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The European Banking Landscape after the Crisis

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Abstract

The financial crisis had a major impact on the banking landscape. As troubled banks were rescued by their home country, the question arises what happened to cross-border banking. Our findings indicate that cross-border banking remains strong within Europe; the Single Market in Banking is still in place. While aggregate figures indicate constant high levels of cross-border penetration within Europe, some individual banking markets have witnessed a major shift. With the demise of Fortis, cross-border penetration from EU countries fell back to 7 percent in the Netherlands. By contrast, cross-border penetration rose to 54 percent in Belgium. More broadly, American banks also kept their international orientation, while Asian-Pacific banks became even more domestically oriented.

* Duisenberg school of finance

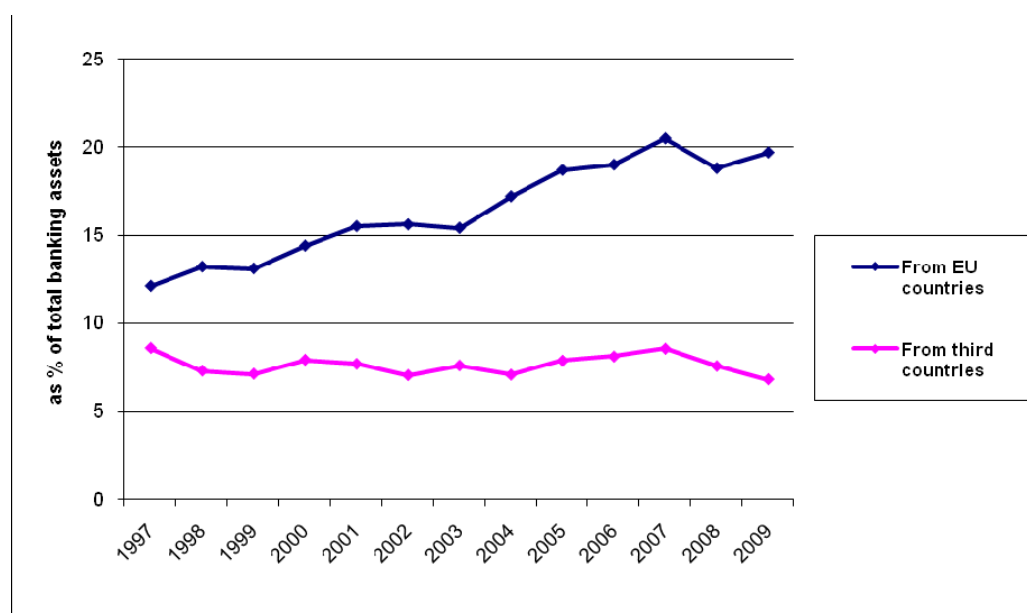
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What happened to cross-border banking?

During the recent global financial crisis, banks in need were largely rescued by their home country. As part of the rescue package, governments required banks to keep up domestic lending in return. There is anecdotal evidence that banks have been retreating from international banking. The demise of international banking is famously summarized in the quote of Mervyn King that "global banks are global in life, but national in death". The question arises what happened to cross-border banking in Europe during the crisis?

One way to assess cross-border banking is the so-called *cross-border penetration*. This measure is defined as the assets of banks from other countries (EU countries or third countries) as a percentage of the country's total banking assets. Figure 1 shows a gradual increase of average cross-border penetration from EU countries from 12 percent in 1997 to 20 percent in 2009. When we look more detailed at the crisis-episode, cross-border penetration fell back from over 20 percent in 2007 to 19 percent in 2008. But it returned to 20 percent in 2009. So, European cross-border banking has been picking up after the crisis-dip.

Figure 1 Cross-border penetration in European banking, 1997-2009



Notes: Share of assets from EU countries and third countries measured as a percentage of total banking assets. The share is calculated for the EU-27.

Source: Authors' calculations based on ECB (2004, 2007 and 2010)

The picture is different for banking flows from third countries. Cross-border penetration had been hovering around 8 percent until 2007 and fell back to less than 7 percent in 2009. Figure 1 thus indicates that financial integration is still strong in Europe, while third country inflows are levelling off.

Still major differences between old and new Member States

The degree of cross-border penetration is very uneven across the EU Member States, as Table 1 shows. The banking systems of the new Member States (NMS-12) are dominated by foreign banks at 63 percent. When the global financial crisis swept the world in 2008, many

countries in emerging Europe proved vulnerable because of their high levels of cross-border banking. Policy-makers in the region became increasingly concerned that foreign-owned banks, despite their declared long-term interest in the region, would seek to cut their losses and run. The banks themselves were also getting worried.

In the so-called Vienna Initiative, the relevant Western and Eastern European governments and banks as well as several multilateral financial institutions provided a coordinated response (Claessens et al, 2010). The Initiative combined appropriate host government policies, massive international support, and parent bank engagement. The coordinated response has fostered stability of the European banking system, both in Western Europe (where the parent banks are located) as in Central and Eastern Europe (where major subsidiaries are located). It also ensured that the high level of cross-border banking from Western to Central and Eastern Europe remained in place.

Turning to the EU-15, the average cross-border penetration is far lower at 19 percent. Luxembourg has the highest cross-border penetration at 84 percent (reflecting the country's favourable tax-regime). Finland and Belgium have also a relatively high level of cross-border penetration at 67 respectively 54 percent. The corresponding figures for France, Germany, the Netherlands, Spain and Sweden are 10 percent or less. The latter countries have mature banking markets with little cross-border inflows. We will examine the Benelux markets in more detail below.

Table 1 also shows that the penetration by banks from third countries is well below 10 percent for all EU Member States, except for the UK where it stands at 24 percent illustrating London's position as major international financial centre. Most banking business in London is focused on large corporate as well as other financial institutions (i.e. wholesale). There is much evidence suggesting that EU wholesale banking markets are highly integrated, in contrast to retail banking, that is banking services delivered to consumers and small and medium enterprises (SMEs). Most small customers receive their financial services from domestic suppliers, and the range and terms under which products are available differ across EU Member States (Dermine, 2006).

Table 1 Cross-border penetration in EU Member States, 2009

	(1)	(2)	(3)	(4)	(5)
	Number of banks	Total banking assets (in EUR billion)	Assets of domestic banks (in % of (2))	Assets of banks from other EU countries (in % of (2))	Assets of banks from third countries (in % of (2))
Old Member States					
Austria	790	1,037	81	15	5
Belgium	104	1,156	39	54	7
Denmark	164	1,105	80	18	2
Finland	349	388	33	67	0
France	712	7,156	89	10	1
Germany	1,948	7,424	89	10	1
Greece	66	490	79	21	0
Ireland	498	1,324	50	43	7
Italy	801	3,692	87	13	1
Luxembourg	147	798	6	84	10
Netherlands	295	2,217	91	7	2
Portugal	166	520	77	22	1
Spain	352	3,433	90	10	0
Sweden	180	935	92	7	1
United Kingdom	389	9,421	48	27	24
EU-15	6,961	41,093	75	19	7
New Member States					
Bulgaria	30	38	16	82	2
Cyprus	155	139	63	33	4
Czech Republic	56	160	6	90	4
Estonia	18	21	5	95	0
Hungary	190	126	41	56	3
Latvia	37	30	31	63	6
Lithuania	84	26	17	83	0
Malta	24	41	62	33	5
Poland	710	274	32	59	9
Romania	42	86	24	76	0
Slovakia	26	55	4	96	0
Slovenia	25	53	71	29	0
NMS-12	1,397	1,051	33	63	4
EU-27	8,358	42,144	74	20	7

Notes: Share of business from domestic banks, share of business of banks from EU countries and share of business of banks from third countries are measured as a percentage of the total banking assets in a country. The shares add up to 100 percent. Figures are for 2009. EU-15, NMS-12 and EU-27 are calculated as a weighted average (weighted according to assets).

Source: ECB (2010)

Changes in the top 30 of European banks

In 2009, there were nearly 8,400 banks in the EU. These banks can be segmented into three groups. The first, very large, group of banks consists of small banks operating in a region of a country. In particular Germany and Austria have many small savings and co-operative banks most of which have assets of less than EUR 1 billion. The second group consists of medium-sized banks with assets ranging from EUR 1 to 100 billion. These banks often operate on a country-wide scale. The third group are the large banks having assets up to EUR 2 trillion; they usually do a significant part of their business abroad.

Table 2 shows the biggest 30 banks in Europe, representing nearly half of the assets of the European banking system assets. Following Schoenmaker and Oosterloo (2005), we split large banks in three categories, depending on the intensity of their cross-border business. The level of cross-border business is measured using the Transnationality Index (TNI) developed by Sullivan (1994). The TNI is an unweighted average of three indicators (assets, revenues and employees) and measures foreign activity of a bank as a percentage of total activity of that bank. The TNI provides a relatively full and stable measure of cross-border activity.

A global bank has less than 50 percent of its business in the home country and less than 25 percent in the rest of Europe. These banks include HSBC, Barclays and Standard Chartered from the UK, UniCredit from Italy, BBVA from Spain and Credit Suisse and UBS from Switzerland. A European bank has less than 50 percent of its business in the home country and more than 25 percent in the rest of Europe. Some European banks focus on a specific region in the EU. The Nordea Group, for example, primarily operates in the Nordic countries. Other European banks operate Europe-wide; examples include BNP Paribas, Deutsche Bank and ING.

Finally, a domestic bank has more than 50 percent of its business in the home country. Examples include Cr dit Agricole in France, the Rabobank in the Netherlands and the Royal Bank of Scotland in the UK. The latter took over ABN-AMRO in 2007, together with Fortis and Santander.

Figure 2 shows that the number of European banks has risen from 7 in 2000 to 9 in 2010, while the number of domestic banks has been dropping from 19 in 2000 to 16 in 2010. The increased number of European banks is consistent with the rising cross-border penetration shown in Figure 1.

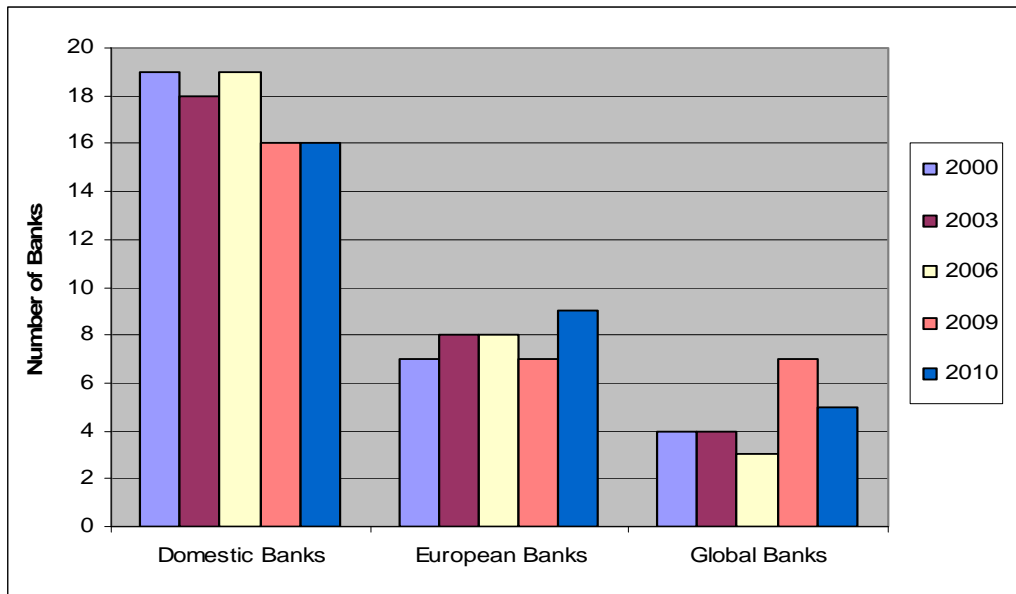
Table 2 Biggest 30 banks in Europe in 2009

Banking groups (2009 figures)	(1) Capital strength (in EUR billion)	(2) Total assets (in EUR billion)	(3) Business in home country (as % of (2))	(4) Business in rest of EU (as % of (2))	(5) Business in rest of world (as % of (2))
Global banks					
1. HSBC (UK)	85	1,641	27	17	56
2. Barclays (UK)	56	1,551	39	16	45
3. UniCredit (Italy)	39	929	41	24	35
4. BBVA (Spain)	27	535	41	2	57
5. Credit Suisse (Switzerland)	24	694	31	25	44
6. UBS (Switzerland)	21	903	39	5	56
7. Standard Chartered (UK)	17	303	15	0	85
European banks					
1. BNP Paribas (France)	63	2,058	45	34	21
2. Santander (Spain)	57	1,111	31	30	39
3. Deutsche Bank (Germany)	34	1,501	30	33	37
4. ING (Netherlands)	34	1,164	43	37	20
5. Nordea (Sweden)	20	508	21	71	8
6. Dexia (Belgium)	18	578	36	47	17
7. KBC (Belgium)	15	324	47	36	17
Domestic banks					
1. Royal Bank of Scotland (UK)	86	1,909	56	19	25
2. Lloyds Group (UK)	53	1,156	92	4	4
3. Crédit Agricole (France)	52	1,694	62	23	15
4. Groupe BPCE (France)	38	1,029	77	5	18
5. Société Générale (France)	35	1,024	56	27	17
6. Rabobank (Netherlands)	32	608	65	14	21
7. Banca Intesa (Italy)	30	625	79	19	3
8. Commerzbank (Germany)	30	844	72	20	8
9. Crédit Mutuel (France)	27	579	93	3	4
10. la Caixa (Spain)	16	272	100	0	0
11. Danske Bank (Denmark)	16	414	52	44	3
12. Landesbank Baden-Württemberg (Germany)	15	412	81	16	3
13. Bayerische Landesbank (Germany)	15	339	84	7	9
14. ABN AMRO (Netherlands)	14	260	84	12	3
15. DnB Nor Group (Norway)	12	219	81	12	6
16. Bank of Ireland (Ireland)	12	179	64	33	4

Notes: Top 30 banks are selected on the basis of capital strength ultimo 2009 (Tier 1 capital as published in *The Banker*). Global banks: less than 50 percent of business in the home country and less than 25 percent in the rest of Europe. European banks: less than 50 percent of business in the home country and more than 25 percent in the rest of Europe. Domestic banks: more than 50 percent of business in the home country.

Source: Annual reports; updated from Schoenmaker and Van Laecke (2006)

Figure 2 Biggest 30 banks in Europe, 2000-2010



Notes: See Table 2 for definitions.

Source: Annual reports; updated from Schoenmaker and Van Laecke (2006)

Although the financial crisis already started in 2007 in the US, it really took off in 2008 with the fall of Lehman Brothers on September 15. To examine the impact of the crisis on the European banking system, we compare the ultimo 2007 figures with the ultimo 2009 figures for the top 30 banks in Europe. Table 3 reports the top 30 for 2007. Comparing Tables 2 and 3, we can see the main casualties: HBOS and Fortis were still prominent at place 3 and 5 in the group of domestic banks in Europe ultimo 2007 (ABN AMRO already dropped out because of the take-over in late 2007), but has disappeared by 2009. HBOS was taken over by Lloyds and the Belgian / Luxembourg part of Fortis by BNP Paribas.

Table 4 reports the developments in assets from 2007 to 2009. The overall movement is modest, a 6 percent decline in the aggregate assets of the top 30 banks. At the bank level, there are clear winners and losers. On the losing side, RBS (-26 percent), Lloyds (-17 percent), Deutsche (-26 percent), Commerzbank (-24 percent) and ABN AMRO (-66 percent) faced substantial downsizing. Also the Swiss banks have significantly downsized with -34 percent at UBS and -17 percent at Credit Suisse as well as the two German Landesbanken (-7 and -18 percent). On the winning side are BNP Paribas (+21 percent) with its take over of the Belgian/Lux parts of Fortis and Santander (+22 percent) with the take-over of the Latin American/Italian parts of ABN AMRO as well as Alliance & Leicester and Bradford & Bingley in the UK. Other winners are the French based Group BPCE (coming out of a merger of Caisse d'Epargne and Banques Populaires), Nordea and Standard Chartered.

Table 3 Biggest 30 banks in Europe in 2007

Banking groups (2007 figures)	(1) Capital strength (in EUR billion)	(2) Total assets (in EUR billion)	(3) Business in home country (as % of (2))	(4) Business in rest of EU (as % of (2))	(5) Business in rest of world (as % of (2))
Global banks					
1. HSBC (UK)	71	1,599	24	13	63
2. Barclays (UK)	37	1,671	46	15	39
3. UBS (Switzerland)	20	1,372	34	18	48
4. Standard Chartered (UK)	11	224	13	0	87
European banks					
1. Santander (Spain)	40	913	39	27	33
2. BNP Paribas (France)	38	1,694	48	31	22
3. UniCredit (Italy)	33	1,022	40	58	2
4. ING (Netherlands)	30	994	30	26	45
5. Deutsche Bank (Germany)	28	2,020	31	30	39
6. Credit Suisse (Switzerland)	21	821	29	28	44
7. Nordea (Sweden)	14	389	27	73	0
Domestic banks					
1. Royal Bank of Scotland (UK)	60	2,587	54	18	28
2. Crédit Agricole (France)	47	1,541	60	26	14
3. HBOS (UK)	33	908	83	8	8
4. Rabobank (Netherlands)	28	571	75	14	11
5. Fortis (Belgium)	26	767	55	38	7
6. Crédit Mutuel (France)	24	553	94	5	1
7. Banca Intesa (Italy)	24	573	77	17	6
8. Groupe Caisse d'Épargne (France)	22	434	90	6	4
9. Société Générale (France)	22	1,072	59	25	16
10. BBVA (Spain)	21	502	53	1	46
11. Lloyds Group (UK)	19	481	99	0	0
12. la Caixa (Spain)	17	248	100	0	0
13. Commerzbank (Germany)	16	616	76	20	3
14. Groupe Banques Populaires (France)	15	273	91	4	5
15. Dexia (Belgium)	15	605	50	29	21
16. Landesbank Baden-Württemberg (Germany)	12	443	89	10	0
17. Bayerse Landesbank (Germany)	12	416	79	11	10
18. Danske Bank (Denmark)	11	448	59	38	3
19. Dresdner Bank (Germany)	9	500	66	23	11

Notes: Top 30 banks are selected on the basis of capital strength ultimo 2007 (Tier 1 capital as published in *The Banker*). Global banks: less than 50 percent of business in the home country and less than 25 percent in the rest of Europe. European banks: less than 50 percent of business in the home country and more than 25 percent in the rest of Europe. Domestic banks: more than 50 percent of business in the home country.

Source: Annual reports; updated from Schoenmaker and Van Laecke (2006)

Table 4 Asset developments at biggest 30 banks in Europe

Banking groups	Assets 2007 (in EUR billion)	Assets 2009 (in EUR billion)	Difference (in EUR billion)	Difference (in %)
1. Royal Bank of Scotland	2,587	1,909	-678	-26
2. HSBC	1,599	1,641	42	3
3. BNP Paribas	1,694	2,058	364	21
4. Santander	913	1,111	198	22
5. Barclays	1,671	1,551	-119	-7
6. Lloyds Group (incl HBOS) ^a	1,389	1,156	-233	-17
7. Crédit Agricole	1,541	1,694	153	10
8. UniCredit	1,022	929	-93	-9
9. Group BPCE	707	1,029	322	46
10. Société Générale	1,072	1,024	-48	-4
11. Deutsche Bank	2,020	1,501	-519	-26
12. ING	994	1,164	170	17
13. Rabobank	571	608	37	7
14. Banca Intesa	573	625	52	9
15. Commerzbank (incl Dresdner) ^b	1,116	844	-272	-24
16. Crédit Mutuel	553	579	26	5
17. BBVA	502	535	33	7
18. Credit Suisse	821	694	-127	-15
19. UBS	1,372	903	-469	-34
20. Nordea	389	508	119	30
21. Dexia	605	578	-27	-4
22. Standard Chartered	224	303	79	36
23. la Caixa	248	272	23	9
24. Danske Bank	448	414	-34	-8
25. KBC	356	324	-31	-9
26. Landesbank Baden-Württemberg	443	412	-32	-7
27. Bayerische Landesbank	416	339	-77	-18
28. ABN AMRO	767	260	-507	-66
29. DnB NOR Group	183	219	36	20
30. Bank of Ireland	212	179	-33	-15
Total	27,007	25,364	-1,643	-6

Notes: Top 30 banks are selected on the basis of capital strength ultimo 2009 (Tier 1 capital as published in *The Banker*).

^aLloyds merged with HBOS. Their combined 2007 assets are 1,389 (Lloyds 481 and HBOS 908).

^bCommerzbank took over Dresdner Bank. Their combined 2007 assets are 1,116 (Commerz 616 and Dresdner 500).

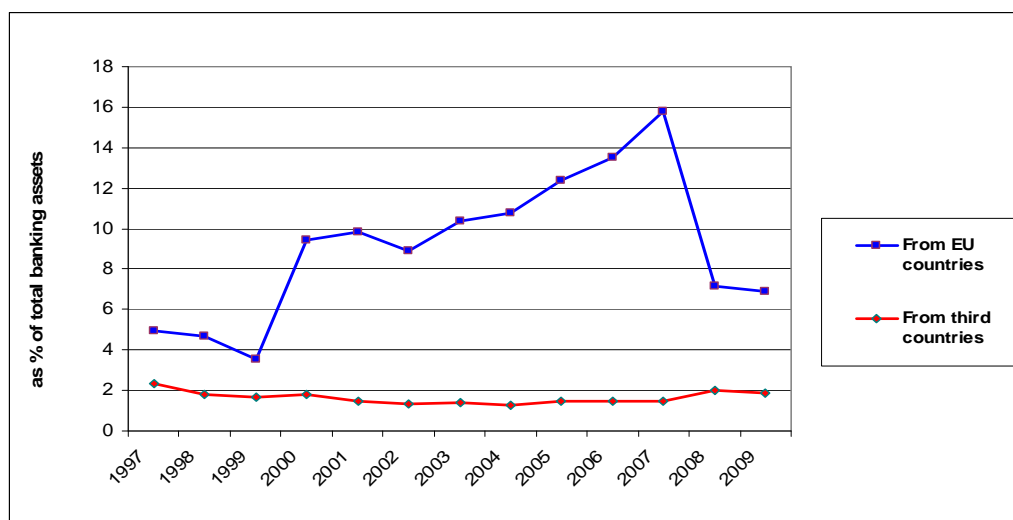
Source: Annual reports; updated from Schoenmaker and Van Laecke (2006)

Upheaval in the Benelux

Cross-border penetration from EU countries increased steadily in the Netherlands, since the Belgian-based Fortis Group merged several Belgian and Dutch banks into Fortis Bank in 2000. Figure 3 indicates that the cross-border penetration jumped to 10 percent in 2000 and subsequently increased to 16 percent in 2007. But the Dutch banking landscape was fundamentally reshaped in 2007, just ahead of the global financial crisis. A major player, ABN AMRO, was taken over by a consortium of Royal Bank of Scotland, Fortis and Santander. To allow for an orderly transition and split-up, the consortium created a Dutch holding, RFS

Holdings, to manage ABN AMRO. For competition purposes, Fortis had to sell some Dutch parts of ABN AMRO. It planned to sell HBU, a business banking part of ABN AMRO, to Deutsche Bank. Before the split-up and sell-off could be completed, the global financial crisis started in 2008. The hefty take-over premium paid for ABN AMRO took its toll, in particular, on RBS and Fortis.

Figure 3 Cross-border penetration in the Netherlands, 1997-2009



Note: Share of assets from EU countries and third countries measured as a percentage of total banking assets in the Netherlands.

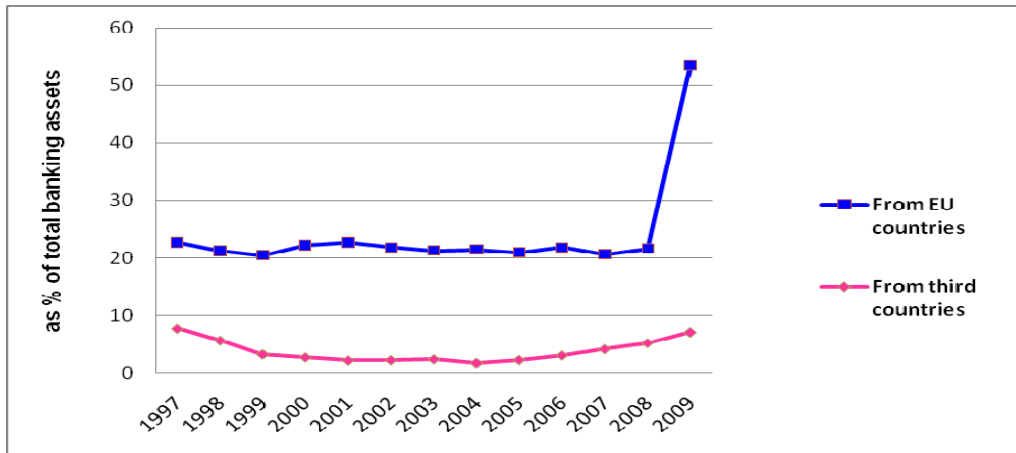
Source: Authors' calculations based on ECB (2004, 2007 and 2010)

The outcome is well known: the Dutch government nationalised the Dutch part of Fortis Group, including the Fortis stake in ABN AMRO. In 2010, the sale of HBU to Deutsche Bank was completed and RBS took its stake in RFS holdings. The result is that Fortis Netherlands and ABN AMRO merged into ABN AMRO (counted as domestic) and that RBS and Deutsche Bank increased their foothold in the Netherlands (counted as cross-border). With the demise of Fortis, cross-border penetration from EU countries fell back from 16 percent to 7 percent in the Netherlands.¹ Table 1 above indicates that the Netherlands (together with Sweden) has now the lowest level of cross-border inflows within the European Union.

By contrast, cross-border penetration increased in Belgium. While the Dutch part of Fortis was sold to the Netherlands government, the remaining part of Fortis was sold to BNP Paribas (later renamed to BNP Paribas Fortis). As Fortis was one of the major banks in Belgium, the sale to French based BNP Paribas increased cross-border penetration from 22 percent in 2008 to 54 percent in 2009 (see figure 4).

¹ ECB figures indicate that cross-border penetration fell back to about 3.5 percent in 2008 and 2009 (ECB, 2010). But RFS holdings, a Dutch holding, was counted as domestic business by the ECB. We made a correction for the RBS stake in RFS holdings - about EUR 65 bn in the Netherlands (RBS Holdings NV, Annual Report 2010) - and for the sale of HBU to Deutsche Bank - about EUR 12 bn in the Netherlands (Deutsche Bank, Annual Report 2010).

Figure 4 Cross-border penetration in Belgium, 1997-2009



Note: Share of assets from EU countries and third countries measured as a percentage of total banking assets in the Netherlands.

Source: Authors' calculations based on ECB (2004, 2007 and 2010)

International banking remains strong, except for Asian-Pacific banks

Turning to international banking, we also examine developments of large banks on the other continents, the Americas and the Asia-Pacific. The 60 largest banks are selected on the basis of Tier 1 capital, as reported in *The Banker*. As the European banks cover about 50 percent of asset of the Banker's Top 1,000 world banks, our dataset also consist of more European than American or Asian-Pacific banks. The dataset is divided into three samples: top 30 European banks, top 15 American banks and top 15 Asian banks.

The geographical segmentation of these banks are reported in the Annex for the years 2006 to 2009. Table 5 summarizes the data. European banks are the most international, with close to 50 percent of business abroad. This may be due to the integrated European banking market. But even when looking at the business outside the region, European banks are the most international with about 25 percent of business in the rest of the world. The American banks are catching up; their business in the rest of the world is rising from 14 percent in 2006 to 21 percent in 2009. So, the European and American banks have kept their international outlook throughout the financial crisis.

The picture is very different for the Asian-Pacific banks. They used to have a very domestic orientation (Schoemaker and Van Laecke, 2006), which was reinforced over the last years. Business in the rest of the world has been declining from 13 percent in 2006 to 8 percent in 2009. Although the Asian-Pacific banks are least affected by the US originated financial crisis, they seem to be retrenching from the international scene. The composition of the top 15 Asian-Pacific banks is shifting from the major Japanese banks to the major Chinese banks (see table A3 in the Annex). The Chinese banks have even a stronger domestic orientation than the Japanese banks.

Table 5 Development of international banking by continent, 2006-2009

Continent	2006			2007			2008			2009		
	h	r	w	h	r	w	h	r	w	h	r	w
Europe	52	23	25	52	22	25	51	21	28	52	22	26
Americas	78	8	14	75	10	15	73	9	18	72	7	21
Asia-Pacific	82	5	13	83	6	11	82	7	11	85	7	8

Notes: Share of business in home country (h), rest of region (r) and rest of world (w) of the top banks by continent. The top 30 banks for Europe; the top 15 banks for Americas and Asia-Pacific. The shares add up to 100 percent.

Source: Authors' calculations based on annual reports (see annex for breakdown of data); updated from Schoenmaker and Van Laecke (2006)

Market structure and competition

A final question is what happened with the market structure in the EU countries. Have the banking markets become more concentrated? Table 6 shows some indicators about the structure of the EU banking sector. Between 2006 and 2009 the total number of banks in the EU decreased from 8,507 to 8,358. When we exclude the jump in the number of credit institutions in Ireland², the number of banks decreased to 7,938, that is a reduction of nearly 7 percent. Due to the decline in the number of credit institutions the concentration in the national banking markets has increased. Table 6 presents two concentration measures: the market share of the biggest five banks (CR5) and the Herfindahl Index, which is defined as the sum of the squares of the market shares of all banks in the sector ($HI = \sum s_i^2$, where s_i is the market share of bank i). While the CR5 ratio is easily measurable, it does not take into account the remaining banks in the industry in contrast to the Herfindahl Index. The latter ranges between $1/n$ and 1, reaching its lowest value, the reciprocal of the number of banks (n), when all banks in a market are of equal size, and reaching unity in the case of monopoly. The index as published by the ECB has been rescaled and ranges between 0 and 10,000.

Table 6 shows that there are substantial concentration differences across the EU. In Austria, France, Germany, Ireland, Italy, Luxemburg, Spain, and the United Kingdom the concentration ratios in the banking markets are relatively low. The highest concentration ratios can be found in Belgium, Estonia, Finland, Lithuania, and the Netherlands. The latter group of countries also have a high Herfindahl Index. The European Commission investigates a proposed merger when the (rescaled) Herfindahl Index would pass the threshold of 2,000 after the merger. Estonia (3,090), Finland (3,120) and the Netherlands (2,032) report a Herfindahl Index greater than 2,000. The reported figures measure the concentration in the overall banking market of a country.

It may be useful to drill down to the various sub-markets in banking. The UK reports, for example, an overall Herfindahl Index of 467, while the Index for the respective sub-markets is far higher: 1830 for personal current accounts, 1220 for savings accounts, 1260 for mortgages, 1620 for personal loans, 1040 for credit cards and 1920 for SME banking (Independent Commission on Banking, 2011). So, the more detailed figures for the sub-markets give a better picture of the concentration levels in banking.

² The jump in the number of credit institutions in Ireland is attributable to a reclassification of 419 credit unions as credit institutions in 2009.

The relevant geographical market for various banking services differs (De Haan *et al*, 2009). The market for banking services to households and SMEs is national. For retail banking, the national concentration ratios in table 6 are thus applicable. While the market for wholesale banking services to large corporates is European, the investment banking market is even global. For competition in wholesale and investment banking, it may be useful to take a system-wide perspective at the European level. Table 7 reports the concentration ratio of the EU banking system. The EU banking system is not very concentrated. To measure the market shares precisely, we only take the assets in the EU (home and rest of Europe) of each bank. BNP Paribas has the largest market share with 4.0 percent. To compare, Bank of America has a market share of 10 percent of the US banking system. While Bank of America (total US assets of 1,250 EUR bn) is smaller than BNP Paribas (total EU assets of 1,676 EUR bn), this difference reflects the fact that the EU has a far larger banking system than the US (also relative to GDP).

Table 6 Market structure indicators

	Size		Concentration				Competition
	Number of banks		CR5 (in %)		Herfindahl Index		H-statistic
	2006	2009	2006	2009	2006	2009	1990-2005
Old Member States							
Austria	809	790	44	37	534	414	0.07
Belgium	105	104	84	77	2,041	1,622	0.54
Denmark	191	164	65	64	1,071	1,042	0.30
Finland	361	349	82	83	2,560	3,120	-0.24
France	829	712	52	47	726	605	0.58
Germany	2,050	1,948	22	25	178	206	0.65
Greece	62	66	66	69	1,101	1,184	0.47
Ireland	78	498	49	59	649	881	1.11
Italy	807	801	26	34	220	353	0.08
Luxembourg	156	147	29	28	294	288	0.31
Netherlands	345	295	85	85	1,822	2,032	0.80
Portugal	178	166	68	70	1,134	1,150	-0.14
Spain	352	352	40	43	442	507	0.87
Sweden	204	180	58	61	856	899	0.48
United Kingdom	394	389	36	41	394	467	0.76
EU-15	6,921	6,961	43	44	601	630	0.59
New Member States							
Bulgaria	32	30	50	58	707	846	n.a.
Cyprus	336	155	64	65	1,056	1,086	-0.11
Czech Republic	57	56	64	62	1,104	1,032	0.77
Estonia	14	18	97	93	3,593	3,090	0.47
Hungary	212	190	54	55	823	861	0.16
Latvia	28	37	69	69	1,271	1,181	0.57
Lithuania	78	84	83	81	1,913	1,693	0.45
Malta	18	24	71	73	1,171	1,246	0.72
Poland	723	710	46	44	599	574	0.10
Romania	39	42	60	52	1,165	857	0.63
Slovakia	24	26	67	72	1,131	1,273	0.26
Slovenia	25	25	62	60	1,300	1,256	0.38
NMS-12	1,586	1,397	59	58	1,012	973	0.31
EU-27	8,507	8,358	43	45	612	638	0.59

Notes: CR5 is the share of the five largest banks in a country, measured as a percentage of total assets. The Herfindahl Index is calculated as the sum of the squares of all the banks' market shares according to total assets, and rescaled from 0 to 10,000. EU-15, NMS-12 and EU-27 are calculated as a weighted average (weighted according to assets).

Source: Number of banks and concentration from ECB (2010); competition from Bikker *et al.* (2006)

Table 7 indicates that the market share of the five largest European banks (CR5) is 16 percent of the EU banking system. The share of the 10 and 25 largest banks (CR10 and CR25) are 26 percent respectively 42 percent. These concentration figures are rather low. While Europe has very large banks (Table 2), the EU banking market as a whole is not very concentrated. So, the market for wholesale and investment banking seems to be competitive.

Table 7 Concentration of EU banking system, 2009

Banking group (2009 figures)	Total assets	Assets in EU	Assets in EU	% of EU banking assets
	(in EUR bn)	(in %)	(in EUR bn)	(in %)
1. BNP Paribas	2,058	81	1,676	4.0
2. Crédit Agricole	1,694	89	1,504	3.6
3. Royal Bank of Scotland	1,909	75	1,429	3.4
4. Lloyds Group	1,156	95	1,094	2.6
5. Group BPCE	1,029	89	920	2.2
6. Deutsche Bank	1,501	60	898	2.1
7. Barclays	1,551	58	892	2.1
8. Santander	1,111	80	889	2.1
9. Société Générale	1,024	85	867	2.1
10. HSBC	1,641	50	823	2.0
11. ING	1,164	69	802	1.9
12. Commerzbank	844	92	772	1.8
13. Banca Intesa	625	97	608	1.4
14. UniCredit	929	58	541	1.3
15. Crédit Mutuel	579	93	537	1.3
16. Rabobank	608	84	511	1.2
17. Dexia	578	83	479	1.1
18. Nordea	508	91	460	1.1
19. Landesbank Baden-Würt,	412	100	412	1.0
20. Danske Bank	414	99	410	1.0
21. Bayerische Landesbank	339	90	305	0.7
22. la Caixa	272	100	272	0.6
23. KBC	324	82	266	0.6
24. ABN AMRO	260	98	255	0.6
25. BBVA	535	45	241	0.6
Total top 25	23,065		17,861	42.4
Total EU banking assets	42,144			
Concentration ratios				(in %)
CR5				15.7
CR10				26.1
CR25				42.4

Notes: CR5 (10, 25) is the share of the five (ten, twenty-five) largest banks in the EU ranked according to assets in the EU, measured as a percentage of total EU banking assets.

Source: Tables 1 and 2

Another important feature of markets is the degree of competition. Panzar and Rosse (1977) have constructed a measure of competition, the so-called *H-statistic*, that is defined as the sum of the factor price elasticities of interest revenue with respect to borrowed capital, labour

and physical capital. The value of H can be interpreted as follows. In case of a monopoly, H is lower than or equal to zero. This also applies to an oligopolistic market with cartels or complete imitation of each other's behaviour. A value of H between zero and one indicates monopolistic competition. A value equivalent to one points to perfect competition, as each change in input prices leads to a comparable change in output prices. The results of Bikker *et al.*, (2006) as shown in Table 6 suggest that there is strong competition (that is values of H above 0,75) in the banking sectors of the Czech Republic, Ireland, the Netherlands, Spain, and the United Kingdom. France and Germany have an intermediate level of competition (H around 0,60), while banking competition in Italy is low.

The *structure-conduct-performance (SCP) paradigm* postulates a connection between market structure, banking behaviour, and profitability. The reasoning is as follows: in markets with a high degree of concentration, firms have more market power, which allows them to set prices above marginal costs and achieve higher profits. While earlier studies find a relationship between concentration and profitability, more recent studies suggest that there is no connection between the two (Claessens and Laeven, 2004).

Two alternative theories suggest that concentration does not necessarily reduce market competition. According to the *contestability theory*, a concentrated banking market can still be competitive as long as the entry barriers for potential newcomers are low. According to the *efficiency hypothesis*, the most efficient banks gain market share at the cost of less efficient banks. In other words, high concentration can be a result of fierce competition in a market (Bikker *et al.*, 2006).

Claessens and Laeven (2004) examine the competitiveness of a banking market in a large cross-section of countries and find no evidence that banking system concentration is negatively associated with competitiveness. In fact, they sometimes find evidence that more concentrated banking systems are more competitive.

Concentration is loosely related to bank size. Markets become more concentrated when the number of banks decreases or when the skewness of the size distribution of banks increases (that is the number of large banks increases). But the markets in some countries (e.g., Germany and France) have low levels of concentration and large banks. As pointed out by Bikker *et al.*, (2006), large banks may have market power as they are probably in a better position to collude with other banks and may benefit from a more established reputation. Furthermore, they are in a better position than small banks to create new banking products due to economies of scale. Indeed, Bikker *et al.*, (2006) report that market power increases with bank size. Their research covers 18,467 banks in 101 countries over a period of 16 years.

Concluding remarks

This paper investigates the strength of cross-border banking after the financial crisis. It appears that cross-border banking remains strong across Europe, both in Western Europe as well as in Central and Eastern Europe. Anecdotal stories about banks that are retreating to their domestic market are not supported by the figures. Nevertheless, there has been some Schumpeterian restructuring in the European banking market. While some banks disappeared (Fortis, HBOS) or were severely affected by the crisis (RBS, Lloyds, ABN AMRO, UBS), other banks gained (BNP Paribas, Santander, Commerzbank). The overall figures indicate that cross-border banking within Europe has returned to the pre-crisis level. The Single Market in Banking is alive and kicking.

During the crisis, some ailing banks have been taken over by their (often domestic) competitors. We find a slight increase in concentration levels of national banking markets. Competition authorities are currently monitoring whether competition in retail banking services is still appropriate (for example, the Independent Banking Commission in the UK). At the system-wide level, we find that the overall European banking market is not very concentrated. So, competition in wholesale and investment banking services is adequate.

Finally, and most importantly, our findings suggest that the financial authorities will continue to have to deal with European banks. The crisis has learned that national authorities cannot deal effectively with the resolution of cross-border banks. The newly created European Banking Authority and the European Systemic Risk Board have thus their work cut out (see, for example, Allen *et al*, 2011; and Schoenmaker, 2011).

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ANNEX

Table A1. Index for the Cross-Border Business of Top 30 European Banking Groups for the years 2006 - 2010

2006				2007				2008				2009				2010			
Bank	h	r	w	Bank	h	r	w	Bank	h	r	w	Bank	h	r	w	Bank	h	r	w
HSBC (UK)	24	11	65	HSBC	24	13	63	RBS	54	21	25	RBS	56	19	25	RBS	60	10	30
Credit Agricole (FR)	64	20	16	RBS	54	18	28	HSBC	28	12	60	HSBC	27	17	56	HSBC	22	11	67
RBS (UK)	69	8	23	Credit Agricole	60	26	14	Credit Agricole	62	22	15	BNP	45	34	21	BNP	41	39	20
Santander (ES)	31	35	35	Santander	39	27	33	Santander	35	27	38	Santander	31	30	39	Santander	20	35	44
BNP (FRr)	52	30	18	BNP	48	31	22	BNP	52	26	22	Barclays	39	16	45	Barclays	38	15	47
Barclays (UK)	49	13	37	Barclays	46	15	39	Barclays	42	15	43	Lloyds	92	4	4	Lloyds	65	10	25
HBOS (UK)	86	7	7	HBOS	83	8	8	Unicredit	44	37	19	Credit Agricole	62	23	15	Credit Agricole	64	25	11
Unicredit (IT)	29	68	3	Unicredit	40	58	2	ING	30	22	48	Unicredit	41	24	35	Unicredit	39	27	34
Rabobank (NL)	73	15	12	ING	30	26	45	Deutsche Bank	43	24	33	Group BPCE	77	5	18	Group BPCE	82	8	11
ING (NL)	29	25	45	Rabobank	75	14	11	Rabobank	69	15	16	Societe Generale	56	27	17	Societe Generale	61	24	16
UBS (CH)	24	24	51	Deutsche Bank	31	30	39	Societe Generale	61	24	15	Deutsche Bank	30	33	37	Deutsche Bank	39	30	31
Deutsche Bank (DE)	27	36	36	Fortis	55	38	7	Banca Intesa	84	15	1	ING	43	37	20	ING	42	32	26
ABN AMRO (NL)	32	34	34	Credit Mutuel	94	5	1	Credit Mutuel	91	6	3	Rabobank	65	14	21	Rabobank	75	9	16
Credit Mutuel (FR)	93	5	1	Banca Intesa	77	17	6	Credit Suisse	30	28	42	Banca Intesa	79	19	3	Banca Intesa	82	15	3
Societe Generale (FR)	58	31	11	GCE	90	6	4	UBS	30	13	57	Commerzbank	72	20	8	Commerzbank	67	25	8
Credit Suisse (CH)	28	25	46	Societe Generale	59	25	16	Commerzbank	69	27	4	Credit Mutuel	93	3	4	Credit Mutuel	78	15	7
BBVA (ES)	53	1	45	Credit Suisse	29	28	44	BBVA	41	2	57	BBVA	41	2	57	BBVA	37	0	63
Lloyds (UK)	99	0	0	BBVA	53	1	46	Fortis	63	35	2	Credit Suisse	31	25	44	Credit Suisse	30	26	44
GCE (FR)	81	2	17	UBS	34	18	48	HBOS	90	5	5	UBS	39	5	56	UBS	35	13	51
GBP (FR)	81	8	11	Lloyds	99	0	0	GBP	93	4	3	Nordea	21	71	8	Nordea	22	71	8
Fortis (NL)	56	38	7	la Caixa	100	0	0	Dexia	44	44	12	Dexia	36	47	17	Dexia	42	40	18
Commerzbank (DE)	74	20	6	Commerzbank	76	20	3	Nordea	36	60	4	S.C.	15	0	85	S.C.	16	0	84
Nordea (SE)	27	73	0	GBP	91	4	5	la Caixa	100	0	0	la Caixa	100	0	0	la Caixa	99	1	0
Dexia (BE)	53	33	15	Dexia	50	29	21	Lloyds	100	0	0	Danske Bank	52	44	3	Danske Bank	49	51	1
Danske Bank (DK)	59	36	5	Nordea	27	73	0	S.C.	12	0	88	KBC	47	36	17	KBC	55	27	18
Banca Intesa (IT)	79	11	10	Landesbank B-W	89	10	0	KBC	44	37	19	L.B.W.	81	16	3	L.B.W.	73	21	6
Dresdner (DE)	65	25	10	Bayerische LB	79	11	10	L.B.W.	89	11	0	B.L.B.	84	7	9	B.L.B.	88	5	7
la Caixa (ES)	100	0	0	Standard Chartered	13	0	87	Danske Bank	48	50	2	ABN AMRO	84	12	3	ABN AMRO	87	8	5
Sanpaolo IMI (IT)	86	11	3	Danske Bank	59	38	3	B.L.B.	81	8	11	DnB NOR Group	81	12	6	DnB NOR Group	81	14	5
KBC (BE)	50	29	22	Dresdner	66	23	11	Bank of Ireland	62	35	3	Bank of Ireland	64	33	4	Bank of Ireland	63	31	6
Weighted average	52	23	25		52	22	25		51	21	28		52	22	26		50	22	28
No. of domestic banks		19				19				16				16				16	
No. of European banks		8				7				7				7				9	
No. of global banks		3				4				7				7				5	

Sources: Annual reports over 2006-2009 and own calculations for the Index; *The Banker* (2006 - 2010) for capital strength.

Notes: 'Home' is defined as a bank's business in its home country (h); 'Rest of the region' is defined as a bank's business in other countries in the region (r); 'Rest of world' is defined as a bank's business in countries outside the region (w). The three categories add up to 100%. Banks are ranked according to 'capital strength' (Tier 1 capital) as reported by *the Banker*.

Table A2. Index for the Cross-Border Business of Top 15 American Banking Groups for the years 2006 - 2009

2006				2007				2008				2009			
Bank	h	r	w	Bank	h	r	w	Bank	h	r	w	Bank	h	r	w
Bank of America (US)	89	3	9	Citigroup	44	24	33	JPMorgan Chase	74	2	24	BoA	81	1	18
Citigroup (US)	52	20	29	JPMorgan Chase	73	3	24	BoA	91	2	7	JPMorgan Chase	75	2	23
JPMorgan Chase (US)	74	2	24	BoA	89	2	9	Citigroup	37	29	33	Citigroup	32	20	48
Wachovia (US)	100	0	0	Wachovia	100	0	0	Wells Fargo	100	0	0	Wells Fargo	100	0	0
Wells Fargo (US)	100	0	0	Wells Fargo	100	0	0	Goldman Sachs	64	0	36	Goldman Sachs	57	0	43
Royal Bank of Canada (Canada)	74	17	9	RBC	64	23	13	Morgan Stanley	62	0	38	Morgan Stanley	78	0	22
Washington Mutual (US)	100	0	0	WM	100	0	0	Itau Unibanco	91	7	2	Itau Unibanco	92	8	0
Scotiabank (Canada)	64	16	20	Scotiabank	63	15	22	RBC	65	20	14	RBC	60	25	14
US Bancorp (US)	100	0	0	BoM	70	24	7	US Bancorp	100	0	0	Scotiabank	55	20	25
Countrywide Financial (US)	100	0	0	US Bancorp	100	0	0	PNC	100	0	0	PNC	100	0	0
Toronto-Dominion (Canada)	69	20	10	Banco Bradesco	99	1	1	Scotiabank	62	11	27	Banco Bradesco	98	1	1
Bank of Montreal (Canada)	69	25	6	Itau Unibanco	89	10	2	Banco Bradesco	90	5	5	Banco de Brasil	99	1	1
Suntrust (US)	99	1	1	Toronto-Dominion	70	18	12	Toronto-Dominion	68	24	8	US Bancorp	100	0	0
COFC (US)	92	2	6	CIBC	66	30	4	BoM	67	27	6	GMAC	69	24	8
National City Corp (US)	100	0	0	COFC	92	2	5	Suntrust	99	1	1	Toronto-Dominion	64	27	10
Weighted average	78	8	14		75	10	15		73	9	18		72	7	21
No. of domestic banks		15				14				14				14	
No. of American banks		0				0				1				0	
No. of global banks		0				1				0				1	

Sources: Annual reports over 2006-2009 and own calculations for the Index; *The Banker* (2006 - 2010) for capital strength.

Notes: 'Home' is defined as a bank's business in its home country (h); 'Rest of the region' is defined as a bank's business in other countries in the region (r); 'Rest of world' is defined as a bank's business in countries outside the region (w). The three categories add up to 100%. Banks are ranked according to 'capital strength' (Tier 1 capital) as reported by *the Banker*.

Table A3. Index for the Cross-Border Business of Top 15 Asian-Pacific Banking Groups for the years 2006 - 2009

2006				2007				2008				2009			
Bank	h	r	w	Bank	r	w	Bank	h	r	w	Bank	h	r	w	
Mitsubishi UFJ (Japan)	71	5	24	Mitsubishi UFJ	74	6	20	Mitsubishi UFJ	73	6	20	ICBC	93	7	0
Industrial Commercial Bank of China	98	1	1	ICBC	98	1	1	ICBC	95	5	0	Mitsubishi UFJ	78	6	16
Bank of China	72	16	11	BoC	77	17	6	BoC	83	13	5	BoC	84	14	2
China Construction Bank	100	0	0	CCB	96	2	2	CCB	96	2	2	CCB	96	2	2
Mizuho (Japan)	67	5	28	Mizuho	74	5	21	Mizuho	70	5	25	Sumitomo Mitsui	84	4	12
Sumitomo Mitsui (Japan)	84	5	11	Sumitomo Mitsui	84	4	12	Sumitomo Mitsui	81	5	14	Mizuho	78	4	19
Norinchukin (Japan)	78	5	17	Resona	90	5	5	ABC	100	0	0	ABC	99	0	1
National Australia Bank	67	11	22	Norinchukin	81	5	14	Norinchukin	80	6	14	NAB	68	13	19
Resona (Japan)	90	5	5	NAB	74	8	19	NAB	62	15	23	Westpac	86	9	6
Australia New Zealand Bank. Group	67	26	7	Bank of Comm.	98	1	1	Resona	90	5	5	Norinchukin	85	4	11
								Bank of							
Commonwealth Banking Group (Aus)	81	13	6	ANZ	68	25	7	Communications	97	1	1	ANZ	68	24	8
Kookmin (Korea)	100	0	0	Kookmin	100	0	0	ANZ	68	25	7	Bank of Comm.	97	2	2
Agricultural Bank of China	100	0	0	State Bank of India	93	4	4	DBS Bank	64	35	1	Resona	93	3	3
												Commonwealth			
Woori (Korea)	100	0	0	Commonwealth B.G.	82	15	3	Commonwealth B. G.	83	14	3	B.G.	86	12	2
Bank of Communications (China)	93	3	3	Woori	100	0	0	Westpac	84	11	5	DBS Bank	62	36	2
Weighted average	82	5	13		83	6	11		82	7	11		85	7	8
No. of domestic banks		15				15				15				15	
No. of Asian-Pacific banks		0				0				0				0	
No. of global banks		0				0				0				0	

Sources: Annual reports over 2006-2009 and own calculations for the Index; *The Banker* (2006 - 2010) for capital strength.

Notes: 'Home' is defined as a bank's business in its home country (h); 'Rest of the region' is defined as a bank's business in other countries in the region (r); 'Rest of world' is defined as a bank's business in countries outside the region (w). The three categories add up to 100%. Banks are ranked according to 'capital strength' (Tier 1 capital) as reported by *the Banker*.