What Determines the Number and Value of Bank Mergers and Acquisitions Around the Globe?

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The reduction in barriers to mergers and acquisitions, both within and across countries, has facilitated the ability of firms everywhere to pursue their expansion goals. This article examines factors influencing bank mergers in terms of both the number and value of all deals completed for domestic, as well as cross-border, mergers and acquisitions. We focus on entry barrier, bank regulatory, macro-governance, and macro-economic country-specific variables in explaining bank mergers and acquisitions from 1995 to 2007, drawing upon new and unique datasets. In doing so, we analyze the extent to which banks are acquiring and being acquired, as well as identify variables that are associated with advancing and averting such bank combinations. In addition to documenting the number and value of combinations by country, we find that, for all bank M&As, there exists a significant relation between the degree of M&A activity and the treatment of foreign banks, but no significant relation with bank restrictions. The three main variables are the rule of law, discrimination and bank domestic credit. The results also clearly indicate that the determining factors of M&A activity differ between domestic and cross-border transactions. This type of information should prove useful to policymakers, analysts and other individuals trying to better understand where and to what extent bank consolidation is occurring and some of the factors that provide incentives or barriers to banking deals around the world.

1. Introduction

There has been substantial consolidation among firms in many industries in countries around the world in recent years. Firms have increased in size and geographical reach through both domestic and cross-border mergers and acquisitions. Such consolidation is driven by the desire to achieve various cost savings through reducing or eliminating redundant operations in separate but related entities. It is also driven by the desire of firms to increase revenues and reduce risk through broadening the scope of activities in which they engage and expanding the geographical market in which their products and services are offered. Reduced barriers to mergers and acquisitions, both within and across countries, has increased the ability of firms worldwide to pursue domestic and global expansion. In particular, the World Trade Organization (WTO), with its approximately 150 member countries, has helped open wider the doors to cross-border consolidation.

Our paper examines the importance of a number of factors related to bank mergers and acquisitions in an effort to explain both the number of deals, as well as the value of the deals completed. Comparative information is provided on the total number of deals and total value of deals by country at different levels of income and in different parts of the world. The same type of information is also provided on within country (domestic) and across country (cross-border) mergers and acquisitions. In addition to providing this aggregate information on all mergers and acquisitions around the world, it is separately provided for each of the top 35 countries ranked by deal value.

The empirical analysis utilizes Tobit regression analysis to examine the importance of bank regulatory, macro-governance, and macro-economic country-specific variables in explaining the variation in both the number and dollar value of bank mergers and acquisitions from 1995 to 2007,

drawing upon new and unique datasets. We specifically examine the period ending in 2007 so as to not obfuscate the date with the global financial crisis that subsequently occurred. The specific focus in the analysis, however, is on the role played by new entry barriers, or a "discrimination" index, in bank mergers. We find that the discrimination measure is significant, but only for cross-border mergers. Other variables that are significant for both domestic and cross border M&As include the rule of law, the level of domestic credit and macroeconomic variables. The key result is that a distinction should be made between domestic and cross-border when evaluating bank M&As.

The importance of this is the vital role that banks play in the financial systems of all countries, but particularly in developing and emerging market economies. As globalization advances, we expect greater activity in foreign bank expansion. We contribute to the existing literature by first documenting, using a large and broad database, the degree and value of bank combinations across the globe, examining whether banks are acquiring or being acquired. Beyond that, we identify the economic, regulatory and governance factors that facilitate and detract from bank merger and acquisition activity within a country.

The next section of the paper provides a brief overview of studies related to cross-border bank mergers and acquisitions. This is followed with a discussion of summary data for all domestic and cross-border mergers and acquisitions, while the three subsequent sections focus on banks specifically. We then discuss the model employed in assessing determinants of the value and number of bank mergers, the data used in its estimation, and the empirical findings. A concluding section completes the paper.

2. Cross-Border Bank Merger and Acquisition Studies

Several studies have examined cross-border bank mergers and acquisitions to assess potential wealth effects, to identify determinants of deal value, and to examine potential efficiency gains. In a paper related to ours, Buch and DeLong (2004) examine 3,000 cross-border bank mergers involving 144 countries between 1995 and 2001. Using data from Thomson Financial Services, they obtain a total sample of 3,081 firms with deals of at least $1 million. In studying the variation in the number of bank mergers across national borders, Buch and DeLong specify a model that includes variables to capture several different elements, such as membership in trading blocs (e.g., the European Union (EU) and the North American Free Trade Agreement (NAFTA)), capital controls, economic activity, legal environment, transparency, and an index of supervisory rigor. Using traditional regression techniques, they estimate several variants of a basic model. Their main conclusions are that increased transparency and stronger supervisory oversight tend to be associated with a higher degree of cross-border merger activity. Further, they find an inverse relationship between the cost of information and merger activity. They do note that this relationship should diminish over time as technology continues to provide for greater and less costly access to information.

There also have been a number of studies examining the importance of wealth effects associated with bank mergers. Typically, these studies utilize an event methodology to examine whether there is a significant announcement effect on bank market capitalization. For U.S. domestic bank mergers, the results generally indicate no significant positive effects that accrue to target banks as well as no effects for the acquiring entity (see, for instance, Hudgins and Seifert, 1996).

Other studies have examined the risk effects of cross-border mergers. Amihud, DeLong and Saunders (2002), for example, examine the effect of mergers on both total risk and systematic risk for banks in member countries of the Organisation for Economic Co-operation and Development (OECD). Additionally, they test for any valuation effects resulting from cross-border mergers. Of interest to policy makers should be their finding that there is no significant change in risk to the acquiring bank. That is, if there are any risk changes, then the increases are countered by other risk decreases, such as through greater diversification. With regard to wealth effects, they find evidence of significant, negative abnormal returns to acquiring banks. This, of course, implies that acquirers are, on average, paying an excess premium, which should also be of interest to policy makers.

Schoenmaker and van Laecke (2007), in still another study, examine the role of several characteristics of the home country in cross-border banking mergers. They find, based on sixty banks, that the level of merger activity is related to country-level economic variables, the banking concentration ratio, and the influence of economic integration within trading blocs, particularly among the EU countries. In a related study, Berger and DeYoung (2006) find that information accessibility facilitates geographic diversification, a finding consistent with the results in this paper.

Other studies related to this one have also considered the economic effects of cross-border expansion, but in the context of foreign-bank ownership. In general, the findings from these studies offer somewhat mixed results, with some concluding that open borders could result in excessive risk to the banking system (see Hellmann, Murdoch, and Stiglitz, 2000 and 2002). Others argue, however, that foreign banks can increase the competitive environment in a country, resulting in a greater availability of funds and more competitive interest rates. This, of course, supports the view that more open borders promote more efficient banking systems (see Berger and Humphrey, 1997, Claessens, Demirgüç-Kunt and Huizinga, 2001, and Dopico and Wilcox, 2002).

Our study builds upon, yet differs from, these earlier studies by focusing on the role played by several new regulatory variables that capture the range of activities in which banks can engage, the extent to which non-financial firms can own banks, barriers to foreign entry, and the extent to which foreign banks are treated less favorably than domestic banks once they are allowed to enter. This particular focus is important because these are variables that are subject to control by policymakers, rather than solely determined by market forces.

3. Global Mergers and Acquisitions: Some Basic Facts

During the period January 1995 through January 2007, there were 154,061 completed mergers and acquisitions with a total deal value of $24.7 trillion in 173 countries (see Table 1). Of these transactions, 27 percent were cross-border and they accounted for 30 percent of the total value of all deals (see Figures 1 and 2). Although domestic deals accounted for the largest share of both the total number and total value of deals, the median and mean values of cross-border deals ($20 and $179 million) were somewhat larger than domestic deals ($13 and $154 million). Involved in the deals were 71,925 unique firms that acquired 154,061 other firms. Of the acquirers, 58,702 firms acquired 112,317 firms within their own country, while 19,613 firms acquired 41,744 firms in other countries. At the same time, only 9 percent of all the acquirers (6,390) acquired firms both within and outside their own country over this time period.

The number of mergers and acquisitions and the value of the deals are distributed quite unevenly among the 173 countries. When ranked by the total value of deals, the top 35 countries account for 97 percent of this value and 93 percent of the total number of deals (see Table 1). The top 5 countries, the United States, United Kingdom, France, Germany, and Japan, account for 46, 11, 6, 4, and 4 percent of total deal value, respectively, and 33, 13, 2, 2, and 6 percent of the total number of deals, respectively. Despite the United States being ranked first with respect to the total value of all deals and the total number of deals, several countries have higher median deal values, with Bermuda being the highest at $83 million, and higher mean deal values, with Switzerland being the highest at $493 million.

Regarding domestic and cross-border transactions, the total value of domestic deals done by acquiring firms in some countries is greater than the total value of cross-border deals. This is the case, for example, in countries like China, India, Japan, Russia, South Korea, Taiwan, and the United States. The opposite situation occurs in countries like Belgium, Bermuda, Luxembourg, United Arab Emirates, and Switzerland. The country with the smallest percent of acquirers doing deals in other countries is China at 7.5 percent, while the country with the lowest percent of deal value in other countries accounted for by their acquirers is South Korea at 6 percent. In contrast, the country with the largest percent of acquirers doing deals in other countries is Luxembourg at 95 percent, while the country with the highest percent of deal value accounted for in other countries is the United Arab Emirates at 96 percent (see Table 1). This situation reflects the fact that acquirers in some countries

Table 1
Global Mergers and Acquisitions: January 1995 through January 2007

Acquiror Nationality	Deal Value ($ Millions)	Percent Cross-border	Total Number of Targets	Total Number of Unique Acquirors	Percent Cross-border (total number)
United States	11,336,157	12	51,158	24,167	16
United Kingdom	2,769,748	47	20,597	8,111	29
France	1,406,115	50	3,421	1,383	51
Germany	1,041,726	57	3,088	1,349	58
Japan	970,172	15	8,785	3,559	13
Canada	797,098	41	7,898	4,383	32
Italy	765,866	22	3,160	1,311	27
Spain	585,635	52	2,786	1,196	30
Netherlands	500,725	71	1,667	702	68
Australia	499,773	42	5,946	2,849	20
Switzerland	394,139	65	1,121	470	75
China	294,928	16	4,221	2,720	8
Sweden	262,558	56	2,151	840	46
Hong Kong SAR	204,171	49	3,955	1,980	50
Russia	180,703	14	1,429	776	15
South Korea	155,513	6	2,205	1,397	8
Singapore	154,569	62	2,694	1,101	50
South Africa	143,577	29	2,081	960	19
Brazil	130,991	31	539	292	19
Belgium	129,823	66	778	374	61
Denmark	124,498	43	788	385	54
Malaysia	117,836	23	3,471	1,620	19
Finland	113,471	56	904	374	49
Norway	113,088	47	1,309	556	40
Mexico	91,942	37	358	184	39
Ireland	79,244	68	1,030	434	64
India	74,665	24	1,685	960	18
Taiwan, China	70,997	16	566	321	33
Luxembourg	70,849	94	240	128	95
Portugal	68,513	35	494	244	31
Bermuda	58,256	90	176	94	91
Austria	57,418	59	495	249	66
Israel	57,122	51	812	435	36
United Arab Emirates	45,470	96	119	78	84
Greece	41,981	39	584	304	32
TOTAL FOR TOP 35	23,909,337	29	142,711	66,365	26
TOTAL FOR ALL OTHERS (138)	808,395	67	11,350	5,700	43
TOTAL FOR ENTIRE SAMPLE (173)	24,717,732	30	154,061	71,925	27

Source: Dealogic

collectively see greater value in domestic deals, whereas acquirers in other countries collectively see greater value in cross-border deals. These figures are likely to change, however, as countries like China, with its rapidly growing economy and large foreign exchange reserves, increase their overseas investments.

It is also useful to comment on the distribution of the number of deals and deal values during the past twelve years (not reported in table). The total value of deals was $559 billion in 1995,

increased to $3,832 billion in 2000, then following the stock market crash declined to $1,377 billion in 2003. Then, once again, the value increased to $3,534 billion in 2006. The number of deals followed a similar path, starting at 4,670 in 1995, rising to 16,585 in 2000, and then falling to 12,277 in 2003 before increasing to an all-time high of 19,350 in 2006. The highest median (mean) deal value over this time period was $23 million in 1996 ($231 million in 2000). The percent of all deals and deal value accounted for by cross-border transactions once again increased with increases in stock prices following the worldwide decline that occurred at the turn of the century.

4. Banks as Acquirers in the Global Marketplace

The role of banks in all the mergers and acquisitions during the past decade is relatively modest. Banks accounted for only 3 percent of all the unique acquirers and acquired less than 4 percent of all the firms involved in completed deals. However, they account for nearly 10 percent of the total value of all deals. The absolute numbers for banks as acquirers are more impressive. Specifically, 2,128 banks in 108 countries acquired 5,977 other firms in deals valued at $2,259 billion (see Table 2). Of these deals, 30 percent of the firms acquired were cross-border, with 24 percent of the total deal value also being cross-border. The median values for the domestic and cross-border deals were $41 and $57 million, respectively, while the mean values for the domestic and cross-border deals were $414 and $295 million, respectively.

The top 35 countries account for 88 percent of all the unique bank acquirers involved in mergers and acquisitions. These same countries also account for 90 percent of all acquisitions and 98 percent of the total deal value. The United States accounts for the largest number of deals at 1,766, or about 30 percent of all deals, and the largest total value of deals with $899 billion, or about 40 percent of the value of all deals. There were 829 acquirers from the United States involved in these deals, or about 40 percent of all unique acquirers. Comparing Tables 1 and 2, there are six countries (Turkey, South Africa, Iceland, the Philippines, Saudi Arabia, and Cyprus) that rank in the top 35 with respect to the value of deals involving just banks as acquirers, but not when including all firms as acquirers.

Comparing domestic and cross-border mergers and acquisitions, 8 of the top 35 countries have cross-border deal values that are less than 10 percent of their total deal values. The countries (ranked smallest to largest by cross-border deal value percentages) are: the Philippines, Japan, India, South Korea, Taiwan, Turkey, Brazil, and the United States. These countries are experiencing significant domestic consolidation. At the other end of the spectrum (i.e., countries with high percentages of cross-border deal values) are: Cyprus (93 percent), Iceland (85 percent), the Netherlands (85 percent), Ireland (73 percent), and Sweden (69 percent) (see Table 2). These countries are relatively small and firms within them are expanding mainly through overseas acquisitions.

The median and mean values in the case of banks being acquirers are higher than in the case of all firms as acquirers. The median values of deals for banks being acquirers are $41 million for domestic deals and $57 million for cross-border deals, while the corresponding values for all types of firms being acquirers are $13 million and $20 million, respectively. The mean values of deals for banks being acquirers are $414 million in the case of domestic deals and $295 million in the case of cross-border deals, while the corresponding mean values for all types of firms being acquirers are $154 million and $179 million, respectively. The median values for domestic deals range from a high of $1,107 million for Saudi Arabian bank acquirers to a low of $4 million for Turkish bank acquirers, while in the case of mean values, the high is $1,429 million for Switzerland bank acquirers and the low is $55 million for Icelandic bank acquirers. In the case of cross-border deals, the median values range from a high of $395 million for Saudi Arabian bank acquirers to a low of $1.5 million for Turkish bank acquirers, while the mean values range from a high of $867 million for Chinese bank acquirers to a low of $48 million for Indian bank acquirers.

During the period January 1995 through January 2007, the number of deals with banks as acquirers rose to a high of 691 in 2000, and then fell before rising again to 586 in 2006. The value of deals also increased to a high of $308 billion in 2000, and then declined before increasing to $269

billion in 2006. The highest median (mean) deal value was $130 million ($1,313 million) in January 2007.

Table 2
Global Bank Mergers and Acquisitions: January 1995 through January 2007

Acquiror Nationality	Deal Value ($ Millions)	Percent Cross-border	Total Number of Targets	Total Number of Unique Acquirors	Percent Cross-border (total number)
United States	898,735	6	1,766	829	10
United Kingdom	200,660	38	324	74	45
Italy	196,281	22	492	128	18
Japan	172,331	1	201	68	6
Spain	130,306	51	375	92	40
Germany	106,386	43	309	74	72
France	90,485	45	204	41	63
Switzerland	64,075	33	150	24	80
Netherlands	43,719	85	111	23	75
Australia	35,867	33	161	34	29
Canada	29,865	64	110	29	53
Sweden	25,489	69	79	13	77
Singapore	25,288	44	86	13	51
Belgium	23,790	64	59	13	85
Portugal	21,735	12	84	28	27
Austria	18,335	59	91	31	68
Brazil	17,855	5	73	23	8
Greece	16,555	37	83	21	34
Finland	13,221	45	31	11	35
South Korea	11,033	3	58	22	12
China	9,217	56	17	14	35
Taiwan, China	8,117	3	40	27	23
Hong Kong SAR	7,798	59	61	22	59
Malaysia	7,423	13	85	27	12
Norway	6,090	12	25	15	24
Turkey	5,945	4	24	18	13
Russia	5,692	26	61	41	15
South Africa	5,119	16	49	24	37
Ireland	4,393	73	33	10	73
Denmark	4,319	59	23	14	26
Iceland	3,760	85	26	11	62
Philippines	3,065	0	40	17	3
Saudi Arabia	3,003	26	4	4	50
Cyprus	2,950	93	10	2	40
India	2,788	2	53	20	11
TOTAL FOR TOP 35	2,221,692	23	5,398	1,865	31
TOTAL FOR ALL OTHERS (73)	37,791	43	579	278	23
TOTAL FOR ENTIRE SAMPLE (108)	2,259,483	24	5,977	2,128	30

Source: Dealogic

5. Banks as Targets in the Global Marketplace

Banks are obviously not only acquirers, but also targets in mergers and acquisitions. Table 3 shows that 2,227 unique acquirers were involved in deals in which 4,053 banks were the targets with

a total deal value of $2,022 billion in 117 countries. Comparing Tables 2 and 3, we see that banks are targets in 9 more countries than the number in which they are acquirers. About 30 percent of the deals, moreover, are cross-border and they account for 23 percent of the total deal value.

Table 3
Global Bank Mergers and Acquisitions: January 1995 through January 2007

Acquiror Nationality	Deal Value ($ Millions)	Percent Cross-border	Total Number of Targets	Total Number of Unique Acquirors	Percent Cross-border (total number)
United States	806,125	7	1,583	950	7
Japan	181,241	0	113	67	10
Italy	168,953	24	335	133	19
United Kingdom	153,872	48	144	59	82
Spain	96,332	53	144	51	60
France	86,472	36	110	35	72
Germany	77,827	33	124	56	56
Netherlands	35,921	90	67	16	88
Switzerland	35,688	14	30	24	60
Singapore	28,081	60	43	12	79
China	20,960	8	40	34	10
Belgium	20,948	52	35	17	77
Australia	20,907	33	49	27	37
Austria	20,803	52	56	27	64
Sweden	17,304	87	44	14	86
Portugal	16,309	14	45	20	47
Taiwan, China	15,577	7	42	29	26
Malaysia	15,415	13	64	38	16
Mexico	13,978	2	14	9	14
Canada	13,922	92	45	19	76
Greece	13,409	51	45	20	51
South Korea	12,190	3	47	28	17
Brazil	11,578	9	38	15	16
Saudi Arabia	10,827	11	14	12	57
Denmark	8,788	34	17	14	35
Finland	7,913	44	17	13	35
Thailand	6,349	0	14	11	7
South Africa	6,156	7	40	30	28
Ireland	5,547	62	15	9	47
Hong Kong SAR	5,372	49	28	19	64
Philippines	5,053	2	43	29	5
Norway	4,911	7	16	11	25
Luxembourg	4,182	100	11	6	100
Hungary	3,132	77	20	8	60
India	2,524	1	29	20	10
TOTAL FOR TOP 35	1,954,566	22	3,521	1,895	28
TOTAL FOR ALL OTHERS (82)	67,083	63	532	350	43
TOTAL FOR ENTIRE SAMPLE (117)	2,021,648	23	4,053	2,227	30

Source: Dealogic

The top 35 countries account for 85 percent of all acquirers and 97 percent of the total value of deals. Once again, the United States ranks number one in terms of both number of deals and deal

value. It accounts for about 40 percent of all deals and about 40 percent of total deal value. Four countries rank in the top 35 countries with banks as targets, but not in the top 35 countries with banks as acquirers. These countries are Luxembourg, Hungary, Mexico, and Thailand. In the case of Mexico and Thailand, more than 98 percent of the value of deals involves domestic transactions, which represents within country consolidation. In contrast, for Hungary and Luxembourg, cross-border transactions are dominant, accounting for 77 and 100 percent of total deal value, respectively. Other countries with domestic transactions accounting for more than 90 percent of total deal value are: the United States (93 percent), Japan (99 percent), China (92 percent), Taiwan (93 percent), South Korea (97 percent), Brazil (91 percent), South Africa (93 percent), Philippines (98 percent), Norway (93 percent), and India (99 percent). Conversely, countries with cross-border deal values exceeding 75 percent, apart from Hungary, are Canada (92 percent), Netherlands (90 percent), and Sweden (87 percent). More generally, Table 3 shows that there is wide diversity in the extent of domestic and cross-border mergers and acquisitions across countries. In this regard, the percentage of total deal value accounted for by cross-border transactions for the top 35 countries is 22 percent, whereas for the other 82 countries, the corresponding proportion is 63 percent.

The median (mean) value of domestic deals is $50 million ($545 million), while for cross-border deals the median (mean) value is $74 million ($390 million). The country with the highest median deal value is Saudi Arabia at $1,575 million, while Denmark accounts for the lowest value at $23 million. Regarding cross-border deals, China accounts for the highest median deal value at $248 million and Finland for the lowest at $6 million. The United Kingdom has the highest mean value for domestic deals at $3,104 million, while Italy has the highest value for cross-border deals at $634 million.

During the period January 1995 through January 2007, the number of deals in which banks are targets rose to a high of 474 in 1998, and then fell before rising to 415 in 2006. The value of deals also increased to a high of $330 billion in 1998, and then declined before increasing to $242 billion in 2006. The highest median (mean) deal value was $100 million ($731 million) in 2006 (2004).

6. Banks as both Acquirers and Targets in the Global Marketplace

The last type of merger and acquisition to be discussed involves transactions in which a bank is both an acquirer and a target. These particular transactions are thus subsets of those appearing in the three tables already discussed. Table 4 shows these transactions, having removed all non-bank firms as either acquirers or targets from the earlier tables. Interestingly, there are 939 banks that acquired 3,562 non-bank targets, and 1,038 non-bank acquirers that acquired 1,638 banks. At the same time, there were 1,189 unique bank acquirers in 104 countries that acquired 2,415 banks. Of course, some banks may have acquired more than one bank over this period and some banks may been acquired more than once. The total value of the deals is $1,431 billion, or about 6 percent of the total value of all mergers and acquisitions. Of these deals, cross-border transactions account for 29 percent of the total number of deals and 22 percent of total deal value.

For transactions involving banks as both acquirer and target, the top 35 countries account for 88 percent of all unique bank acquirers, 91 percent of the total number of bank targets, and 99 percent of the total deal value. The United States was at the top once again in number of acquirers (561, or 47 percent), number of targets (981, or 41 percent), and deal value ($625 billion, or 44 percent). Adding Italy, Japan, the United Kingdom, and Spain, the top 5 countries ranked by deal value account for 62 percent of all bank acquirers, 62 percent of all bank targets, and 78 percent of total deal value. Stated another way, the remaining 69 countries with any of these types of transactions account for only 12 percent of all acquirers, 9 percent of all targets, and 1 percent of the total value of all deals.

The percentages of the number of cross-border deals and value of cross-border deals for the top 35 countries are 28 and 22, respectively. The corresponding figures for individual countries are quite diverse. For example, Sweden has the highest percentage of deals that are cross-border at 97 percent, while China has the highest percentage of deal value that is cross-border at 99 percent. At the other

end of the spectrum, there were no cross-border deals in the Philippines, and the percentage of such deals is less than 2 in the United States and 10 or less in Argentina and Japan. Cross-border transactions account for less than 10 percent of deal value in 12 countries, including: Brazil, India, Japan, South Korea, and the United States.

Table 4
Global Bank Mergers and Acquisitions: January 1995 through January 2007

Acquiror Nationality	Deal Value ($ Millions)	Percent Cross-border	Total Number of Targets	Total Number of Unique Acquirors	Percent Cross-border (total number)
United States	624,638	4	981	561	2
Italy	158,869	24	265	89	19
Japan	129,319	0	68	35	9
United Kingdom	107,239	42	66	18	86
Spain	89,903	56	121	35	69
France	32,801	82	69	22	81
Switzerland	32,693	12	18	13	61
Germany	30,584	46	79	28	67
Singapore	21,935	49	30	8	73
Australia	19,667	35	34	14	41
Netherlands	16,802	99	20	5	90
Austria	15,702	65	47	19	72
Sweden	15,555	95	37	8	97
Belgium	15,172	52	18	10	89
Portugal	13,716	13	31	10	52
Greece	12,235	49	34	12	53
Canada	11,898	99	33	12	82
Brazil	11,363	8	35	12	14
South Korea	6,731	4	24	13	25
Finland	6,314	55	7	4	57
Malaysia	5,632	14	23	11	17
Taiwan, China	5,141	4	16	13	44
Norway	4,209	8	10	6	40
Hong Kong SAR	3,814	47	17	10	65
Hungary	2,543	95	17	6	71
Philippines	2,302	0	20	10	0
Denmark	2,287	82	12	10	33
Saudi Arabia	2,215	0	3	3	33
India	1,918	1	10	7	30
China	1,776	99	5	4	80
Kuwait	1,758	26	8	6	50
Turkey	1,676	0	5	5	20
Colombia	1,584	2	9	5	11
Mexico	1,570	18	9	7	22
Argentina	1,507	3	20	13	10
TOTAL FOR TOP 35	1,413,066	22	2,201	1,047	28
TOTAL FOR ALL OTHERS (69)	17,482	41	214	148	39
TOTAL FOR ENTIRE SAMPLE (104)	1,430,548	22	2,415	1,189	29

Source: Dealogic

The median (mean) value of domestic deals is $58 million ($649 million), while for cross-border

deals the corresponding figure is $81 million ($452 million). The highest median (mean) value for domestic deals involves Belgium banks acquiring other domestic banks at $3,614 million ($3,614 million). For cross-border transactions, the highest median (mean) value involves U.S. banks acquiring banks in other countries at $414 million ($1,758 million).

During the period January 1995 through January 2007, the number of deals with banks as both acquirers and targets rose to a high of 286 in 1998, and then fell before rising to 229 in 2006. The value of deals also increased to a high of $200 billion in 1998, and then declined before increasing to $207 billion in 2004. The highest median (mean) deal value was $129 million ($3,368 million) in January 2007.

7. Models, Data, and Empirical Results

We now explore some of the factors that may explain the variation in both number and value of deals involving banks, both scaled by GDP. More specifically, two basic empirical models are estimated as follows:

$$\text{Deal Value of Bank Mergers / GDP} = \alpha + \beta x_1 + \gamma x_2 + \delta x_3 + \mu \tag{1}$$

and

$$\text{Number of Bank Merger Deals / GDP} = \alpha + \beta x_1 + \gamma x_2 + \delta x_3 + \mu, \tag{2}$$

where x_1 is a vector of country-specific variables designed to capture differences in government ownership of banks, regulatory restrictions imposed on the scope of bank activities (i.e., securities, insurance and real estate), the formation of financial conglomerates (i.e., bank ownership of nonfinancial firms and vice versa), and openness to and discrimination against foreign banks, x_2 is a vector of country-specific variables that capture macro-governance factors, and x_3 represents a vector of country-specific variables that control for macroeconomic factors. Data for almost all of these variables are obtained from the World Bank and descriptions for these and other variables are provided in Appendix 1. Data for the number of deals and the value of deals are from Dealogic and include only those deals where banks are involved as the target, the acquirer, or both.

Government ownership of banks is measured by the share of total bank assets that is 50 percent or more owned by the government in a country. This measure is included since government-bank ownership has, in earlier studies, been shown to reduce banking efficiency, particularly for less developed economies. We also include a measure of *bank-nonbank firm ownership restrictions*. That is, in a given country, this variable measures the degree to which the mixing of banking and commerce is allowed. Clearly, the number of potential acquirers and a larger pool of available resources may affect the number of deals occurring and the value of those completed. This is an index ranging in value from 2 representing no restrictions to 8 representing a prohibition of the mixing of banking and commerce. A measure of the restrictions on the scope of activities allowed for banks is included, which ranges from a low of 3 to a high of 12, the latter indicating unrestricted securities, insurance and real estate activities. This variable is included because more deals and the value of such deals may both increase to the extent that banks are allowed to engage in a broader range of activities.

We further include a set of variables to capture macro-governance elements in a particular country. These include an index from the World Bank that measures the freedom of citizens within a country to express their views through voting and also the degree to which there is freedom of media. Other variables include indices of *government effectiveness*, the *rule of law*, *control of corruption* within a country, and *democracy*.

A final group of variables is included to control for macroeconomic effects. These include the more traditional measures used in these types of studies: *inflation*, *real GDP growth*, *real GDP per capita* and the ratio of *bank domestic credit to GDP*. We also include two new measures, one (*openness*) that measures the degree to which countries are open to foreign banks and the other (*discrimination*) that measures the extent to which foreign banks are treated less favorably than domestic banks. These two variables are new and taken from and fully explained in Barth, Marchetti, Nolle and Sawangngoenyuang (forthcoming), and are described in Table 5.

Summary statistics and correlations among the variables are reported in Tables 5 and 6, respectively. Before discussing the regression results, it is useful to comment briefly on some of the correlations. One finds that countries that impose greater restrictions on bank activities and with higher degrees of government ownership of banks are also those with lower levels of each of our macro-governance variables. Countries that are less open to foreign banks and discriminate more against foreign banks once they are allowed to enter are also those that tend to have lower levels of the different macro-governance variables. Furthermore, countries that impose higher restrictions on banks activities and bank ownership are also countries that are less open and discriminate more against foreign banks.

Table 5
Descriptive Statistics

	Mean	Median	Maximum	Minimum
Total Deal Value / GDP	0.0089	0.0034	0.3676	0.0000
Number of Deals / GDP	0.0001	0.0000	0.0016	0.0000
Restrictions on Bank Activities	7.1582	7.0000	12.0000	3.0000
Restrictions on Bank Ownership	4.5929	5.0000	8.0000	2.0000
Government Ownership of Banks (%)	15.6710	4.4000	98.1000	0.0000
Bank Concentration (%)	69.8571	70.5800	100.0000	11.8000
Openness	24.1821	21.3000	49.6000	0.0000
Discrimination	14.6372	11.3000	34.6000	0.0000
Voice and Accountability	0.3737	0.3988	1.8264	-1.6614
Political Stability and Absence of Violence	0.1570	0.2866	1.6880	-2.2129
Government Effectiveness	0.5441	0.5174	2.3025	-1.2166
Regulatory Quality	0.5352	0.5416	2.0279	-1.7082
Rule of Law	0.3956	0.3943	2.0624	-1.6629
Control of Corruption	0.4382	0.2753	2.5351	-1.3226
Democracy	7.1468	8.0000	10.0000	0.0000
Inflation (%)	7.9037	3.9046	948.5454	-23.4789
Real GDP Growth (%)	3.9176	3.9661	26.2000	-13.1267
Real GDP per Capita ($)	10,343.0000	4,584.0000	52,183.0000	140.0000
Bank Domestic Credit (%)	80.0039	66.1706	318.6732	3.4771

Notes: The data include all transactions by country and year for which deal value is available and either the acquirer or target is a bank.

Due to the high correlations among some of our variables, not all can be incorporated into our models. For example, our *Openness* and *Discrimination* indices have a correlation coefficient of 0.8070. For this reason, our models focus on the *Discrimination* variable. Similar high correlations exist among our *Voice and Accountability*, *Political Stability and Absence of Violence, Government Effectiveness*, *Regulatory Quality*, *Rule of Law, Control of Corruption*, and *Democracy* variables. Our models, therefore, include only the *Rule of Law*, which controls for many of these other factors. In addition, because of the dominance in number and value of deals by a few countries, we have a *Top 5 Dummy*, which is equal to one for deals where the acquirer is from the United States, United Kingdom, Italy, Japan, or Spain, as these are the top 5 countries for deal value involving banks as acquirors, banks as targets, or banks as both acquirer and target.

The results of our Tobit regressions are reported in Tables 7 and 8. Table 7 reports the results for the total value of deals scaled by GDP. Model 1 includes all deals, which means both domestic

Table 6
Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Restrictions on Bank Activities	1.00															
2	Restrictions on Bank Ownership	0.43	1.00														
3	Government Ownership of Banks	0.20	0.04	1.00													
4	Bank Concentration	0.12	-0.04	-0.11	1.00												
5	Openness	0.29	0.23	0.05	0.20	1.00											
6	Discrimination	0.25	0.21	-0.04	0.09	0.81	1.00										
7	Voice and Accountability	-0.19	-0.20	-0.17	-0.04	-0.36	-0.16	1.00									
8	Political Stability and Absence of Violence	-0.14	-0.21	-0.17	0.01	-0.37	-0.20	0.74	1.00								
9	Government Effectiveness	-0.14	-0.17	-0.16	0.00	-0.25	0.06	0.83	0.81	1.00							
10	Regulatory Quality	-0.15	-0.18	-0.16	-0.02	-0.32	-0.08	0.82	0.79	0.94	1.00						
11	Rule of Law	-0.13	-0.19	-0.14	-0.01	-0.20	0.13	0.81	0.83	0.97	0.92	1.00					
12	Control of Corruption	-0.13	-0.20	-0.16	0.03	-0.19	0.12	0.78	0.80	0.97	0.91	0.97	1.00				
13	Democracy	-0.15	-0.16	-0.13	-0.13	-0.33	-0.23	0.85	0.43	0.51	0.56	0.48	0.45	1.00			
14	Inflation	0.00	0.02	0.17	0.02	0.00	-0.05	-0.33	-0.33	-0.40	-0.42	-0.40	-0.37	-0.04	1.00		
15	Real GDP Growth	-0.05	0.09	0.06	-0.03	0.05	-0.01	-0.27	-0.15	-0.20	-0.22	-0.23	-0.23	-0.24	-0.11	1.00	
16	Real GDP per Capita	-0.09	-0.10	-0.14	-0.09	-0.18	0.13	0.65	0.66	0.84	0.76	0.84	0.86	0.43	-0.12	-0.16	1.00
17	Bank Domestic Credit	-0.06	-0.05	-0.14	-0.15	-0.19	0.14	0.46	0.44	0.60	0.53	0.62	0.59	0.30	-0.14	-0.21	0.61

Notes: The data include all transactions by country and year for which deal value is available and either the acquirer or target is a bank. Each cell contains the Pearson correlation coefficient

Table 7
Determinants of Total Deal Value / GDP

	Model 1	Model 2	Model 3
	(All Deals)	(Domestic Deals)	(Cross-Border Deals)
Intercept	-4.9888***	-7.4258***	-4.4289***
Top 5 Dummy	-0.3530	0.6034	-0.5801***
Restrictions on Bank Activities	0.0863	0.1144	0.0868
Restrictions on Bank Ownership	-0.0697	-0.1954	-0.0574
Government Ownership of Banks	-0.0025	0.0040	-0.0056
Bank Concentration	-0.0016	0.0062	-0.0045
Discrimination	-0.0439***	0.0071	-0.0740***
Rule of Law	0.8524***	0.7402**	0.4474*
Inflation	0.0069	0.0310	-0.0190
Real GDP Growth	-0.0178	-0.0075	0.0084
Real GDP per Capita	0.0000	0.0000	0.0000
Bank Domestic Credit	0.0028	0.0057*	0.0009
Number of Observations	150	110	131

Notes: Coefficients from Tobit estimations are presented. The data include all transactions by country and year for which deal value is available and either the acquirer or target is a bank. ***, **, and * represent significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table 8
Determinants of Total Number of Deals / GDP

	Model 1	Model 2	Model 3
	(All Deals)	(Domestic Deals)	(Cross-Border Deals)
Intercept	-7.5632***	-9.2502***	-8.3573***
Top 5 Dummy	-0.1606	0.6795*	-1.5378***
Restrictions on Bank Activities	-0.0096	0.2262***	-0.0208
Restrictions on Bank Ownership	-0.1192	-0.3360***	-0.0605
Government Ownership of Banks	-0.0046	-0.0116**	-0.0022
Bank Concentration	0.0001	0.0007	0.0018
Discrimination	-0.0291***	-0.0133	-0.0501***
Rule of Law	-0.1170	0.4750**	-0.3587*
Inflation	-0.0088	-0.0026	0.0025
Real GDP Growth	-0.0023	-0.0054	0.0521
Real GDP per Capita	0.0001	-0.0001**	0.0001
Bank Domestic Credit	-0.0082***	-0.0068***	-0.0073***
Number of Observations	150	110	131

Notes: Coefficients from Tobit estimations are presented. The data include all transactions by country and year for which deal value is available and either the acquirer or target is a bank. ***, **, and * represent significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

and cross-border deals. We do not find any significant relationship between *restrictions on bank activities* or *restrictions on bank ownership* and total deal value. This implies that the scope of activities is not a decisive factor in the value of deals. We do find *discrimination* to be negative and significant for the overall sample. This is being driven by cross-border deals, which is not surprising. The *rule of law* is positive and significant in examining deal value. *Bank domestic credit* is not when analyzing the overall sample.

Model 2 in Table 7 presents the results for just domestic deals. Again, neither of the restrictions variables are significantly associated with total deal value. Also, the *discrimination* variable is not significantly associated with deal value, which one might expect. Among the macro-governance variables, the *rule of law* variable is significantly positively related to deal value. Only one of the macroeconomic control variables is positively and significantly related to deal value, namely, *bank domestic credit*. This result is as expected since bigger deals would occur in countries with larger banking sectors that are experiencing consolidation.

Model 3 in Table 7 presents the results for just cross-border deals. In this case, we find a significant and negative relationship between our top 5 dummy variables and deal value. Furthermore, the *discrimination* variable is negative and significantly related to deal value. This finding is consistent with our expectation was that when foreign firms are treated less favorably than domestic firms, deal values should be lower. Among the macro-governance variables, *rule of law* remains significantly associated with deal value.

The same three models are estimated with results reported in Table 8 but with the total number of deals scaled by GDP as the dependent variable. The results for Model 1 in Table 8 are broadly similar to those of Model 1 in Table 8 with two exceptions. First, *rule of law* is no longer significant. Second, *domestic credit* is now negative and highly significant. Model 2 results, however, differ to a greater extent from those found for Model 2 in Table 8. Our *top 5 dummy* is positive and significant, *restrictions on bank activities* is now positive and significant, *restrictions on bank ownership* is negative and significant, *real GDP per capita* is negative and significant, and *bank domestic credit* switches signs and is negative and significant. *Rule of law* remains significantly positive. The results in Model 3, as in Model 3 in Table 7, indicate that the *top 5 dummy* and *discrimination* variables remain negative and significant. In addition, *bank domestic credit* is significantly negatively related to the number of deals.

The findings provide evidence that it is important when examining the determinants of deals, to separately consider domestic and cross-border deals, rather than focusing on only on total deals. Our results indicate that the factors explaining the different type of deals are not identical, though discrimination, rule of law, and bank domestic credit clearly play important roles. It is also important to distinguish between the value and number of deals. Furthermore, it is interesting, but not surprising, that our discrimination variables are only significant in explaining cross-border deal values and not domestic deal values, which might be expected. Of course, we hope this analysis stimulates more research on the important issue of the determinants of the consolidation of banking through both domestic and cross-border mergers and acquisitions.

8. Concluding Comments

The first objective of this research is to document the value and incidence of domestic and cross-border bank mergers and acquisitions across countries, whether the bank is acquiring or being acquired. The second objective is to empirically examine the entry barrier, bank regulatory, macro-governance, and macro-economic factors that promote and suppress bank merger and acquisition activity. Using a new and broad dataset, we document that consolidation in the banking industry is economically significant in many countries and which countries are the leaders in bank M&A activity.

We partition our data by whether deals are within a given country or across political borders and provide evidence that the determinants of bank mergers and acquisitions differ by whether the deal is domestic or cross-border. In addition, we find that significant country-level factors affecting bank M&A deals include discrimination of foreign banks, rule of law, and bank domestic credit.

We are able to conclude that the extent to which countries open their banking systems to foreign banks and once they do, how those foreign banks are treated matters for deal values, something neglected in previous research in the area. It is therefore incumbent upon researchers to account for discrimination and differentiate between domestic and cross-border transactions in future studies of mergers and acquisitions in the banking sector.

References

Amihud, A., DeLong, G. Saunders, A., 2002, The effects of cross-border bank mergers on bank risk and value. *Journal of International Money and Finance* 21, 857-877.

Barth, J., Marchatti, J., Nolle, D., Sawangngoenyuang, W., forthcoming. Are countries fulfilling their WTO commitments on foreign bank entry? A cross-country analysis of openness and discrimination. in: Berger, A., Molyneux, P., Wilson, J. (Eds.), Oxford Handbook in Banking, Oxford University Press, Oxford, England.

Barth, J., Caprio, G., Levine, R., 2006**,** Rethinking Bank Regulation: Till Angels Govern. Cambridge University Press, New York, NY.

Berger, A., DeYoung R., 2006, Technological progress and the geographic expansion of the banking industry. *Journal of Money, Credit and Banking* 38, 1483-1514

Berger, A., Humphrey, D., 1997, Efficiency of financial institutions: International survey and directions for future research. Wharton Financial Institutions Center Working Paper Series, 97-05.

Buch, Claudia M. and DeLong, Gayle., 2004, Cross-border bank mergers: what lures the rare animal*? Journal of Banking and Finance* 28, 2077-2102.

Claessens S., Demirgüç -Kunt, A., Huizinga, H., 2001, How does foreign entry affect domestic banking markets? *Journal of Banking and Finance* 25, 891-911.

Dopico, L., Wilcox, J., 2002, Openness, profit opportunities and foreign banking. *Journal of International Financial Markets, Institutions and Money* 12, 299-320.

Focarelli, D., Pozzolo, A.F., 2001, The patterns of cross-border bank mergers and shareholdings in OECD countries. *Journal of Banking and Finance* 25, 2305-2337.

Hellmann, T., Murdoch, K., Stiglitz, J., 2000, Liberalization, moral hazard in banking and prudential regulation: Are capital requirements enough? *American Economic Review* 90, 147-165.

Hellmann, T., Murdoch, K., Stiglitz, J., 2002, Franchise value and the dynamics of financial liberalization: The use of capital requirements and deposit rate controls for prudential regulation, in: Meyendorff, A., Thakor, A. (Eds.), Financial Systems in Transition: The Design of Financial Systems in Central Europe, MIT Press, Cambridge, MA, pp. 111-127.

Hudgins, S., Seifert, B., 1996, Stockholders and international acquisitions of financial firms: An emphasis on banking. *Journal of Financial Services Research* 10, 163-180.

Schoenmaker, D., van Laecke, C., 2007, Determinants of international banking: evidence from the world's largest banks.   http://ssrn.com/abstract=965826

Appendix 1 : Codes, Names, Definitions and Sources of Variables

Variable Name	Definition	Source
Total Deal Value / GDP	Total value of all M&A transactions by country and year for which deal value is available and either the acquirer or target is a bank (in $M) divided by GDP ($M).	Dealogic and World Development Indicator 2007, World Bank; and World Economic Outlook Database, International Monetary Fund.
Number of Deals / GDP	Total number of all M&A transactions by country and year for which deal value is available and either the acquirer or target is a bank divided by GDP ($M).	Dealogic and World Development Indicator 2007, World Bank; and World Economic Outlook Database, International Monetary Fund.
Restrictions on Bank Activities	This variable measures the degree to which banks can engage securities, insurance and real estate activities. The index ranges from 1 to 4, with larger numbers representing greater restrictiveness. (1. Unrestricted – a full range of activities in the given category can be conducted directly in the bank; 2. Permitted – a full range of activities can be conducted, but all or some must be conducted in subsidiaries; 3. Restricted – less than a full range of activities can be conducted in the bank or subsidiaries; 4. Prohibited – the activity cannot be conducted in either the bank or subsidiaries.)	World Bank, Banking Regulation Supervision Survey, 1999, 2003 and 2005.
Restrictions on Bank Ownership	This variable measures the degree to which banks can own voting shares in nonfinancial firms and vice versa. The index ranges from 2 to 8. (1. Unrestricted -- a bank may own 100% of the equity in any nonfinancial firm; 2. Permitted -- a bank may own 100% of the equity in a nonfinancial firm but ownership is limited based upon a bank's equity capital; 3. Restricted -- a bank can only acquire less than 100 percent of the equity of a nonfinancial firm; 4. Prohibited -- a bank may not acquire any equity investment in a nonfinancial firm.)	World Bank, Banking Regulation Supervision Survey, 1999, 2003 and 2005.
Government Ownership of Banks	Percent of government-owned bank assets to total country bank assets. (%)	World Bank, Banking Regulation Supervision Survey, 1999, 2003 and 2005.
Bank Concentration	Percent of the largest five banks' assets to total country bank assets. (%)	World Bank, Banking Regulation Supervision Survey, 1999, 2003 and 2005.
Openness	The market openness index measures the degree of overall openness to banking entry and range of permissible activities. Higher values indicate less openness.	Barth, Marchetti, Nolle and Sawangngoenyuang (forthcoming)
Discrimination	The discrimination index measures the extent to which there is a regulations-related disadvantage under which foreign banks operate, post-entry, relative to domestic banks. Higher values indicate more discrimination.	Barth, Marchetti, Nolle and Sawangngoenyuang (forthcoming)
Voice and Accountability	Voice and accountability measures the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and free media. Index ranges from about -2.5 to 2.5, where higher values indicate better outcome.	World Bank

Variable Name	Definition	Source
Political Stability and Absence of violence	Political stability and absence of violence measure perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including political violence and terrorism. Index ranges from about -2.5 to 2.5, where higher values indicate better outcome.	World Bank
Government Effectiveness	Government effectiveness measures the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Index ranges from about -2.5 to 2.5, where higher values indicate better outcome.	World Bank
Regulatory Quality	Regulatory quality measures the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Index ranges from about -2.5 to 2.5, where higher values indicate better outcome.	World Bank
Rule of Law	Rule of law measures the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence. Index ranges from about -2.5 to 2.5, where higher values indicate better outcome.	World Bank
Control of Corruption	Control of corruption measures, the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Index ranges from about -2.5 to 2.5, where higher values indicate better outcome.	World Bank
Democracy	Democracy is measured by evaluating three components: the competitiveness of political participation, the openness and competitiveness of executive recruitment, and constraints on the chief executive. Index ranges from 0 to 10, where higher values indicate greater democracy.	Polity IV Project 2007, Center for Systematic Peace
Inflation	Gross domestic product deflator (annual %)	World Development Indicator 2007, World Bank; and World Economic Outlook Database, International Monetary Fund.
Real GDP Growth	Real GDP growth (annual %)	World Development Indicator 2007, World Bank; and World Economic Outlook Database, International Monetary Fund.
Real GDP per Capita	Real GDP per capita (US$)	World Development Indicator 2007, World Bank; and World Economic Outlook Database, International Monetary Fund.
Bank Domestic Credit	Domestic credit provided by banking sector (% of GDP)	World Development Indicator 2007, World Bank