United Kingdom have implications for corporate governance in the EU banking sector. In Continental Europe, owing to the high degree of ownership concentration principal-agent problems are more severe between large shareholders and minority shareholders than between the management and minority shareholders. The opposite is the case in the United Kingdom. British banks are controlled by the management, since the largest blockholder alone cannot control the bank. He must form a coalition with other investors to have at least a blocking minority. Given these differences, the next section discusses the impact of corporate governance regulations in the EU on the level of investor protection and the efficiency of the market for corporate control in the EU banking sector.

### **3 Corporate Governance Regulation in the EU**

The corporate governance regulation in the EU has mainly been shaped by the 2002 report of the *High Level Group* (Winter et al., 2002). It has resulted in an action plan that was adopted by the EU Commission in 2004. In the following, I will present the directives that I deem particularly relevant for investor protection and the market for corporate control in the EU banking sector. They illustrate the

trade-off between a higher level of investor protection and a higher efficiency of the market for corporate control and the problems that arise if the EU corporate governance regulation does not take account of differences in the ownership structures of banks.

### **3.1 Transparency Directive**

The *Transparency Directive* 2004/109/EC (amended by directive 2007/14/EC) aims at protecting minority shareholder rights by setting minimum transparency requirements regarding the publication of periodic financial information and the notification of the acquisition and disposal of major shareholdings. The directive requires shareholders to notify the issuer about the proportion of their voting rights once the latter exceeds 5, 10, 15, 20, 25, 30, 50, and 75 percent as a result of the acquisition or disposal of shareholdings. The reporting requirement not only includes voting rights that are directly held by the investor, but also those that are indirectly held by a third party. The Transparency Directive only imposes minimum harmonisation requirements. This allows member states to adopt more stringent notification requirements to increase transparency. This is reflected in Table 21. Italy, for example, sets the initial disclosure threshold at the 2-percent and Germany, Spain, and the United Kingdom at the 3-percent level. France sets the initial disclosure threshold in line with the directive at the 5-percent level.

The disclosure requirement aims at facilitating the monitoring of large shareholders by regulators, minority shareholders, and the market for corporate control to avoid that they use their power to extract private benefits at the expense of other shareholders (Goergen, Martyonva, & Renneboog, 2005). While the Transparency Directive has increased protection of minority shareholders, it has also reduced the efficiency of the market for corporate control. The reason is that the disclosure of a large blockholding may alert the market that a bid is likely to take place. This will drive up the share price. If the shareholders expect the bidder to raise the efficiency of the bank, they will not tender their shares unless the

**Table 21: Disclosure Thresholds**

	Lower	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	
		(1/3)						(2/3)													
Austria		x	x	x	x	x	x	x	x	x	x						x				
Belgium		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Finland		x	x	x	x	x	x				x						2/3				
France		x	x	x	x	x	1/3				x						2/3			x	x
Germany	3%	x	x	x	x	x	x				x						x				x
Greece																					
Ireland	3%																				
Italy	2%	x	x	x	x	x	x	x	x	x	x				2/3		x			x	x
Luxembourg		x	x	x	x	x	1/3				x						2/3				
Netherlands		x	x	x	x	x	x		x		x		x				x				x
Portugal		x	x	x	x	x	1/3				x						x				
Spain	3%	x	x	x	x	x	x	x	x	x	x		x		x	x	x			x	
United Kingdom	3%																				

Source: EU Commission (2007). Table 21 shows the disclosure thresholds (in percent) that are applied in individual EU countries.

share price offered by the bidder reflects the full efficiency gains from the takeover (Grossman & Hart, 1980). It follows that the bidder withdraws his offer, because he will not make any profits under these conditions. One solution to this problem is that the bidder is allowed to extract private benefits after the takeover (Grossman & Hart, 1980).<sup>20</sup> Another is to build up a toehold in the target before the official takeover bid is launched (Shleifer & Vishny, 1986). The toehold allows the bidder to make a profit, since he gains on the shares he owns. Takeovers are, hence, more likely to take place if the bidder has a blockholding in the target before he makes the actual takeover bid.<sup>21</sup> Critical is the level at which the toehold has to be disclosed. If the disclosure level is low and the bidder not able to acquire a blockholding that is large enough to make profits from the

<sup>20</sup>Grossman & Hart (1980) call this *dilution*. One method is for shareholders to permit a successful bidder to sell the firm's assets or output to another company owned by the bidder at terms which are disadvantageous to minority shareholders (Grossman & Hart, 1980). Dilution of minority shareholders is expected to raise the threat of a takeover, since it excludes the shareholders that are not tendering from completely sharing in the benefits of improving the corporation after the takeover. Grossman & Hart (1980) show that dilution is under certain conditions beneficial for minority shareholder as well, since the threat of a takeover forces the management to be more efficient.

<sup>21</sup>Toeholds also lower the chance of entry of a rival bidder and reduce managerial resistance against a takeover (Betton & Eckbo, 2000). For more on this issue see also Bulow, Hiuang, & Klemperer (1999).

takeover, the threat of a takeover is low, since most of the efficiency gains that arise from the takeover have to be passed on to the minority shareholders. This suggests that the Transparency Directive has improved investor protection, but reduced the efficiency of the market for corporate control in the EU banking sector.

### **3.2 Takeover Directive**

The *Takeover Directive* 2004/25/EC was adopted in 2004 and had to be implemented in national law until 2006. The directive has two major goals. On the one hand, the directive aims at improving the efficiency of the market for corporate control by introducing common rules for takeovers in the EU. The directive particularly aims at facilitating takeovers in Continental Europe, since the market for corporate control is assumed to be active in the United Kingdom (Franks & Mayer, 1996 and Berglöf & Burkart, 2003). On the other hand, the Takeover Directive aims at improving investor protection in the case of a takeover.

The main changes of the directive are the introduction of a mandatory bid rule, a squeeze-out rule, a sell-out rule, a board neutrality rule, and a breakthrough rule. While the mandatory bid and sell-out rule aim at increasing investor protection, the aim of the squeeze-out rule, the board neutrality rule, and the breakthrough rule is to facilitate takeovers. In the following, each of these rules and their impact on investor protection and the market for corporate control are discussed in greater detail.

#### ***3.2.1 The Mandatory Bid Rule***

The *mandatory bid rule* obliges an investor to make a full takeover bid for all remaining voting shares of a listed firm once he has taken over a blockholding that directly or indirectly gives him de facto control over the acquired company. A mandatory bid is only required if the bidder makes a takeover bid to a single shareholder or a group of shareholders in a privately negotiated deal. If he makes a voluntary offer for all shares of all shareholders, the mandatory bid rule does not



apply. De facto control is assumed if the number of voting shares exceeds particular thresholds. Most common is the 30-percent threshold which is applied in Spain, Italy, and the United Kingdom (see Table 22). Germany and France set the threshold at 33 percent. The impact of the mandatory bid rule on the ownership structure of banks becomes visible in the United Kingdom where most of the largest blockholdings stop short of the 30-percent mandatory bid threshold (see Figure 4).

**Table 22: Mandatory-Bid, Squeeze-Out, and Sell-Out Thresholds**

	Mandatory-Bid Threshold	Squeeze-Out Threshold	Sell-Out Threshold
Austria	30%	90%	90%
Belgium	30%	95%	95%
Finland	30%	90%	90%
France	33%	95%	95%
Germany	30%	95%	95%
Greece	33%	90%	90%
Ireland	30%	90%	90%
Italy	30%	95%	95%
Luxembourg	33%	95%	95%
Netherlands	30%	95%	95%
Portugal	33%	90%	90%
Spain	30%	90%	90%
United Kingdom	30%	90%	90%

Source: EU Commission (2007). Table 22 shows the mandatory bid, squeeze-out, and sell-out thresholds that are applied in individual EU countries.

The mandatory bid rule aims at protecting minority shareholders by granting them the right to sell their shares in the event of a change of control (EU Commission, 2007). Investor rights are protected, since the acquirer may use his control power after the takeover to extract private benefits at the expense of minority shareholders. While the mandatory bid rule improves investor protection in the case of a takeover, it also reduces the likelihood of a takeover. The reason is that the *principle of equal treatment* requires that minority investors have to be paid the same price for their shares as the selling blockholder. Since the selling blockholder generally receives a premium for the sale of a control block, the mandatory bid rule drives up the share price and makes takeovers more costly

(Berglöf & Burkhart, 2003). The bidder will only be willing to pay the higher price if he expects to create sufficient added value that compensates for the higher share price. Since takeovers require a higher added value if the minority shareholders have to be paid the same price as the incumbent blockholder, the mandatory bid rule prevents value decreasing transactions (Berglöf & Burkhart, 2003). It, however, also reduces the bidder's willingness to take over a bank, even though the control transfer would add value (Berglöf & Burkhart, 2003). Takeovers are particularly less likely in Continental Europe. Since ownership is concentrated, the share price will increase owing to the block premium that has to be paid to the incumbent blockholder. This premium will drive up the total purchase price and reduce the attractiveness of a bank as a takeover target.<sup>22</sup> If the bidder offers a smaller block premium to reduce the total purchase price, the incumbent blockholder will most likely not get appropriately compensated for the loss of his private benefits of control. This should reduce the likelihood that he accepts the bid. The mandatory bid rule, hence, reduces the likelihood of a takeover particularly in those countries where the Takeover Directive aims at increasing it. In the United Kingdom, in contrast, the market for corporate control is almost unaffected. The reason is that the bidders usually do not have to pay a block premium because ownership is widely dispersed. Takeovers also usually do not take place through privately negotiated sales, but rather through public tender offers.

### ***3.2.2 The Board Neutrality Rule***

The *board neutrality rule* aims at facilitating takeovers. It provides that during the bid period the board of the takeover target must obtain prior authorization from the general meeting of shareholders before the adoption of *post-bid* defences. Examples for post-bid defences are share buybacks or the issuance of share capital. They are put in place once a company has become subject to a takeover

---

<sup>22</sup>Nenova (2003) shows that controlling blocks are more valuable in countries where investor protection is low and where blockholders have more scope to extract private benefits of control. To illustrate, the average value of a control block votes is 4.5 percent of company market value in common law countries (e.g. United Kingdom) and 16.6 percent in civil law countries (e.g. Continental Europe) (Nenova, 2003).

bid. Under the Takeover Directive the board is only allowed to search for an alternative bidder (“white knight”). The board neutrality rule should make takeovers easier by limiting the board’s power to raise obstacles to takeovers (EU Commission, 2007). Managers may use post-bid defences, since the bidder likely replaces the management after the takeover. Since bidders usually targets inefficient banks, defence mechanisms are likely to prevent value-enhancing acquisitions and harm shareholders. Whether the board neutrality rule increases the efficiency of the market for corporate control, however, depends on the ownership structure of the firm. In the United Kingdom, the introduction of the board neutrality rule likely improves the functioning of the takeover market. In Continental Europe, in contrast, the effect of the board neutrality rule is ambiguous, since the blockholder can be virtue of having a controlling stake alone decide on post-bid defenses. This makes him more entrenched, since he has the power to affect any corporate decisions not through the management, but directly (Goergen et al., 2005).

### ***3.2.3 The Breakthrough Rule***

The *breakthrough rule* aims at facilitating takeovers by enabling the bidder to break through existing defences that make takeovers more difficult. While the board neutrality rule focuses on post-bid defences, the breakthrough rule aims at eliminating *pre-bid* defences (EU Commission, 2007). It divides the takeover process into two different phases. The first phase is the *acquisition phase*. During this phase the breakthrough rule eliminates defensive mechanisms like, for example, share transfer restrictions, voting restrictions and multiple voting shares. The second phase is the *post-takeover phase*. During this phase the breakthrough rule eliminates all defence mechanisms that prevent the restructuring of the target. It provides that once the bidder holds 75 percent or more of the shares carrying voting rights no restrictions on the transfer of securities neither on voting rights nor any extraordinary rights of shareholders concerning the appointment or

removal of board members apply on the first general meeting of the shareholders after the acquisition.<sup>23</sup>

The breakthrough rule facilitates takeovers, since it allows the bidder to bypass the incumbent blockholder. Since every share has only one vote under the breakthrough rule, the bidder can directly make a tender offer to the minority shareholders to take over control. This means that he does not have to make a privately negotiated block trade with the holder of multiple voting shares to assume control. This should reduce the purchase price, since the bidder neither has to pay a control premium to the controlling blockholder nor has to make a subsequent mandatory bid in which he has to pay the premium to the minority shareholders. The breakthrough rule, hence, makes value increasing control transfers feasible that are frustrated by the opposition of the incumbent blockholder or by the mandatory bid rule (Berglöf & Burkhart, 2003). Since controlling blocks with less than 25 percent of the votes lose their veto power on the first general meeting of the shareholders after the takeover, blockholders that have less than a blocking minority lose their control premium. The loss will be reflected in smaller price differentials between shares with high voting power and shares with low voting power and should manifest in a lower premium paid in block trades to the extent that such transactions continue to take place in the presence of a mandatory bid (Berglöf & Burkhart, 2003).

Since blockholders that own less than 25 percent of the voting rights do not get appropriately compensated for the loss of private benefits in a block trade, they will likely adopt measures to frustrate the bidder. Provided that the incumbent blockholders are not financially constrained, one way is to increase the blockholding above the 25-percent threshold. If the incumbent blockholder is financially constrained,<sup>23</sup> he might sell his shareholding or form a control pyramid and enhance cross-shareholding structures (Berglöf & Burkhart, 2003). Such

---

<sup>23</sup>The breakthrough rule does not apply to securities where the restrictions on voting rights are compensated for by specific pecuniary advantages (e. g. non-voting preference shares).

defensive mechanisms are not covered by the directive.<sup>24</sup> Bennedsen & Nielsen (2004) point out that the breakthrough rule may also have an impact on firms in which the controlling blockholder owns more than 25 percent of the capital. Since such blockholders are able to block the restructuring of the target after the takeover, the likelihood of a takeover is smaller for firms that have a shareholder that holds more than 25 percent of the votes. This makes the blockholder more entrenched (Berglöf & Burkhardt, 2003). The effect of the breakthrough rule on the efficiency of the market for corporate control is, hence, ambiguous in Continental Europe. In the United Kingdom, in contrast, the breakthrough rule should facilitate takeovers.

### ***3.2.4 The Squeeze-Out Rule and Sell-Out Rule***

The *squeeze-out rule* allows bidders that have taken over a large part of capital to acquire the outstanding shares for a fair price. Forcing out minority shareholders out of the bank should liberate the bidder from costs and risks which continued existence of minorities could trigger (EU Commission, 2007). The squeeze-out rule also reduces the problem that minority shareholders do not tender their shares unless the share price offered by the bidder reflects the full efficiency gains from the takeover (Grossman & Hart, 1980). As argued in Section 3.1, this will drive up the share price and may lead to the withdrawal of the bid. The squeeze-out rule reduces this *holdout* problem because minority shareholders cannot gain from not tendering their shares if the bid is conditional on the squeeze-out threshold. This implies that they are willing to sell their shares for a price that is less than the post-takeover price (Goergen et al., 2005). It follows that the bidder is able to internalize more efficiency gains after the takeover. The squeeze-out rule, hence, increases the incentive of the bidder to take over a firm and improves the efficiency of the market for corporate control. It steps in if the ownership share of

---

<sup>24</sup>The Winter Group explicitly acknowledges that pyramids and dual class shares serve the purpose of keeping control with little equity capital, but recommends that the breakthrough rule should not apply to pyramids because it was argued to be too complicated and expensive (Winter et al., 2002). Bebchuk & Hart (2002) criticize that exempting pyramids the breakthrough rule may promote pyramid structures and affect existing corporate governance arrangements asymmetrically.

the blockholder exceeds particular thresholds. The EU member countries are free to set this threshold between 90 and 95 percent. This is reflected in Table 22.

Most common is the 90-percent threshold which is used in Spain and the United Kingdom. France, Germany, and Italy set the threshold at 95 percent. Since shareholders can be forced out of the firm against their will, the squeeze-out rule reduces the level of investor protection. The effect of the squeeze-out rule differs between Continental Europe and the United Kingdom. In Continental Europe, the effect on takeovers is ambiguous, since the incumbent blockholder can be virtue of having a large shareholding alone prevent that the squeeze-out rule steps in. This should increase the level of entrenchment of the blockholder. In the United Kingdom, in contrast, the squeeze-out threshold should facilitate takeovers, since ownership is more dispersed.

The counterpart of the squeeze-out rule is the *sell-out rule*. It gives shareholders the right to sell their shares to the blockholder once the latter has passed the sell-out threshold. The sell-out rule should protect minority shareholders from being expropriated by the blockholder after the takeover (“exit option”). It, however, also reduces the likelihood of a takeover if the bidder is not interested in taking over all shares. The sell-out rule, hence, increases the level of investor protection, but reduces the efficiency of the market for corporate control in the EU banking sector.

To summarize, the Takeover Directive aims at facilitating takeovers and protecting minority shareholders in the case of a takeover. While the directive has reached its aim to improve investor protection, it has failed to raise the likelihood of takeovers in countries where ownership is concentrated. In Continental Europe, the mandatory bid and squeeze-out rule have increased entrenchment of the blockholder. This is particularly the case when they enjoy large private benefits of control. The positive effect of the squeeze-out on the takeover market is offset by the introduction of the sell-out rule. The breakthrough rule also fails to improve the efficiency of the market for corporate control, because the incumbent blockholder is still able to approve defensive mechanisms in the general meeting

of the shareholders if ownership is concentrated. He may also increase the level of entrenchment by forming control pyramids. Entrenchment may also be increased by the possibility to *opt-out* of the board neutrality and breakthrough rule.

**Table 23: Adoption of the Board Neutrality and Breakthrough Rule**

	Transposition of the Takeover Directive	Board Neutrality Rule	Breakthrough Rule	Principle of Reciprocity
Austria	yes	adopted	not adopted	not adopted
Belgium	no	not adopted	not adopted	adopted
Finland	yes	adopted	not adopted	not adopted
France	yes	adopted	not adopted	adopted
Germany	yes	not adopted	not adopted	adopted
Greece	yes	adopted	not adopted	adopted
Ireland	yes	adopted	not adopted	not adopted
Italy	no	not adopted	not adopted	adopted
Luxembourg	yes	not adopted	not adopted	not adopted
Netherlands	no	not adopted	not adopted	adopted
Portugal	yes	adopted	not adopted	adopted
Spain	no	adopted	not adopted	adopted
United Kingdom	yes	adopted	not adopted	not adopted

Source: EU Commission (2007). Table 6 shows which EU countries have transposed the Transparency Directive and which countries apply the board neutrality rule, the breakthrough rule, and the principal of reciprocity.

Table 23 shows that Germany and Italy have used this option. They neither apply the board neutrality nor the breakthrough rule. Where the EU member states make use of this option, companies have the right to *opt-in* and to apply the rules. France and Spain oblige their companies to apply the board neutrality rule, but not the breakthrough rule. They have, however, introduced the *principal of reciprocity* that allows them to exempt their companies from the board neutrality rule if the bidder does not apply the board neutrality rule himself. This principal was introduced to prevent that a company that is not allowed to use defence mechanisms is taken over by a company that is allowed to do so. It has undermined the introduction of the board neutrality rule in France and Spain. The United Kingdom also applies the board neutrality rule, but not the principle of reciprocity. The probability of a takeover is also reduced by the fact that the breakthrough rule does not apply to securities that confer special rights on the EU member states (“golden shares”). This should reduce the likelihood of a takeover if government ownership is high.

The shortcomings of the Takeover Directive have been recognized by the EU Commission. In its report on the implementation of the takeover directive it states that the board neutrality rule as implemented in the member states holds back the emergence of a market for corporate control (EU Commission, 2007). The Commission, furthermore, notes that it is unlikely that the breakthrough rule will bring significant benefits (EU Commission, 2007). It hopes that the directive will indirectly improve the conditions for takeovers through the disclosure of takeover defences, however (EU Commission, 2007). If investors are aware of such defences, they may push the management to abolish them to reduce managerial entrenchment. That market forces may prevent the adoption of takeover defences is demonstrated by the United Kingdom. Although many devices to separate ownership and control are not legally prohibited, British companies usually do not apply them (Shearman & Sterling, 2007).

## **4 Conclusions**

Ownership structures widely differ across the EU. While large blockholdings dominate in Continental Europe, ownership is usually widely dispersed in the United Kingdom. These differences have consequences for corporate governance in EU banking sector. In the United Kingdom, principal-agent problems arise between the management and minority shareholders as a result of the dispersed ownership structure in the banking sector. In Continental Europe, ownership is concentrated and agency problems occur between minority shareholders and large blockholders. Corporate governance deals with these problems. The aim of this chapter was to analyze the existing corporate governance systems in the EU banking sector against the background of the regulatory environment and differences in the ownership structure of banks. Table 24 provides a summary of the effects of the EU directives discussed in this chapter on the efficiency of the market for corporate control and the level of investor protection in the EU banking sector.

The results indicate that EU regulations have not always improved corporate governance. While the Transparency Directive has improved investor protection



by raising transparency, it has also reduced the efficiency of the market for corporate control. This illustrates the trade-off between better investor protection and a higher efficiency of the market for corporate control that is characteristic for corporate governance regulation in the EU. The same trade-off characterizes the Takeover Directive. While the squeeze-out rule has increased the efficiency of the market for corporate control, the sell-out rule has reduced it.

Another problem of corporate governance regulation in the EU is that it fails to take account of the differences in the ownership structure of banks. This has been demonstrated by the mandatory bid rule. While it fails to have an effect on takeover activity in countries with dispersed ownership structures (United Kingdom), it has increased the level of entrenchment in countries with concentrated ownership structures (Continental Europe). The consequence is that the mandatory bid rule has reduced the efficiency of the takeover market particularly in those countries where the EU Commission aims at increasing it. This suggests that corporate governance regulations should be customized to the specific ownership structures of banks in the EU and not toward harmonising national regulations. The “one-size-fits-all” approach to harmonize the existing legal and regulatory framework, hence, seems to be inappropriate for the EU banking sector. This should be kept in mind if the EU plans to change existing or adopt new corporate governance regulations for banks in response to the crisis.

**Table 24: Effect of EU Directives on Takeovers and Investor Protection in the EU Banking Sector**

	Concentrated Ownership Structure		Dispersed Ownership Structure	
	Continental Europe		United Kingdom	
	Impact on the Market for Corporate Control	Impact on Investor Protection	Impact on the Market for Corporate Control	Impact on Investor Protection
<b>Transparency Directive</b>	Fewer M&As	Better Protection	No Impact	Better Protection
<b>Takeover Directive</b>				
<i>Mandatory Bid Rule</i>	Less Trade in Controlling Blocks	Better Protection	No Impact	Better Protection
<i>Board Neutrality Rule</i>	Ambiguous	Better Protection	More M&As	Better Protection
<i>Breakthrough Rule</i>	Ambiguous	Ambiguous	More M&As	Better Protection
<i>Squeeze-Out Rule</i>	Ambiguous	Less Protection	More M&As	Less Protection
<i>Sell-Out Rule</i>	Fewer M&As	Better Protection	Fewer M&As	Better Protection

Note: Table 24 shows the impact of the regulations discussed in the previous sections on the market for corporate control and the level of investor protection in the EU banking sector.

# 5

## *Bank Owners or Bank Managers: Who is Keen on Risk? Evidence From the Financial Crisis*

*“What I think is a much more fundamental question about the structure and the short-termism [of remuneration schemes] would probably be by looking at the one of the banks that has failed recently. If one of those banks in 2005 decided to be more conservative and hold back in their activity, they more than likely would have had their CEO and board even replaced in 2006 for failing to take advantage of the opportunities, so the structure was one which was one widely supported by players, shareholders and everybody.”*

Peter Hahn, Former Citigroup Managing Director in a Report to the Treasury Committee of the British Parliament<sup>25</sup>

### **1 Introduction**

In this chapter, Reint Gropp and I examine whether owner-controlled banks or manager-controlled banks suffered larger losses during the crisis. We show that it is owner-controlled banks that experienced the largest losses. Banks operating in countries with better shareholder rights and banks with a controlling shareholder recorded larger losses during the crisis than banks operating in countries with poor shareholder rights and banks without a controlling shareholder. In the period before the crisis, however, the owner controlled banks show superior performance. This is consistent with fewer private benefits to managers in those

---

<sup>25</sup>Quote from a report to the Treasury Committee of the British Parliament on remuneration in the banking sector (Remuneration in the Banking Sector, 2010).

banks, but also with higher risk-taking before the crisis.<sup>26</sup> Overall, the results imply that better aligning the incentives of managers with shareholder interests will not result in less risk-taking by banks as has been suggested by some in the recent policy debate on management compensation.<sup>27</sup> Furthermore, privately optimal contracts that align the incentives of management and shareholders may not be socially optimal as these contracts do not take the externality of higher financial fragility into account. When devising management compensation schemes, there appears to be a trade-off between bank efficiency and bank stability. A contract that minimises agency costs may, hence, result in socially “excessive” risk-taking.

Our results are consistent with long-standing agency theoretic arguments of a negative relationship between risk-taking and shareholder control of management. For example, Amihud and Lev (1981), Holmstrom & Ricart I Costa (1986), and Hirshleifer & Thakor (1992) argue that managers avoid taking risks due to career concerns and undiversifiable employment risk. According to this view, managers may even spend corporate resources to diversify their companies’ operational risk to protect their position in the firm. They also support the recent findings in Fahlenbrach & Stulz (2009) and Beltratti & Stulz (2009), who show that stock price performance during the crisis was worse in those banks, in which the incentives of management were better aligned with the interests of shareholders. The results contradict popular sentiment, also reflected in some policy reports (e.g. OECD, 2009), that in weakly controlled banks, managers were able to obtain compensation packages that rewarded short term risk-taking.

---

<sup>26</sup>The result that owner-controlled banks are riskier highlights the importance of controlling for risk when estimating the importance of private benefits of management in manager-controlled banks. The results in this paper suggest that risk seems to explain most of the difference in performance between owner-controlled banks and manager-controlled banks. Hence, it may be problematic to attribute differences in performance entirely to the private benefits of management in management-controlled banks.

<sup>27</sup>In addition to the quote above, see, for example, the article “*U.S. eyes bank pay overhaul: Administration in early talks on ways to curb compensation across finance*” in the *Wall Street Journal* (Solomon & Parletta, 2009) or “*U.S. targets excessive pay for top executives*,” in the *Washington Post* (Cho, Goldfarb, & Murakami Tse, 2009).

We use a large dataset of OECD banks, for which we collected information on ownership concentration. In total, the sample consists of more than 1,100 banks for 24 OECD countries. In particular, in addition to most listed banks, the sample also includes many unlisted credit institutions. We think this is important for the broader applicability of the results, since unlisted banks represent the majority of banks in most countries around the world (see e.g. Gropp & Kashyap, 2009 and Table 25). We also think that the greater variability in ownership and corporate governance structures will help us to identify the effects of governance on risk-taking.

We estimate the average performance before the crisis during 2000 to 2006 and the deviation from this average performance during the crisis as a function of shareholder rights and ownership concentration. We find that owner-controlled banks tend to perform better, on average, before the crisis compared to manager-controlled banks and that owner-controlled banks experienced larger losses in the crisis than manager-controlled banks. One innovation of this paper is to use realized losses during the crisis relative to average performance in calm times as a proxy for the risks that were incurred before the crisis. We claim that this approach addresses some of the measurement problems frequently encountered when attempting to measure bank risk.<sup>28</sup>

Relying on the literature (John, Litov, & Yeung, 2008 and Laeven & Levine, 2009), we use two proxies for the degree to which management is controlled by shareholders: Ownership concentration (a bank-specific variable) and shareholder rights (a country-specific variable). Concentrated ownership may help in controlling management, as large blockholders may possess more ability and greater incentives to monitor management compared to dispersed shareholders (Shleifer & Vishny, 1986).<sup>29</sup> Better shareholder rights may enable even dispersed

---

<sup>28</sup>For example, standard accounting measures, like problem loans or loan loss reserves, tend to be backward looking and limited to on-balance sheet risk; stock price volatilities are limited to listed banks, which constitute only a minority among banks in the OECD (Gropp & Kashyap, 2009 and Table 25).

<sup>29</sup>They may, however, extract private benefits at the expense of minority shareholders (Shleifer & Vishny, 1997).

shareholders to control the management, for instance, through calling extraordinary meetings or through the ability to take legal action against management (La Porta et al., 1998 and 1999).

Theory would tell us that dispersed shareholders have larger incentives to increase risk compared to large blockholders, because they are more diversified (Demsetz & Lehn, 1985 and Esty, 1998).<sup>30</sup> Large blockholders have greater ability to affect bank performance and bank risk-taking, but it is more difficult for them to diversify their holdings. In addition, large blockholders may try to protect private benefits in the firms that they control (Morck, Wolfenzon, & Yeung, 2005 and Stulz, 2005). Hence, the effect of large blockholders on risk-taking is ambiguous *ex ante*. On the other hand, the effect of stronger shareholder rights on risk is unambiguous. Stronger shareholder rights enable even minority shareholders to exercise better control of the management.

We find that shareholders prefer more risk relative to managers irrespective of whether we measure owner control using shareholder rights or ownership concentration. For large blockholders, the ability to control management seems empirically to be more important than the risk reducing effect of a lack of diversification. The results are consistent with Saunders, Strock, & Travlos (1990) for banks, John et al. (2008) for non-financial firms, and Laeven & Levine (2009) for banks.<sup>31</sup> The evidence shows that bank managers prefer less risk compared to owners, whether dispersed or concentrated. The results are robust to controlling for differences in regulation and supervision across countries as suggested by Laeven & Levine (2009), a host of other legal variables as in Caprio, Laeven, & Levine (2007) and differences in profits smoothing (Leuz, Nanda, & Wysocki, 2003). We also find that owner-controlled banks are significantly more likely to receive government assistance during the crisis, again irrespective of how we measure the ability of owners to control the management.

---

<sup>30</sup>See also Burkart, Panunzi, & Shleifer (2003).

<sup>31</sup>To our knowledge only Gorton & Rosen (1995) and Knopf & Teall (1996) find the opposite, namely that manager controlled banks make the riskiest and most unprofitable investment.

We test and control for the endogeneity of the ownership structure of banks as originally suggested by Demsetz (1983). He argues that the ownership structure of a firm is an endogenous outcome of a competitive selection process in which various advantages and disadvantages of different degrees of ownership concentration are balanced. The results indicate that different levels of ownership concentration are consistent with value maximisation (Stulz, 1988, Morck, Shleifer, & Vishny, 1988 and Demsetz & Villalonga, 2001).

The estimates suggest an economically substantial effect of governance on performance and risk-taking: A bank whose largest shareholder owns less than 10 percent and who is headquartered in a country with poor shareholder rights is estimated to have an 2000 to 2006 average ROE of 6.3 percent. In 2008, the ROE was five percentage points lower. In contrast, a bank headquartered in a country with strong shareholder rights and where the largest shareholder owns 75 percent of the shares would have an average 2000 to 2006 ROE of 30.1 percent and the 2008 ROE would be 31 percentage points lower, i.e. a ROE of minus one percent.

The literature suggests a number of reasons why agency problems in financial institutions may be particularly important and strong shareholder rights alone may not be sufficient to control managers. For example, Prowse (1997), Macey & O'Hara (2003), and Levine (2004) argue that due to the high level of regulation, principal-agent problems may be more severe in the banking sector than in other sectors. Banking regulations restrict the ability of the market for corporate control to discipline banks (Prowse, 1995), as hostile takeovers in many countries are explicitly discouraged.<sup>32</sup> Existing management tends to be protected by regulations on entry, mergers, takeovers, and administrative rules (Cheng, Duncan, & Wall, 1989, Prowse, 1997). Further, deposit insurance may aggravate agency problems, since it increases the incentive of shareholders to engage in

---

<sup>32</sup>For example, the Bundesbank warns against hostile takeovers of large German banks, because “*an unfriendly takeover of a big bank could create problems of financial stability*” (Bundesbank Warns Against Hostile Bank Takeovers, 2007). Furthermore, during the crisis of Société Générale in 2008 the French Prime Minister Francois Filion warned that the government “*will not allow Société Générale to be the target of hostile raids by other companies*” (Société Générale Shares Rise on Takeover Report, 2008).

excessive risk-taking (Prowse, 1997 and Macey & O'Hara, 2003). Agency problems may also be exacerbated by the opacity of banks (Morgan, 2002 and Levine, 2004). Opacity creates additional difficulties for shareholders and debt holders to monitor the behaviour of managers and to design contracts that align the objectives of managers and shareholders. Intervention by large shareholders is also less likely if firms are opaque, because the information costs that have to be incurred to understand the institution may be higher (Kahn & Winton, 1998). Seen in this light, the extremely generous performance based compensation packages given to bank managers may be interpreted as an attempt by shareholders to induce management to increase risk-taking.

This chapter is organized as follows. In the next section, we present the data and some descriptive statistics on ownership structures, performance, and the losses in 2008 among OECD banks. The econometric model and the definitions of the main variables used in the regressions are presented in Section 3 and our baseline results in Section 4. In Section 5, we test whether our results hold if we control for bank characteristics. In Section 6 and 7, we check whether they are robust to the inclusion of bank regulatory and other country variables. Section 8 examines whether the results are driven by profit smoothing and shows that owner controlled banks were more likely to require government assistance during the recent crisis. Section 9 concludes.

## **2 Data and Econometric Model**

### **2.1. Data**

We use a new dataset on the ownership structure of large banks in 24 OECD countries to test our hypotheses. Information on bank shareholders comes from Bankscope (2009). Virtually all of our data on ownership structure are for 2007 and 2008 though we also occasionally use observations from 2005 and 2006. However, since ownership patterns tend to be relatively stable over time, we do not view this as a serious shortcoming (La Porta et al., 1998, 1999 and Caprio et al., 2007). Bankscope is also the source of balance sheet information. We only include banks that are larger than one billion US-Dollar in total assets in 2006.



**Table 25: Bank Sample**

	<b>Number of Banks</b>	<b>of which listed</b>	<b>of which unlisted</b>
Australia	13	6	7
Austria	50	8	42
Belgium	14	3	11
Canada	25	11	14
Denmark	28	19	9
Finland	3	1	2
France	126	19	107
Germany	95	14	81
Greece	10	9	1
Ireland	12	2	10
Italy	99	26	73
Japan	103	88	15
Korea, Rep.	14	9	5
Mexico	17	3	14
Netherlands	21	4	17
New Zealand	6	0	6
Norway	13	10	3
Portugal	10	5	5
Spain	25	10	15
Sweden	16	3	13
Switzerland	59	21	38
Turkey	13	10	3
United Kingdom	53	14	39
United States	317	180	137
<b>Total</b>	<b>1,142</b>	<b>475</b>	<b>667</b>

Source: Bankscope (2009). Table 25 presents summary statistics on the geographical distribution of the banks in our sample. We focus on large banks having at least one billion US-Dollar in total assets in the last available year. Banks for which we do not have at least three observations for the period between 2000 and 2006 are not included.

**Table 26: Banks by Specialization**

	<b>Number of Banks</b>	<b>of which listed</b>	<b>of which unlisted</b>
Bank Holding & Holding Company	233	202	31
Commercial Bank	526	185	341
Cooperative Bank	92	23	69
Investment Bank/Securities House	68	20	48
Medium & Long Term Credit Bank	18	6	12
Multi-Lateral Governmental Bank	1	0	1
Real Estate/Mortgage Bank	60	13	47
Savings Bank	95	13	82
Specialised Governmental Credit Institution	49	13	36
<b>Total</b>	<b>1,142</b>	<b>475</b>	<b>667</b>

Source: Bankscope (2009). Table 26 presents summary statistics on the specialization of the banks included in our sample. We focus on large banks having at least one billion US-Dollar in total assets in the last available year. Banks for which we do not have at least three observations for the period between 2000 and 2006 are not included.

We also require that we have at least three observations over the period between 2000 and 2006 and information on bank performance in 2008. There is some survivorship bias here, as our empirical approach requires that banks survive as an entity until 2008. We checked whether there were any banks that satisfy the size criterion and the criterion of at least three observations in 2000 to 2006, but are without information for 2008. We were unable to identify a single bank. In our view this is a reflection of the fact that our dataset only contains relatively large banks. In case of serious problems, these banks tend to be either bailed out by the government or merged with another bank. Hence, in order to address this issue head-on, in Section 8 we also estimate the probability that a bank received some form of government assistance as a function of governance variables.

The dataset includes 1,142 banks of which 475 are listed and 667 are unlisted. To our knowledge this is the first paper on bank corporate governance that includes unlisted banks. The regional distribution of banks is reported in Table 25. Most banks are located in the United States (317), France (126), Japan (103), and Germany (95). The distribution of banks by specialization is reported in Table 26. Most banks are classified either as commercial bank (526) or as bank holding company (233), but we also have savings banks (95), cooperative banks (92), investment banks (68), mortgage banks (60), and different types of state banks in our sample. The sample, hence, represents a broad snapshot of large banks in OECD countries.

## **2.2. Econometric Model and Main Variables**

We are interested in the relationship between bank performance, bank risk, and the strength of shareholder control of management. Ownership and management structures are highly persistent and do not respond to annual changes of performance (Zhou, 2001 and Caprio et al., 2007). Using a panel estimator with fixed effects or first differences may, hence, result in spurious correlation between ownership structure and performance (Zhou, 2001). This eliminates the merits of using a panel (Caprio et al., 2007). Furthermore, with rational managers maximising expected long-term self-interest, it is not clear whether small annual changes in ownership are indicative of notable changes in managerial incentives

that are likely to lead to substantive annual changes in performance (Zhou, 2001). As managers are usually with a bank for many years, their incentives depend on the link between their expected long-term self-interest and the bank's expected long-term performance. Hence, the relationship between ownership structure, risk, and performance is likely to be a cross-sectional phenomenon (Zhou, 2001). For these reasons, we estimate the following equations for bank performance (6) and bank risk (7):

$$\overline{RoE}_i = \alpha_0 + \alpha_1 STAKE_i + \alpha_2 RIGHTS_c + AX + \varepsilon_i, \quad (6)$$

and

$$DROE_i = \beta_0 + \beta_1 STAKE_i + \beta_2 RIGHTS_c + BX + u_i \quad (7)$$

$\overline{RoE}_i$  is the average performance of bank  $i$  during 2000 to 2006 and  $DROE_i$  the deviation from average ROE in 2008. DROE is defined as  $1 - [RoE_{2008} - \overline{RoE}]$ . It can be interpreted as one plus the percentage point drop-off in profits in 2008 relative to the long-run average. Hence, a positive coefficient in equation (7) corresponds to larger losses in 2008.  $A$  and  $B$  are vectors of coefficients.  $X$  represents a set of bank- and country-specific control variables explained below.  $\varepsilon_i$  and  $u_i$  are the error terms. The variables of interest are STAKE and RIGHTS.

In line with the literature, STAKE is defined as the size of the largest ownership block and measures the level of ownership concentration in bank  $i$  (see also Glassman and Rhoades, 1980, Cole & Mehran, 1998, Caprio et al., 2007, and Laeven & Levine, 2009). The largest ownership block is defined as the largest direct or indirect stake owned by an individual shareholder or a group of shareholders. A direct stake involves shares registered in the shareholder's name, while indirect ownership involves bank shares that are held by entities that are controlled by the ultimate shareholder. We follow Caprio et al. (2007) and Laeven & Levine (2009) and set every direct and indirect ownership stake below 10 percent to zero. The 10-percent threshold is widely used in the literature (La Porta et al., 1999 and La Porta, Lopez-de-Silanes, & Shleifer 2002) and differentiates

between widely-held manager-controlled banks and banks that have a concentrated ownership structure and may, hence, be more likely to be controlled by their shareholders.

The relationship between STAKE and  $\overline{RoE}_i$  is not clear a priori. If large shareholders have greater incentives and are better able to control managers than minority shareholders, the relationship between ownership concentration and bank performance should be positive as agency costs and private benefits to management are reduced (Shleifer & Vishny, 1986). However, large shareholders may also have the incentive to extract benefits at the expense of the other (minority) shareholders (Shleifer & Vishny, 1997). This could reduce long-term performance.

Theory tends to suggest a positive relationship between shareholder concentration and risk (DROA). Career concerns (Amihud & Lev, 1981), non-diversifiable human capital risk (Jensen & Meckling, 1976), and private benefits of control (Demsetz & Lehn, 1985 and Kane, 1985) all would result in shareholders preferring more risk compared to managers. However, the ability of shareholders to diversify may matter. If large blockholders are unable to fully diversify, they would not necessarily be interested in more risk than managers. In addition, large shareholders may want to protect private benefits by reducing risk-taking (Stulz, 2005). Ultimately, which effect dominates is an empirical matter (John et al., 2008).

Our second proxy for the degree to which managers act in the interest of bank owners is RIGHTS. RIGHTS is an index of anti-director rights taken from La Porta et al. (1999). It is commonly used in the literature to measure the level of investor protection (Caprio et al., 2007 and Laeven & Levine, 2009). It is measured at the country level. If shareholder rights are stronger, even minority shareholders are able to exercise better control over management. If this reduces the ability of management to extract private benefits, we would expect a positive relationship between RIGHTS and  $\overline{RoE}_i$ . Similarly, if minority shareholders push for greater risk-taking to increase their return on investment, we would also

expect a positive relationship between RIGHTS and bank risk (DROE). In particular, minority shareholders may have an incentive to increase risk, given that they are able to fully diversify firm-specific risk (Shleifer & Vishny, 1997). The effect of RIGHTS on risk may, hence, be larger than the effect of STAKE.<sup>33</sup>

We use different sets of control variables,  $X$ . Our baseline model includes only bank type dummies. In order to test the robustness of our results, we later also control for state ownership (STATE) and foreign ownership (FOREIGN), as well as whether the bank is listed or not (LIST). Furthermore, we later add several bank-specific variables, such as capital, and country-specific variables, such as regulatory quality. We also control for profit smoothing. For a complete list and a description of the variables used see Table A7. Summary statistics are presented in Table A8.

### 3 Descriptive Statistics

#### 3.1 Ownership Concentration in the OECD Banking Sector

Our dataset contains unlisted banks, savings, and cooperative banks, as well as a number of specialised credit institutions. As this represents a deviation from the previous literature, we present detailed descriptive statistics for relationships among the main variables of interest. Table 27 presents summary statistics for the largest shareholding according to the type of bank. Table 27 indicates that the degree of ownership concentration varies across bank types. While ownership in bank holding companies and cooperative banks is usually more dispersed, ownership is highly concentrated in state banks and investment banks. There are also significant differences between listed and unlisted banks. As expected, ownership is more dispersed in case of listed credit institutions. However, overall ownership tends to be concentrated with the largest blockholder holding, on

---

<sup>33</sup>John et al. (2008) argue that there is an indirect effect of RIGHTS on risk-taking that operates through ownership concentration. In countries with strong shareholder protection there are fewer benefits to having dominant shareholders. This may have the consequence that management has more discretionary power and ultimately result in less risk taking. Hence, in all our regressions we control for ownership concentration when examining the effect of shareholder rights on risk and we also control for the endogeneity of ownership concentration using an instrumental variables approach (see Section 4).

average, more than 50 percent of the shares. This is consistent with previous research that finds that banks are generally not widely held (Caprio et al., 2007).

**Table 27: Ownership Concentration by Specialization**

	Obs.	Mean	Median	Max.	Min.	Std. Dev.
Bank Holding & Holding Company	233	17.94	0.00	100.00	0.00	30.54
Commercial Bank	526	57.80	50.10	100.00	0.00	38.61
Cooperative Bank	92	32.95	25.00	100.00	0.00	33.18
Investment Bank/Securities House	68	67.09	100.00	100.00	0.00	40.89
Medium & Long Term Credit Bank	18	62.99	65.00	100.00	0.00	36.50
Multi-Lateral Governmental Bank	1	60.11	60.11	60.11	60.11	0.00
Real Estate/Mortgage Bank	60	58.99	61.65	100.00	0.00	37.64
Savings Bank	95	53.99	50.10	100.00	0.00	32.96
Specialised Governmental Credit Institution	49	76.87	85.00	100.00	22.50	24.60
<b>Total</b>	<b>1,142</b>	<b>48.87</b>	<b>50.10</b>	<b>100.00</b>	<b>0.00</b>	<b>39.83</b>
- Listed Banks	475	18.19	0.00	100.00	0.00	26.86
- Unlisted Banks	667	70.17	85.00	100.00	0.00	32.49

T-test statistic on the sample mean: Listed Banks vs. Unlisted Banks: 29.8151\*\*\*.

Source: Bankscope (2009). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 27 presents summary statistics on the degree of ownership concentration for different types of banks. Ownership concentration is measured by the largest direct or indirect ownership stake. Every direct and indirect shareholding below 10 percent is set to zero. Means equality tests for listed versus unlisted banks reported at the bottom of the table.

Table 28 indicates that ownership structures also differ across countries. As expected, bank ownership is more dispersed in the United States and the United Kingdom compared to most other countries. La Porta et al. (1998) argue that differences in the degree of ownership concentration are caused by different levels of investor protection. If investor rights are better protected, shareholders have less need for a large block of shares to control the management. Hence, ownership should be more dispersed in countries where shareholder rights are better protected and more concentrated in countries where investor rights are less protected. This is reflected in Table 28. With a T-test statistic of 6.8, ownership is significantly more concentrated in civil law than in common law countries (La Porta et al., 1998). At the same time, shareholder rights are significantly better protected in common law than in civil law countries (with a T-test statistic of 59.6).

**Table 28: Ownership Concentration and Shareholder Rights by Country**

	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Max.</b>	<b>Min.</b>	<b>Std. Dev.</b>	<b>RIGHTS</b>
Australia	13	42.76	99.77	100.00	11.44	35.58	4
Austria	50	68.96	73.94	100.00	0.00	27.40	2
Belgium	14	73.38	99.77	100.00	11.44	35.58	0
Canada	25	43.73	50.10	100.00	0.00	41.38	5
Denmark	28	26.59	0.00	100.00	0.00	36.44	2
Finland	3	59.12	56.90	100.00	20.48	39.80	3
France	126	61.17	56.46	100.00	0.00	34.51	3
Germany	95	78.44	92.50	100.00	0.00	27.89	1
Greece	10	54.49	47.17	100.00	0.00	31.34	2
Ireland	12	83.33	100.00	100.00	0.00	38.92	4
Italy	99	49.90	51.03	100.00	0.00	36.77	1
Japan	103	15.76	0.00	100.00	0.00	31.03	4
Korea, Rep.	14	54.30	61.25	100.00	0.00	38.13	2
Mexico	17	75.43	99.97	100.00	0.00	35.28	1
Netherlands	21	77.43	100.00	100.00	0.00	32.04	2
New Zealand	6	100.00	100.00	100.00	100.00	0.00	4
Norway	13	2.61	0.00	34.00	0.00	9.42	4
Portugal	10	64.72	86.20	100.00	0.00	42.76	3
Spain	25	35.02	14.98	100.00	0.00	37.19	4
Sweden	16	70.60	100.00	100.00	0.00	40.30	3
Switzerland	59	73.77	88.10	100.00	0.00	32.77	2
Turkey	13	72.38	76.99	100.00	30.15	22.49	2
United Kingdom	53	72.29	100.00	100.00	0.00	41.68	5
United States	317	29.00	13.65	100.00	0.00	32.20	5
<b>Total</b>	<b>1,142</b>	<b>48.87</b>	<b>50.10</b>	<b>100.00</b>	<b>0.00</b>	<b>39.83</b>	<b>3.26</b>
- of which common law countries	426	38.72	49.00	100.00	0.00	38.67	4.92
- of which civil law countries	716	54.91	53.65	100.00	0.00	39.31	2.27

T-test statistic on the sample mean: Common law countries vs. civil law countries: 6.7981\*\*\*

We additionally test whether anti-director rights (RIGHTS) significantly differ for common law and civil law countries.

	<b>Obs.</b>	<b>Mean</b>	<b>Median</b>	<b>Max.</b>	<b>Min.</b>	<b>Std.Dev.</b>
- of which common law countries	426	4.92	5	5	4	0.26
- of which civil law countries	716	2.27	2	4	0	1.14

T-test statistic on the sample mean: Common law countries vs. civil law countries: -59.60\*\*\*

Source: Bankscope (2009) and La Porta et al. (1998). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 28 presents summary statistics on the degree of ownership concentration and investor protection for different countries. Ownership concentration is measured by the largest direct or indirect ownership stake. Every direct and indirect shareholding below 10 percent is set to zero. Investor protection is measured by the anti-director rights index (La Porta et al., 1998). Means equality tests for common law and civil law countries are reported at the bottom of the table. Common law countries are Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States. All other countries are civil law countries.

### 3.2. Bank Performance and Bank Risk-Taking

We measure bank performance using the return-on-equity (ROE). Given that we are interested in the effect of governance by shareholders on performance and risk, ROE comes closest to what may enter shareholders' objective functions, given that we are limited to accounting data. Since we are interested in the long-run structural relationship between the performance and the ownership structure of banks, we use the average ROE in the *pre-crisis period* between 2000 and 2006 to measure long-term performance. Summary statistics for the long-run performance are presented in Table 29. Table 29 indicates that investment banks and bank holding companies had the best and governmental credit institutions the worst average performance in the pre-crisis period. This may be evidence that the managers of governmental credit institutions had more scope to extract private benefits than the managers of investment banks or bank holding companies, but it may also simply suggest that governmental institutions are poorly managed, as the government may not pursue profit maximizing objectives. Interestingly, savings banks (average ROE of 15 percent) do not necessarily show a lower average ROE compared to commercial banks (14 percent) or bank holding companies (17 percent).

**Table 29: Summary Statistics for Bank Performance ( $\overline{RoE}_i$ )**

	Obs.	Mean	Median	Max.	Min.	Std. Dev.
Bank Holding & Holding Company	233	0.17	0.17	0.46	-0.16	0.08
Commercial Bank	526	0.14	0.14	0.46	-0.16	0.11
Cooperative Bank	92	0.12	0.11	0.46	0.02	0.05
Investment Bank/Securities House	68	0.20	0.19	0.46	-0.02	0.14
Medium & Long Term Credit Bank	18	0.11	0.10	0.27	0.04	0.06
Multi-lateral Governmental Bank	1	0.03	0.03	0.03	0.03	0.00
Real Estate/Mortgage Bank	60	0.12	0.11	0.34	-0.16	0.08
Savings Bank	95	0.15	0.14	0.46	0.03	0.07
Specialised Governmental Credit	49	0.10	0.10	0.46	-0.13	0.10
Total	1,142	0.14	0.14	0.46	-0.16	0.10

Source: Bankscope (2009). Table 29 presents summary statistics for bank performance. Bank performance is measured by the average return-on-equity (ROE) in period between 2000 and 2006. Banks for which we do not have at least three observations are not included. ROE is winsorized at the 1-and 99-% level.



**Table 30: Summary Statistics for Bank Risk (DROE)**

	Obs.	Mean	Median	Max.	Min.	Std. Dev.
Bank Holding & Holding Company	233	1.19	1.11	2.50	0.41	0.28
Commercial Bank	526	1.11	1.05	2.50	0.41	0.28
Cooperative Bank	92	1.06	1.04	1.37	0.96	0.08
Investment Bank/Securities House	68	1.17	1.06	2.50	0.41	0.37
Medium & Long Term Credit Bank	18	1.19	1.13	1.19	0.41	0.37
Multi-lateral Governmental Bank	1	0.99	0.99	0.99	0.99	0.00
Real Estate/Mortgage Bank	60	1.05	1.04	2.31	0.41	0.26
Savings Bank	95	1.16	1.08	2.50	0.70	0.27
Specialised Governmental Credit	49	1.09	1.03	2.42	0.41	0.27
<b>Total</b>	<b>1,142</b>	<b>1.13</b>	<b>1.06</b>	<b>2.50</b>	<b>0.41</b>	<b>0.28</b>

Source: Bankscope (2009). Table 30 presents summary statistics for bank risk. Bank risk is measured by the deviation in ROE in 2008 from its average performance in the period between 2000 and 2006. Banks for which we do not have at least three observations are not included. DROE is defined as  $1 - [RoE_{2008} - \overline{RoE}]$ . A larger value for DROE, hence, indicates greater losses in 2008. To eliminate outliers, DROE is winsorized at the 1-and 99-% level.

To measure bank risk, we use the 2008 deviation from the long-term average ROE (DROE). Since risks have materialized during the crisis, we expect that banks that raised their profits between 2000 and 2006 through higher risk-taking should perform worse in 2008. The size of the 2008 deviation from the long-run can, therefore, be used as an indicator for bank risk-taking in the pre-crisis period. Summary statistics for DROE are presented in Table 30.<sup>34</sup> Table 30 shows that investment banks, bank holding companies, and medium and long-term credit banks suffered the largest and cooperative and mortgage banks the smallest losses in 2008 relative to long-run profitability. Investment banks, bank holding companies, and medium and long-term credit banks appear to have taken greater risk in the pre-crisis period than cooperative and mortgage banks. To illustrate the relationship between bank performance and bank risk, we plot ROE against DROE. Figure A2 in the appendix shows a significant (at the 1-percent level) and positive relationship between average bank performance and bank risk-taking. This suggests that the superior long-term performance of investment banks and bank holding companies may be attributed to greater risk-taking in the pre-crisis period.

<sup>34</sup>Recall that DROE is defined as  $1 - [RoE_{2008} - \overline{RoE}]$ , and is increasing in the 2008 loss.

## 4 Baseline Results

We start with regressing ROE on STAKE and RIGHTS using OLS without any additional control variables. The results of this simple model are reported in the first column of Table 31. We find that STAKE and RIGHTS are both significantly related to average ROE. The positive coefficient for STAKE and RIGHTS indicates that bank performance is higher if ownership is more concentrated and if banks are located in countries with a higher level of investor protection. To check whether the positive relationship is due to higher risk-taking, we regress DROE on STAKE and RIGHTS. The results are reported in the second column of Table 31. Both STAKE and RIGHTS are highly significant. The positive coefficient for RIGHTS indicates that banks in countries with better shareholder protection incurred greater risks. In stark contrast to RIGHTS, we obtain a negative coefficient for STAKE, which is significant at the 1-percent level. Banks with more concentrated owners appear to incur fewer risks.

The results are inconsistent if the ownership structure of a bank is endogenous and the outcome of a competitive selection process in which various advantages and disadvantages of different degrees of ownership concentration are balanced (Demsetz, 1983). For this reason, we instrument STAKE with a dummy variable indicating whether a bank is located in civil law or common law countries (COMMON). Since investor rights are better protected in common law countries, ownership should be more dispersed in common law than in civil law countries.<sup>35</sup> Table 28 indicates that ownership concentration is indeed significantly higher in civil law than in common law countries. Since COMMON seems to capture differences in the ownership structure reasonably well and since it is largely determined by cultural and historical facts, we regard COMMON as a valid

---

<sup>35</sup>We obtain very similar results if we use the average ownership concentration of banks in a given country as an instrument as in Laeven & Levine (2009). The results are available from the authors upon request.

instrument for STAKE.<sup>36</sup> The results of the instrumental variables regression are reported in columns 3 and 4 of Table 31.

**Table 31: Baseline Results**

	Model 1		Model 2		Model 3	
	ROE	DROE	ROE	DROE	<i>Baseline</i>	
					ROE	DROE
STAKE	0.000195** (2.34)	-0.000615*** (-2.76)	0.00523* (4.49)	0.00595*** (3.00)	0.00362*** (5.63)	0.00348*** (2.82)
RIGHTS	0.0136*** (6.88)	0.0216*** (3.69)	0.0568** (5.21)	0.0778*** (4.08)	0.0310*** (5.89)	0.0428*** (3.84)
HOLDING					0.135*** (5.70)	0.162*** (3.55)
SAVINGS					0.0381** (2.48)	0.0719** (2.14)
COOPERATIVE					0.0938*** (3.80)	0.0592 (1.44)
INVESTMENT					0.0116 (0.46)	0.00591 (0.11)
MORTGAGE					0.00356 (0.17)	-0.0309 (-0.75)
STATE-BANK					-0.0583*** (-3.30)	-0.00258 (-0.06)
Observations	1,142	1,142	1,142	1,142	1,142	1,142
F-test of excluded instruments			24.20***	24.20***	48.18***	48.18***
Endogeneity test-statistic			66.77***	20.97***	58.34***	14.83***

Source: Own Calculations. \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 31 presents the regression results for bank performance ( $\overline{RoE}_i$ ) and bank risk (DROE). Data on bank performance and bank risk comes from the Bankscope database of Bureau van Dijk. DROE is defined as  $1 - \left[ \overline{RoE}_{2008} - \overline{RoE} \right]$ . A larger value for DROE indicates greater losses in 2008. Regressions use OLS (Model 1) and Two-Stage Least Squares (Model 2 and 3). We test for endogeneity using STATA's endog option. The null hypothesis is that the endogenous variable can be treated as exogenous. The test-statistic is reported at the bottom of Table 31. To control for heteroscedasticity, we use White-robust standard errors (White, 1980). The sample includes 1,142 banks. For a complete list and a description of the variables used in the regression analysis see Tables A7 and A8.

While the results for STAKE and RIGHTS remain unchanged in the *performance equation* (ROE), the sign of STAKE changes from negative to positive in the *risk equation* (DROE). The reason is simultaneity. If risk increases with ownership concentration because large shareholders are better able to affect risk-taking, but ownership concentration decreases as risk increases – which is reasonable since

<sup>36</sup>Test statistics indicate that this is indeed the case.

large owners are less diversified than minority shareholders –, the coefficient for STAKE may become negative if we do not control for endogeneity. This is consistent with the literature. Caprio et al. (2007), for example, argue that investor protection alone may not provide a sufficiently powerful corporate governance mechanism to small shareholders. Put differently, even with strong investor protection laws, small shareholders may lack the means to monitor and govern banks. Since tests indicate that STAKE is endogenous, we from now on only report results using instrumental variables regressions. The positive and significant coefficients for STAKE and RIGHTS in the instrumental variable regression indicate that shareholders push for greater risk-taking and not managers. This is in line with recent findings by Fahlenbrach & Stulz (2009) and Beltratti & Stulz (2009). They show that stock price performance during the crisis was worse in those banks, in which the incentives of management were better aligned with the interests of shareholders.

In the next step, we add bank type dummy variables. Gropp & Kashyap (2009), for example, show that due to differences in the market for corporate control (cooperative banks cannot be taken over) the bank type may be an important determinant of performance (and possibly risk) over the medium term. The results are reported in columns 5 and 6 of Table 31. We refer to this specification as our *baseline model* below. STAKE and RIGHTS remain highly significant and keep their positive sign indicating that a higher level of ownership concentration and better investor protection increase bank performance and bank risk-taking. In addition, the HOLDING, SAVINGS, and COOPERATIVE dummy indicate that the average performance of bank holding companies, savings banks, and cooperative banks was significantly better, while the performance of state-banks (STATEBANK) was significantly worse compared to commercial banks (the omitted category). Bank holding companies and savings banks also show, on average, larger downward deviation from long run averages in 2008 as indicated by the significant and positive coefficient for HOLDING and SAVINGS in the risk equation.

Using the baseline coefficients, we find that, evaluated at the sample mean, a one percent increase in ownership concentration, would result in 1.26 percent better average performance during 2000 to 2006 and 0.15 percent worse performance during 2008. A one percent increase in ownership rights, again evaluated at the mean, would result in a 0.74 percent better performance during 2000 to 2006 and 0.12 percent larger loss in 2008 relative to average performance. An illustration may help to better understand the economic magnitudes. The coefficients suggest that a bank whose largest shareholder owns less than 10 percent and who is headquartered in a country with poor shareholder rights (RIGHTS equal to two, e.g. Switzerland) is estimated to have an 2000 to 2006 average ROE of 6.3 percent. In 2008, the ROE was five percentage points lower. In contrast, a bank headquartered in a country with strong shareholder rights (RIGHTS equal to five, e.g. United Kingdom) and where the largest shareholder owns 75 percent of the shares would have an average 2000 to 2006 ROE of 30.1 percent and the 2008 ROE would be 31 percentage points lower, i.e. a ROE of minus one percent.

Overall, therefore, we find that owner-controlled banks performed significantly better before the crisis and significantly worse during the crisis compared to manager controlled banks. The effects are economically large. Bank owners seem to have been the driving force behind the risks that banks incurred in the wake of the crisis, not the managers. This is consistent with standard agency theoretic arguments (Amihud & Lev, 1981, Holmstrom & Ricart I Costa, 1986, and Hirshleifer & Thakor, 1992). Risk-averse managers, faced with undiversifiable career and income risk, would like to incur fewer risks than desired by the owners of the bank. If agency conflicts between management and share holders are reduced when shareholder rights are stronger or ownership is more concentrated, the outcome is more risk-taking. We also find that controlling for shareholder rights, large stakeholders prefer more risk than management. Large stakeholders seem to use their power to control management to increase risk-taking. We find no evidence that their lack of diversification or their desire to protect private benefits is empirically important.

In the following sections, we extend and modify our model in order to check the robustness of the results. We add several bank-specific variables to examine whether our results are explained by other bank characteristics that happen to be correlated with the degree of shareholder control of management. Second, as suggested by Laeven & Levine (2009), we check whether the relationship between performance, risk, ownership concentration, and shareholder rights depends on the level of banking regulation and supervision. Third, we test whether the results for STAKE and RIGHTS change if we control for other important institutional factors and if the results are robust to controlling for the structure of the banking market in the country where the bank is located. Since our measures for bank risk and performance may be influenced by profit smoothing, we additionally check whether our results are robust if we control for profit smoothing. Finally, we test whether the likelihood that a bank received financial support from the government during the crisis is higher if ownership is concentrated and investor rights better protected.

## **5 Bank Characteristics**

First, we add a set of dummy variables indicating whether a bank is state-owned (STATE), foreign-owned (FOREIGN), or listed (LIST). The results are reported in the first two columns of Table 32. The dummy variables turn out to be highly significant. The results indicate that listed banks performed better in terms of ROE than banks that are not listed. This is consistent with the idea that better functioning markets for corporate control push managers towards better performance (Gropp & Kashyap, 2009). In contrast, banks owned by the state or by foreign shareholders perform significantly worse, consistent with the literature which usually finds that government (La Porta et al., 2002) and foreign ownership (De Young & Nolle, 1996 and Berger et al., 2000) reduces bank performance. Berger et al. (2000) explain the relative inefficiency of foreign credit institutions by organizational diseconomies to operating and monitoring banks from distance. Government ownership reduces bank performance, since politicians acquire control of bank to provide employment, subsidies, and other benefits to supporters

**Table 32: Bank Characteristics**

	Model 4		Model 5	
	State and Foreign Ownership		Bank Characteristics	
	ROE	DROE	ROE	DROE
STAKE	0.0127** (2.15)	0.0154* (1.79)	0.00437*** (4.99)	0.00458*** (2.93)
RIGHTS	0.0721** (2.46)	0.0971** (2.22)	0.0294*** (5.47)	0.0442*** (4.23)
HOLDING	0.147*** (2.59)	0.172** (2.08)	0.166*** (5.22)	0.209*** (3.67)
SAVINGS	0.203** (2.01)	0.301** (2.01)	0.0365** (2.04)	0.0719** (2.03)
COOPERATIVE	0.392** (1.96)	0.460 (1.58)	0.110*** (3.51)	0.0708 (1.42)
INVESTMENT	-0.0468 (-0.66)	-0.0767 (-0.75)	0.0339 (1.01)	0.0459 (0.73)
MORTGAGE	0.0993 (1.22)	0.106 (0.91)	-0.0298 (-1.12)	-0.0427 (-0.88)
STATE-BANK	-0.00767 (-0.12)	0.125 (1.28)	-0.0698*** (-3.10)	-0.0186 (-0.38)
LIST	0.583** (2.00)	0.778* (1.82)		
STATE	-0.211* (-1.74)	-0.380** (-2.26)		
FOREIGN	-0.0750** (-2.27)	-0.0672 (-1.39)		
SIZE			0.0102** (2.21)	0.0234*** (2.63)
EQUITY			-0.000750 (-0.63)	-0.00181 (-0.97)
DEPOSITS			0.0629* (1.89)	0.0334 (0.54)
LOANS			0.102*** (2.97)	0.188*** (2.96)
Observations	1,142	1,142	1,073	1,073
F-test of excluded instruments	5.04**	5.04**	33.48***	33.48***
Endogeneity test-statistic	51.22***	13.07***	66.28***	17.13***

Source: Own calculations. \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 32 presents the results of robustness checks controlling for bank characteristics. Data on bank performance ( $\overline{RoE}_i$ ) and bank risk (DROE) comes from the Bankscope database of Bureau van Dijk. DROE is defined as  $1 - \left[ \overline{RoE}_{2008} - \overline{RoE} \right]$ . A larger value for DROE, hence, indicates greater losses in 2008. Since tests indicate that STAKE is endogenous, we only report the results of Two-Stage Least Squares regressions. We test for endogeneity using STATA's endog option. The null hypothesis is that the endogenous variable can be treated as exogenous. The test-statistic is reported at the bottom of Table 32. To control for heteroscedasticity, we use White-robust standard errors (White, 1980). The sample includes 1,142 banks. Since data on the bank characteristics is not available for the full samples, the number of observations in the regression including the bank variables is smaller than in the baseline model. For a complete list and a description of the variables used in the regression analysis see Tables A7 and A8.

who return the favor in the form of votes in the next election (La Porta et al., 2002).<sup>37</sup> The results for DROE suggest that listed banks increased their performance in the pre-crisis by greater risk-taking (significant at the 10-percent level). In contrast, controlling for ownership concentration and shareholder rights, banks owned by the government reported, on average, smaller losses in 2008.<sup>38</sup> The basic result of the paper remains unchanged, however: STAKE and RIGHTS remain significant and retain their positive sign. Next, we add several bank accounting variables to our model. Consistent with the dependent variable in the performance regressions, they are averaged over the period 2000 to 2006. Since we do not regard them as strictly exogenous to bank performance and bank risk, we do not include them in our baseline model.

The results are reported in columns 3 and 4 of Table 32.<sup>39</sup> The first variable included is the logarithm of total bank assets to control for bank size (SIZE). SIZE turns out to be significant and positive in the regression with ROE indicating that larger banks performed better between 2000 and 2006 than smaller credit institutions. Larger banks may outperform smaller banks because of economies of scale and scope or greater market power (Berger et al., 2000). However, SIZE is also significant and positive in the risk equation. This suggests that at least part of the superior performance of large banks in the pre-crisis period can also be attributed to greater risk-taking. Bank risk increases with SIZE, because large banks may be more likely to engage in more risky transactions on the international financial market owing to the large fixed costs necessary to operate globally (Chen & Mazumdar, 1997). They may also have incurred greater risks

---

<sup>37</sup>Sapienza (2004), for example, finds that state-owned banks in Italy charge systematically lower interest rates in regions in which the political party affiliated with the bank is stronger.

<sup>38</sup>This finding is inconsistent with anecdotal evidence for Germany, where in particular the state-owned *Landesbanken* were affected by the crisis. Several of these banks had to be bailed out by the Government. We checked whether these banks are in the sample and they are. It turns out that their performance before the crisis was already quite poor, which implies that their losses relative to average performance (DROE) were not as large as for some private sector banks. Furthermore, some *Landesbanken* recorded their largest losses in 2009. *BayernLB*, for example, announced additional losses of 3.8 billion euro in December 2009. Since we focus on the losses in 2008, the losses in 2009 are not included. The results for the government ownership dummy should, hence, be interpreted with caution.

<sup>39</sup>Note that we lose a few observations due to missing values for the loans and deposits category (see also Table 8).



based on the expectation of a government bail-out in case things turn out poorly (Boyd & Runkle, 1993).

The second bank characteristic included is the ratio of total equity to total assets (EQUITY). The effect of EQUITY on performance is not clear a priori. On the one hand, better capitalized banks should have lower refinancing costs owing to lower insolvency risk. This suggests that EQUITY is positively related to long-term performance. However, a higher level of capital may also indicate that banks forego profitable investment opportunities. This should reduce performance. Our results suggest that neither of these effects dominates, since EQUITY is insignificant for ROE. While the effect on long-term performance is not clear a priori, better capitalized banks should have suffered smaller losses during the crisis, based on the idea that banks with larger charter values (more “*skin in the game*”) are hesitant to incur great risks (Keeley, 1990 and Cordella & Yeyati, 2003). This implies that EQUITY should be negatively related to DROE in the risk equation. This is what we find. However, the effect of EQUITY is not statistically significant. This contrasts with Beltratti & Stulz (2009), who find a significant and positive link between EQUITY and performance during the crisis.

To control for the liability side of the bank, we include DEPOSITS defined as the ratio of total deposits to total bank assets. DEPOSITS is significantly (at the 10-percent level) related to long-term performance. The positive coefficient indicates that banks with a larger deposit base have a higher long-term performance than banks that have a smaller deposit base. This is reasonable, since refinancing via deposits is cheaper than other sources of funding, especially in light of deposit insurance. Some form of explicit deposit insurance existed in all countries of our sample (Barth et al., 2006). Since deposit funding usually also provides a more stable source of funding, in particular, when money markets work poorly, we expect that banks with a larger deposit base should have also experienced smaller losses in 2008. The results do not support this hypothesis. DEPOSITS is insignificant for DROE and consistent with evidence in Beltratti & Stulz (2009).

To control for the asset side of the bank, we include LOANS defined as the ratio of total loans to total assets. Banks where LOANS is higher should have a smaller portfolio of securities. We would expect such banks to have performed better during the crisis because their regulatory capital would have been less endangered by the increase in credit spreads that reduces securities values (Beltratti & Stulz, 2009). However, these banks would have also had to increase loan loss reserves on their loans. The results suggest that the second effect dominates, since performance dropped more in 2008 if banks had a larger loan portfolio as indicated by the positive and significant coefficient for LOANS in the risk equation. Greater lending activities also seem to have raised average performance in the pre-crisis period. More importantly, however, bank performance and bank risk are still positively and significantly (at the 1-percent level) related to the degree of ownership concentration and the level of investor protection.

## **6 Banking Regulation and Supervision**

Next, we test whether our results are robust to the inclusion of bank regulatory variables. Caprio et al. (2007) and Laeven & Levine (2009) show that bank valuation and risk-taking depend on the level of banking regulation and supervision. Hence, we include RESTRICT, CAPITAL, OFFICIAL, and INDEPENDENCE. RESTRICT is an index that measures to which extent the regulator can restrict the activities of banks, while CAPITAL measures regulatory oversight over bank capital. OFFICIAL and INDEPENDENCE control for the power and the independence of the supervisory authority. For a more detailed description of these variables see Table A7. The results with the banking regulation and supervision variables are reported in Table 33. We follow the literature (Caprio et al., 2007, Laeven & Levine, 2009) and add each variable separately to our baseline model. A priori, if regulation is effective in reducing risk-taking by banks, bank losses in 2008 should be smaller in countries with tighter regulation and a more powerful and independent regulator. However, consistent with less risk-taking, we would also expect that banks located in countries with better regulation and supervision performed worse in the pre-crisis

**Table 33: Banking Regulation and Supervision**

	Model 6		Model 7		Model 8		Model 9		Model 10	
	Activity Restrictions		Capital Regulation		Power of the Supervisor		Independence of the Supervisor		Deposit Insurance	
	ROE	DROE	ROE	DROE	ROE	DROE	ROE	DROE	ROE	DROE
STAKE	0.00316*** (6.25)	0.00261*** (2.67)	0.00435*** (5.27)	0.00378*** (2.59)	0.00370*** (5.73)	0.00346*** (2.85)	0.00404*** (5.66)	0.00368*** (2.82)	0.00346*** (5.48)	0.00394*** (2.98)
RIGHTS	0.0241*** (6.12)	0.0297*** (3.35)	0.0338*** (5.41)	0.0432*** (3.64)	0.0323*** (6.13)	0.0361*** (3.35)	0.0370*** (6.23)	0.0456*** (3.79)	0.0291*** (5.62)	0.0441*** (3.73)
HOLDING	0.103*** (5.90)	0.102*** (2.92)	0.159*** (5.38)	0.173*** (3.32)	0.139*** (5.86)	0.159*** (3.53)	0.152*** (5.74)	0.169*** (3.53)	0.131*** (5.68)	0.174*** (3.65)
SAVINGS	0.0333** (2.34)	0.0628** (1.99)	0.0185 (1.06)	0.0574 (1.61)	0.0374** (2.42)	0.0680** (2.01)	0.0405** (2.51)	0.0730** (2.15)	0.0365** (2.44)	0.0683** (1.98)
COOPERATIVE	0.103*** (4.48)	0.0767* (1.94)	0.119*** (3.77)	0.0728 (1.51)	0.0913*** (3.52)	0.0661 (1.55)	0.0836*** (3.14)	0.0545 (1.31)	0.0883*** (3.71)	0.0656 (1.52)
INVESTMENT	0.0373* (1.71)	0.0547 (1.11)	0.00956 (0.31)	0.0101 (0.17)	0.00969 (0.38)	0.00438 (0.08)	0.0156 (0.59)	0.00775 (0.14)	0.0108 (0.43)	-0.00674 (-0.12)
MORTGAGE	0.0152 (0.79)	-0.00876 (-0.21)	-0.0136 (-0.55)	-0.0518 (-1.21)	-0.00101 (-0.05)	-0.0427 (-1.04)	0.0134 (0.57)	-0.0264 (-0.63)	-0.00926 (-0.45)	-0.0418 (-0.95)
STATE-BANK	-0.0488*** (-3.03)	0.0155 (0.38)	-0.0465* (-1.90)	0.0557 (0.91)	-0.0563*** (-2.95)	-0.0166 (-0.35)	-0.0412** (-2.15)	0.00530 (0.12)	-0.0575*** (-3.33)	-0.0114 (-0.25)
RESTRICT	0.0148*** (4.28)	0.0281*** (4.11)								
CAPITAL			0.00692* (1.80)	0.00999 (1.59)						
OFFICIAL					-0.00171 (-0.77)	0.00571 (1.29)				
INDEPENDENCE							-0.0388*** (-3.72)	-0.0178 (-0.92)		
COVERAGE									-0.0000547 (-0.86)	-0.000221** (-1.97)
Observations	1 142	1 142	1 070	1 070	1 125	1 125	1 142	1 142	1 123	1 123
F-test of excluded instruments	80.21***	80.21***	35.50***	32.50***	50.00***	50.00***	44.51***	44.51***	48.73***	48.73***
Endogeneity test-statistic	60.85***	11.40***	62.36***	12.89***	65.34***	15.08***	66.62***	15.08***	51.99***	16.73***

Source: Own calculations. \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 33 presents the results of robustness checks controlling for the level of banking regulation and supervision. Data on bank performance ( $\overline{RoE}_i$ ) and bank risk (DROE) comes from the Bankscope database of Bureau van Dijk. DROE is defined as  $1 - \left[ RoE_{2008} - \overline{RoE} \right]$ . A larger value for DROE, hence, indicates greater losses in 2008. Since tests indicate that STAKE is endogenous, we only report the results of Two-Stage Least Squares regressions. We test for endogeneity using STATA's endog option. The null hypothesis is that the endogenous variable can be treated as exogenous. The test-statistic is reported at the bottom of Table 33. To control for heteroscedasticity, we use White-robust standard errors (White, 1980). The sample includes 1,142 banks. Since data on banking regulation and supervision is not available for all countries, the number of observations in the regressions including the banking regulation and supervision is smaller than in the baseline model. For a complete list and a description of the variables used in the regression analysis see Tables A7 and A8.

period. This suggests that the regulatory variables are negatively related to ROE and DROE. Our results show the opposite. RESTRICT is positive and significant at the 1-percent level in both regressions, while CAPITAL is positive and marginally significant at the 10-percent level. Limiting banks in their activities (RESTRICT) and the quality of capital requirements (CAPITAL) are positively related to bank performance and bank risk. This corresponds to recent empirical work by Caprio et al. (2007), Beltratti & Stulz (2009), and Laeven and Levine (2009). The latter argue that bank owners may seek to compensate for the utility loss from stricter activity restrictions by increasing risk on remaining activities, while stricter regulations on capital may have motivated banks to engage in off-balance sheet activities to evade capital regulation. OFFICAL and INDEPENDENCE are not significantly related to bank performance and risk, consistent with Caprio et al. (2007).

Finally, we add a variable that captures the level of deposit insurance coverage (COVERAGE). Deposit insurance may aggravate agency problems, since it lowers the incentive of depositors to monitor the bank, because their funds are protected regardless of the outcomes of the investment strategies the bank selects (Macey & O'Hara, 2003). This should increase the incentive of shareholders to engage in excessive risk-taking (Prowse, 1997 and Macey & O'Hara, 2003). Alternatively, deposit insurance may reduce the incentives for risk-taking as it increases the charter value of the bank (Keeley, 1990 and Cordella & Yeyati, 2003). Unfairly priced deposit insurance constitutes an implicit government subsidy to the bank, increasing profits and the incentives to remain in business and, therefore, may reduce risk-taking. Our results are consistent with the second idea. While COVERAGE is insignificant in the performance equation, it is negative and significantly related to bank risk in the risk equation.

Overall, as in all other regression that include banking regulation and supervision variables STAKE and RIGHTS remain significant and positively related to bank performance and risk-taking consistent with the hypothesis that shareholders and not managers push for greater risk-taking.

## 7 Other Country Characteristics

Finally, to test whether our shareholder rights variables proxies for some other country variables, we follow Beltratti & Stulz (2009) and Caprio et al. (2007) and include variables that control for the overall institutional environment. The first index measures to what extent agents in a country have confidence in contract enforcement and property rights (RULE OF LAW), while the overall quality of the regulatory environment is proxied by REGULATORY QUALITY. Furthermore, we include an index on the level of corruption (CORRUPTION). Since these indices are correlated, we add each index separately to our baseline model. The results are reported in columns 1 to 6 of Table 34. The institutional variables turn out to be mostly insignificant. In contrast, STAKE and RIGHTS remain significant and positively correlated with ROE and DROE.

To control for the structure of the banking system, we use DBAGDP and C3. DBAGDP measures the size of the banking system and is defined as the ratio of total deposit money bank assets to GDP. C3 proxies for the degree of banking market concentration by the sum of the market share of the three largest banks. The results are reported in columns 7 and 8 of Table 34. They suggest that average long-term performance is higher in countries with a smaller banking system and a higher degree of banking market concentration. Bank risk, in contrast, does not seem to be higher in countries with a larger banking sector, but is lower in countries with a higher degree of banking market concentration. The latter may indicate that banks that operate in more concentrated markets may have fewer incentives to engage in more risky activities to increase their profits owing to a lower level of product market competition. This is consistent with the idea that bank charter values reduce risk-taking (Keeley, 1990). However, even controlling for the banking sector characteristics does not change our results for STAKE and RIGHTS.

Since the financial crisis started in the United States and may have hit U.S. banks hardest, we were concerned that the large number of US banks in our sample –

**Table 34: Other Country Characteristics**

	Model 11 <i>Rule of Law</i>		Model 12 <i>Regulatory Quality</i>		Model 13 <i>Corruption</i>		Model 14 <i>Banking Market Structure</i>	
	ROE	DROE	ROE	DROE	ROE	DROE	ROE	DROE
STAKE	0.00362*** (5.63)	0.00349*** (2.82)	0.00424*** (4.11)	0.00382** (2.11)	0.00373*** (5.41)	0.00359*** (2.74)	0.00213*** (4.02)	0.00265** (2.04)
RIGHTS	0.0333*** (5.66)	0.0438*** (3.55)	0.0374*** (4.16)	0.0462*** (2.78)	0.0341*** (5.42)	0.0458*** (3.53)	0.0208*** (4.88)	0.0240** (2.30)
HOLDING	0.135*** (5.70)	0.162*** (3.55)	0.159*** (4.15)	0.174*** (2.64)	0.139*** (5.49)	0.166*** (3.47)	0.0710*** (3.51)	0.120** (2.33)
SAVINGS	0.0403*** (2.63)	0.0729** (2.14)	0.0451** (2.48)	0.0756** (2.07)	0.0413*** (2.62)	0.0750** (2.18)	0.0126 (1.05)	0.0687** (1.97)
COOPERATIVE	0.0928*** (3.85)	0.0588 (1.45)	0.107*** (3.22)	0.0665 (1.27)	0.0952*** (3.78)	0.0606 (1.45)	0.0419** (2.13)	0.0347 (0.78)
INVESTMENT	0.0150 (0.61)	0.00748 (0.14)	0.0118 (0.44)	0.00605 (0.11)	0.0158 (0.63)	0.00995 (0.19)	0.0315 (1.60)	0.0308 (0.59)
MORTGAGE	0.0117 (0.53)	-0.0272 (-0.63)	0.0159 (0.60)	-0.0243 (-0.52)	0.0147 (0.64)	-0.0201 (-0.45)	-0.00673 (-0.42)	-0.0225 (-0.54)
STATE-BANK	-0.0523*** (-2.91)	0.000162 (0.00)	-0.0566*** (-2.89)	-0.00166 (-0.04)	-0.0519*** (-2.84)	0.00369 (0.08)	-0.0455*** (-3.11)	0.0207 (0.48)
RULE OF LAW	-0.0220 (-1.64)	-0.0100 (-0.39)						
REGULATORY QUALITY			-0.0369 (-1.26)	-0.0198 (-0.38)				
CORRUPTION					-0.0215* (-1.74)	-0.0208 (-0.88)		
DBAGDP							-0.0703*** (-5.02)	0.00727 (0.21)
C3							0.0538* (1.78)	-0.192** (-2.50)
Observations	1 142	1 142	1 142	1 142	1 142	1 142	1 142	1 142
F-test of excluded instruments	48.85***	48.85***	23.53***	23.53***	44.68***	44.68***	40.45***	40.45***
Endogeneity test-statistic	58.89***	15.10***	47.38***	8.843***	59.10***	14.34***	25.55***	8.08***

Source: Own calculations. \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 34 presents the results of robustness checks controlling other country characteristics. Data on bank performance (ROE) and bank risk ( $RoE_t$ ) comes from the Bankscope database of Bureau van Dijk. DROE is defined as  $1 - \left[ \frac{RoE_{2008} - \overline{RoE}}{RoE_{2008}} \right]$ . A larger value for DROE, hence, indicates greater losses in 2008 and greater risk-taking. Since tests indicate that STAKE is endogenous, we only report the results of Two-Stage Least Squares (IV) regressions. We test for endogeneity using STATA's endog option. The null hypothesis is that the endogenous variable can be treated as exogenous. The test-statistic is reported at the bottom of Table 34. To control for heteroscedasticity, we use White-robust standard errors (White, 1980). The sample includes 1,142 banks. Since data on banking regulation and supervision is not available for all countries, the number of observations in the regressions including other country characteristics is smaller than in the baseline model. For a complete list and a description of the variables used in the regression analysis see Table A7 and A8.

almost one third of all banks in our sample are located in the US – could drive our results. For this reason, we check whether our results are robust to the inclusion of a dummy variable for the United States. The results are indeed weaker, but both STAKE and RIGHTS retain their positive relationship with performance before the crisis and losses during the crisis. The effect is significant at the 10-percent level. Furthermore, although we think that ROE comes closest to what may enter shareholders' objective function, we replace ROE by the return-on-assets (ROA) to see whether our results are robust to the choice of the dependent variable. The results are the same: STAKE and RIGHTS remain positive and significant indicating that shareholders and not managers push for greater risk-taking to increase long-term performance. Both results are not reported for the sake of brevity.

## **8 Profit Smoothing and Bail-Outs**

A fundamental concern is that our risk and performance measure may be influenced by profit smoothing incentives of managers. Managers may have the incentive to smooth profits to mask true firm performance and risk-taking and to conceal their private benefits from shareholders (Leuz et al., 2003). They can do so by using their accounting discretion to create reserves for future periods by understating earnings in years of good performance and by reporting higher profits in years with bad performance. Leuz et al. (2003) show that accounting discretion is particularly large in firms with a dispersed ownership structure and weak shareholder rights. This suggests that our results for bank performance may not driven by the incentive of managers to reduce risk, but by greater discretion of managers to smooth profits over time.

To control for profit smoothing, we follow John et al. (2008) and include one minus the ratio of the bank-level standard deviation of operating income divided by the bank-level standard deviation of cash flow operations (SMOOTHING) between 2000 and 2006. The cash flow from operations is measured indirectly by subtracting accruals from operating income. Following Healy (1985), Jones (1991), Leuz et al. (2003), and John et al. (2008), we calculate accruals as

follows:  $(\Delta\text{total current assets} - \Delta\text{cash}) - (\Delta\text{total current liabilities} - \Delta\text{short-term debt} - \Delta\text{taxes payable}) - \text{depreciation and amortization expenses}$ . The latter is assumed to be zero in case of banks, while short-term debt is proxied by deposits and short-term funding. If a bank does not report information on any of these variables, we follow Leuz et al. (2003) and assume that the change in this variable is zero. If managers smooth profits over time the standard deviation operating income should be smaller than the standard deviation of cash-flows. Hence, a higher value for SMOOTHING indicates a higher level of earnings smoothing. Summary statistics for SMOOTHING are presented in Table A8. A priori, we would expect the impact of earnings smoothing on  $\overline{RoE}_i$  to be small, because  $\overline{RoE}_i$  represents average performance over an extended period. The main focus is, therefore, on the risk equation with DROE as the dependent variable. Profit smoothing may explain at least part of the smaller drop in earnings in 2008 for banks with weak governance (Leuz et al., 2003). The results for the baseline model including SMOOTHING are reported in columns 1 and 2 of Table 35. Like John et al. (2008), we obtain a negative and significant coefficient for SMOOTHING in the profit equation, even though we use averages over 2000 to 2006. This indicates that even average performance is lower if bank managers smooth profits over time. Somewhat surprisingly, SMOOTHING is insignificant in the risk equation and the coefficients for STAKE and RIGHTS remain significant and positive. This suggests that our results are not driven by profit smoothing.

Our results indicate that owner-controlled banks incurred greater risks and had to report larger losses in 2008 than banks that are controlled by their managers. As a consequence, owner-controlled banks may be more likely to need financial support from the government during the crisis than manager-controlled banks. To test this hypothesis, we run an instrumental variables probit regression. The dependent variable takes a value of one if a bank has received any kind of financial support from the government during the crisis and zero otherwise (GOVAID). The results for the baseline model are reported in column 3 of Table



**Table 35: Further Robustness Checks and Model Extensions**

	Model 15		Model 16
	<i>Profit Smoothing</i>		<i>Instrumental Variables Probit</i>
	ROE	DROE	GOVAID
STAKE	0.00366*** (5.37)	0.00321** (2.54)	0.02522*** -0.008
RIGHTS	0.0320*** (5.81)	0.0407*** (3.60)	0.268*** (0.0611)
HOLDING	0.133*** (5.47)	0.152*** (3.33)	2.055*** (0.321)
SAVINGS	0.0356** (2.29)	0.0729** (2.15)	0.118 (0.255)
COOPERATIVE	0.0979*** (3.81)	0.0508 (1.23)	0.785** (0.348)
INVESTMENT	-0.000430 (-0.02)	0.0280 (0.50)	-0.659* (0.339)
MORTGAGE	-0.000603 (-0.03)	-0.0316 (-0.73)	0.267 (0.278)
STATE-BANK	-0.0615*** (-3.33)	-0.0226 (-0.49)	0.109 (0.269)
SMOOTHING <sub>2</sub>	-0.0629** (-2.03)	-0.00706 (-0.13)	
Observations	1,100	1,100	1,142
F-test of excluded instruments	43.72***	43.72***	
Endogeneity test-statistic	55.85***	12.59***	

Source: Own calculations. \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table 35 presents the results of further robustness checks and model extensions. Columns 1 and 2 report the results of the baseline model including SMOOTHING. SMOOTHING is defined as one minus the ratio of the bank-level standard deviation of operating income divided by the bank-level standard deviation of cash flow operations between 2000 and 2006. Data on bank performance (ROE) and bank risk (DROE) comes from the Bankscope database of Bureau van Dijk. DROE is defined as  $1 - \left[ \frac{RoE_{2008}}{RoE} \right]$ . A larger value for DROE, hence, indicates greater losses in 2008. Since tests indicate that STAKE is endogenous, we only report the results of Two-Stage Least Squares (IV) regressions. We test for endogeneity using STATA's endog option. The null hypothesis is that the endogenous variable can be treated as exogenous. The test-statistic is reported at the bottom of Table 35. To control for heteroscedasticity, we use White-robust standard errors (White, 1980). The third column reports the results of an instrumental variables probit regression. The dependent variable is a dummy variable that is one if a bank received any kind of financial support from the government during the crisis and zero otherwise (GOVAID). For a complete list and a description of the variables used in the regression analysis see Table A7 and A8.

35. The results are consistent with our hypothesis. STAKE and RIGHTS are significant and positively related with the probability that a bank has received government aid. This indicates that owner-controlled banks took greater risk in the pre-crisis period and, thus, needed greater financial support from the government than manager-controlled banks once the crisis started to unfold and

the incurred risks to materialize.<sup>40</sup> The probit regression, hence, provides further evidence that banks that are controlled by their owners took greater risk than manager-controlled banks. RIGHTS are significant and positively related with the probability that a bank has received government aid. This indicates that owner-controlled banks took greater risk in the pre-crisis period and, thus, needed greater financial support from the government than manager-controlled bank.

## 9 Conclusions

The results in this chapter suggest that owner-controlled banks experienced higher profits before the crisis and larger losses during the crisis. Both imply that owner-controlled banks incurred greater risks compared to manager-controlled banks. Economically these effects are large. The profits of banks owned by a majority shareholder operating in a country with strong shareholder rights declined about five times as much during the recent crisis compared to widely held banks operating in countries with weak shareholder rights. These effects are robust to including a wide variety of regulatory, bank-specific, and country-specific variables. We also find that the probability of owner-controlled banks to receive government assistance during the crisis is significantly higher than that of manager-controlled banks.

We obtain the results using a large dataset of OECD banks, for which we collected information on ownership concentration. In total, the sample consists of more than 1,100 banks for 24 OECD countries. In particular, in addition to most listed banks, the sample also includes many unlisted credit institutions. We think this is important for the broader applicability of the results, since unlisted banks represent the majority of banks in most countries around the world. The greater variability in ownership and corporate governance structures assists us in identifying the effects of governance on bank risk-taking.

---

<sup>40</sup> We made no attempt to control for the additional equity received in 2008 from the government in the DROE regressions. Most banks reported losses in 2008 and therefore not removing the government equity share understates the effect of STAKE and RIGHTS on DROE.

The results contradict the popular sentiment that managers took advantage of insufficient control by shareholders to obtain compensation packages that disproportionately reward short-term risk-taking (e.g. OECD, 2009). They do not support the idea that aligning the interests of management better with shareholders will reduce risk-taking of banks. Instead they suggest the opposite. If management is better controlled by shareholders, banks may increase their risk-taking. Indeed, one may be able to interpret the observed compensation schemes before the crisis as attempts by shareholders to induce management to increase their risk taking in line with the preferences of shareholders. At the same time, weakening the control of shareholders over management would not only reduce risk, but may entail significant efficiency costs for banks. Privately optimal management compensation schemes may not be socially optimal, as they do not take the externality of a higher probability of bank failure into account.



## References

- Adam, K., Jappelli, T., Menichini, A., Padula, M., & Pagano, M. (2002). *Analyse, Compare, and Apply Alternative Indicators and Monitoring Methodologies to Measure the Evolution of Capital Market Integration in the EU*. Working Paper, Centre for Financial Studies in Economics and Finance, University of Salerno.
- Allen, L. & Cebenoyan, A. S. (1991). Bank Acquisitions and Ownership Structure: Theory and Evidence. *Journal of Banking and Finance*, 15(2), 425-458.
- Amihud, Y. & Lev, B. (1981). Risk Reduction as Managerial Motive for Conglomerate Mergers. *Bell Journal of Economics*, 12, 605-617.
- Artis, M. J. & Bayoumi, T. (1991). Global Capital Market Integration and the Current Account. In M. P. Taylor (Ed.), *Money and Financial Markets*. Cambridge, MA: Blackwell.
- Baello, L., Ferrando, A., Hördahl, P., Krylova, E., & Monnet, C. (2004). *Measuring Financial Integration in the Euro Area*. Occasional Paper Series, No. 14, European Central Bank, Frankfurt.
- Bankscope (2008) Bankscope Database Containing Information on Private and Public Banks, provided by Bureau van Dijk.
- Bankscope (2009) Bankscope Database Containing Information on Private and Public Banks, provided by Bureau van Dijk.
- Banning, K. C. (1999). Ownership Concentration and Bank Acquisition Strategy: An Empirical Examination. *International Journal of Organizational Analysis*, 7(2), 135-152.

- Barth, J., Caprio, G., & Levine, R. (2001). *The Regulation and Supervision of Banks Around the World - A New Database*. Policy Research Working Paper, No. 2588, World Bank.
- Barth, J., Caprio, G., & Levine, R. (2006), *Rethinking Banking Regulation: Till Angels Govern*. Cambridge: Cambridge University Press.
- Bayoumi, T. (1990), Saving-Investment Correlations: Immobile Capital, Government Policy, or Endogenous Behaviour. *IMF Staff Papers*, 37(2), 360-387.
- Bebchuk L. & Hart, O. D. (2002, May 31). A Threat to Dual-Class Shares. *Financial Times*. Retrieved March 1, 2010, from <http://www.law.harvard.edu/faculty/bebchuk/pdfs/FT.Dual.Class.Share.2002.pdf>.
- Becht, M. & Böhmer, E. (1999). Ownership and Voting Power in Germany. In F. Barca and M. Becht (Eds.), *The Control of Corporate Europe*. Oxford: Oxford University Press.
- Becht, M., Chapelle, A., & Renneborg, L. (1999). Shareholding Cascades: The Separation of Ownership and Control in Belgium. In F. Barca and M. Becht (Eds.), *The Control of Corporate Europe*. Oxford: Oxford University Press.
- Becht, M. & Röell, A. (1999). Blockholdings in Europe: An International Comparison. *European Economic Review*, 43, 10-43.
- Beitel, P. & Schierenbeck, D. (2006). Value Creation by Domestic and Cross-Border M&A Transactions in the European Banking Market. *ICFAI Journal of Mergers & Acquisitions*, 3(3), 7-29.
- Bekaert, G., Harvey, C., & Lundblad, C. (2006). *Growth Volatility and Financial Liberalization*. *Journal of International Money and Finance*, 25, 370-403.

- Beltratti, A. & Stulz, R. M. (2009). *Why did Some Banks Perform Better During the Credit Crisis? A Cross-Country Study of the Impact of Governance and Regulation*. Working Paper, No. 15180, National Bureau of Economic Research.
- Bennedsen, M. & Nielsen K. (2004). The Impact of a Break-Through Rule on European Firms. *European Journal of Law and Economics*, 17(3), 259-283.
- Berger, A. N., Saunders, A., Scalise, J. M., & Udell, G. F. (1998). The Effect of Bank Mergers on Small Business Lending. *Journal of Banking and Finance*, 50, 187-229.
- Berger, A. N., Demsetz, R. S., & Strahan, P. E. (1999). The Consolidation of the Financial Services Industry: Causes, Consequences, and Implications for the Future. *Journal of Banking and Finance*, 23, 135-194.
- Berger, A. N., DeYoung, R., Genay, H., & Udell, G. F. (2000). Globalization of Financial Institutions: Evidence from Cross-Border Banking Performance. In R. E. Litan & A. M. Santomero (Eds.), *Brookings Wharton Papers on Financial Services, 2000*. Washington: Brookings Institution.
- Berger, A. N., DeYoung, R., & Udell, G. F. (2001). Efficiency Barriers to the Consolidation of the European Financial Services Industry. *European Financial Management*, 7(1), 117-130.
- Berger, A. N., Buch, C. M., DeLong, G., & DeYoung, R. (2004a). Exporting Financial Institutions Management via Foreign Direct Investment Mergers and Acquisitions. *Journal of International Money and Finance*, 23, 333-366.
- Berger, A. N., Demirguc-Kunt, A., Levine, R., & Haubrich, J. G. (2004b). Bank Concentration, Competition: An Evolution in the Making. *Journal of Money, Credit, and Banking*, 36, 433-451.
- Berger, A. N. (2007). Obstacles to a Global Banking System: “Old Europe” Versus “New Europe”. *Journal of Banking and Finance*, 31, 1955-1973.

- Berglöf, E. & Burkart, M. (2003). European Takeover Regulation. *Economic Policy*, 18(36), 171-213.
- Betton, S. & Eckbo, B. E. (2000). Toeholds, Big-Jumps and Expected Payos in Takeovers. *Review of Financial Studies*, 13, 841-882.
- Bianchi, M., Bianco, M., & Enriques, M. (1999). Pyramidal Groups and the Separation Between Ownership and Control in Italy. In F. Barca and M. Becht (Eds.), *The Control of Corporate Europe*. Oxford: Oxford University Press.
- Bloch, L. & Kremp, E. (1999). Ownership and Voting Power in France. In F. Barca and M. Becht (Eds.), *The Control of Corporate Europe*. Oxford: Oxford University Press.
- BNP Weighing Bids for Crisis-Hit Société Générale (2008). Retrieved March 1, 2010, from <http://afp.google.com/article/ALeqM5iYiuhfh4f9m4PXHFbcvcHwKTmHAA>.
- Bonin, J. P., Hasan, I., & Wachtel, P. (2005). Bank Performance, Efficiency and Ownership in Transition Countries. *Journal of Banking and Finance*, 29, 31-53.
- Boot, A. W. A. (1999). European Lessons on Consolidation in Banking. *Journal of Banking and Finance*, 23 (2), 609-613.
- Boyd, J. & Runkle, D. (1993). Size and Performance of Banking Firms: Testing the Predictions of Theory. *Journal of Monetary Economics*, 31(1), 47-67.
- Buch, C. M. (1999). Capital Mobility and EU Enlargement. *Review of World Economics*, 135 (4), 629-656.
- Buch, C. M. & DeLong, G. (2003). Information or Regulation: What Drives the International Activities of Commercial Banks?. *Journal of Money, Credit and Banking*, 35(6), 851-869.



- Buch, C. M. & DeLong, G. (2004). Cross-Border Bank Mergers - What Lures the Rare Animal?. *Journal of Banking and Finance*, 28(9), 2077-2102.
- Buch, C. M. (2005). Distance and International Banking. *Review of International Economics*, 13(4), 787-804.
- Bulow, J., Hiuang, M., & Klemperer, P. (1999). Toeholds and Takeovers. *Journal of Political Economy*, 107(3), 427-454.
- Bundesbank Warns Against Hostile Bank Takeovers (2010). Retrieved March 1, 2010, from <http://www.reuters.com/article/idUSL3032699720070430>.
- Burkart, M., Panunzi, F., & Shleifer, A. (2003). Family Firms. *Journal of Finance*, 58, 2167-2201.
- Cabral, I., Dierck, F., & Vesala, J. (2002). *Banking Integration in the Euro Area*. Occasional Paper, No. 6, European Central Bank.
- Carletti, E., Hartmann P., & Ongena, S. (2007). *The Economic Impact of Merger Control – What is Special About Banking?*. Working Paper, No. 786, European Central Bank.
- Caprio G., Laeven, L., & Levine, R. (2007). Bank Valuation and Corporate Governance. *Journal of Financial Intermediation*, 1(4), 584-617.
- Cecchetti, S. G. (2001). Legal Structure, Financial Structure, and Monetary Policy. In Deutsche Bundesbank (Ed.), *The Monetary Transmission Process*. Basingstoke: Palgrave.
- Cerruti, E., Dell'Aricca, G., & Soledad Martinez Peria, M. (2007). How Banks Go Abroad: Branches or Subsidiaries?. *Journal of Banking and Finance*, 31(6), 1669-1692.
- Chen, A. H. & Mazumdar, S. C. (1997). A Dynamic Model of Firewalls and Non-Traditional Banking. *Journal of Banking and Finance*, 21, 393-416.

- Cheng, D. C., Duncan, W. A., & Wall, L. D. (1989). Financial Determinants of Takeovers: A Note. *Journal of Money, Credit and Banking*, 21, 524-536.
- Cho, D., Golfarb, Z. A., & Murakami Tse, T. (2009). U.S. Targets Excessive Pay for Top-Executives. *Washington Post*. Retrieved March 1, 2010, from <http://www.washingtonpost.com/wp-dyn/content/article/2009/06/10/AR2009061001416.html>.
- Claessens, S. (2006). Corporate Governance and Economic Development. *World Bank Research Observer*, 21 (1), 91-122.
- Claessens, S., Dell'Araccia, Igan, D., & Laeven, L. (2010). *Lessons and Policy Implications from the Global Financial Crisis*. Working Paper, 10/44, International Monetary Fund.
- Coakley, J., Kulasi, F., & Smith, R. (1996). Current Account Solvency and the Feldstein Horioka Puzzle. *Economic Journal*, 106, 620-627.
- Coakley, J., Kulasi, F., & Smith, R. (1999). Savings, Investment and Capital Mobility in LDC. *Review of International Economics*, 7(4), 632-640.
- Cole, R. A. & Mehran, H. (1998). The Effects of Changes in Ownership Structure on Performance: Evidence From the Thrift Industry. *Journal Financial Economics*, 50(3), 291-317.
- Cordella, T. & Yeyati, E. L. (2003). Bank Bailouts: Moral Hazard vs. Value Effect. *Journal of Financial Economics*, 12, 300-330.
- Crespí-Cladera, R. & Garcia-Cestona, M. A. (1999). Ownership and Control: A Spanish Survey. In F. Barca and M. Becht (Eds.), *The Control of Corporate Europe*. Oxford: Oxford University Press.
- Datastream (2008). Financial Statistical Database, provided by Thomson Reuters.

- De Jong, A., Kabir, R., Marra, T., & Röell, A. (1999). Ownership and Control in the Netherlands. In F. Barca and M. Becht (Eds.), *The Control of Corporate Europe*. Oxford: Oxford University Press.
- Demirgüç-Kunt, A. & Huizinga, H. (1999). Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence. *World Bank Economic Review*, 13, 379-408.
- Demirgüç-Kunt, A. & Huizinga, H. (2000), *Financial Structure and Bank Profitability*. Policy Research Working Paper, No. 2430, World Bank.
- Demirgüç-Kunt, A. & Detragiache, E. (2005). Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation. *Journal of Monetary Economics*, 49, 1373-1406.
- Demsetz, H. (1983). The Structure of Ownership and the Theory of the Firm. *Journal of Law and Economics*, 26, 375-390.
- Demsetz, H. & Lehn, K. (1985). The Structure Corporate Ownership: Causes and Consequences. *Journal of Political Economy*, 93, 1155-1177.
- Demsetz, H. & Villalonga, B. (2001). Ownership Structure and Corporate Performance. *Journal of Corporate Finance*, 7(3), 209-233.
- DeYoung, R. & Nolle, D. E. (1996). Foreign-Owned Banks in the US – Earning Market Share or Buying it?. *Journal of Money, Credit and Banking*, 28(4), 622-636.
- Dewatripont, M. & Tirole, J. (1994). *The Prudential Regulation of Banks*. Cambridge, MA: MIT Press.
- Dickey, D.A. & Fuller, W. A (1979). Distribution of the Estimators for Autoregressive Time-Series with a Unit Root. *Journal of the American Statistical Association*, 74, 427–31.

- Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2008). The Law and Economics of Self-Dealing, *Journal of Financial Economics*, 88(3), 430-465.
- ECB (2006). *Cross-Border Banking in the EU: Developments and Emerging Policy Issues*, Speech by José Manuel González-Páramo on February 24, 2006. Retrieved March 1, 2010, from <http://www.ecb.int/press/key/date/2006/html/sp060224.en.html>.
- ECB (2008). *Report on EU Banking Structures*. Retrieved March 2, 2010, from <http://www.ecb.int/pub/pdf/other/eubankingstructures2008en.pdf>.
- ECB (2009). *Financial Integration in Europe*. Retrieved March 1, 2010, from <http://www.ecb.eu/pub/pdf/other/financialintegrationineurope200904en.pdf>.
- Esty, B. C. (1998). The Impact of Contingent Liability on Commercial Bank Risk Taking. *Journal of Financial Economics*, 26, 189-218.
- European Commission (1998). *Notes on Council Regulation (EEC) 4064/89*. Retrieved September 23, 2006, from <http://ec.europa.eu/competition/mergers/legislation/regulation/notes.html>.
- European Commission (1999a). *Financial Services: Commission to Send Reasoned Opinion to Portugal Over Veto Against BSCH Participation in Champalinaud Group* (Press Release IP/99/773). Retrieved March 1, 2010, from <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/99/773&format=HTML&aged=1&language=EN&guiLanguage=en>.
- European Commission (1999b). *Commission Decides to Open Infringement Procedure Against Portugal Over Veto Against BSCH Participation in Grupo Mundial Confiança* (Press Release, IP/99/551). Retrieved March 1, 2010, from <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/99/551&format=HTML&aged=1&language=EN&guiLanguage=en>.

- European Commission (2005a). *Cross-Border Consolidation in the EU Financial Sector* (Commission Staff Working Document). Retrieved March 1, 2010, from [http://ec.europa.eu/internal\\_market/finances/docs/cross-sector/mergers/cross-border-consolidation\\_en.pdf](http://ec.europa.eu/internal_market/finances/docs/cross-sector/mergers/cross-border-consolidation_en.pdf).
- European Commission (2005b). *Free Movement of Capital: Commission Opens an Infringement Procedure Against Italy on the Issue of Acquisition of Stakes in Domestic Banks* (Press Release, IP/05/1595). Retrieved March 1, 2010, from <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/05/1595&format=HTML&aged=0&language=EN&guiLanguage=en>.
- European Commission (2006a). *Financial Sector: Commission Acts to Improve Supervisory Approval Process for Mergers and Acquisitions* (Press Release IP/06/1174). Retrieved March 1, 2010, from <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/1174&format=HTML&aged=0&language=EN&guiLanguage=en>.
- European Commission (2006b). *Proposal for a Directive of the European Parliament and the Council Amending Council Directive 92/49/EEC and Directives 2002/83/EC, 2004/39/EC, 2005/68/EC and 2006/48/EC as Regards Procedural Rules and Evaluation Criteria for the Prudential Assessment of Acquisitions and Increase of Shareholdings in the Financial Sector*. Retrieved March 1, 2010, from [http://ec.europa.eu/internal\\_market/finances/docs/cross-sector/mergers/directive-proposal\\_en.pdf](http://ec.europa.eu/internal_market/finances/docs/cross-sector/mergers/directive-proposal_en.pdf).
- European Commission (2007). *Report on the Implementation of the Directive of Takeover Bids* (Commission Staff Working Document). Retrieved March 1, 2010, from [http://ec.europa.eu/internal\\_market/company/docs/takeoverbids/2007-02-report\\_en.pdf](http://ec.europa.eu/internal_market/company/docs/takeoverbids/2007-02-report_en.pdf).

- European Commission (2009). *European Financial Integration Report 2009* (Commission Staff Working Document). Retrieved March 1, 2010, from [http://ec.europa.eu/internal\\_market/finances/docs/cross-sector/fin-integration/efir\\_report\\_2009\\_en.pdf](http://ec.europa.eu/internal_market/finances/docs/cross-sector/fin-integration/efir_report_2009_en.pdf).
- Fahlenbrach, R. & Stulz, R. M. (2009). *Bank CEO Incentives and the Credit Crisis*. Working Paper, No. 15212, National Bureau of Economic Research.
- Fecht, F., Grüner, H., Hartmann, P., & Lo Duca, M. (2009). Financial Globalization and Stability. In D. D. Evanoff, D. S. Hoelscher, & G. G. Kaufman (Eds.), *Globalization and Systemic Risk*, Hackensack: World Scientific Publishers, 53-84.
- Feldstein, M. & Horioka, C. (1980). Domestic Saving and International Capital Flows. *Economic Journal*, 90, 314–29.
- Feldstein, M. & Bachetta P. (1989). National Saving and International Investment. In B. D. Bernheim & J. B. Shoven (Eds.), *National Saving and Economic Performance*, Chicago: University of Chicago Press.
- Foccarelli D. & Pozzolo, A. F. (2001). The Patterns of Cross-Border Mergers and Shareholdings in OECD Countries. *Journal of Banking and Finance*, 25, 2305-2337.
- Foccarelli D. & Pozzolo, A. F. (2005). Where Do Bank Expand Abroad? An Empirical Analysis. *Journal of Business*, 78(6), 2345-2464.
- Franks, J. & Mayer, C. (1996). Hostile Takeovers and the Correction of Managerial Failure. *Journal of Financial Economics*, 40(1), 163-181.
- Giannetti, M. & Ongena, S. (2009). Financial Integration and Firm Performance: Evidence from Foreign Bank Entry in Emerging Markets. *Review of Finance*, 13, 181-223.

- Glassman C. A. & Rhoades, S. A. (1980). Owner vs. Manager Control Effects on Bank Performance. *Review of Economics and Statistics*, 62(2), 263-270.
- Goergen, M. & Renneboog, L. (1999). Strong Managers and Passive Institutional Investors in the U.K.. In F. Barca and M. Becht (Eds.), *The Control of Corporate Europe*. Oxford: Oxford University Press.
- Goergen, M., Martyonva, M., & Renneboog, L. (2005). Corporate Governance Convergence: Evidence From Takeover Regulation Reforms in Europe. *Oxford Review of Economic Policy*, 21(2), 243-268.
- Goodhart, C., Hartmann, P., Llewellyn, D., Rojas-Suarez, L., & Weisbrod, S. (1998). *Financial Regulation: Why, How, and Where Now?*, London: Routledge.
- Gorton, G. & Rosen, R. (1995). Corporate Control Portfolio Choice, and the Decline of Banking. *Journal of Finance*, 50, 1377-1420.
- Granger, C. W. J. & Newbold, P. (1974). Spurious Regressions in Econometrics. *Journal of Econometrics*, 2, 111–120.
- Gropp, R. & Kashyap, A. (2009). A New Metric for Banking Integration in Europe. In A. Alesina and F. Giavazzi (Eds.), *Europe and the Euro*. Chicago: University of Chicago Press.
- Grossman, S. J. & Hart, O. (1980). Takeover Bids, the Free-Rider Problem, and the Theory of the Corporation. *Bell Journal of Economics*, 11(1), 42-64.
- Gual, J. (2004). The Integration of EU Banking Markets. In J. Gual (Ed.), *Building a Dynamic Europe - The Key Policy Debates*, Cambridge: Cambridge University Press.
- Gugler, K. S., Kalss, Stomper, A., & Zechner, J. (1999). The Separation of Ownership and Control: An Austrian Perspective. In F. Barca and M. Becht (Eds.), *The Control of Corporate Europe*. Oxford: Oxford University Press.

- Harberger, A. C. (1980). Vignettes on the World Capital Market. *The American Economic Review*, 70, 331–337.
- Hannan T. H. & Rhoades, S. (1987). Acquisition Targets and Motives: The Case of the Banking Industry. *The Review of Economic and Statistics*, 69(1), 67-74.
- Hannan, T. H. & Pilloff, S. J. (2009). Acquisition Targets and Motives in the Banking Industry. *Journal of Money, Credit and Banking*, 41(6), 1167-1187.
- Hartmann, P., Maddaloni, A., & Manganelli, S. (2003). The Euro Area Financial System: Structure, Integration and Policy Initiatives. *Oxford Review of Economic Policy*, 19(1), 180-213.
- Healy, P. M. (1985). The Effect of Bonus Schemes on Accounting Decisions. *Journal of Accounting and Economics*, 7, 85-107.
- Heinkel, R. L. & Levi, M. D. (1992). The Structure of International Banking. *Journal of International Money and Finance*, 11, 251-272.
- Heritage Foundation (2008). *Economic Freedom of the World Database*. Retrieved March 1, 2010, from <http://www.heritage.org/index/>.
- Hernando, I., Nieto, M. J., & Wall, L. D. (2009). Determinants of Domestic and Cross-Border Acquisitions in the European Union. *Journal of Banking and Finance*, 33, 1022-1032.
- Herring, R. & Litan, R. (1995). *Financial Regulation in the Global Economy*. Washington: Brookings Institution.
- Hirshleifer, D. & Thakor, A. V. (1992). Managerial Conservatism, Project Choice, and Debt. *Review of Financial Studies*, 5(3), 437-470
- Holmstrom, B. & Ricart I Costa, J. (1986). Managerial Incentives and Capital Management. *Quarterly Journal of Economics*, 101(4), 835-860.



- Hosking, P. (2009, January 9). OECD Blames Weak Bank Regulation for Financial Crisis. *Times Online*. Retrieved March 1, 2010, from [http://business.timesonline.co.uk/tol/business/industry\\_sectors/banking\\_and\\_finance/article5477971.ece](http://business.timesonline.co.uk/tol/business/industry_sectors/banking_and_finance/article5477971.ece).
- International Monetary Fund (2005). Database on International Financial Statistics. Retrieved March 1, 2010, from <http://www.imfstatistics.org/imf/>.
- Jarocinsk, M. (2009). Responses to Monetary Policy Shocks in the East and the West of Europe: A Comparison. *Journal of Applied Econometrics*, forthcoming.
- Jensen, M. C. & Meckling, W. H. (1976). Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3, 305-360.
- John, K., Litov, L., & Yeung, B. (2008). Corporate Governance and Risk-Taking. *Journal of Finance*, 63(4), 1679-1728.
- Jones, J. J. (1991). Earnings Management During Import Relief Investigations. *Journal of Accounting Research*, 29(2), 193-228.
- Kahn, C. & Winton, A. (1998). Ownership Structure, Speculation and Shareholder Intervention. *Journal of Finance*, 53, 99-129.
- Kalemli-Ozcan, S., Sorensen, B., & Yosha, O. (2003). Risk Sharing and Industrial Specialization: Regional and International Evidence. *American Economic Review*, 93, 903-918.
- Kane, E. J. (1985). *The Gathering Crisis in Federal Deposit Insurance*. Cambridge, MA: MIT Press.
- Kaufman, D., Kraay, A., & Matruzzi, M. (2008). *Governance Matters VII: Governance Indicators for 1997-2007*. Policy Research Working Paper, No. 4654, World Bank.

- Keeley, M. C. (1990). Deposit Insurance, Risk, and Market Power in Banking. *American Economic Review*, 80(5), 1183-1200.
- Knopf, J. D. & Teall, J. L. (1996). Risk-Taking Behaviour in the US Thrift-Industry: Ownership Structure and Regulatory Changes. *Journal of Banking and Finance*, 20, 1329-1350.
- Kose, M. A., Prasad, E., Rogoff, K., & Wei, S.-J. (2006). *Financial Globalization: A Reappraisal*. Working Paper, No. 06/189, International Monetary Fund.
- Kwiatkowski, D., Phillips, P. C. B., Schmidt, P., & Shin, Y. (1992). Testing the Null Hypothesis of Stationary Against the Alternative of a Unit Root. *Journal of Econometrics*, 54, 159–178.
- Lane, P. R. & Milesi-Ferretti, G. M. (2003). International Financial Integration. *IMF Staff Papers*, 50, Special Issue.
- Lanine, G. & Vander Venet, R. (2007). Microeconomic Determinants of Acquisitions of Eastern European Banks by Western European Banks. *Economics of Transition*, 15(2), 285-308.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1998). Law and Finance. *Journal of Political Economy*, 106(6), 1113-1155.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1999). Corporate Ownership Around the World. *Journal of Finance*, 54(2), 471-517.
- La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2000). Investor Protection and Corporate Governance. *Journal of Financial Economics*, 58, 3-27.
- La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). Government Ownership of Banks. *Journal of Finance*, 57(2), 265-301.

- Laeven, L. & Levine, R. (2009). Bank Governance, Regulation, and Risk-Taking. *Journal of Financial Economics*, 93(2), 259-275.
- Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings Management and Investor Protection: An International Comparison. *Journal of Financial Economics*, 69, 505-527.
- Levine, R. (2004). *The Corporate Governance of Banks: A Concise Discussion of Concepts and Evidence*. Policy Research Working Paper, No. 3404, World Bank.
- Macey, J. R. & O'Hara, M. (2003). The Corporate Governance of Banks. *Federal Reserve Bank of New York Economic Policy Review*, 9(1), 91-107.
- Manne, H. G. (1965). Mergers and the Market for Corporate Control. *Journal of Political Economy*, 73 (2), 110-120.
- Morck, R., Shleifer, A., & Vishny, R. W. (1988). Management Ownership and Corporate Performance - An Empirical Analysis. *Journal of Financial Economics*, 20, 293-315.
- Morck, R., Wolfenzon, D., & Yeung, B. (2005). Corporate Governance, Economic Entrenchment, and Growth. *Journal of Economic Literature*, 43, 657-722.
- Morgan, D. (2002). Rating Banks, Risk, and Uncertainty in an Opaque Industry. *American Economic Review*, 92, 874-888.
- Murphy, R. (1984). Capital Mobility and the Relationship Between Saving and Investment Rates in the OECD Countries. *Journal of International Money and Finance*, 3, 327-42.
- Nenova, T. (2003). The Value of Corporate Voting Rights and Control: A Cross-Country Analysis. *Journal of Financial Economics*, 68, 325-351.

- Obstfeld, M. (1995). International Capital Mobility in the 1990s. In P. B. Kenen (Ed.), *Understanding Interdependence – The Macroeconomics of the Open Economy*. New Jersey: Princeton University Press.
- Obstfeld, M. & Taylor, A. M. (2004). *Global Capital Markets: Integration, Crisis, and Growth*. Cambridge: Cambridge University Press.
- OECD (2009). *Corporate Governance and the Financial Crisis: Key Findings and Main Messages*. Retrieved March 2, 2010, from <http://www.oecd.org/dataoecd/3/10/43056196.pdf>.
- Office of Financial Stability (2010). *Agency Financial Report - Fiscal Year 2009*. Retrieved January 25, 2010, from <http://www.treas.gov/press/releases/OSF%20AFR%2009.pdf>.
- Pasiouras, F., Tanna, S., & Gaganis, C. (2007). *What Drives Acquisitions in the EU Banking Industry? The Role of Bank Regulation and Supervision Framework, Bank-Specific and Market-Specific Factors*. Coventry University, Economics, Finance and Accounting Applied Research Working Paper, No. 2007-3, Coventry University.
- Paterson (1998, February 28). Lloyds TSB Eyes up Crédit Lyonnais Takeover bid. *The Independent*. Retrieved March 1, 2010, from <http://www.independent.co.uk/news/business/lloyds-tsb-eyes-up-credit-lyonnais-takeover-bid-1147442.html>.
- Petrovic, A. & Tusch, R. (2009). *National Rescue Measures in Response to the Current Financial Crisis*. Legal Working Paper, No. 8, European Central Bank.
- Popov, A. & Udell, G. F. (2010). *Cross-Border Banking and the International Transmission of Financial Distress During the Crisis of 2007-08*. Working Paper, European Central Bank, forthcoming.

- Pozzolo, A. F. (2009). Bank Cross-Border Mergers and Acquisitions: Causes, Consequences, and Recent Trends. In P. Alessandrini, M. Fratianni, & A. Zazzaro (Eds.), *Changing Geography of Banking and Finance*. Heidelberg: Springer.
- Prowse, S. D. (1995). Alternative Methods of Corporate Control in Commercial Banks. *Federal Reserve Bank of Dallas Economic Policy Review*, Third Quarter, 24-36.
- Prowse, S. D. (1997). Corporate Control in Commercial Banks. *Journal of Financial Research*, 20 (4), 509-527.
- Remuneration in the Banking Sector (2010). Retrieved March 1, 2010, from <http://www.publications.parliament.uk/pa/cm200809/cmselect/cmtreasy/519/51905.htm>.
- Sapienza, P. (2004). The Effects of Government Ownership on Bank Lending. *Journal of Financial Economics*, 72, 357-384.
- Saunders, A., Strock, E., & Travlos, N. (1990). Ownership Structure, Deregulation and Bank Risk Taking. *Journal of Finance*, 45(2), 643-654.
- Shearman & Sterling (2007). *Proportionality Between Ownership and Control in EU Listed Companies: Comparative Legal Study*. Retrieved March 1, 2010, from [http://ec.europa.eu/internal\\_market/company/docs/shareholders/study/study\\_report\\_en.pdf](http://ec.europa.eu/internal_market/company/docs/shareholders/study/study_report_en.pdf).
- Shleifer, A. & Vishny, R. (1986). Large Shareholders and Corporate Control. *Journal of Political Economy*, 94 (3), 461-488.
- Shleifer, A. & Vishny, R. (1997). A Survey on Corporate Governance. *Journal of Finance*, 52 (2), 737-781.

- Sinn, S. (1992). Saving-Investment Correlations and Capital Mobility: On the Evidence From Annual Data. *Economic Journal*, 102, 1162–1170.
- Sinn, H.-W. (2009). *Kasino Kapitalismus*. Berlin: ECON.
- Société Générale Shares Rise on Takeover Report (2008). Retrieved March 1, 2010, from [http://www.bloomberg.com/apps/news?pid=20601087&sid=aG3\\_fd9J4xeE&refer=home](http://www.bloomberg.com/apps/news?pid=20601087&sid=aG3_fd9J4xeE&refer=home).
- Solomon, D. & Paletta, D. (2009). U.S. Eyes Bank Pay Overhaul. *Wall Street Journal*. Retrieved March 1, 2010, from <http://online.wsj.com/article/SB124215896684211987.html>.
- Stulz, R. M. (1988). Managerial Control of Voting Rights: Financing Policies and the Market for Corporate Control. *Journal of Financial Economics*, 20, 25-54.
- Stulz, R. M. (2005). The Limits of Financial Globalization. *Journal of Finance*, 60, 1595-1638.
- Summers, L. H. (1989). *Tax Policy and International Competitiveness*. Working Paper, No. FW2007, National Bureau of Economic Research.
- Ter Wengel, J. (1995). International Trade in Banking Services. *Journal of International Money and Finance*, 14, 47-64.
- Vander Vennet, R. (1996). The Effect of Mergers and Acquisitions on the Efficiency and Profitability of EC Credit Institutions. *Journal of Banking and Finance*, 20(9), 1531-1558.
- White, H. (1980). A Heteroskedasticity Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica*, 48, 817-838.

- Winter, J., Garrido Garcia, J. M., Hopt, K. J., Rickford, J., Rossi, G., Schans Christensen, J., & Simon, J. (2002). *Report of the High Level Group of Company Law Experts on A Modern Regulatory Framework for Company Law*. Retrieved March 1, 2010, from [http://ec.europa.eu/internal\\_market/company/docs/modern/report\\_en.pdf](http://ec.europa.eu/internal_market/company/docs/modern/report_en.pdf).
- World Bank (2008). *New Database on Financial Development and Structure*. Retrieved March 1, 2010, from <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20696167~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html>.
- World Bank (2009). *New Database on Financial Development and Structure*. Retrieved March 1, 2010, from <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20696167~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html>.
- Yamori, N. (1998). A Note on the Location Choice of Multinational Banks: The Case of Japanese Financial Institutions. *Journal of Banking and Finance*, 22, 109-120.
- Zephyr (2008). Zephyr Database Containing Information on M&A, IPO, Private Equity and Venture Capital Deals, provided by Bureau van Dijk.
- Zhou, X. (2001). Understanding the Determinants of Managerial Ownership and the Link Between Ownership and Performance: Comment. *Journal of Financial Economics*, 62, 559-571.

# Appendix

**Table A1: The Questionnaire**

## 1. Restrictions on Ownership

a) Was there a **maximum** percentage of bank capital that could be owned by a **single domestic** investor (legal entity or natural person) between 1990 and 2005?

Yes  No

If **yes**, please fill out:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ownership limit (in % of total capital)																

b) Was there a **maximum** percentage of bank capital that could be owned by a **single foreign** investor (legal entity or natural person) between 1990 and 2005?

Yes  No

If **yes**, please fill out:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ownership limit (in % of total capital)																

c) Was there a maximum percentage of bank capital that could **collectively** be owned by **foreign** investors (legal entities or natural persons) between 1990 and 2005?

Yes  No



If **yes**, please fill out:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ownership limit (in % of total capital)																

## 2. Approval and Reporting Requirements

a) Did the transfer of bank ownership between **domestic** investors have to be reported to the supervisory authority and/or any other institution (e.g. government, competition authority, central bank) in your country between 1990 and 2005?

Yes  No

If **yes**, please explain what percent of bank capital had to be transferred between domestic investors to be subject to **reporting** to an institution in your country between 1990 and 2005:

<u>Percent of Bank Capital:</u>	<u>Name of the Institution to be informed:</u>	<u>Time Period:</u>

b) Did the transfer of bank ownership between **domestic and foreign** investors have to be reported to the supervisory authority and/or any other institution (e.g. government, competition authority, central bank) in your country between 1990 and 2005?

Yes  No

If **yes**, please explain what percent of bank capital had to be transferred between domestic and foreign investors to be subject to **reporting** to an institution in your country:

<u>Percent of Bank Capital:</u>	<u>Name of the Institution to be informed:</u>	<u>Time Period:</u>

c) Did the transfer of bank ownership between **domestic** investors require **approval** by the supervisory authority and/or any other institution (e.g.

government, competition authority, central bank) in your country between 1990 and 2005?

Yes  No

If **yes**, please explain what percent of bank capital had to be transferred between domestic investors to be subject to **approval** by any institution in your country:

<u>Percent of Bank Capital:</u>	<u>Name of the Institution that gives Approval:</u>	<u>Time Period:</u>

d) Did the transfer of bank ownership between **domestic and foreign** investors require **approval** by the supervisory authority and/or any other institution (e.g. government, competition authority, central bank) in your country between 1990 and 2005?

Yes  No

If **yes**, please explain what percent of bank capital had to be transferred between domestic and foreign investors to be subject to **approval** by any institution in your country:

<u>Percent of Bank Capital:</u>	<u>Name of the Institution that gives Approval:</u>	<u>Time Period:</u>

### 3. Transparency of the Supervisory Review Process

a) Bank supervisory authorities in the EU are allowed to block mergers in the banking sector to ensure sound and prudent management of credit institutions, if they are not satisfied with the “suitability and qualifications of the proposed investor” (Article 19 of the EU Banking Directive). Please note what **criteria** (e.g. financial solidity, reputation of the investor, potential benefits of a merger for customers in your country) your institution used between 1990 and 2005 to assess the suitability and the qualifications of the proposed investor:

<u>Criteria to assess the suitability of the proposed investor:</u>	<u>Time</u>
<u>Period:</u>	

b) Was the institution in your country legally required **to publish the decision and the reasons**, if it is **not** satisfied with the suitability and the qualifications of the proposed investor?

Yes  No

If **yes**, please specify (X) in which years the supervisory authority in your country was legally required to publish the decision and the reasons for blocking a proposed merger in the banking sector in your country:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>Publication of the decision and the reasons</b>																

**Table A2: Data Sources**

Country	Source	Date
AT	Bundesgesetz über das Bankwesen (BWG)	1993
CZ	Questionnaire	2007
CZ	Czech Republic, Act of the Czech Republic No. 21/1992 Sb. on banks	1992
CZ	New York University School of Law, Conditions for the Establishment of New Banks in the Czech	1994
CZ	New York University School of Law, The Act of July 8, 1994 passed by the Czech Parliament	1994
CZ	Matoušek, R.: The Czech Banking System in the Light of Regulation and Supervision, Selected Issues	2005
DE	Questionnaire	2007
DE	Federal Republic of Germany, Kreditwesengesetz	1988
EE	IMF, Report on the Observance of Standards and Codes (ROSC) Estonia	2000
EE	Republic of Estonia, Eesti Pank, Law on Credit Institutions	1994
EE	Eesti Pank, Credit Institutions Act	1999
EE	Republic of Estonia, Credit Institutions Act	2005
ES	Republic of Spain, Law 26/1988: Discipline and Intervention of Credit Institutions	1988
ES	Bank of Spain, Law 13/1994: Law of Autonomy of the Banco de España	1994
ES	Republic of Spain, Royal Decree 1245/1995	1995
ES	IMF, Country Report No. 06/218: Financial Sector Assessment Program	2006
FI	Republic of Finland, Act on the Operation of a Foreign Credit Institution or Financial Institution in	2001
FI	Republic of Finland, Act on Credit Institutions	2005
FR	Banque de France, Comité des Établissements de Crédit et des Entreprises d'Investissement, Annual	2005
FR	Banque de France, Comité de la Réglementation Bancaire et financière, French Banking Act 24	1984

FR	Republic of France, Regulation 96-16 of December 1996	2001
FR	Republic of France, Regulation 92-13 of 23 December 1992	2005
FR	IMF, Country Report No. 05/186	2005
FR	Republic of France, Regulation 92-14 of December 1992	2006
GR	Questionnaire	2007
GR	The Impact of the Banking Directives on the Greek Banking System	2004
HU	Act CXII of 1996 on Credit Institutions and Financial Enterprises	1997
HU	Act CXII of 1996 on Credit Institutions and Financial Enterprises	2006
HU	Barsi, T., Overview on Banking Regulations. International Law Office Internet Publication	2000
HU	Budai, J. und H. Bozsonyik, Preperation for Single Market Supervision Tasks	2001
HU	IMF, Country Report No. 05/348	2005
HU	Hungarian Financial Supervisory Authority: Authorization guidelines (Money Market).	2006
IT	Questionnaire	2007
IT	Banca of Italy, The 1993 Banking Law	1993
IT	Republic of Italy, The 1993 Banking Law	2000
IT	IMF Country Report No. 04/133	2004
IT	IMF, Financial System Stability Assessment	2006
LI	Questionnaire	2007
LI	New York University School of Law, Law on Commercial (Joint Stock) Banks	1992
LI	Bank of Lithuania, Operations of Credit Institutions in 2000	2000
LI	Bank of Lithuania, The Law on the Bank of Lithuania	1994
LI	Republic of Lithuania, Law on Commercial Banks	1994
LI	Republic of Lithuania, Law on Banks	2004
LI	Republic of Lithuania, Law on Commercial (Joint Stock) Banks	2005
LI	Operations of Credit Institutions in 2004	2005
LI	Republic of Lithuania, Law on Financial Institutions	2005
LU	Questionnaire	2007
LV	Questionnaire	2007
LV	Bank of Latvia, Regulations on granting licenses to perform banking transactions	1993
LV	Republic of Latvia, Law of National Republic of Latvia	1998
LV	Bank of Latvia, Credit Institutions Supervision Department, Annual Report 1999	2000
LV	Bank of Latvia, Operations of Credit Institutions in 2000	2000
MA	Questionnaire	2007
MA	Banking Act, Act XV of 1994	1994

NL	Credit System Supervision Manual, Act on the Supervision of the Credit System 1992	2005
NL	De Nederlandsche Bank, Bank Act 1998	2000
PL	New York University School of Law, The Banking Law of January 31, 1989	1992
PL	New York University School of Law, Act of December 19, 1992	1993
PL	Republic of Poland, The Banking Act of August 29, 1997	1998
PL	National Bank of Poland, The Polish Banking System in the Nineties	2001
PT	Questionnaire	2007
PT	IMF, Financial Sector Assessment Program	2006
SK	Questionnaire	2007
SK	National Bank of Slovakia, European Banking Directives and Their Implementation in the Slovak	2000
SK	Republic of Slovakia, Act on Banks	2001
SL	Republic of Slovenia, Law on Banks and Savings Banks	1991
SL	Republic of Slovenia, Banking Act	1999
SL	Republic of Slovenia, Official Gazette of the Republic of Slovenia, Banking Act	1999
SL	Republic of Slovenia, Act on the Amendments and Additions to the Banking Act	2001
SL	Bank of Slovenia, Annual Overview	2004
SL	Bank of Slovenia, Law on the Bank of Slovenia	1991
SL	Bank of Slovenia, Bank of Slovenia Act	2002
SL	Bank of Slovenia, Regulation on the Harmonisation of the Amounts of the minimum initial capital of a	2004
SL	Republic of Slovenia, Act on the Amendments and Additions to the Banking Act 2	2004
SL	New York University School of Law, Law on Banks and Savings Banks	2007
SE	Questionnaire	2007
SE	Republic of Sweden, The Banking Business Act (SFS 1987:617)	1987

Note: Table A2 shows the data sources used to construct the merger control indices presented in Chapter 3. The countries for which index values are available are Austria (AT), the Czech Republic (CZ), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Latvia (LV), Lithuania (LI), Luxembourg (LU), Malta (MT), Poland (PL), Portugal (PT), the Slovak Republic (SK), Slovenia (SL), Spain (ES), and Sweden (SE).

**Table A3: T-Test on the Sample Mean**

<b>T-Test on Sample Mean: Domestic and Cross-Border Targets vs. Banks that were not acquired</b>			
	Domestic and Cross-Border Targets	Banks that were not acquired	T-Test Statistic
	Mean	Mean	
Log(Total Bank Assets) (SIZE)	14.30	13.53	-4.63***
Cost-Income Ratio (CIR)	82.51	71.03	-4.12***
Return-on-Assets (ROA)	0.21	0.66	2.54**
Total Equity/Total Assets (CAPITAL)	10.54	12.51	2.43**
Liquid Assets/Customer and Short-Term Funding (LIQUID)	25.86	37.62	5.45***
Net-Interest Revenue/Total Revenue (NIREV)	35.44	32.75	-2.16**
<b>T-Test on Sample Mean: Domestic Targets vs. Banks that were not acquired</b>			
	Domestic Targets	Banks that were not acquired	T-Test Statistic
	Mean	Mean	
Log(Total Bank Assets) (SIZE)	14.44	13.53	-3.60***
Cost-Income Ratio (CIR)	87.64	71.03	-3.59***
Return-on-Assets (ROA)	0.07	0.66	2.28**
Total Equity/Total Assets (CAPITAL)	10.56	12.51	1.54
Liquid Assets/Customer and Short-Term Funding (LIQUID)	26.32	37.62	4.44***
Net-Interest Revenue/Total Revenue (NIREV)	32.84	32.75	-0.05
<b>T-Test on Sample Mean: Cross-Border Targets vs. Banks that were not acquired</b>			
	Cross-Border Targets	Banks that were not acquired	T-Test Statistic
	Mean	Mean	
Log(Total Bank Assets) (SIZE)	14.15	13.53	-2.95***
Cost-Income Ratio (CIR)	77.18	71.03	-2.16**
Return-on-Assets (ROA)	0.35	0.66	1.27
Total Equity/Total Assets (CAPITAL)	10.53	12.51	2.04**
Liquid Assets/Customer and Short-Term Funding (LIQUID)	25.38	37.62	3.56***
Net-Interest Revenue/Total Revenue (NIREV)	38.19	32.75	-3.12***
<b>T-Test on Sample Mean: Domestic Targets vs. Cross-Border Targets</b>			
	Domestic Targets	Cross-Border Targets	T-Test Statistic
	Mean	Mean	
Log(Total Bank Assets) (SIZE)	14.44	14.15	0.88
Cost-Income Ratio (CIR)	87.64	77.18	1.94*
Return-on-Assets (ROA)	0.07	0.35	-0.81
Total Equity/Total Assets (CAPITAL)	10.56	10.53	0.02
Liquid Assets/Customer and Short-Term Funding (LIQUID)	26.32	25.38	0.22
Net-Interest Revenue/Total Revenue (NIREV)	32.84	38.19	-2.22**

Source: Own calculations (2009). \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level. Table A3 shows descriptive statistics for the bank variables used in the regression analysis in Chapter 3.

**Table A4: Correlation Analysis**

	SIZE	ROA	NIREV	CAPITAL	LIQUID	LIST	EMU	CEEC	IMGDP	STKMCP	DBAGDP	C3	INVFREE	FINFREE	INDEPEN-	
<b>SIZE</b>	1.0000															
<b>ROA</b>	0.0037	1.0000														
<b>NIREV</b>	-0.2290*	0.0903*	1.0000													
<b>CAPITAL</b>	-0.4001*	0.1309*	0.1762*	1.0000												
<b>LIQUID</b>	-0.1900*	-0.0240*	-0.1052*	0.4530*	1.0000											
<b>LIST</b>	0.0566*	0.0675*	0.1401*	-0.0007	-0.1018*	1.0000										
<b>EMU</b>	0.0890*	-0.0643*	-0.0828*	-0.0202	0.0101	-0.1213*	1.0000									
<b>CEEC</b>	-0.1476*	0.0264*	0.0008	0.0076	-0.1761*	0.0133	-0.4048*	1.0000								
<b>IMGDP</b>	-0.0583*	0.0148	-0.0651*	-0.0602*	-0.1260*	0.0285*	-0.2194*	0.5775*	1.0000							
<b>STKMCP</b>	0.1344*	0.0497*	-0.0149	0.0601*	0.1450*	-0.1031*	-0.0025	-0.4727*	-0.2762*	1.0000						
<b>DBAGDP</b>	0.1711*	-0.0302*	-0.0679*	-0.0100	0.1701*	-0.0170	0.2111*	-0.7016*	-0.3407*	0.4020*	1.0000					
<b>C3</b>	-0.0494*	0.0256*	0.0152	-0.0880*	-0.0979*	0.2495*	-0.1405*	0.0524*	0.4395*	-0.1539*	0.0582*	1.0000				
<b>INVFREE</b>	0.0769*	-0.0303*	-0.0008	0.0041	0.1095*	0.0022	0.1063*	-0.1556*	0.1077*	-0.0098	0.3949*	0.1850*	1.0000			
<b>FINFREE</b>	0.0537*	0.0787*	0.0900*	0.0545*	0.0446*	0.0880*	-0.4983*	0.0316*	0.2216*	0.3432*	0.1247*	-0.0231*	0.2192*	1.0000		
<b>INDEPENDENCE</b>	-0.1126*	0.0119	0.0644*	0.0312*	-0.0508*	0.0758*	-0.2708*	0.4562*	0.3289*	-0.2184*	-0.4198*	0.0000	-0.0709*	-0.0389*	1.0000	
<b>TRANSPARENCY</b>	-0.1648*	0.0414*	0.0764*	0.0203	-0.1088*	0.0653*	-0.3392*	0.5961*	0.5831*	-0.3631*	-0.5233*	0.1540*	0.0040	0.2020*	0.6563*	

Source: Own calculations (2209). \* indicates significance at the 10-percent level. Table A4 presents correlation coefficients for the explanatory variables used in the regression analysis in Chapter 3. For a description of the variables see Table A5.

**Table A5: Variables**


---

SIZE	Log(Total Bank Assets) Source: Bankscope (2008)
ROA	Return-on-Assets Source: Bankscope (2008)
CIR	Cost-Income Ratio Source: Bankscope (2008)
CAPITAL	Total Equity/Total Assets Source: Bankscope (2008)
LIQUID	Liquid Assets/Customer and Short-Term Funding Source: Bankscope (2008)
NIREV	Net-Interest Revenue/Total Revenue Source: Bankscope (2008)
IMGDP	Total Imports/Total GDP Source: Datastream (2008)
DBAGDP	Deposit Money Bank Assets/GDP Source: World Bank (2008)
STKMCAP	Stock Market Capitalization/GDP Source: World Bank (2008)
C3	Market Share of the Three Largest Banks Source: World Bank (2008)
FINFREE	Financial Freedom Index Source: Heritage Foundation (2008)
INVFREE	Investment Freedom Index Source: Heritage Foundation (2008)
INDEPENDENCE	Independence of Supervisory Authority Index Source: Köhler (2007)
TRANSPARENCY	Transparency of Merger Control Index Source: Köhler (2007)
EMU	Dummy Variable indicating whether a bank is located in a country that is member of the European Monetary Union
CEEC	Dummy Variable indicating whether a bank is located in Central and Eastern Europe
SMALL	Dummy variable indicating whether a bank is small. Banks are considered as small if their assets are below the 25-percentile.
MEDIUM	Dummy variable indicating whether a bank is small. Banks are considered as medium-sized if their assets are above the 25-percentile, but below the 75-percentile.
LARGE	Dummy variable indicating whether a bank is small. Banks are considered as large if their assets are above the 75-percentile.
TRANSPARENCY*SMALL	Interaction term between INDEPENDENCE and SMALL
TRANSPARENCY*MEDIUM	Interaction term between INDEPENDENCE and MEDIUM
TRANSPARENCY*LARGE	Interaction term between INDEPENDENCE and LARGE

---

Note: Table A5 presents the variables used in Chapter 3 to estimate the probability that a bank is taken over.



**Table A6: Bank Sample**

France	Number of Shareholders	Percent	Cumulative
ABC Arbitrage	13	2.67	2.67
Affine	24	4.93	7.6
Altarea	14	2.87	10.47
BNP Paribas	85	17.45	27.93
Banque Tarneaud	2	0.41	28.34
Banque de Savoie	1	0.21	28.54
Banque de la Réunion	1	0.21	28.75
Bourse Direct	10	2.05	30.8
Boursorama	19	3.9	34.7
CFCAL Banque-Crédit Foncier et Communal	4	0.82	35.52
Caisse régionale de crédit agricole mut	1	0.21	35.73
Cofitem - Cofimur	25	5.13	40.86
Compagnie Financière Martin-Maurel	6	1.23	42.09
Credit Agricole Alpes Provence-Caisse r	1	0.21	42.3
Credit Agricole Centre Loire-Caisse Reg	1	0.21	42.51
Credit Agricole Sud Rhône Alpes-Caisse	4	0.82	43.33
Credit Agricole de la Touraine et du Po	1	0.21	43.53
Crédit Agricole Atlantique Vendée-Caiss	2	0.41	43.94
Crédit Agricole Loire Haute-Loire-Caiss	4	0.82	44.76
Crédit Agricole Nord de France-Caisse r	2	0.41	45.17
Crédit Agricole S.A.	37	7.6	52.77
Crédit Agricole d'Aquitaine-Caisse régi	1	0.21	52.98
Crédit Agricole d'Ile-de-France-Caisse	1	0.21	53.18
Crédit Agricole de Toulouse et du Midi	1	0.21	53.39
Crédit Agricole de l'Ille-et-Vilaine-Ca	3	0.62	54
Crédit Agricole du Morbihan-Caisse régi	3	0.62	54.62
Crédit Industriel et Commercial - CIC	15	3.08	57.7
Eurosic	23	4.72	62.42
FALA	4	0.82	63.24
I.R.D. Nord Pas-de-Calais-Institut Régi	10	2.05	65.3
Initiative & Finance Investissement SA	3	0.62	65.91
Locindus	17	3.49	69.4
Natixis	21	4.31	73.72
SDR Bretagne	21	4.31	78.03
SIIC de PARIS	7	1.44	79.47
SIIC de PARIS 8ème	9	1.85	81.31
Société Générale	62	12.73	94.05
Société financière pour le financement	7	1.44	95.48
Union Financière de France Banque	14	2.87	98.36
Viel & Compagnie	8	1.64	100.00
<b>Total</b>	<b>487</b>	<b>100.00</b>	<b>100.00</b>

Germany	Number of Shareholders	Percent	Cumulative
AXG Investmentbank AG	2	0.41	0.41
Aareal Bank AG	41	8.35	8.76
Ahag Wertpapierhandelsbank AG	3	0.61	9.37
Baader Wertpapierhandelsbank AG	10	2.04	11.41
Bankverein Werther AG	1	0.2	11.61
Bayerische Hypo-und Vereinsbank AG	3	0.61	12.22
Berlin Hyp-Berlin-Hannoverschen Hypothe	5	1.02	13.24
Comdirect Bank AG	13	2.65	15.89
Commerzbank AG	67	13.65	29.53
Concord Investmentbank AG	9	1.83	31.36
DAB Bank AG	15	3.05	34.42
DF Deutsche Forfait Aktiengesellschaft	16	3.26	37.68
DVB Bank AG	3	0.61	38.29
Deutsche Bank AG	53	10.79	49.08
Deutsche Hypothekenbank (Actien-Gesells	7	1.43	50.51
Deutsche Postbank AG	42	8.55	59.06
Eurohypo AG	3	0.61	59.67
GFKL Financial Services AG	4	0.81	60.49
GRENKELEASING AG	23	4.68	65.17
Gebhard Bank-Gebhard & Co. Wertpapierha	5	1.02	66.19
Gontard & Metallbank AG	8	1.63	67.82
HSBC Trinkaus & Burkhardt AG	4	0.81	68.64
Hornblower Fischer AG	2	0.41	69.04
Hypo Real Estate Holding AG	78	15.89	84.93
IKB Deutsche Industriebank AG	9	1.83	86.76
LBB Holding AG-Landesbank Berlin Holdin	2	0.41	87.17
Merkur-Bank KGaA	2	0.41	87.58
NORDAKTIENBANK AG	6	1.22	88.8
Sino AG	11	2.24	91.04
Tradegate AG Wertpapierhandelsbank	3	0.61	91.65
UmweltBank AG	3	0.61	92.26
VEM Aktienbank AG	5	1.02	93.28
Varengold Wertpapierhandelsbank AG	7	1.43	94.7
Wüstenrot & Württembergische	10	2.04	96.74
mwb Wertpapierhandelsbank AG	9	1.83	98.57
quirin bank AG	7	1.43	100.00
Total	491	100.00	100.00

Italy	Number of Shareholders	Percent	Cumulative
Anima S.G.R.p.A	14	1.51	1.51
Apulia ProntoPrestito SpA	8	0.86	2.37
Azimet Holding SpA	72	7.77	10.14
Banca Carige SpA	17	1.83	11.97
Banca Finnat Euramerica SpA	12	1.29	13.27
Banca Ifis SpA	15	1.62	14.89
Banca Intermobiliare di Investimenti e	17	1.83	16.72
Banca Italease SpA	40	4.31	21.04
Banca Popolare dell'Etruria e del Lazio	14	1.51	22.55
Banca Popolare di Intra SpA	13	1.4	23.95
Banca Popolare di Milano SCaRL	66	7.12	31.07
Banca Popolare di Sondrio Societa Coope	1	0.11	31.18
Banca Popolare di Spoleto SpA	13	1.4	32.58
Banca Profilo SpA	21	2.27	34.84
Banca popolare dell'Emilia Romagna	3	0.32	35.17
Banco Desio - Banco di Desio e della Br	18	1.94	37.11
Banco Popolare	44	4.75	41.86
Banco di Sardegna SpA	4	0.43	42.29
CREDEM-Credito Emiliano SpA	21	2.27	44.55
Conafi Prestito SpA	28	3.02	47.57
Credito Artigiano	5	0.54	48.11
Credito Bergamasco	3	0.32	48.44
Credito Valtellinese SCaRL	13	1.4	49.84
Generbanca-Banca Generali SpA	14	1.51	51.35
Gruppo Monte dei Paschi di Siena-Banca	32	3.45	54.8
IFI - Istituto Finanziario Industriale	33	3.56	58.36
IW Bank SpA	14	1.51	59.87
Intesa Sanpaolo	87	9.39	69.26
Mediobanca SpA	88	9.49	78.75
Meliorbanca SpA-Meliorbanca Group	19	2.05	80.8
Mittel SpA	11	1.19	81.98
Toscana Finanza SpA	23	2.48	84.47
UBI Banca - Proforma-Unione di Banche I	36	3.88	88.35
UniCredito Italiano SpA	91	9.82	98.17
iNTEK SpA	17	1.83	100.00
Total	927	100.00	100.00

<b>Spain</b>	<b>Number of Shareholders</b>	<b>Percent</b>	<b>Cumulative</b>
Banco Bilbao Vizcaya Argentaria SA	183	23.22	23.22
Banco Espanol de Crédito SA, BANESTO	43	5.46	28.68
Banco Guipuzcoano SA	40	5.08	33.76
Banco Pastor SA	51	6.47	40.23
Banco Popular Espanol SA	94	11.93	52.16
Banco Santander SA	178	22.59	74.75
Banco de Andalucía SA	10	1.27	76.02
Banco de Castilla SA	8	1.02	77.03
Banco de Crédito Balear SA	10	1.27	78.3
Banco de Galicia SA	6	0.76	79.06
Banco de Sabadell SA	62	7.87	86.93
Banco de Valencia SA	39	4.95	91.88
Banco de Vasconia SA	7	0.89	92.77
Bankinter SA	57	7.23	100.00
<b>Total</b>	<b>788</b>	<b>100.00</b>	<b>100.00</b>

<b>United Kingdom</b>	<b>Number of Shareholders</b>	<b>Percent</b>	<b>Cumulative</b>
3i Group plc	94	3.67	3.67
Aberdeen Asset Management Plc	97	3.79	7.47
Alliance & Leicester Plc	67	2.62	10.09
Alliance Trust Plc	21	0.82	10.91
Arbutnot Banking Group Plc	46	1.8	12.71
Baillie Gifford Japan Trust Plc (The)	16	0.63	13.33
Baillie Gifford Shin Nippon Plc	15	0.59	13.92
Bankers Investment Trust Plc	9	0.35	14.27
Barclays Plc	99	3.87	18.14
Bradford & Bingley Plc	67	2.62	20.76
Brewin Dolphin Holdings Plc	73	2.85	23.61
British Assets Trust Plc	17	0.66	24.28
Cattles Plc	99	3.87	28.15
Close Brothers Group Plc	84	3.28	31.43
Dunedin Enterprise Investment Trust plc	21	0.82	32.25
Dunedin Smaller Companies Investment Tr	10	0.39	32.64
Edinburgh Investment Trust Plc (The)	17	0.66	33.31
Edinburgh Worldwide Investment Trust Pl	14	0.55	33.85
Electra Private Equity Plc	17	0.66	34.52
Foreign & Colonial Investment Trust Plc	15	0.59	35.11
HBOS Plc	91	3.56	38.66
HSBC Holdings Plc	72	2.81	41.48
ICAP Plc	92	3.6	45.07
Intermediate Capital Group Plc	91	3.56	48.63
Investec Plc	87	3.4	52.03
Islamic Bank of Britain Plc	22	0.86	52.89
Jupiter Primadona Growth Trust Plc	25	0.98	53.87
Lloyds TSB Group Plc	112	4.38	58.25
London Scottish Bank Plc	66	2.58	60.83
Man Group Plc	113	4.42	65.25
Mercantile Investment Trust plc (The)	16	0.63	65.87
Mid Wynd International Investment	1	0.04	65.91
Monks Investment Trust Plc	6	0.23	66.15
Murray International Trust Plc	15	0.59	66.73
Northern 3 VCT Plc	1	0.04	66.77
Northern Aim VCT Plc	1	0.04	66.81
Northern Investors Company Plc	28	1.09	67.9

Northern Venture Trust Plc	2	0.08	67.98
Pacific Horizon Investment Trust plc	12	0.47	68.45
Paragon Group of Companies Plc	78	3.05	71.5
Polar Capital Technology Trust Plc	13	0.51	72.01
Provident Financial Plc	93	3.64	75.65
RIT Capital Partners Plc	9	0.35	76
Rathbone Brothers Plc	99	3.87	79.87
Royal Bank of Scotland Group Plc (The)	135	5.28	85.14
Schroders Plc	91	3.56	88.7
Scottish Investment Trust Plc	19	0.74	89.44
Scottish Mortgage Investment Trust Plc	13	0.51	89.95
Standard Chartered Plc	118	4.61	94.57
Throgmorton Trust PLC	20	0.78	95.35
Tullett Prebon Plc	99	3.87	99.22
Utilico Investment Trust Plc	7	0.27	99.49
Witan Investment Trust Plc	13	0.51	100.00
<b>Total</b>	<b>2,558</b>	<b>100.00</b>	<b>100.00</b>

Source: Bankscope (2008). Table A6 shows the banks and the number of shareholders per bank that are included in the dataset in Chapter 4.

**Table A7: Description of Variables**

Variable	Description
$\overline{RoE}_i$	Average return-on-equity over the period between 2000 and 2006 for bank <i>i</i> . To eliminate outliers, ROE is winsorized at the 1- and 99-percent level. Source: Bankscope (2008)
DROE	DROE is defined as $1 - \left[ RoE_{2008} - \overline{RoE} \right]$ . A larger value for DROE, hence, indicates greater losses in 2008 and thus greater risk-taking in the period between 2000 and 2006. To eliminate outliers, DROE is winsorized at the 1- and 99-percent level. Source: Bankscope (2009)
STAKE	The largest direct or indirect stake that an individual shareholder or an affiliated group of shareholders has. A direct stake involves shares registered in the shareholder's name, while indirect ownership involves bank shares that are held by entities that are controlled by the ultimate shareholder. Every direct and indirect ownership stake below 10 percent is set to 0 Source: Bankscope (2008)
RIGHTS	Index of anti-director rights for the country. Formed by adding one when: (1) the country allows shareholders to mail their proxy vote, (2) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting, (3) cumulative voting or proportional representation of minorities on the board of directors is allowed, (4) an oppressed minorities mechanism is in place, (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10 percent (the sample median), or (6) when shareholders have preemptive rights that can only be waived by a shareholders meeting. The range for the index is from zero to six. Source: La Porta et al. (1998).
SAVINGS	Dummy variable indicating whether a bank is classified as savings bank. Source: Bankscope (2008)
COOPERATIVE	Dummy variable indicating whether a bank is classified as cooperative bank. Source: Bankscope (2008)
HOLDING	Dummy variable indicating whether a bank is classified as bank holding company bank. Source: Bankscope (2008)
INVESTMENT	Dummy variable indicating whether a bank is classified as investment bank or a securities house. Source: Bankscope (2008)
MORTGAGE	Dummy variable indicating whether a bank is classified as real-estate or mortgage bank. Source: Bankscope (2009)
STATEBANK	Dummy variable indicating whether a bank is classified as a multi-lateral governmental bank, specialized governmental credit institution or medium- and long-term credit bank. Source: Bankscope (2008)
FOREIGN	Dummy variable indicating whether the largest shareholder is a foreign entity or individual. Source: Bankscope (2008)
STATE	Dummy variable indicating whether the state or any other governmental institution is the largest shareholder. Source: Bankscope (2008)
LIST	Dummy variable indicating whether a bank is listed on a stock exchange. Source: Bankscope (2008)

SMOOTHING	SMOOTHING measures whether bank managers have smoothed profits over time. It is defined as one minus the ratio of the bank-level standard deviation of operating income divided by the bank-level standard deviation of cash flow operations between 2000 and 2006. A larger value for SMOOTHING indicates greater profit smoothing. The cash flow from operations is measured indirectly by subtracting accruals from operating income. Following Healy (1985), Jones (1991), Leuz et al. (2003) and John et al. (2008), we calculate accruals as follows: $(\Delta\text{total current assets} - \Delta\text{cash}) - (\Delta\text{total current liabilities} - \Delta\text{short-term debt} - \Delta\text{taxes payable}) - \text{depreciation and amortization expenses}$ . Depreciation and amortization expenses is assumed to be zero in case of banks. Short-term debt is proxied by deposits and short-term funding. To eliminate outliers, SMOOTHING is winsorized at the 1- and 99-percent level. Bank data is from Bankscope (2008).
GOVAID	Dummy variable indicating whether a bank received any kind of financial support from the government during the crisis. Source: Petrovic and Tusch (2009), Sinn (2009) and Office of Financial Stability (2010). For countries where we did not find any information on government rescue programs for the financial sector, we randomly checked on the internet whether banks received any kind of financial support from the government during the crisis.
SIZE	Average of the logarithm of total bank assets (\$ Million) in the period between 2000 and 2006. To eliminate outliers, SIZE is winsorized at the 1- and 99-percent level. Source: Bankscope (2008)
EQUITY	Average ratio of total equity to total bank assets in the period between 2000 and 2006. To eliminate outliers, EQUITY is winsorized at the 1- and 99-percent level. Source: Bankscope (2008)
DEPOSITS	Average ratio of total deposits to total bank assets in the period between 2000 and 2006. To eliminate outliers, DEPOSITS is winsorized at the 1- and 99-percent level. Source: Bankscope (2008)
SDPROFIT	Standard deviation of net operating profits in the period between 2000 and 2006. To eliminate outliers, SDPROFIT is winsorized at the 1- and 99-percent level. Source: Bankscope (2008)
LOANS	Average ratio of total loans to total bank assets in the period between 2000 and 2006. To eliminate outliers, LOANS is winsorized at the 1- and 99-percent level. Source: Bankscope (2008)
RESTRICT	Index of regulatory restrictions on banks ability to engage in securities market activities, the insurance business and conduct real estate activities. The index ranges from 4 to 12 with higher values indicating more restrictions. Data are for 2003. Source: Barth, Caprio, and Levine (2006).
CAPITAL	Capital regulatory index. The index that includes information on the following questions. 1. Is the minimum capital-asset ratio requirement risk weighted in line with the Basel guidelines? 2. Does the minimum ratio vary as a function of market risk? 3. Are market value of loan losses not realized in accounting books deducted from capital? 4. Are unrealized losses in securities portfolios deducted? 5. Are unrealized foreign exchange losses deducted? 6. What fraction of revaluation gains is allowed as part of capital? 7. Are the sources of funds to be used as capital verified by the regulatory/supervisory authorities? 8. Can the initial disbursement or subsequent injections of capital be done with assets other than cash or government securities? 9. Can initial disbursement of capital be done with borrowed funds? The index ranges from 0 to 10 with higher values indicating greater stringency. Data are for 2003. Source: Barth, Caprio, and Levine (2006).

OFFICIAL	Index of official supervisory power. Adds one for an affirmative response to each for the following 14 questions: 1.Does the supervisory agency have the right to meet with external auditors to discuss their report without the approval of the bank? 2.Are auditors required by law to communicate directly to the supervisory agency any presumed involvement of bank directors or senior managers in illicit activities, fraud, or insider abuse? 3.Can supervisors take legal action against external auditors for negligence? 4.Can the supervisory authority force a bank to change its internal organizational structure? 5.Are off-balance sheet items disclosed to supervisors? 6. Can the supervisory agency order the bank's directors or management to constitute provisions to cover actual or potential losses? 7. Can the supervisory agency suspend the directors' decision to distribute: a) Dividends? b) Bonuses? c) Management fees? 8.Can the supervisory agency legally declare-such that this declaration supersedes the rights of bank shareholders-that a bank is insolvent? 9.Does the Banking Law give authority to the supervisory agency to intervene that is, suspend some or all ownership rights-a problem bank? 10.Regarding bank restructuring and reorganization, can the supervisory agency or any other government agency do the following: a) Supersede shareholder rights? b) Remove and replace management? c) Remove and replace directors? shareholder rights? b) Remove and replace management? c) Remove and replace directors? The index ranges from 0 to 14 with higher values indicating greater power of the supervisory authority. Data are for 2003. Source: Barth, Caprio, and Levine (2006).
INDEPENDENCE	The degree to which the supervisory authority is independent from the government and legally protected from the banking system. The index ranges from 0 to 2 with higher values indicating greater independence of the supervisory authority. Data are for 2003. Source: Barth, Caprio, and Levine (2006).
COVERAGE	Ratio of deposit insurance coverage to per capita Gross Domestic Product (GDP) in 2003. Source: Demirgüç-Kunt et al. (2005)
RULE OF LAW	The average value the Rule of Law Index in the period between 2000 and 2006. Source: Kaufman et al. (2008)
REGULATORY QUALITY	The average value the Regulatory Quality in the period between 2000 and 2006. Source: Kaufman et al. (2008)
CORRUPTION	The average value the Freedom of Corruption Index in the period between 2000 and 2006. Source: Kaufman et al. (2008)
DBAGDP	Ratio of deposit-money bank assets to GDP. Source: World Bank (2009)
C3	Market share of the three largest credit institutions. Source: World Bank (2009)

---

Note: Table A7 shows the variables used in the regression analysis in Chapter 5.



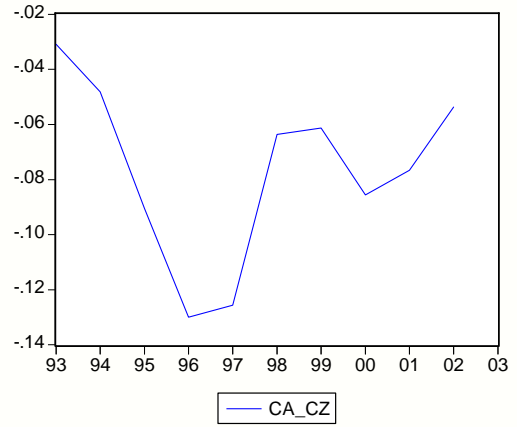
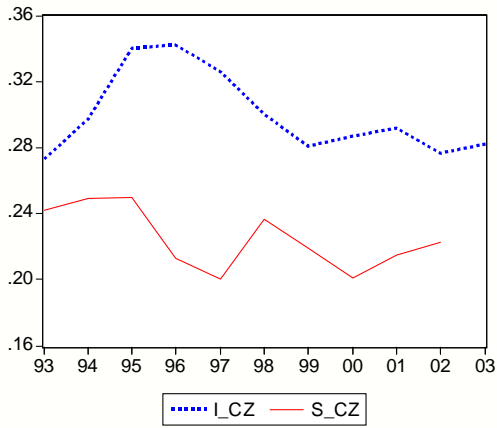
**Table A8: Summary Statistics**

Variable	Obs.	Mean	Median	Max.	Min.	Std.Dev.
ROE	1,142	0.14	0.14	0.46	-0.16	0.10
DROE	1,142	1.13	1.06	2.50	0.41	0.28
STAKE	1,142	48.87	50.10	100.00	0.00	39.84
RIGHTS	1,142	3.27	3.00	5.00	0.00	1.58
HOLDING	1,142	0.20	0.00	1.00	0.00	0.40
SAVINGS	1,142	0.08	0.00	1.00	0.00	0.28
COOPERATIVE	1,142	0.08	0.00	1.00	0.00	0.27
INVESTMENT	1,142	0.06	0.00	1.00	0.00	0.24
MORTGAGE	1,142	0.05	0.00	1.00	0.00	0.22
STATEBANK	1,142	0.06	0.00	1.00	0.00	0.24
LIST	1,142	0.42	0.00	1.00	0.00	0.49
FOREIGN	1,142	0.20	0.00	1.00	0.00	0.40
STATE	1,142	0.05	0.00	1.00	0.00	0.21
SMOOTHING	1,100	0.89	0.94	0.99	-0.31	0.16
SIZE	1,142	8.79	8.62	13.57	5.92	1.71
CAPITAL	1,142	8.79	7.48	52.18	1.02	7.23
DEPOSITS	1,079	0.55	0.61	0.93	0.00	0.26
LOANS	1,123	0.60	0.66	0.98	0.01	0.23
SDPROFIT	1,101	120.31	17.36	2244.96	0.49	332.42
RESTRICT	1,142	8.80	10.00	12.00	4.00	2.21
CAPITAL	1,070	5.92	6.00	10.00	3.00	1.52
OFFICIAL	1,125	10.66	12.00	14.00	5.00	2.59
INDEPENDENCE	1,142	0.83	1.00	2.00	0.00	0.58
RLAW	1,142	1.44	1.55	1.93	-0.39	0.42
REGQUAL	1,142	1.35	1.54	1.84	0.14	0.34
CORR	1,142	1.53	1.65	2.41	-0.29	0.53

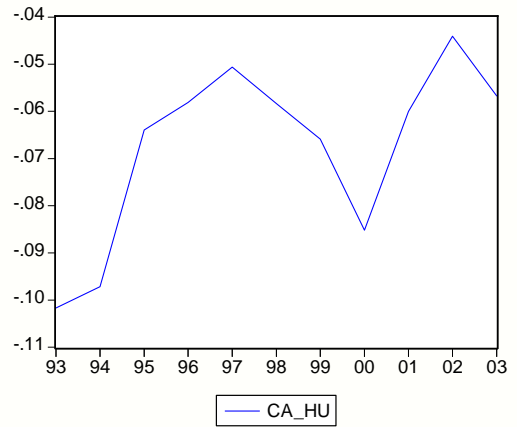
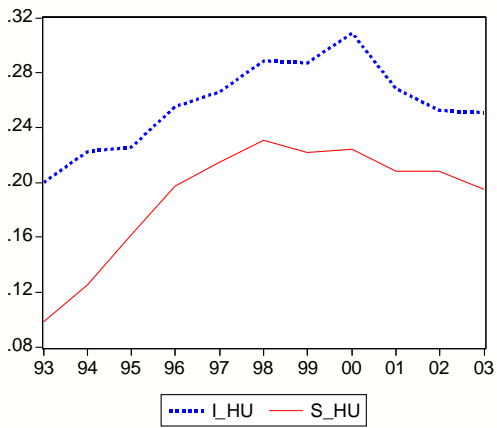
Source: Own calculations (2010). Table A8 presents summary statistics for the variables used in the regression analysis in Chapter 5. For a complete list and a description of the variables see Table A7.

**Figure A1: Saving Rates, Investment Rates, and the Current Account**

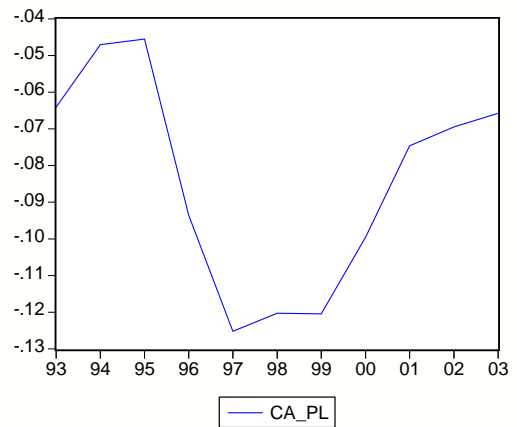
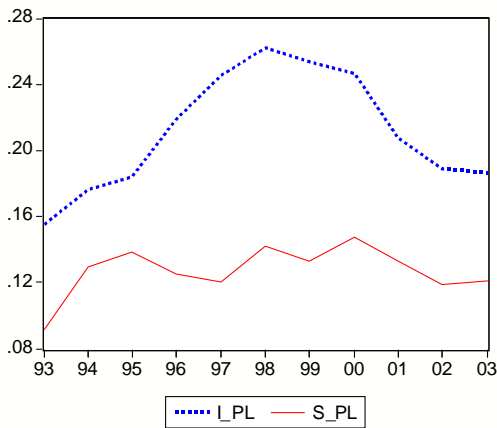
a) Czech Republic



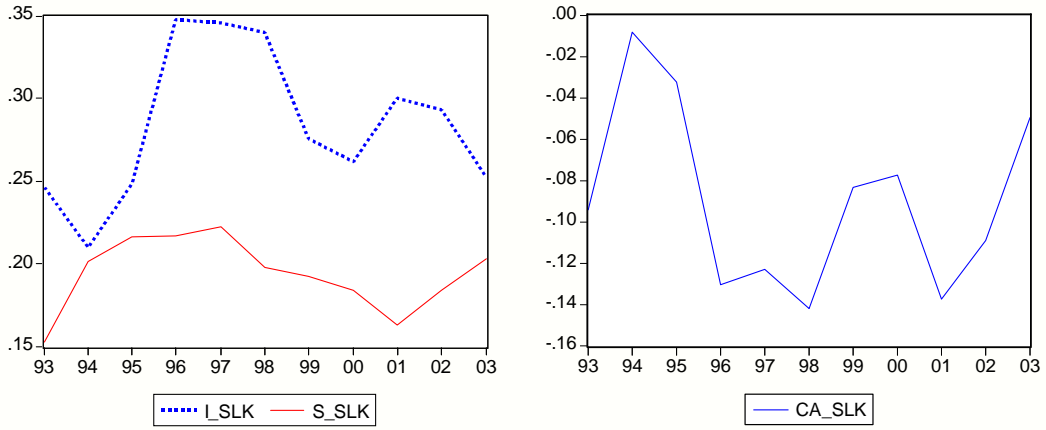
b) Hungary



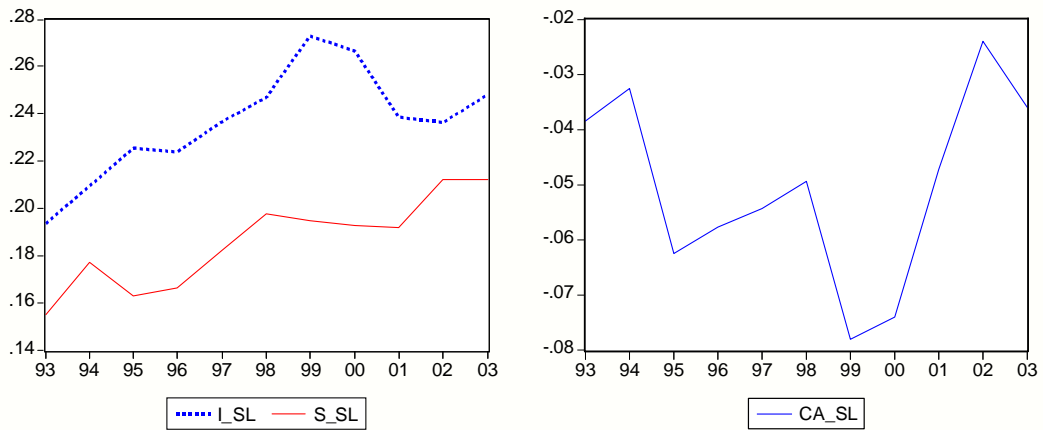
c) Poland



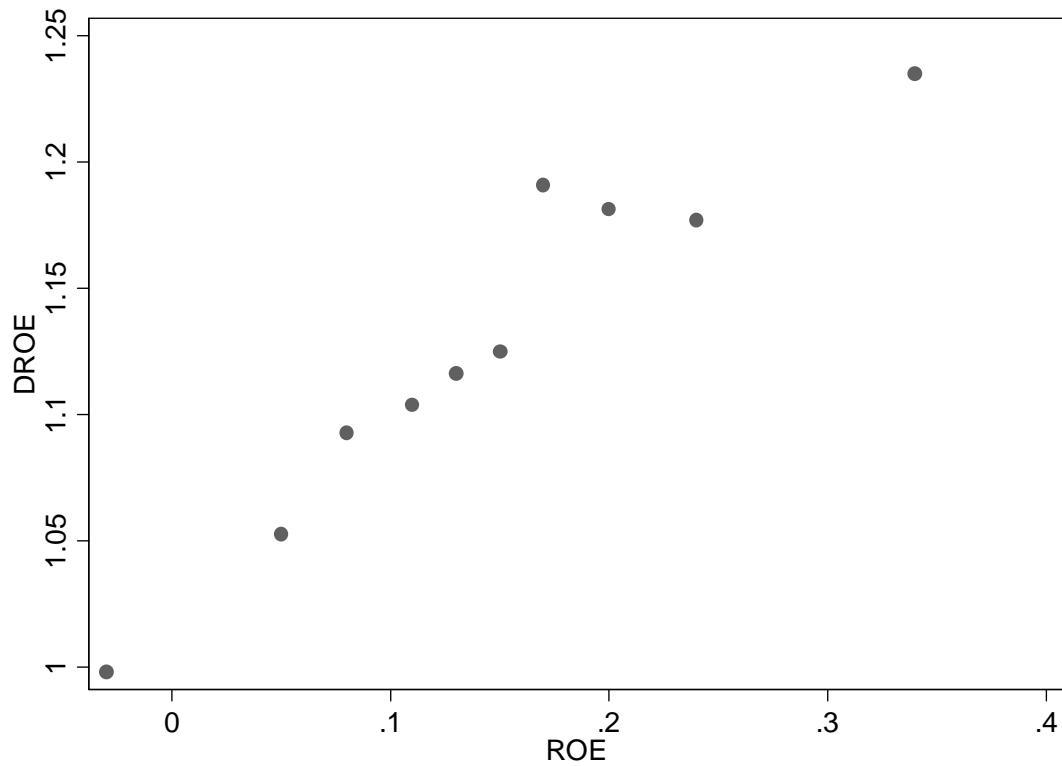
d) Slovak Republic



e) Slovenia



Source: International Monetary Fund (2005) and own calculations (2005). Figure A1 shows the development of the savings rate (S), the investment rate (I), and the current account (CA) in the Czech Republic (CZ), Hungary (HU), Poland (PL), the Slovak Republic (SK), and Slovenia (SL) between 1993 and 2003. The investment rate is the ratio of gross fixed capital formation and changes in inventories divided by GDP. The savings rate is equal to the sum of gross investments and the balance of the current account divided by GDP. The current account series is the difference between the savings rate and the investment rate.

**Figure A2: Relationship between Bank Risk and Bank Performance**

Correlation between DROE and ROE for the full sample: 0.2474\*\*\*

Figure A2 illustrates the relationship between bank performance and bank risk-taking. Bank performance is measured by the average return-on-equity (ROE) in the period between 2000 and 2006. Bank risk is measured by the drop-off in ROE in 2008 from the average ROE in the period between 2000 and 2006 (DROE). To eliminate outliers, all variables are winsorized at the 1- and 99-percent level. DROE is constructed in a way that a higher value for DROE indicates greater risk-taking. To make interpretation easier, we calculate the average ROE for every decile of the distribution. Hence, each dot reflects the combination of average bank performance in each decile and the corresponding average value for bank risk-taking in the respective decile. \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level.

## **Declaration**

I declare upon my word of honor that the dissertation submitted herewith is entirely my own work and that only the sources and aids listed have been used. All references or quotations in any form and their use have been clearly identified in the source references.

Schloß Reichartshausen, 09.03.2010

---

Matthias Köhler