Transparency of Regulation and Cross-Border Bank Mergers*

Matthias Köhler
Centre for European Economic Research (ZEW)

There is ample anecdotal evidence that political influence might constitute a barrier to the integration of European banking markets. Based on a data set on the transparency of the supervisory review process of bank mergers in the EU, we estimate the probability that a credit institution will be taken over as a function of bank and country characteristics and the transparency of merger control. The results indicate that a credit institution is systematically more likely to be taken over by foreign banks if the regulatory process is transparent. In particular, large banks seem to be less likely to be taken over by foreign credit institutions if merger control lacks procedural transparency.

JEL Codes: G21, G28, G34.

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

(Close advisor of French President Nicolas Sarkozy, after Société Générale announced trading losses of almost €5 billion)

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1. Introduction

Although the EU has removed barriers to cross-border banking through the harmonization of banking regulations, the number of cross-border mergers and acquisitions (M&As) in the EU banking sector is still low compared with domestic and cross-border M&As in other sectors (European Commission 2005). This paper shows that a lack of procedural transparency of merger control might constitute a systematic barrier to cross-border consolidation in the banking sector if politicians and supervisors use the intransparency to block cross-border M&As for nationalistic feelings.

The fact that interference by politicians and supervisors constitutes a barrier to banking market integration in the EU was recently demonstrated in France when the French government made clear that it would protect Société Générale from being taken over by foreign credit institutions. "Every time there is an attack on the banking system, every government in Europe is active, they intervene. . . . France is just like the others," said a close advisor of French President Nicolas Sarkozy. This was not the first time that French politicians intervened in the acquisition of domestic banks. The case of Crédit Lyonnais is another example. Crédit Lyonnais was privatized in 1999, with the state retaining 10 percent of ownership shares until the end of 2000. This made the takeover of Crédit Lyonnais by foreign banks more difficult, since government officials repeatedly stated they would oppose the acquisition of the bank by a foreign credit institution. The importance of the political dimension for bank acquisitions is also reflected by a statement of the former chairman of Lloyds TSB. In an interview, he said that Lloyds TSB would like to buy Crédit Lyonnais but was put off by the regulatory and political climate in France. This explains why Lloyds never made an official takeover bid for Crédit Lyonnais, although it frequently expressed its interest in the French bank.[1] The political dimension of bank mergers seems to be important in other member countries as well. In Italy, the acquisition of Banca Antonveneta (BA) and

[1]Political influence also played a role in the bidding war for Crédit Industriel et Commercial (CIC) (Boot 1999). Although ABN AMRO was favored because of its excellent track record vis-à-vis competing French bidders, CIC was sold in 1998 to Crédit Mutuel.

Banca Nazionale de Lavoro (BNL) by the Dutch ABN AMRO and the Spanish Banco Bilbao Vizcaya Argentaria (BBVA) was blocked by the Bank of Italy in 2005 for prudential reasons and formal errors. Because it later became public that the deals were not blocked for prudential reasons, but to protect Banca Antonveneta and Banca Nazionale de Lavoro from foreign ownership, the EU Commission brought actions against Italy for infringement of the principle of the free movement of capital.[2] To improve the legal certainty, clarity, and transparency of the merger control process, the Commission furthermore proposed changes of the EU Banking Directive to increase the transparency of merger control in the banking sector (European Commission 2006).

Although these examples demonstrate that political interference makes cross-border takeovers in the banking sector more difficult, systematic empirical evidence on the role of politicians and supervisors as a barrier to cross-border consolidation is missing. This paper aims to fill this gap. It relies on a unique database on the transparency of merger control in the banking sector. To our knowledge, this is the first paper to examine the difference between domestic and cross-border acquisitions as a function of bank characteristics, country characteristics, and the transparency of merger control in the banking sector. The paper is organized as follows. After a literature survey on the determinants of domestic and cross-border acquisition in the banking sector, we estimate the probability that a bank will be taken over by domestic and foreign credit institutions. We find that the likelihood of a takeover depends not only on the characteristics of the acquired bank and the country where it is located but also on the degree of transparency of merger control in the banking sector. The results indicate that cross-border takeovers are systematically more likely if merger control is more transparent. In particular, large banks seem to be less likely to be taken over if merger control lacks transparency. This supports the hypothesis that politicians might

[2] Another example where cross-border takeovers were blocked for opaque concerns is the proposed acquisition of the Portuguese financial group Champlinaud by the Spanish Banco Santander Central Hispanio (BSCH) in 1999. The acquisition was vetoed by the Portuguese Minister of Finance. 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 1999).

use merger control to block cross-border acquisitions if they want to protect national flagships. Domestic takeovers are not affected. The results suggest that merger control might constitute a barrier to cross-border consolidation and that further integration of EU banking markets requires a higher degree of procedural transparency of merger control.

2. Literature

European banking markets are still not integrated. One indicator for this lack of integration is that domestic bank mergers still outnumber cross-border M&As in the EU banking sector (Cabral, Dierick, and Vesala 2002).[3] This indicates that there are barriers to consolidation that are larger for foreign banks than for domestic banks. These barriers might be differentiated into market entry and efficiency barriers.

Berger, De Young, and Udell (2001) argue that one reason for the small number of cross-border M&As in the banking sector is efficiency barriers. Differences in banking regulation and supervision are one example of these kinds of barriers. Since foreign banks have to comply with regulations both at home and abroad, domestic credit institutions have cost advantages because complying with two different sets of regulations imposes additional costs on foreign banks. Different regulations furthermore reduce the amount of overlapping fixed costs. This decreases the potential to reap benefits from economies of scale and scope and makes the acquisition of foreign banks less attractive. Efficiency barriers might also arise from cultural diversity, different languages, and corporate cultures. Cultural diversity and different languages raise information costs and make an efficient restructuring and reorganization of the acquired institution more difficult. This reduces the potential to increase X-efficiency. X-efficiency gains arise if the acquiring institution is more efficient ex ante and brings the efficiency of the target bank up to its own level (Berger et al. 2000). The expectation is that more efficient banks

[3] Adam et al. (2002) and Affinito and Farabullini (2006) measure the degree of banking market integration based on the law of one price. Another indicator for banking market integration has recently been proposed by Gropp and Kashyap (2009). They look at the rate of convergence of bank return on assets to measure banking market integration. Both measures of integration indicate that EU banking markets are still fragmented along national lines.

will restructure and transfer their managerial expertise, policies, and procedures to the acquired institution in order to increase efficiency. Since efficiency barriers are assumed to be higher for foreign banks than for domestic banks, the potential to raise X-efficiency appears to be lower for cross-border takeovers than for domestic takeovers. This might reduce the incentive to take over or merge with credit institutions in other countries. Consolidation across borders is therefore likely to be limited as long as barriers exist that prevent foreign banks from taking full advantage of potential efficiency gains from this consolidation (Berger, DeYoung, and Udell 2001).

The empirical literature on the efficiency effects of M&As in the banking sector suggests that efficiency barriers exist. Vander Vennet (1998), for example, finds that in Europe some acquisitions tended to improve cost efficiency, whereas other types tended to decrease cost efficiency.[4] Studies that compare the efficiency of foreign and domestic banks also do not find much evidence for efficiency gains through cross-border consolidation. Vander Vennet (1996) concludes that foreign banks in Europe had about the same cost efficiency as domestic credit institutions. In contrast, Bonin, Hasan, and Wachtel (2005) find that they are more cost efficient than domestic banks in ten Central and Eastern European countries. In contrast, Kraft and Tirtiroglu (1998) for Croatia and Matousek and Taci (2002) for the Czech Republic find no evidence of greater efficiency of foreign banks. These results suggest that in some countries substantial efficiency barriers exist that offset most of any potential efficiency gains from cross-border takeovers. Since only the most efficient banks are able to overcome these barriers, efficiency barriers constitute an obstacle to the integration of banking markets.

Cross-border consolidation in the EU banking sector is also restricted by market entry barriers. Entry barriers make it harder or even impossible for banks to take over or merge with foreign banks. Ownership limits for foreign investors are one example of

[4]Studies on U.S. bank mergers also find on average only little or no cost X-efficiency improvements through M&As (Berger and Humphrey 1992; Peristiani 1997; Berger 1998; Rhoades 1998; Cummins, Tennyson, and Weiss 1999; De Young 1999; and Fried, Knox Lovell, and Yaisawarng 1999). The evidence on cost X-efficiency in Europe is mixed as well. Vander Vennet (1996, 1998) finds that some groups of M&As, particularly cross-border M&As, tend to improve, whereas other types tend to decrease, cost efficiency.

such barriers. Market entry barriers also arise from political interference. Boot (1999) argues that central banks, ministries of finance, and domestic banks operate in close concert to block cross-border takeovers and promote domestic takeovers because they want the largest institution in the country to be domestically owned. Since ownership limits on foreign shareholdings are prohibited by the EC Treaty, politicians have to look for other ways to block foreign investment in the EU banking sector. One way is to block cross-border acquisitions and to promote domestic acquisitions during merger control. The fact that merger control might constitute a barrier to cross-border consolidation has been demonstrated in Italy, where the central bank blocked the acquisition of BA and BNL by the Dutch ABN AMRO and the Spanish BBVA in 2005.

Market entry barriers only constitute a barrier to integration if banks want to take over a foreign credit institution. Efficiency barriers always constitute a barrier to integration, since they reduce the incentive of banks to take over a foreign credit institution. Since efficiency barriers lower the potential to generate X-efficiency gains from mergers, only the most efficient banks are expected to take over foreign credit institutions. This is consistent with Foccarelli and Pozzolo (2001). They find that banks are more likely to take over foreign credit institutions if they are large and efficient. Banks with a larger share of non-interest income are also more likely to have foreign shareholdings. The size of the banking sector and the average national return on assets in the country where the acquiring bank is located are positively correlated, and the size of the stock market is negatively correlated, with the probability that a bank will take over a foreign credit institution. This suggests that the takeover decision depends not only on bank-specific but also on location-specific determinants.

This paper differs from Foccarelli and Pozzolo (2001) in two important dimensions. While we also analyze the determinants of cross-border bank takeovers, we do not focus on the acquiring bank and the country where the acquiring bank is located, but rather on the acquired banks and on the characteristics of the country where the acquired bank is located. This distinction is necessary, since we want to find out if political interference constitutes a barrier to cross-border consolidation. This cannot be analyzed if we focus on the acquiring bank, because the likelihood that a bank will be

taken over depends not only on whether a bank is willing to acquire foreign credit institutions, but also on whether it is able to do so or whether cross-border takeovers are blocked by politicians or supervisors. Since the scope to block cross-border M&As and promote domestic M&As in the banking sector is larger if merger control lacks transparency, we use three indices that measure the degree of political independence of the supervisor and procedural transparency of merger control. To account for the fact that politicians and supervisory authorities might block cross-border acquisitions and promote domestic acquisitions, we estimate the determinants of acquisitions in the EU banking sector for domestic and cross-border takeovers separately in a multinomial logit framework.

3. Merger Control as Barrier to Integration

Political interference has been identified by Boot (1999) as a barrier to cross-border consolidation in the EU banking sector. This has recently been confirmed by a survey of the EU Commission on the barriers to cross-border banking in Europe. It indicates that political interference and the misuse of supervisory powers is one of the main barriers to the integration of EU banking markets (European Commission 2005).

The survey was initiated by the Economics and Finance Ministers of the EU after the acquisition of BA and BNL by the Dutch ABN AMRO and the Spanish BBVA had been blocked by the Bank of Italy in 2005 for prudential reasons and formal errors.[5] The central bank simultaneously promoted takeover bids from domestic financial institutions for the same targets. Because it later became public that both deals were blocked by the supervisor to protect BA and BNL from foreign ownership, the EU Commission has brought actions against Italy for infringement of the principle of the free movement of capital. The Commission complained that the merger control process of the Bank of Italy lacks procedural transparency and can create legal uncertainty. This could lead to a situation in which the supervisors can refuse authorization based on opaque

[5]For more information on these two cases and the EU directive proposal to improve the legal certainty, clarity, and transparency of the merger control process, see Köhler (2007).

concerns (European Commission 2005). The Commission, furthermore, initiated changes of the EU banking directive to increase the transparency of merger control in the EU banking sector.

To find out if merger control lacks procedural transparency in EU member countries, Köhler (2007) sent out a questionnaire to supervisory authorities of the twenty-five EU member countries between November 2006 and March 2007. The aim of the questionnaire was to find out how transparent merger control in the EU is. Based on information from this questionnaire and additional sources, he has constructed two indices for twenty EU countries that measure the degree of procedural transparency of merger control in the banking sector. Both indices are based on the idea that merger control is more transparent if the criteria according to which supervisors assess the suitability of potential investors is known. The difference between these indices is that they concentrate on different criteria that are used to assess potential investors. The General Criteria Index (GCI) measures the general criteria supervisors use to assess the suitability of potential investors. Takeovers are generally assessed based on a prudential and competition assessment. Merger control is assumed to be intransparent if the general criteria used to assess the suitability of potential investors is not known. While the GCI looks at whether prudential criteria are used by supervisors at all to assess the suitability of potential investors, the Prudential Criteria Index (PCI) focuses on the specific criteria that are used by supervisors for the prudential assessment of potential investors. Possible criteria for the prudential assessment are the reputation and financial soundness of the proposed investor as well as the experience of the future management. Merger control is assumed to be more transparent, the larger the number of criteria is that are known to potential investors and the public. The idea is that supervisors and politicians should have less scope to block cross-border takeovers if the prudential assessment is based on a closed list of official criteria.[6]

Table 1 indicates that the proportion of cross-border takeovers to the total number of takeovers in the banking sector is positively correlated with the average degree of procedural transparency of

[6]The twenty EU countries for which index values are available are Austria, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Luxembourg, Malta, the Netherlands, Poland, Portugal, the Slovak Republic, Slovenia, Spain, and Sweden.

Table 1. Correlation Analysis

	Index of Political Independence	General Criteria Index	Prudential Criteria Index	Domestic M&As to the Total Number of M&As in the Banking Sector	Cross-Border M&As to the Total Number of M&As in the Banking Sector
Index of Political Independence	1.00				
General Criteria Index	−0.23	1.00			
Prudential Criteria Index	0.75	−0.36	1.00		
Domestic M&As to the Total Number of M&As in the Banking Sector	−0.14	0.20	−0.40	1.00	
Cross-Border M&As to the Total Number of M&As in the Banking Sector	0.14	−0.20	0.40	−1.00	1.00

Source: Köhler (2007), Bankscope (2008), and Zephyr (2008).

merger control between 1997 and 2006. This is in line with the hypothesis that politicians and supervisors have less scope to block cross-border acquisitions and to promote domestic takeovers if the supervisory review process of bank mergers is transparent. The correlation seems to be stronger for the PCI than for the GCI. Cross-border takeovers also seem to be more frequent in countries where the supervisor is more politically independent. The degree of political independence of the supervisor is measured by the Index of Political Independence (IPI) (Köhler 2007). This index measures which authority approves bank mergers and how the head of this institution is appointed. The idea is that the scope for political interference is larger if a government body approves mergers or if the head of the institution that assesses the suitability of potential investors in the banking sector is appointed by the government.

4. Empirical Model

Since we assume that the scope for political interference is larger if merger control lacks procedural transparency, we expect that the

probability that a bank will become the target of a cross-border takeover is smaller and the likelihood that a credit institution will be taken over by a domestic bank is larger if the supervisory review process of bank mergers is intransparent and politicians want banks in domestic ownership.

This makes it necessary to estimate the probability that a bank will be taken over by a domestic and a foreign credit institution separately. Hence, we use a multinomial logit framework that allows multiple choices and which is standard in this context (see, for example, Pasiouras, Tanna, and Gaganis 2007). The model can then be described as follows:

$$\text{Prob}\,(Y_i = j) = \frac{\exp(x_i\beta_{1j} + z_i\beta_{2j})}{\sum_{j=1}^{J}\exp(x_i\beta_{1j} + z_i\beta_{2j})},$$

where $i = 1, 2, 3, \ldots$ represent the individual bank and $j = 1, 2, 3, \ldots$ the possible outcomes (1 = not taken over, 2 = taken over by a domestic bank, and 3 = taken over by a foreign bank), x = vector of bank-specific determinants, and z = vector of location-specific determinants. To remove the indeterminacy associated with this model, we define $j = 1$ as the base category. This gives the following probability for each outcome:

$$\text{Prob}\,(Y_i = j) = \frac{\exp(x_i\beta_{1j} + z_i\beta_{2j})}{1 + \sum_{j=2}^{J}\exp(x_i\beta_{1j} + z_i\beta_{2j})},$$

and for the reference category:

$$\text{Prob}\,(Y_i = 1) = \frac{1}{1 + \sum_{j=2}^{J}\exp(x_i\beta_{1j} + z_i\beta_{2j})}.$$

All coefficients are estimated relative to this base and express the probability that a bank will be taken over by domestic or foreign credit institutions relative to the probability that a bank will not be taken over.

5. Data

5.1 Bank Sample

To estimate our model, we have constructed a data set on M&As in the banking sector of the twenty-five EU member countries for

the period between 1997 and 2006. Information on M&As comes from the Zephyr database. Deals are considered M&As if investors buy more than 50 percent of ownership shares or increase a majority shareholding. Minority shareholdings are not included. Balance-sheet data has been taken from BankScope. We use consolidated balance sheets whenever possible and concentrate on commercial banks only. Coverage by BankScope is very comprehensive in most countries, with banks included accounting for 90 percent of the assets of all banks. The final data set includes 415 deals, of which 184 were cross-border and 231 were domestic. Since some banks were taken over more than once, the number of deals is larger than the number of acquired credit institutions. The reference group consists of all commercial banks that were not taken over in the twenty-five EU member countries between 1997 and 2006. Together with the acquired banks, the final data set includes 1,934 credit institutions. This gives us 7,734 bank-year observations.

The distribution of banks in the sample is reported in table 2. The largest number of banks comes from France (302), Germany (274), and Italy (218). The United Kingdom has 204, Luxembourg 140, and Spain 113 banks. All other countries report fewer than 100 credit institutions. France, Germany, and Italy also record the largest number of deals in the banking sector. While domestic deals outnumber cross-border deals in the larger EU countries, the number of cross-border deals is larger in the smaller EU countries. Cross-border deals are particularly important in the new member states. In all of these countries, the number of cross-border deals exceeded the number of domestic deals. One reason for the large number of cross-border deals in the new member states is the liberalization and privatization of the banking sector. Many Central and Eastern European countries have opened their banking sectors to foreign investors after having experienced banking crises in the nineties.

5.2 Variables

5.2.1 Bank-Specific Variables

One motive for the acquisition of or the merger with a bank in the same or in a foreign country is to transfer the managerial expertise and organization of the acquiring bank on the acquired credit

Table 2. Bank Sample

A. Banks and Deals by Country

	Banks	Bank M&As	of which: Domestic M&As	of which: Cross-Border M&As
Austria	85	6	2	4
Belgium	64	16	9	7
Cyprus	22	0	0	0
Czech Republic	33	22	5	17
Denmark	63	6	5	1
Estonia	11	13	0	13
Finland	10	1	1	0
France	302	52	37	15
Germany	274	44	32	12
Greece	27	7	5	2
Hungary	33	23	6	17
Ireland	45	2	1	1
Italy	218	73	66	7
Lithuania	13	8	2	6
Luxembourg	140	23	11	12
Latvia	28	17	1	16
Malta	14	1	0	1
Netherlands	64	4	0	4
Poland	62	34	14	20
Portugal	32	9	8	1
Slovak Republic	22	12	2	10
Slovenia	28	6	3	3
Spain	113	26	14	12
Sweden	27	2	2	0
United Kingdom	204	8	5	3
Total	1,934	415	231	184

B. Deals by Year

Year	Bank M&As	of which: Domestic M&As	of which: Cross-Border M&As
1997	11	6	5
1998	26	15	11
1999	40	22	18
2000	58	35	23
2001	53	32	21
2002	58	35	23
2003	43	25	18
2004	37	21	16
2005	51	22	29
2006	38	18	20
Total	415	231	184

Source: Zepyhr (2008).

institution to generate X-efficiency gains from a better management. To control for this motive, we use the cost-income ratio (CIR) as a measure of cost and the return on assets (ROA) as a measure of profit efficiency. Since X-efficiency gains are more likely to be achieved if the acquired credit institution is less efficient, we expect the CIR to be positively correlated and the ROA to be negatively correlated with the probability of a takeover (Berger and Humphrey 1992 and Berger et al. 2000).

Another motive of acquisitions in the banking sector is economies of scale and scope. To control for this motive, we use bank assets (SIZE). Cost economies of scale occur if the average costs of production decrease as the size of the institution increases. Revenue scale economies might arise because some customers might need or prefer the services of larger institutions (Berger et al. 2000). Economies of scope might originate on the cost and revenue side as well. Cost economies of scope might arise among others from sharing physical inputs (Berger et al. 2000). Revenue scope economies might emerge from the cross-selling of financial products through different distribution channels (Berger et al. 2000). Since larger banks have a larger market share, SIZE also controls for the motive to obtain market power. If banks are taken over to generate economies of scale and to get market power, SIZE and the probability of a takeover are positively correlated. But the effect of SIZE on the probability that a bank is acquired might also be the opposite. If larger banks are more difficult to integrate and to restructure owing to increased organizational complexity, diseconomies of scale arise and SIZE is expected to be negatively correlated with the probability of being acquired. The acquisition of smaller banks is also less likely to raise problems with the antitrust authority.

To control for the business orientation of banks, we use the ratio of net interest to total revenue (NIREV). The importance of interest-earning activities to total business activities might be relevant for banks that take over other credit institutions to get access to local retail-banking markets. Retail banking has become more attractive in recent years because it provides a more stable source of income than non-interest-earning activities. Non-interest-earning activities are, however, considered as having a larger growth potential than interest-earning activities. Because of that, NIREV is often regarded as measuring bank *in*efficiency as well (see, for example, Foccarelli

and Pozzolo 2001). Banks with a larger proportion of interest income to total income, hence, not only have a stronger business focus on retail-banking activities, but are also expected to be less efficient. Both suggest that NIREV and the probability of being taken over are positively correlated.

To find out if the probability of a takeover depends on the degree of capitalization and liquidity of the acquired bank, we include the ratio of equity to assets (CAP) and the ratio of liquid assets to customer and short-term funding (LIQ). The effect of CAP on the probability of a takeover is not obvious a priori (Hannan and Rhoades 1987 and Hannan and Pilloff 2006). CAP is positively correlated with the probability that a credit institution is acquired if a high level of capital indicates that a bank is less diversified. Such banks are attractive for acquirers that are more diversified, since the latter can free capital if they transfer their knowledge of risk diversification to the acquired credit institution. Banks might also take over a well-capitalized credit institution if they face pressure by the regulator to increase their level of capital. The effect of CAP on the probability of a takeover might, however, also be the opposite. If a higher level of capital indicates better management skills and organization, well-capitalized credit institutions are less attractive to potential investors, since potential X-efficiency gains from better management are expected to be smaller. Acquisitions are also more likely to occur if a bank's capitalization is so low that it is in danger of default. CAP is then expected to be negatively correlated with the probability of being taken over. The relationship between LIQ and the probability of a takeover is not obvious a priori as well. On the one hand, the likelihood that a credit institution will be taken over is larger if it is close to illiquidity. On the other hand, a high level of liquidity might indicate a lack of investment opportunities or managerial inefficiency in allocating liquid funds. Both make banks more attractive takeover targets.

Table 4 presents descriptive statistics on these bank characteristics.[7] Correlation coefficients are reported in table 5. To eliminate outliers, all observations below the 1st and above the 99th percentile of the respective variable are winsorized. In order to minimize the

[7] A list of bank- and location-specific variables used in this paper is provided in table 3 in the appendix.

Table 4. Descriptive Statistics

Domestic and Cross-Border Targets (EU-25)	**Mean**	**Median**	**Std. Dev.**
Bank Assets (in USD)	18.800.000	1.486.587	65.300.000
Equity to Total Assets	11.05	8.00	12.20
Liquid Assets to Customer and Short-Term Funding	26.50	17.84	31.41
Cost-Income Ratio	77.17	71.58	32.63
Return on Assets	0.60	0.64	2.22
Net Interest Revenue to Total Revenue	34.74	34.88	15.23
Customer Deposits to Total Assets	52.88	57.76	24.52
Customer Loans to Total Assets	49.41	51.85	23.47
Domestic Targets (EU-25)	**Mean**	**Median**	**Std. Dev.**
Bank Assets (in USD)	21.300.000	1.253.906	73.600.000
Equity to Total Assets	12.35	7.92	15.62
Liquid Assets to Customer and Short-Term Funding	25.77	21.63	22.05
Cost-Income Ratio	83.14	75.13	39.67
Return on Assets	0.45	0.42	2.44
Net Interest Revenue to Total Revenue	33.57	32.59	15.63
Customer Deposits to Total Assets	50.26	50.15	25.16
Customer Loans to Total Assets	49.90	50.59	24.23
Cross-Border Targets (EU-25)	**Mean**	**Median**	**Std. Dev.**
Bank Assets (in USD)	16.800.000	1.543.445	58.000.000
Equity to Total Assets	9.94	8.06	8.09
Liquid Assets to Customer and Short-Term Funding	27.12	14.19	37.63
Cost-Income Ratio	72.02	68.43	24.08
Return on Assets	0.72	0.89	2.01
Net Interest Revenue to Total Revenue	35.77	36.11	14.87
Customer Deposits to Total Assets	55.17	62.23	23.82
Customer Loans to Total Assets	48.97	52.74	22.89
Non-Targets (EU-25)	**Mean**	**Median**	**Std. Dev.**
Bank Assets (in USD)	9.233.282	738.065	44.000.000
Equity to Total Assets	12.71	7.99	15.10
Liquid Assets to Customer and Short-Term Funding	38.53	25.02	43.00
Cost-Income Ratio	68.55	64.36	35.29
Return on Assets	0.73	0.58	1.87
Net Interest Revenue to Total Revenue	30.25	29.02	18.80
Customer Deposits to Total Assets	46.83	50.40	29.41
Customer Loans to Total Assets	43.39	43.20	28.90

Source: Bankscope (2008). To eliminate the influence of outliers, observations below the 1st percentile and above the 99th percentile have been winsorized.

Table 5. Correlation Analysis

	SIZE	CIR	ROA	NIREV	CAP	LIQ	DEP	LOAN
SIZE	1.00							
CIR	−0.04	1.00						
ROA	−0.02*	−0.53*	1.00					
NIREV	−0.11*	−0.04*	0.08*	1.00				
CAP	−0.12*	0.07*	0.19*	0.22*	1.00			
LIQ	−0.10*	0.09*	−0.02*	−0.15*	0.38*	1.00		
DEP	−0.10*	0.08*	−0.01	0.15*	−0.26*	−0.01	1.00	
LOAN	0.00	−0.08*	0.03*	0.41*	−0.16*	−0.51*	0.06*	1.00

Source: Bankscope (2008) and own calculations. Correlation coefficients have been calculated for winsorized data. * indicates significance at the 5 percent level.

effects of particular events, all data on bank characteristics are averages for the period between 1997 and 2006. The numbers are broadly consistent with the hypotheses put forward. Large banks are more likely to be taken over than small credit institutions. This is in line with the hypothesis that banks are taken over to obtain market power and to generate economies of scale and scope. Measured by CIR and ROA, targets are less efficient than banks that were not taken over. This supports the hypothesis that banks tend to take over less efficient credit institutions to spread managerial expertise and operating procedures to generate X-efficiency gains from better management. In particular, domestic acquisitions seem to be driven by the motive to increase X-efficiency. Banks that were not involved in merger activity are, on average, better capitalized and more liquid. This is consistent with the hypothesis that less capitalized and less liquid banks are more likely to be acquired. The relative importance of retail-banking business is reflected by the proportion of net-interest revenue to total revenue (NIREV), which is higher for targets than for banks that were not acquired. This supports the hypothesis that banks take over credit institutions to get access to local retail-banking markets. That targets are more active in retail banking than banks that were not taken over is also reflected by the ratio of customer deposits to total assets (DEP) and customer loans to total assets (LOAN). DEP and LOAN are both higher for targets than for banks that were not taken over. The correlation analysis suggests that there is no link between bank efficiency and the proportion of interest earnings to total earnings.

5.2.2 Location-Specific Variables

The probability of a takeover depends not only on bank characteristics but also on the characteristics of the country where potential targets are located. For this reason, we have to control for location-specific determinants as well. The first location-specific determinant is the real gross domestic product (GDP). It measures the market potential in the host country. GDP has been found to be relevant for multinational banking (Berger et al. 2004 and Buch and DeLong 2004). GDP seems to be particularly relevant for banks that follow a market-seeking strategy, while the degree of trade openness is expected to be particularly relevant for credit institutions that take over or merge with foreign banks to provide services to customers from the home country that make business in the country where the potential target is located. This follow-your-customer strategy has been confirmed by Heinkel and Levi (1992), Ter Wengel (1995), and Yamori (1998). To control for this strategy, we use the ratio of aggregate imports to GDP (IMGDP) to measure trade integration.

Besides the market potential and the degree of trade openness, the structure of the banking system also matters. For this reason, we include the market share of the three largest banks (C3) to measure banking market concentration. The effect of C3 on the probability of being acquired is not obvious a priori (Hannan and Rhoades 1987 and Hannan and Pilloff 2006). On the one hand, a higher level of concentration might make acquisitions more likely by banks that operate in the same market as the potential target, since market power could be enhanced by the acquisition. On the other hand, since antitrust authorities are designed to prevent takeovers from reducing competition, domestic acquisitions are less likely to occur if the degree of market concentration is high. Cross-border takeovers are less likely to be challenged for antitrust reasons. This suggests that the effect of market concentration on the probability that a bank will be taken over by a domestic and foreign credit institution is different. The size of the banking sector (BSSIZE) might also affect the decision to take over or merge with a domestic or foreign bank. BSSIZE is expected to be positively correlated with the probability of being acquired, since a larger banking sector offers greater opportunities to generate economies of scale and scope (Buch and DeLong 2004). BSSIZE might, however, also have a negative impact

on the probability of a takeover if bank profitability is lower in a larger banking sector (Demirgüc-Kunt and Huizinga 1999 and Buch and DeLong 2004).

To control for bank regulation and the supervisory framework, we construct an index on banking and financial freedom (BFFREE) based on data from the Heritage Foundation (2008). BFFREE measures restrictions on capital inflows and banking activity as well as government ownership in the banking sector. A larger value of BFFREE indicates a lower degree of banking and financial freedom. Since cross-border acquisitions are more likely if foreign capital inflows are not restricted and government ownership is low, we expect BFFREE to be negatively correlated with the probability of being taken over by a foreign credit institution. Domestic takeovers should not be affected. We also include an index that measures government intervention in the economy (GOVINT). GOVINT is also based on data from the Heritage Foundation (2008). It measures government intervention by the share of revenues from state-owned enterprises and property. Another variable that controls for the institutional environment in the host country is EMU. EMU is a dummy variable that is set equal to 1 for countries that are members of the European Monetary Union (EMU) and zero otherwise. EMU membership should increase the probability of being acquired by a foreign investor, since the introduction of a common currency facilitates cross-border bank entry. If banks are afraid of being taken over by foreign investors, it might also raise the pressure for domestic consolidation. This suggests that EMU might be positively correlated not only with the likelihood that a bank will be taken over by a foreign credit institution, but also with the likelihood that it will be taken over by a domestic credit institution.

Since it is more difficult for banks to generate X-efficiency gains if languages and cultures are different, we include a variable that measures the distance between the capital of the country where potential targets are located and the center of Europe (DIST). The idea is that efficiency barriers that arise from differences in cultures and language are expected to be larger the farther away countries are from the center. DIST also controls for omitted variables that are correlated with distance. Berger et al. (2004), for example, argue that agency costs associated with monitoring the management of the acquired bank increase with geographical distance. For this reason,

we expect distance to be negatively correlated with the probability of a cross-border takeover (Berger et al. 2004 and Buch and DeLong 2004). Domestic takeovers should not be affected.

6. Results

The blocked cross-border acquisitions of Banca Antonveneta and Banca Nazionale de Lavoro by the Dutch ABN AMRO and the Spanish Banco Bilbao Vizcaya Argentaria have demonstrated that a lack of transparency of merger control in the banking sector could lead to a situation in which the supervisors can refuse authorization based on opaque concerns. To find out if EU banks are systematically more likely to be taken over by foreign credit institutions, controlling for bank- and location-specific characteristics, we perform a multinomial logit analysis. In the first step of the analysis, we examine which bank- and location-specific characteristics make it more likely that a bank will be taken over relative to a bank that will not be taken over. In the second step, we add the indices presented in section 3 to find out if the probability that a bank will be taken over by a domestic or foreign investor is larger if the supervisor is more politically independent and merger control more transparent.

Since we are only interested in the bank- and location-specific characteristics of acquired banks at the time when the deal takes place, observations for targets are dropped after the deal has been completed. The results of the regressions are presented in table 6. 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 control for heteroskedasticity and serial correlation, we use robust standard errors clustered on the bank level.

6.1 Bank- and Location-Specific Determinants

The first step in the regression analysis is to estimate the effect of bank-specific and location-specific variables on the probability of a takeover separately. To check the robustness of our results, we then put both groups of variables together in a single regression. The results are reported in table 6.

The results suggest that bank size is an important determinant for domestic and cross-border M&As in the EU banking sector. The

Table 6. Regression Results

	Model 1		Model 2		Model 3		Model 4	
	Domestic M&As	Cross-Border M&As	Domestic M&As	Cross-Border M&As	Domestic M&As	Cross-Border M&As	Domestic M&As	Cross-Border M&As
WLNSIZE	**0.243*** **	**0.241*** **			**0.279*** **	**0.492*** **	**0.3*** **	**0.519*** **
	(0.057)	(0.063)			(0.065)	(0.083)	(0.068)	(0.083)
WCIR	**0.121*** **	**0.008*** **			**0.01*** **	**0.007*** **	**0.01*** **	**0.006** **
	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)	(0.003)
WNIREV	**0.13** **	**0.027*** **			0.008	**0.029*** **	0.005	**0.024** **
	(0.007)	(0.007)			(0.007)	(0.010)	(0.007)	(0.011)
WCAP2	0.01	0.001			0.012	0.005	0.015	0.01
	(0.014)	(0.010)			(0.014)	(0.012)	(0.014)	(0.013)
WLIQ1	**−0.009*** **	**−0.008** **			**−0.006***	0.001	−0.004	0.004
	(0.003)	(0.004)			(0.003)	(0.004)	(0.003)	(0.004)
LNGDP			**0.341** **	−0.036	0.36	−0.242	0.4	−0.004
			(0.137)	(0.128)	(0.221)	(0.168)	(0.274)	(0.302)
IMGDP			**3.047*** **	**4.043*** **	**3.218** **	**4.955*** **	**3.189***	**5.843*** **
			(1.044)	(0.983)	(1.609)	(1.210)	(1.787)	(1.645)
BSASSTOGDP			**−1.165*** **	**−1.507*** **	**−1.611*** **	**−1.296*** **	**−1.522** **	**−1.63** **
			(0.346)	(0.414)	(0.562)	(0.475)	(0.708)	(0.716)
INDIST			**0.767*** **	0.23	**0.615***	0.33	**0.767** **	0.048
			(0.267)	(0.351)	(0.370)	(0.364)	(0.387)	(0.432)
EMU			**0.861*** **	0.053	**0.782*** **	0.08	**0.675** **	0.488
			(0.190)	(0.257)	(0.267)	(0.378)	(0.285)	(0.476)
C3			**−1.477** **	−1.044	−0.612	−0.655	−0.812	0.668
			(0.640)	(0.751)	(0.910)	(0.821)	(1.052)	(1.006)
Index of Political Independence							−0.805	0.23
							(0.704)	(0.654)
General Criteria Index							0.45	0.43
							(0.981)	(0.640)
Prudential Criteria Index							1.236	**1.205***
							(1.002)	(0.660)
Observations	7,743		13,666		6,022		4,753	
Pseudo-R^2	0.044		0.071		0.16		0.176	

(continued)

Table 6. (Continued)

	Model 5		Model 6		Model 7	
	Domestic M&As	**Cross-Border M&As**	**Domestic M&As**	**Cross-Border M&As**	**Domestic M&As**	**Cross-Border M&As**
WLNSIZE	**0.294*** **	**0.501*** **	**0.298*** **	**0.501*** **	**0.299*** **	**0.516*** **
	(0.068)	(0.085)	(0.680)	(0.084)	(0.068)	(0.083)
WCIR	**0.01*** **	**0.005***	**0.01*** **	0.005*	**0.01*** **	**0.006** **
	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)
WNIREV	0.005	**0.028** **	0.005	**0.024** **	0.005	**0.024** **
	(0.007)	(0.011)	(0.007)	(0.011)	(0.007)	(0.011)
WCAP2	0.014	0.007	0.014	0.007	0.015	0.01
	(0.014)	(0.013)	(0.014)	(0.013)	(0.014)	(0.013)
WLIQ1	−0.004	0.004	−0.004	0.004	−0.004	0.004
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)
LNGDP	0.303	−0.098	0.378	−0.254	0.461	−0.045
	(0.265)	(0.286)	(0.256)	(0.198)	(0.286)	(0.215)
IMGDP	**3.397***	**6.174*** **	**4.137** **	**6.332*** **	**3.515***	**5.221*** **
	(1.864)	(1.567)	(1.923)	(1.539)	(1.886)	(1.545)
BSASSTOGDP	**−1.39** **	**−1.508** **	**−1.534** **	**−1.342** **	**−1.477** **	**−1.557** **
	(0.628)	(0.717)	(0.685)	(0.606)	(0.657)	(0.680)
INDIST	**0.73***	0.182	**0.798** **	0.291	**0.801** **	−0.007
	(0.373)	(0.410)	(0.377)	(0.397)	(0.388)	(0.435)
EMU	**0.73** **	0.559	**0.702** **	0.495	**0.691** **	0.537
	(0.291)	(0.469)	(0.292)	(0.451)	(0.292)	(0.474)
C3	−1.033	0.279	−0.78	0.113	−0.826	0.543
	(0.975)	(0.971)	(1.024)	(0.915)	(0.965)	(0.887)
Index of Political Independence	−0.268	0.658				
	(0.702)	(0.682)				
General Criteria Index			0.695	1.139		
			(0.865)	(0.441)		
Prudential Criteria Index					0.847	**1.496*** **
					(0.832)	(0.477)
Observations	4,753		4,753		4,753	
Pseudo-R^2	0.1693		0.172		0.175	

(continued)

Table 6. (Continued)

	Model 8		Model 9		Model 10		Model 11	
	Domestic M&As	**Cross-Border M&As**	**Domestic M&As**	**Cross-Border M&As**	**Domestic M&As**	**Cross-Border M&As**	**Domestic M&As**	**Cross-Border M&As**
WLNSIZE	**0.298*** **	**0.494*** **	**0.354*** **	**0.542*** **	**0.349*** **	**0.568*** **	**0.305*** **	**0.515*** **
	(0.069)	(0.089)	(0.073)	(0.073)	(0.074)	(0.093)	(0.068)	(0.082)
WCIR	**0.01*** **	**0.006** **	**0.01*** **	**0.007** **	**0.011*** **	**0.007** **	**0.01*** **	**0.006** **
	(0.002)	(0.003)	(0.003)	(0.073)	(0.003)	(0.003)	(0.002)	(0.003)
WNIREV	0.005	**0.023** **	0.006	**0.027** **	0.005	**0.029** **	0.003	**0.023** **
	(0.007)	(0.011)	(0.008)	(0.073)	(0.009)	(0.012)	(0.008)	(0.011)
WCAP2	0.016	0.01	0.017	0.011	0.017	0.01	0.016	0.009
	(0.014)	(0.014)	(0.014)	(0.073)	(0.015)	(0.013)	(0.014)	(0.013)
WLIQ1	−0.004	0.004	−0.005	0.003	**−0.007** **	0.004	**−0.006** *	0.004
	(0.003)	(0.004)	(0.003)	(0.073)	(0.003)	(0.004)	(0.003)	(0.004)
LNGDP	0.45	−0.053	0.643	−0.046	−0.126	−1.418	0.347	−0.146
	(0.283)	(0.214)	(0.392)	(0.073)	(1.013)	(3.026)	(0.282)	(0.242)
IMGDP	**3.44** *	**5.033*** **	1.141	**4.476*** **	−2.314	1.381	0.896	**4.333** **
	(1.912)	(1.504)	(2.180)	(0.073)	(10.136)	(3.853)	(2.261)	(1.682)
BSASSTOGDP	**−1.47** **	**−1.538** **	−0.673	**−1.446** **	0.482	−1.458	**−2.175*** **	**−1.683** **
	(0.666)	(0.683)	(0.571)	(0.073)	(2.634)	(2.267)	(0.762)	(0.681)
INDIST	**0.804** **	−0.018	**1.115** **	0.036	1.61	**24.229** *	0.162	−0.254
	(0.389)	(0.433)	(0.435)	(0.073)	(6.873)	(13.606)	(0.483)	(0.456)
EMU	**0.696** **	0.542	**−1.156** **	0.117	**−21.343*** **	−0.647	**0.966*** **	0.675
	(0.292)	(0.476)	(0.531)	(0.073)	(6.361)	(0.966)	(0.328)	(0.479)
C3	−0.791	0.565	−1.426	0.664	0.77	0.211	0.104	0.524
	(0.963)	(0.903)	(0.965)	(0.073)	(3.382)	(3.606)	(0.953)	(0.890)

(continued)

Table 6. (Continued)

	Model 8		Model 9		Model 10		Model 11	
	Domestic M&As	**Cross-Border M&As**	**Domestic M&As**	**Cross-Border M&As**	**Domestic M&As**	**Cross-Border M&As**	**Domestic M&As**	**Cross-Border M&As**
PCI SMALL	0.162	**1.363***						
	(0.985)	(0.734)						
PCI MED	1.343	**1.49*****						
	(0.887)	(0.531)						
PCI LARGE	−0.806	**1.873*****						
	(2.618)	(0.680)						
PRUDENTIAL CRITERIA INDEX			1.115	**1.519*****	21.43	**1.621****	0.86	**1.359*****
			(0.978)	(0.073)		0.824	(0.799)	(0.515)
FREEDOM							−0.496	−0.239
							(0.400)	(0.301)
GOVINT							**−0.357****	−0.139
							(0.150)	(0.168)
Observations	4,753		4,753		4,753		4,753	
Pseudo-R^2	0.177		0.203		0.225		0.182	

Source: Own calculations. */**/*** indicate significance at the 10/5/1 percent level. Estimates have been calculated by multinomial logit estimation with cluster robust standard errors.

coefficient for SIZE is positive and highly significant, indicating that larger banks are more likely to be taken over than small banks. That confirms our hypothesis that banks are acquired to reap benefits from economies of scale and scope and to obtain market power. The results are in line with Lanine and Vander Vennet (2007) and Pasiouras, Tanna, and Gaganis (2007). Lanine and Vander Vennet analyze the determinants of cross-border acquisition of banks from Central and Eastern Europe by banks from Western Europe for the period between 1995 and 2002. They also find that bank size is positive and highly significant for acquisitions in Central and Eastern Europe. Pasiouras, Tanna, and Gaganis get the same results for a sample of commercial banks from the EU-15 for the period between 1997 and 2002.[8]

Domestic and cross-border takeovers are also more likely to happen if banks are cost inefficient. The coefficient for CIR is positive and significant for domestic and cross-border targets. To test if profit efficiency determines the probability of a takeover, we replace CIR with the return on assets (ROA). The coefficient for ROA is negative and significant for domestic and cross-border acquisitions. This indicates that less efficient banks are more likely to be acquired. Both results are consistent with the hypothesis that banks are taken over to transfer the managerial expertise from the acquiring bank to the acquired bank in order to generate X-efficiency gains from better management.[9]

To control for the overall risk profile of the acquired bank, we include the ratio of equity to total assets (CAP). CAP is insignificant for domestic and cross-border targets.[10] A low level of liquidity

[8]Hannan and Pilloff (2006) find out for a sample of U.S. banks that larger banks are more likely to be taken over than smaller credit institutions.

[9]We do not include CIR and ROA together in a single regression because both variables are correlated. The regression results with CIR and ROA are in line with Lanine and Vander Vennet (2007) and Pasiouras, Tanna, and Gaganis (2007). Hannan and Pilloff (2006) get the same results for a sample of U.S. banks. The results for the regression with ROA are not reported, but are available from the author upon request.

[10]This contrasts with Lanine and Vander Vennet (2007) and Pasiouras, Tanna, and Gaganis (2007). Both find a significant and negative relationship between the size of the capital buffer and the probability of being acquired for a sample of banks from the EU-15. Hannan and Pilloff (2006) get mixed evidence for the role of capital for their sample of U.S. banks.

does not seem to increase the likelihood that a bank will be taken over by foreign banks either. LIQ is insignificant for cross-border acquisitions. This suggests that neither the level of bank risk nor the degree of liquidity is an important determinant of cross-border takeovers in the EU banking sector. There is, however, weak evidence that liquidity matters for domestic consolidation. LIQ is negative and significant in some regressions for domestic acquisitions. This indicates that banks that face liquidity difficulties are more likely to be acquired by domestic credit institutions.[11]

To control for the business orientation of banks, we use the proportion of interest income to total income (NIREV). NIREV is insignificant for domestic acquisitions, but significant and positive for cross-border targets. This suggests that banks are taken over by foreign credit institutions to get access to local retail-banking markets. Retail banking has become more attractive in recent years because it provides a more stable source of income than non-interest-earning activities.

Location-specific determinants also matter for acquisitions in the banking sector. IMGDP is positive and significant for cross-border targets. This 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. IMGDP is mostly significant and positive for domestic acquisitions as well. Since countries that are more open to trade might also be more open to foreign investment, the pressure for domestic consolidation might be higher in countries where the degree of trade openness is high. Pressure for domestic consolidation might also explain why EMU membership seems to matter for domestic takeovers. The positive and significant coefficient for EMU in the equation for domestic acquisitions might reflect the domestic consolidation process that has taken place in the larger Western European countries, which might have been triggered by the introduction of a common currency that has made cross-border takeovers of banks within the EMU easier. There is no evidence that the euro has had a significant impact on cross-border takeovers. The

[11] This is partly in line with Pasiouras, Tanna, and Gaganis (2007). They get a significant and negative coefficient for LIQ for both domestic and cross-border acquisitions.

primary response to the introduction of the euro thus seems to be defensive. This result is consistent with Boot (1999). He argues that the liberating EU directives have so far only had a positive effect on domestic mergers but not on cross-border takeovers because mergers among domestic credit institutions have generally been encouraged to protect national internets.

While GDP does not seem to matter for M&As in the banking sector, the size of the banking system (BSSIZE) does. BSSIZE is significant and negative for both domestic and cross-border takeovers.[12] This suggests that banks do not invest in countries that have a large banking sector. One reason might be that countries with a larger banking system have a more competitive banking sector where margins are smaller and banks are less profitable than countries with smaller banking systems (Demirgüc-Kunt and Huizinga 1999). Since profitability is one of the main reasons for multinational banking, foreign bank expansion in countries with more competitive banking markets is less attractive. Domestic takeovers are also less likely if banking markets are large. Since banks in countries with smaller banking markets are considered less competitive than banks in countries where banking markets are large and where competition is high, credit institutions in countries with smaller banking sectors might be under pressure to merge among themselves in order to increase their level of competitiveness and to prevent being taken over by more efficient banks from countries with larger banking markets.[13] This is also in line with the result that less efficient banks are more likely to be taken over than efficient banks. In particular, domestic acquisitions seem to be driven by the motive to increase X-efficiency (see table 4). One reason is that X-efficiency gains are more likely to be achieved in domestic takeovers because efficiency barriers are lower for domestic banks than for foreign banks. Another reason is that domestic consolidation is often regarded as a precondition

[12]Pasiouras, Tanna, and Gaganis (2007) also find banking sector development to be negatively correlated with the likelihood of an acquisition.

[13]This is supported by Focarelli and Pozzolo (2001) and Buch and DeLong (2004). Both find that banks from countries with large banking markets are more often involved in cross-border acquisition than banks from small banking markets because banks from countries with a more developed banking market are more likely to have a competitive advantage over their competitors in countries with smaller banking systems.

for cross-border consolidation, since a strong position in the home market is believed to be crucial for a successful expansion in foreign markets (Boot 1999).

Domestic consolidation is possible because mergers among domestic banks do not seem to raise antitrust concerns. This is indicated by C3, which is insignificant for cross-border acquisitions and mostly insignificant for domestic acquisitions. To test if this result is robust, we replace C3 with the Herfindahl Index (HHI). HHI measures market concentration based on the sum of the squared market shares of all banks in the country and, thus, takes account of the structure of the whole banking system. C3 measures market concentration only based on the market share of the three largest banks. The regressions with HHI provide further evidence that banking market concentration does not matter for cross-border takeovers. HHI is insignificant for cross-border acquisitions. This is what we have expected, since cross-border takeovers are less likely to raise antitrust concerns. Domestic acquisitions do not seem to raise antitrust concerns as well.[14] DIST is insignificant for cross-border acquisitions. This suggests that efficiency barriers that might arise from distance do not determine the decision to take over or merge with foreign credit institutions. The probability of domestic takeovers, in turn, is positively related to distance. This might indicate that domestic consolidation is more intense in countries that are farther away from the geographical center of Europe.

6.2 The Role of Merger Control

The next step of the regression analysis is to analyze if the probability of a takeover depends on the degree of transparency of merger

[14]Hannan and Pilloff (2006) do not find any significant evidence that banking market concentration measured by HHI matters for acquisitions in the U.S. banking sector. Pasiouras, Tanna, and Gaganis (2007) get a significant and negative correlation between the degree of banking market concentration measured by the market share of the five largest banks (C5) for a sample French, German, Italian, Spanish, and British bank. For the sample of the remaining ten EU member countries, they get a significant and positive coefficient for C5. The results for the regression with HHI are not reported, but are available from the author upon request.

control. For that reason, we add the merger control indices presented in section 3 to the regression. Since a higher index value indicates a higher degree of transparency of merger control and political independence of the supervisory authority, we expect the indices to be positively correlated with the probability that a bank will be taken over by a foreign credit institution if politicians and supervisors use merger control to block cross-border acquisitions in the banking sector.

The first step is to put all indices together into a single regression. The results are presented in column 4 of table 6. All indices are insignificant. Only the Prudential Criteria Index (PCI), which measures how transparent the prudential assessment of potential investors is, is highly significant. Since some of the indices are correlated, we ran separate regressions for all indices to prevent multicollinearity. The results of these regressions are presented in columns 5, 6, and 7 of table 6. All indices are insignificant in the regression for domestic acquisition, but significant in the regression for cross-border takeovers. The positive sign for all coefficients indicates that acquisitions of domestic banks by foreign credit institutions are more likely if supervisors are more politically independent and merger control is more transparent. This is in line with the hypothesis that merger control might constitute a barrier to cross-border consolidation in the EU banking sector if politicians and supervisors use the intransparency of the regulatory process to block cross-border takeovers for other than prudential reasons. Since the coefficients for domestic targets are insignificant, politicians and supervisors do not seem to have used their powers to promote mergers between domestic banks.

Interference by politicians and supervisors seems to be particularly likely if foreign banks are interested in large domestic banks. This is also reflected by the comments of the French government to speculations that Société Générale might be taken over by foreign investors. Société Générale is the second largest bank in France, measured by assets, and Crédit Lyonnais was one of the largest banks as it was taken over by Crédit Agricole. To find out if the political dimension is particularly important for the takeover of large banks, we have created three dummy variables, each representing a different bank size. Banks are considered small if their assets are smaller than the 25th percentile, middle-sized if their assets lie within the

25th and 75th percentile, and large if their assets exceed the 75th percentile. The results of the regression with these dummies are presented in column 8 of table 6. Since we multiply the size dummies with PCI, each coefficient measures the effect of merger control on the probability of a takeover for a different size of banks. The results suggest that large banks are more likely to be taken over by foreign credit institutions if merger control is transparent. Although all interaction terms are significant in the equation for cross-border targets, the coefficient is higher for large banks than it is for small banks. This supports the hypothesis that the acquisition of large banks by foreign credit institutions is less likely if merger control lacks procedural transparency. The results are also in line with Boot (1999). He argues that the political dimension of bank mergers is particularly important if politicians want to protect national flagships.

6.3 Robustness Tests

To find out if our results are biased by omitted variables, we did several robustness tests. The first test is to add time dummies to the baseline regression with PCI (column 9 of table 6). Time dummies control for shocks that occurred in a given year and had the same effect on all countries in our sample. We, furthermore, estimate a model that includes both time and country dummies (column 10 of table 6). While time dummies control for common shocks in a given year, country dummies control for omitted variables that do not vary over time and that are specific to each country. Examples for such time-invariant variables are culture and 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. Time and country dummies, hence, control for a lot of determinants of multinational banking that cannot be controlled for with the variables in the baseline regressions. However, even if we control for such omitted variables, the results of the baseline regressions do not change. PCI remains significant and keeps its positive sign.

Another problem of the baseline regression might be that PCI only varies for the Central and Eastern European countries. To test if this has caused the significance of the PCI, we run a separate

regression for the new member states. This regression also controls for the fact that many countries in Central and Eastern Europe opened their banking sectors to foreign investors after they experienced banking crises in the nineties. This might have led to an overestimation of the effect PCI has on the likelihood that a bank will be taken over. The results of the separate regression indicate that overestimation has not caused our results. PCI remains positive and significant. This suggests that our results are not driven by differences between new and old EU member countries, but rather by country-by-country differences in the degree of transparency of merger control.

A third robustness check is to estimate the baseline regression with PCI together with indices that measure the quality of the institutional environment in the country where the target is located. The results of the regression with BFFREE and GOVINT are reported in column 11 of table 6. BFFREE measures restrictions on capital inflows and banking activity as well as government ownership in the banking sector. GOVINT measures government influence in the economy. Both are based on data from the Heritage Foundation (2008). Since both indices should reflect the attitude of politicians and supervisors toward foreign investment in the banking sector, they might capture what PCI measures. BFFREE and GOVINT have the expected negative sign, which indicates that acquisitions are less likely in countries where restrictions on foreign investment are higher and government intervention is more intense. Both indices are, however, not significant. They, furthermore, do not change the sign and the significance of PCI. This suggests that barriers that might arise from a lack of transparency of merger control cannot be measured by BFFREE and GOVINT.

7. Conclusions

Domestic M&As still outnumber cross-border acquisitions in the EU banking market (Cabral, Dierick, and Vesala 2002). We argue that a lack of procedural transparency of merger control might constitute a barrier to cross-border consolidation, since this could lead to a situation in which the supervisors can refuse authorization based on opaque concerns. The fact that merger control might constitute a barrier to cross-border takeovers in the EU banking

sector was demonstrated in 2005 when the Bank of Italy blocked the acquisition of Banca Antonveneta and Banca Nazionale de Lavoro by ABN AMRO and Banco Bilbao Vizcaya Argentaria. To find out if merger control is a systematic barrier to cross-border consolidation in other EU member countries, we estimate the probability of a takeover as a function of bank and country characteristics and the degree of transparency of the regulatory process.

We find that the likelihood that a bank will be taken over by a foreign credit institution is larger if merger control is transparent. In particular, large banks are less likely to be taken over by foreign credit institutions if merger control lacks transparency. This suggests that governments might block cross-border takeovers and promote domestic takeovers because they want the largest institution in the country to be domestically owned. Domestic takeovers are not affected.

Besides the transparency of merger control, bank characteristics also matter for the probability of a takeover. We find that larger banks are more likely to be acquired, which is consistent with the hypothesis that M&As are driven by economies of scale and scope. Acquirers also seem to be driven by the motive to generate X-efficiency gains from better management because less efficient banks are more likely to be acquired. Cross-border acquisitions also seem to be used to gain access to local retail-banking markets. Banks with a stronger focus on interest-earning activities are more likely to be taken over.

Country characteristics determine in which countries potential targets are taken over. We find that cross-border mergers are more likely if a country's degree of trade integration is high. This suggests that banks follow their customers abroad in order to provide them banking services in foreign countries. Cross-border acquisitions are also more likely if the banking sector where the target is located is small. The euro does not seem to have increased the probability that a bank will be taken over by a foreign credit institution. There is, however, evidence that it has a positive impact on domestic takeovers. Trade openness is also positively related to domestic consolidation. Together, these findings suggest that domestic takeovers might be a defensive reaction to prevent foreign investors from buying majority shareholdings.

Appendix

Table 3. Variables

SIZE	Log (Total Bank Assets)
MS	Total Bank Assets/Total Banking Sector Assets
ROA	Pre-Tax Profits/Total Assets
CIR	Total Expenses/Total Income
CAP	Total Equity/Total Assets
LIQ	Liquid Assets to Customer and Short-Term Funding
NIREV	Net Interest Income to Total Income
DEP	Customer Deposits to Total Bank Assets
LOAN	Customer Loans to Total Bank Assets
GDP	Log (Gross Domestic Product)
IMGDP	Total Imports to GDP
DIST	Log (Distance)
C3	Market Share of the Three Largest Banks
BFFREE	Average (Banking and Investment Freedom Index)
GOVINT	Government Intervention Index
HHI	Herfindahl Index
EMU	Dummy Variable for EMU Membership
IPI	Index of Political Independence
GCI	General Criteria Index
PCI	Prudential Criteria Index

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