

# When Austrian banks cross borders

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*Cross-border banking fulfills an important function in financial resource allocation. International financial integration can have great benefits, such as risk diversification and increased competition, but may at the same time result in financial imbalances that in turn contribute to the build-up of financial stability risks. The first part of this article outlines some stylized facts about recent cross-border activities of Austrian banks. In the second part, I reflect on four basic aspects of cross-border banking flows with a potential impact on financial stability: first, the cyclical nature of cross-border flows; second, banks' reliance on different types of funding sources; third, borrowing and lending in a foreign currency; and fourth, the geographical distribution of banking counterparties.*

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In 2012 a group of researchers from Austria, Germany, the United Kingdom and the U.S.A. established the International Banking Research Network (IBRN) with the aim of bringing together central bank researchers from around the world to analyze issues pertaining to global banks. The IBRN saw a need for joint analysis of key questions, such as the role of cross-border banking in the transmission of financial shocks and the benefits of each participating central bank having access to bank-, time- and country-level data. The network enables researchers at the participating central banks to use the manifold micro data that commercial banks are required to report to their central banks. Usually those data sources are not predominantly used for research purposes. The goal was to define common data standards for each country team, which would allow the comparison of estimations across countries without exchanging individual confidential data sets. So far, 26 institutions<sup>2</sup> have joined the IBRN. Its co-directors are Linda Goldberg, Vice

President of the Financial Intermediation Function of the Federal Reserve Bank of New York, and Claudia Buch, Deputy President of the Deutsche Bundesbank. The IBRN's first research project (2013) explores how funding shocks affecting parent banks are transmitted to foreign countries through these banks' cross-border activities. One study presents an overview of the analysis and findings, with eleven country studies reporting the country-specific findings produced with individual central bank data applying a common econometric methodology. All articles are currently under revision in the IMF Economic Review. Under the IBRN's second research topic (2014) participants explore the changing scale, type, and location of banking activity stemming from shifts in micro- and macro-prudential regulatory policy. For this purpose, Cerrutti et al. (2015) provide new data and measures of quarterly changes in prudential instruments for 57 countries for the years from 2000 to 2014.

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<sup>2</sup> Reserve Bank of Australia, Oesterreichische Nationalbank, Banco Central do Brasil, Bank of Canada, Central Bank of Chile, Banque de France, Deutsche Bundesbank, European Systemic Risk Board, Hong Kong Monetary Authority, Central Bank of India, Central Bank of Ireland, Banca d'Italia, Bank of Korea, Banco de Mexico, De Nederlandsche Bank, National Bank of Poland, Banco de Portugal, Banka Slovenije, Banco de España, Sveriges Riksbank, Swiss National Bank, Central Bank of the Republic of Turkey, Bank of England, U.S. Federal Reserve System, Bank for International Settlements and International Monetary Fund.

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Working with micro banking data yields enormous benefits. In particular, it allows combining information on different units like banks, firms, households and recipient countries to evaluate behavior within financial systems. An international bank decides on credit provision in one country relative to its credit provision in another country. Conditions in one country (e.g. less regulation or easier access to wholesale funding) will impact the bank's overall lending strategy. The aim of IBRN studies is to account for bank specificities within a (potentially causal) framework that links bank shocks to various transmission channels. This should not be understood as an argument in favor of collecting more and more detailed data or singling out one particular bank and its lending behavior. Central banks already accommodate comprehensive micro-level data, which are collected for various purposes. Looking at these data from a microeconomic perspective will help to gain improved insights relevant to financial stability. Yet micro data analysis also involves specific challenges to economists. Not only do we need to agree on common methodologies and data terminologies. But the granularity of the data implies that more tedious and elaborate data processing is necessary compared to macroeconomic analysis. In general, central banks host many high-quality micro-level databases. Central banks report a selection of commercial banks' balance sheet positions in aggregated format to the Bank for International Settlements (BIS). The data sets are harmonized and, most importantly, accessible without confidentiality restrictions. Unfortunately, the BIS consoli-

dated and locational statistics offer only a limited perspective of the funding side of banking. Efforts are currently underway to achieve a more detailed reporting of liability breakdowns in future.<sup>3</sup>

Austrian banks are much smaller in terms of cross-border banking volumes than German or U.S. global banks. However, one distinguishing feature of Austrian banks is their unparalleled exposure to Eastern Europe. Key cross-border statistics of large internationally active Austrian, German and U.S. banks show that the cross-border banking activities of Austrian banks in terms of GDP are substantial and therefore important for systemic risk monitoring. The Austrian participation in and active contribution to the network yields insights both for the international and national policy discussion, but also contributes to improved analysis at the Austrian central bank. On the basis of a range of supervisory data (which commercial banks are required to report to the Oesterreichische Nationalbank), a complex data set covering the period from 2005 to 2012 has been produced. This article aims to demonstrate different aspects and broad trends of cross-border banking from an Austrian perspective. For a more recent and current policy debate on cross-border banking covering 2013 and 2014 selected references have been provided.

## 1 Key figures of the Austrian banking sector

To shed some light on the dimensions of cross-border banking, I provide some key figures for Austria. We observe around 800 incorporated financial institutions, with approximately half of the institutions representing

<sup>3</sup> Another major limitation of country aggregate banking statistics is that they do not facilitate the in-depth analysis of banking channels and incidences on home and host markets. For such an analysis we need to work with bank- and country-level information.

95% of the sector's total assets. The majority of these banks have no foreign affiliates (395) and only 42 own foreign affiliates. Among the banks with total assets of more than EUR 500 million, 150 banks have no foreign affiliates, and 36 do have foreign affiliates. Foreign affiliates take the form of branches or subsidiaries. The majority of Austrian parent banks that own foreign affiliates operate them in up to 3 countries (27 Austrian parent banks), and 9 Austrian parent banks have affiliates in 4 or more countries, of which 4 parent banks have affiliates in 14 or more countries. Broadly speaking, we observe three channels through which Austrian globally operating banks provide credit to counterparties outside Austria.<sup>4</sup> First, Austrian parent banks engage in direct cross-border activities, i.e. they lend to and take deposits from foreign counterparties. Second, Austrian parent banks serve their affiliates. Third, subsidiaries outside Austria provide credit to local counterparties and engage in cross-border banking activities.

To put the lending definitions into perspective, I present some relative magnitudes for the fourth quarter of 2012. At the unconsolidated level, direct cross-border total claims are equivalent to approximately 75% of Austrian GDP (EUR 231 billion). About half of this amount (36% of GDP or EUR 113 billion) are cross-border claims on nonaffiliated banks. Loans to affiliated banks amount to 18% of GDP (EUR 57 billion). Claims of Austrian banks' foreign subsidiaries (local

claims) are approximately 95% of GDP (EUR 288 billion). At the consolidated level, Austrian banks' total claims amount to an equivalent of 163% of Austrian GDP (EUR 503 billion).

Why is it important to distinguish between unconsolidated and consolidated data? In Austria, individual bank entities report unconsolidated cross-border banking statistics in great detail. Cross-border activities of Austrian banks' foreign subsidiaries are reported separately, and intra-group flows between Austrian parent institutions and foreign subsidiaries are not reported in balance sheet statistics and therefore have to be approximated.<sup>5</sup> Consolidated (at the level of headquarters of sometimes multi-tiered ownership structures) figures are usually coarser data; here, different reporting thresholds apply. These data are useful to assess overall exposure incorporating ownership and accounting practices. Unconsolidated data have the advantage of very rich details; the other data source is suited for tracking overall exposure and changes over time. Neither data source can give us the complete picture by itself, but ultimately, all data sources need to complement each other to provide an overall pattern. Therefore I suggest approaching all available data sources as two sides of the same coin.<sup>6</sup>

Chart 1 shows the volumes of unconsolidated and consolidated claims over time for the sample of banks representing 95% of the sector's total assets.<sup>7</sup>

<sup>4</sup> Two concepts of global liquidity flows are usually distinguished. First, official liquidity provided by central banks. Second, private sector liquidity provided by global banks engaging in cross-border operations (directly or through affiliates).

<sup>5</sup> Credit (including interbank credit) above EUR 350,000 has to be reported to the Central Credit Register (CCR). As the reporting formats of bank balance sheet data sources and CCR differ, the latter has not been used for the statistics presented here.

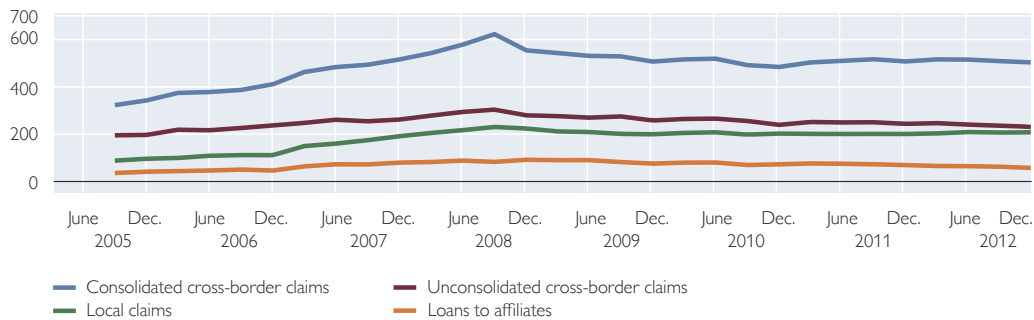
<sup>6</sup> For an overview of data sources at the international level regarding cross-border banking issues, see Lane (2014).

<sup>7</sup> I consider all banks that hold an Austrian banking license, not differentiating between domestic (Austrian) and foreign passive ownership, with all figures being gross figures.

Chart 1

### Consolidated and unconsolidated claims of Austrian parent banks

EUR billion



Source: Author's calculations using OeNB supervisory data.

Note: Claims include loans, securities and shares. Cross-border claims are Austrian banks' claims on their foreign counterparties. Local claims are foreign subsidiaries' claims. Loans to affiliates are loans by Austrian banks to foreign branches or subsidiaries.

Complementing the picture of the three lending channels, table 1 lists the countries in which Austrian banks are active, including their share in the total amount of claims. The recipient countries are ranked in descending order by the amount of direct cross-border lending by the Austrian parent bank.

It is commonly known that Eastern Europe, and in particular the Czech Republic, is an important market for Austrian banks. Germany also hosts many branches and accounts for a substantial amount of loans from Austrian banks. In other Western European countries (e. g. the United Kingdom, Switzerland and the U.S.A.) interbank activities dominate. The largest amounts of intra-bank flows (that means loans by the Austrian parent bank to its affiliate) go to Croatia, Romania, Hungary and Russia. Intra-bank flows mirror the importance of the countries as credit providers to the respective local markets through foreign subsidiaries. Turkey as a recipient market is gaining in importance for Austrian banks, though the supervisory data capture this business trend only partially, as

Austrian banks do not own subsidiaries in Turkey.<sup>8</sup>

In the following, I will analyze basic cross-border banking developments, emphasizing the Austrian perspective and with a focus on the provision of credit to the nonbank sector. The idea is to analyze scenarios under which cross-border banking activities might contribute to the build-up of financial stability risks. In this context I present four features of a structural trend in global banking, in particular in the context of cross-border private credit provision: first, the cyclicity of cross-border credit that may have contributed to exacerbating the effects of the recent financial and economic crisis; second, wholesale funding as a source for cross-border credit expansion prior to the crisis; third, maturity and exchange rate developments that created mainly short-term balance sheet mismatches of both currency and maturity and therefore contributed to financial vulnerabilities; and fourth, the different importance of banking activities in recipient countries and the resulting challenges for micro- and macroprudential regulatory policies.

<sup>8</sup> For instance, Austrian banks hold equity interests in joint ventures in Turkey, see Wittenberger et al. (2014).

Table 1

**Countries in which Austrian banks are active by claims volumes**

Unconsolidated					Unconsolidated			Unconsolidated		Consolidated	
Direct cross-border channel					Affiliate channel			Subsidiary channel		Channel	
Country	Rank	Banks	Claims (EUR billion)	Loans (% of claims)	Banks	Claims (EUR billion)	Loans (% of claims)	Banks	Claims (EUR billion)	Rank	Claims (EUR billion)
Germany	1	358	47.42	0.84	91	2.78	0.81	<4	3.86	2	44.38
United Kingdom	2	326	17.63	0.79	<4	1.14	1.00	<4		10	17.83
Italy	3	315	12.53	0.29	<4	3.02	0.82	<4	3.01	8	20.62
Poland	4	245	11.34	0.56	<4	0.21	0.12	<4	0.11	9	20.55
France	5	287	11.28	0.59	<4	0.27	0.20	<4	0.27	12	11.95
Croatia	6	220	9.98	0.94	9	8.74	0.64	9	24.18	3	38.80
Switzerland	7	342	9.54	0.92	4	0.78	0.97	<4	0.05	19	9.47
Turkey	8	118	9.47	0.70						18	9.69
Netherlands	9	305	9.01	0.46						17	9.75
U.S.A.	10	334	8.27	0.36	<4	0.02	1.00			13	11.29
Romania	11	185	7.82	0.89	5	6.92	0.95	4	18.59	5	34.51
Czech Republic	12	284	7.78	0.84	25	1.75	0.39	5	40.28	1	62.34
Slovenia	13	195	6.72	0.93	11	3.43	0.84	5	6.87	11	14.34
Hungary	14	304	6.24	0.71	14	5.27	0.88	8	18.73	7	29.03
Russia	15	191	5.06	0.92	4	5.49	0.55	4	30.46	4	35.68
Slovakia	16	260	4.73	0.57	12	1.14	0.53	5	18.03	6	31.22
Luxembourg	17	186	4.19	0.34						22	4.53
Cayman Islands	18	55	3.40	0.64						24	4.25
Cyprus	19	102	3.04	0.98						25	3.34
Spain	20	238	2.91	0.42						26	3.24
Bulgaria	21	133	2.26	0.88	<4	2.34	0.38	<4	7.36	14	10.76
Belgium	22	214	2.20	0.58						27	2.20
Ukraine	23	117	2.08	0.66	4	3.26	0.63	4	6.47	15	10.41
Serbia	24	153	1.97	0.87	7	1.63	0.59	7	6.31	20	9.16
Singapore	25	92	1.95	1.00	<4	1.81	1.00			40	1.23
Sweden	26	260	1.76	0.27	<4	0.00				33	1.75
Ireland	27	152	1.69	0.18						32	1.92
Denmark	28	165	1.34	0.40						38	1.38
Bosnia and Herzegovina	29	160	1.24	0.93	9	1.24	0.52	9	6.37	21	6.97

Source: Author's calculations based on research for the IBRN project 2013, using individual bank-level information (for each bank  $i$ , quarter  $q$ , country  $j$ ), Segalla (2014).

Note: This table reports selected figures for three different credit channels by recipient country for Q4 2012. It shows volumes of banking activities (in EUR billion), the share of loans in total claims (%), the importance of the recipient country (rank) and the number of banks engaged in the respective banking activities. "Claims" refer to the broad asset category including loans, securities and shares. Columns 1 to 5: direct cross-border credit by Austrian parent banks to foreign counterparties on the basis of unconsolidated data. Columns 6 to 8: Austrian parent banks' claims on their foreign affiliates (intra-bank lending) on the basis of unconsolidated data. Columns 9 to 10: foreign subsidiaries claims on local and foreign counterparties on the basis of unconsolidated data. If a country does not host affiliates of Austrian parent banks, no entry is shown for affiliates and subsidiary claims. For countries that host fewer than 4 affiliates, no exact count is shown due to data confidentiality requirements. Columns 11 to 13: claims on the basis of consolidated data for each recipient country.

## 2 Has cross-border lending been more cyclical than domestic lending?

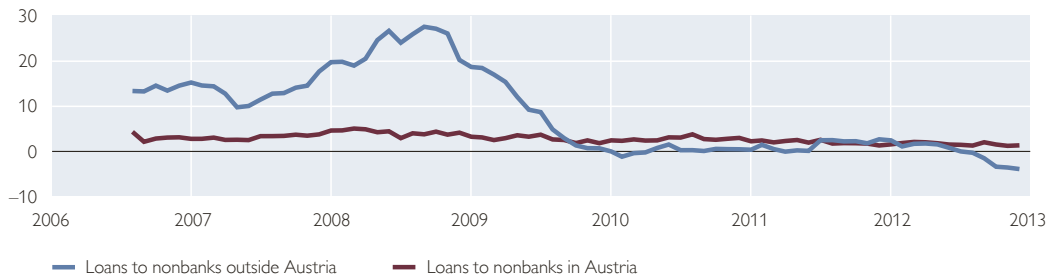
Nonbank lending is usually less volatile than the interbank market. Since 2006, lending to nonbanks by domestic banks has been very stable compared to lending across borders. In terms of volatility, we observe the following ranking: cross-border interbank lending is more volatile than domestic interbank lending,

followed by cross-border lending to nonbanks and finally domestic lending to nonbanks. We observe this well-documented pattern not only at the international but also at the national level. Chart 2 shows domestic (red line) and direct cross-border lending (blue line) by Austrian banks. Domestic lending is credit provided by Austrian banks to the private sector in Austria. Cross-border lending is credit provided

Chart 2

### Growth of Austrian banks' loans to nonbanks

Percentage change on the previous year (monthly data)



Source: Author's calculations using OeNB supervisory data.

Note: The figures do not include local positions of Austrian banks' foreign subsidiaries. All loans are reported in euro; the exchange rate at the time of reporting is applied. The nonbank sector includes the household, government, financial and nonfinancial sectors.

to the private sector outside Austria by a foreign branch or by an Austrian parent institution.<sup>9</sup> Chart 3 shows credit growth from the perspective of foreign subsidiaries of Austrian banks. For example, it includes data on Bulgarian subsidiaries of Austrian parent banks, which provide local credit within Bulgaria but also engage in cross-border lending activities in Romania. We again observe a higher cyclicality for cross-border lending than for local lending. The de-

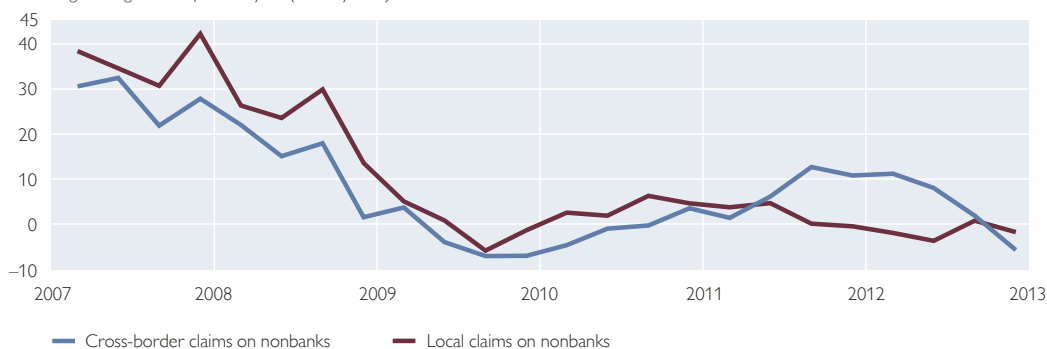
cline in cross-border credit growth after 2008 has been offset only partially by the growth of credit provided by foreign subsidiaries. It is important to note that this picture of credit growth conceals substantial heterogeneity at the country level. A point we will discuss later in the article.

The data patterns presented here end with 2012 and therefore do not reflect developments of the most recent two years. Recent policy measures that

Chart 3

### Growth of Austrian banks' foreign subsidiaries' claims on nonbanks

Percentage change on the previous year (monthly data)



Source: Author's calculations using OeNB supervisory data.

Note: Cross-border claims exclude claims on Austrian counterparties and claims on the government; they include the household, financial and nonfinancial sectors. Cross-border claims exclude Serbian and Cypriot subsidiaries' claims. All claims are reported in euro; the exchange rate at the time of reporting is applied. The nonbank sector includes the household, government, financial and nonfinancial sectors. Local claims mean that the foreign subsidiary provides credit to counterparties from the same country. Cross-border claims mean that the foreign subsidiary provides credit to counterparties from a different country.

<sup>9</sup> The figure using consolidated data shows a similar pattern, though the peak in 2008 is a bit lower.

may have contributed to cushioning the deleveraging tendencies associated with cross-border flows and their cyclicity included, importantly, the Vienna Initiative 1.0,<sup>10</sup> the sustainability package<sup>11</sup> and measures to reduce the risks emanating from foreign currency loans.<sup>12</sup>

### 3 How much lending has been funded by wholesale sources?

Besides the volatility of cross-border lending before the crisis, international discussions have also concentrated on how global banks funded their (cross-border) credit expansion. The growing lending activities of global banks are claimed to have been financed heavily by wholesale funding flows. The dependence on wholesale funds seems to be determined by bank size. Small European banks resort to wholesale funding much less than medium-sized and large European banks.<sup>13</sup> Furthermore, data on wholesale liabilities are rarely broken down by liabilities from domestic operations and from cross-border operations. Hills and Hogarth (2013) combine two pieces of international evidence to validate the argument that wholesale funding fueled credit expansion before the recent crisis. First, they show that cross-border liabilities grew more rapidly than domestic liabilities in the pre-crisis period (in 2008 the percentage changes on the previous year were around 30%). Second, they look at two key funding ratios: the ratio of banks' domestic loans to deposits and the ratio of whole-

sale funding to total liabilities. In 2008, the loan-to-deposit ratio rose to 110% and the wholesale-to-liabilities ratio rose to 45% for European global banks.

Turning to Austrian banks, we observe that their cross-border deposits increased more than domestic deposits (chart 4) between 2005 and 2012. In particular, domestic interbank deposits increased dramatically during the crisis. The wholesale-to-total liabilities ratio of Austrian banks had increased to 35% prior to 2008, remaining 10 percentage points below the comparable international figure. This suggests that Austrian banks' asset growth continued to be funded predominantly through deposits rather than through wholesale funds.

Although these two key funding ratios are commonly used measures to demonstrate the importance of wholesale funding, they involve some measurement problems. Due to the multi-tiered structure of the decentralized banking sectors in Austria, the ratios include intra-sector deposits and are therefore biased upward. According to adjusted calculations presented in the OeNB's Financial Stability Report (2012), short-term wholesale funding (including cross-border transactions) accounted for approximately 15% of Austrian banks' consolidated total assets at the end of 2011 (compared to 19% on an unadjusted basis).

In line with international calculations and taking into account that the evidence is suggestive, the figures presented here are indicative of two developments over time: The share of banks'

<sup>10</sup> [http://vienna-initiative.com/wp-content/uploads/2015/01/DCM-note-Q3-2014\\_Jan2015final.pdf](http://vienna-initiative.com/wp-content/uploads/2015/01/DCM-note-Q3-2014_Jan2015final.pdf) (accessed on June 8, 2015).

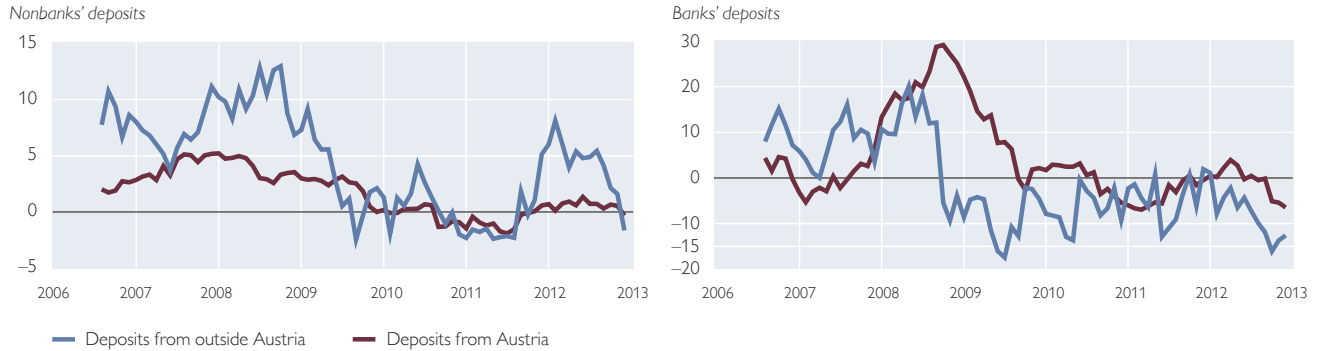
<sup>11</sup> <http://www.oenb.at/en/Financial-Stability/Systemic-Risk-Analysis/Sustainability-of-Large-Austrian-Banks--Business-Models.html> (accessed on June 8, 2015).

<sup>12</sup> <http://www.oenb.at/en/Financial-Stability/Systemic-Risk-Analysis/Foreign-Currency-Loans-and-Repayment-Vehicle-Loans.html> (accessed on June 8, 2015).

<sup>13</sup> Van Rixtel and Gasperini (2013) provide an overview of bank funding trends in the euro area after the financial crisis.

Chart 4

### Nonbanks' and banks' deposits at Austrian banks between 2005 and 2012

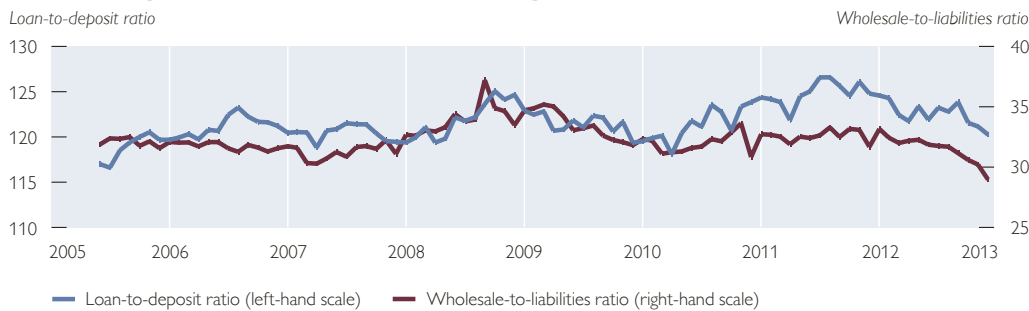


Source: Author's calculations using OeNB supervisory data.

Note: The figures do not include local positions of Austrian banks' foreign subsidiaries. All deposits are reported in euro; the exchange rate at the time of reporting is applied. Nonbanks include the household, government, financial and nonfinancial sectors.

Chart 5

### Key funding ratios of the Austrian banking system



Source: Author's calculations using OeNB supervisory data.

Note: The figures do not include local positions of Austrian banks' foreign subsidiaries. The loan-to-deposit ratio is loans by banks to the private sector divided by customer deposits. The wholesale-to-liabilities ratio is bank liabilities (excluding equity, affiliates' deposits and central bank deposits) minus customer deposits divided by total liabilities.

total liabilities that are nondomestic and wholesale rose before 2008 and fell afterward, but the pattern is less pronounced for Austrian banks than for other European banks.

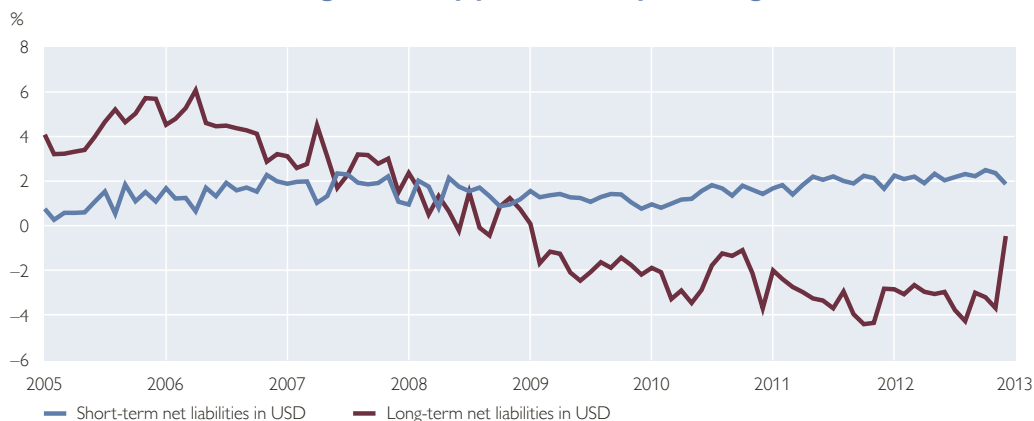
So far we have analyzed cross-border banking ignoring currency issues. The next section will deal with the role of foreign currency positions in cross-border banking.

#### 4 How have maturity and currency mismatches evolved?

International data for cross-border banking flows suggests that part of the

balance sheet expansion of European banks before 2008 was financed through branches located in the U.S.A. According to Hills and Hoggarth (2013) "European banks raised wholesale funds from their affiliates in the United States. Via their head offices and/or financial centers, they lend funds back to non-banks [...] either directly or by funding local banks." These banking practices add the risk of currency mismatches to the general risk of maturity mismatches. Researchers usually compare net lending to non-banks (to proxy long-term positions) in



**Austrian banks' net foreign currency position as a percentage of Austrian GDP**

Source: Author's calculations using OeNB supervisory data.

Note: Foreign subsidiaries' positions are not included. Short-term net liabilities are overnight deposits minus overnight loans. Long-term net liabilities are [deposits (excluding overnight) plus bond issuance] minus [loans (excluding overnight) plus securities].

U.S. dollars, on the one hand, and net borrowing from banks (to proxy short-term positions) in U.S. dollars, on the other. Using BIS data, Hills and Hoggarth (2013) show that the divergence between short-term and long-term positions was growing before the crisis and that on average the sum of short-term and long-term net positions as a percentage of GDP after 2008 is around  $-4\%$  for European resident banks. During the crisis many European banks faced a large U.S. dollar shortage. A temporary swap facility between the ECB and the U.S. Federal Reserve alleviated access to U.S. dollar funding at the time.

For Austria, we benefit from precise (unconsolidated) data on currency positions and the corresponding maturity positions to estimate the currency-maturity composition as a percentage of Austrian GDP. Foreign currency

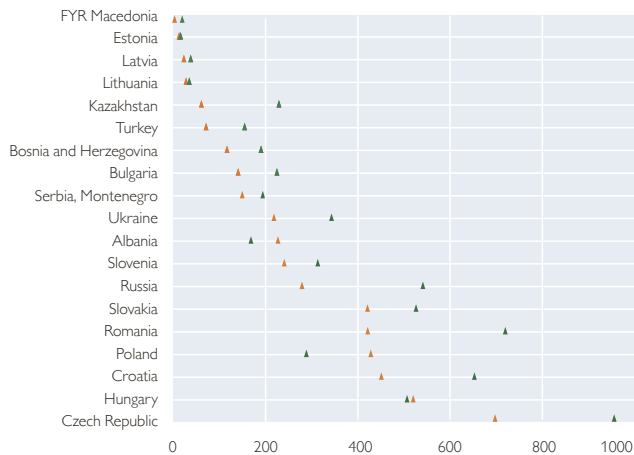
loans extended by Austrian banks are mainly made up of Swiss franc-denominated loans (Q4 2012: CHF 67.26 billion) and U.S. dollar-denominated loans (Q4 2012: USD 38 billion). I focus on the latter because Austrian banks' U.S. dollar positions are almost entirely cross-border positions.<sup>14</sup> In 2012, Russia (13%), the United Kingdom (8.7%), Ukraine (8.2%), Turkey (7.6%), the U.S.A. (7.6%) and some offshore financial centers (21.2%) were the main recipient countries of U.S. dollar-denominated loans. In the next chart, I compare short-term net liabilities (overnight deposits minus overnight loans in U.S. dollars) to long-term net liabilities (deposits plus issued bonds minus loans and securities) in U.S. dollars. It shows that on average the sum of short-term and long-term net positions as a percentage of GDP after 2008 is  $-1.8\%$ .

<sup>14</sup> Unlike Swiss franc positions, of which 80% (in Q4 2012: EUR 51.82 billion) are loans to the Austrian nonbank sector and less than 15% are loans to nonbanks in Switzerland, Hungary, Germany and Croatia. The long-term net liabilities in Swiss francs are approximately  $-16\%$  of GDP, with short-term net liabilities in Swiss francs being close to zero and therefore negligible. If we exclude Swiss franc claims of Austrian residents, the long-term net liabilities ratio in Swiss francs is around  $-4\%$  of GDP. For more information, see Auer et al. (2012).

## Austrian banks' average claims on nonbanks by region

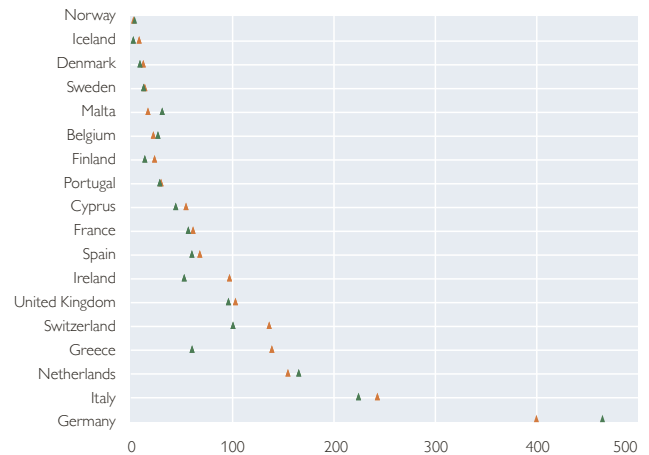
### Eastern Europe

EUR million



### Western Europe

EUR million



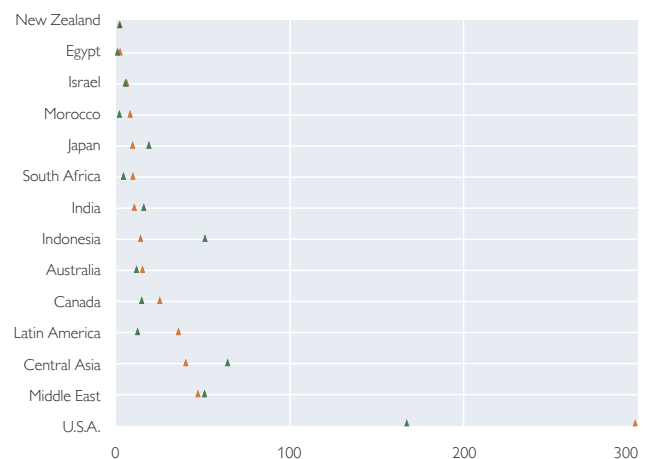
### Offshore financial centers

EUR million



### Outside Europe

EUR million



▲ Before 2008    ▲ After 2008

Source: Author's calculations using supervisory data.

Note: The chart is based on consolidated locational statistics. The pre-crisis period includes quarterly data from the first quarter of 2005 to the fourth quarter of 2008, the post-crisis period includes quarterly data from the first quarter of 2009 to the fourth quarter of 2012. Claims include loans, securities and shares.

I find evidence for a currency-maturity mismatch for Austrian banks, though on a smaller scale than for the total of European resident banks. After 2008, long-term net deposits in U.S. dollars were around  $-3\%$  of Austrian GDP, whereas short-term net deposits in U.S. dollars accounted for about  $+2\%$ . We observe a growing divergence not prior to the Lehman crisis, but rather afterward. Prior to Lehman,

Austrian banks were holding a surplus of U.S. dollar funding. It is important to note that these data account for neither off-balance sheet items (such as derivatives) nor positions held by foreign subsidiaries. It is likely that Austrian banks close the currency-maturity gap in U.S. dollars through the use of derivatives to hedge currency risk. Still, for Austrian banks continued access to U.S. dollar funding seems to

be important, though very few have direct affiliates in U.S. dollar-denominated locations.<sup>15</sup> This leads me back to the importance of counterparty locations and, therefore, the importance of recipient countries of lending flows.

### 5 Which lending recipient countries are important for Austria?

The approach I follow here is to quantify cross-border financial linkages before and after the crisis. Where did cross-border credit provided by Austrian banks go to and how differently were countries affected by the crisis? Chart 7 illustrates the average amount of Austrian banks' claims on nonbanks by country within four regions: Eastern Europe, Western Europe, offshore financial centers and non-European countries.<sup>16</sup> The precrisis period includes quarterly data from the first quarter of 2005 to the fourth quarter of 2008, the postcrisis period includes quarterly data from the first quarter of 2009 to the fourth quarter of 2012. Almost all Eastern European countries (with the exception of Albania, Hungary and Poland) recorded more cross-border credit after the crisis. The amount of claims on the countries of the other three regions decreased after the crisis (with the exception of the amount of claims on Malta, Germany, Virgin Islands and some countries in Asia). To investigate the heterogeneity of recipient countries and banks' adjustments to their lending behavior more in-depth, we need to explore the effects of country-specific regulatory environments on global banking activity.

How Austrian banks adjust their credit provision to a particular country

depends not only on their overall credit provision capacities but also on the regulatory environment in the recipient country. In a multi-country project conducted by the IBRN 2014 we aim to map the effect of regulatory policies on the activities of global banks. For this purpose Cerrutti et al. (2015) provide new data and measures of quarterly changes in prudential instruments for 57 countries for the years 2000 to 2014.

### 6 Summary

Cross-border flows potentially have a strong impact on financial stability at the global level. On the one hand, international financial integration can have great benefits such as risk diversification and increased competition. On the other hand, it can lead to financial imbalances that in turn contribute to the build-up of financial stability risks. Under the International Banking Research Network (IBRN), researchers at 26 central banks are working to enrich the analysis of global banking themes with insights gained from confidential micro banking data. The first part of this article outlines some stylized facts about recent cross-border banking activities of Austrian banks. Austrian multinational banks are small compared to their German or U.S. counterparts in terms of their cross-border claims volumes; when measured as a percentage of GDP, however, Austrian banks' cross-border claims are substantially larger than those of their international peers.

In the second part of this study I reflect on four basic aspects of cross-border banking flows with a

<sup>15</sup> For more general information on U.S. dollar funding see: [https://www.esrb.europa.eu/pub/pdf/recommendations/2011/ESRB\\_2011\\_2.en.pdf?893058c770aff5809f955f3931baac8c](https://www.esrb.europa.eu/pub/pdf/recommendations/2011/ESRB_2011_2.en.pdf?893058c770aff5809f955f3931baac8c) (accessed on June 8, 2015).

<sup>16</sup> Unfortunately, for this time period consolidated banking data for the liability side by country split is not available.

potential impact on financial stability. We see that first, cross-border credit is more volatile than domestic credit. Second, multinational banks rely on different types of funding sources (deposit versus wholesale funding) to finance credit expansion. Third, borrowing short and lending long in a foreign currency creates a currency-maturity mismatch that requires continued monitoring. Finally, the geographical distribution of banking counterparties matters. Not surprisingly,

capital flows are quite heterogeneous across recipient countries. The question that the IBRN (2014) aims to highlight is whether multinational banks have been taking advantage of regulatory arbitrage or not. The policies implemented at national levels to reduce risk may in fact increase risk in other countries. Therefore, in-depth research into the relative effects of changes in the regulatory environment in recipient countries is warranted.

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