

B Cross-border banking in the euro area since the crisis: what is driving the great retrenchment?

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This special feature examines the potential drivers of the post-crisis retrenchment in cross-border banking in the euro area, which stands out in international comparison. Examining a wide range of possible determinants of this phenomenon, it establishes a significant link between deteriorating asset quality and the retrenchment in cross-border banking. Conversely, tighter prudential policies and the introduction of bank levies do not contribute to explaining the reduction in cross-border banking activity. Therefore, tackling the persistent asset quality problems, along with the completion of the banking union, would seem to be pivotal to reaping the potential benefits of cross-border banking within the euro area in terms of risk diversification and risk-sharing.

Introduction

Financial integration via cross-border banking may bring important financial stability benefits in terms of risk diversification and risk-sharing.

A geographically diversified loan book and deposit base make banks less susceptible to domestic shocks and thus reduce the volatility of their lending and income streams. Further benefits from financial integration may stem from enhanced competition and greater stability of banking systems. For instance, foreign banks entering less mature markets tend to introduce more sophisticated risk management practices, accelerate the process of privatisation of state-owned banks and contribute to faster resolution of non-performing loans (NPLs).

However, cross-border banking may also entail financial stability costs. The presence of foreign banks, which are associated with greater mobility of capital than domestic banks, may weigh on financial stability in the host economy, owing to spillovers from external shocks. Indeed, the post-crisis deleveraging by European banks, shedding cross-border assets initially while sheltering domestic assets, is a case in point. Nevertheless, the view that financial integration via cross-border banking is beneficial overall, except in situations where cross-border exposures are excessive, prevails in the literature.¹⁴⁹

The precipitous decline in cross-border bank lending within the euro area since the global financial crisis, especially between banks, partly reflects some excesses prior to the crisis. Part of the reduction in cross-border banking positions may, therefore, be seen as a welcome development, as the elevated pre-crisis levels

¹⁴⁹ For a discussion of the costs and benefits of cross-border banking, see, among others, Allen, F., Beck, T., Carletti, E., Lane, P.R., Schoenmaker, D. and Wagner, W., "Cross-border Banking in Europe: Implications for Financial Stability and Macroeconomic Policies", VOX, CEPR's Policy Portal, Centre for Economic Policy Research, June 2011; and Beck, R., Dedola, L., Giovannini, A. and Popov, A., "Financial integration and risk sharing in a monetary union", *Financial integration in Europe 2016*, ECB, April 2016, pp. 80-98.

may have reflected to some extent distorted incentives for banks to expand their balance sheets. This notwithstanding, cross-border banking integration in the euro area seems desirable, given the relatively limited cross-border penetration of the banking industry. As well as further enhancing risk-sharing within the euro area, cross-border integration via, for example, cross-border mergers and acquisitions (see **Box A** in this special feature) could also help tackle the “over-banking” problem in some countries.¹⁵⁰

This special feature examines the potential drivers of the post-crisis retrenchment of cross-border banking in the euro area.¹⁵¹

First, it provides an anatomy of the cross-border bank retrenchment in the euro area observed since the outbreak of the global financial crisis. Second, it investigates a wide range of possible drivers of this phenomenon, including various measures of banking sector performance and stability, prudential policies and the use of bank levies.

The retrenchment in euro area cross-border banking

The global financial crisis triggered a rapid decline in international capital flows, followed by an asymmetric recovery across regions and instruments.

The halt in international financial integration was particularly pronounced for capital flows intermediated by banks, which prior to the crisis had been increasing dynamically.¹⁵² The sharp decline has highlighted the volatile nature of cross-border bank flows compared with other types of financial flows, such as foreign direct investment.¹⁵³ By 2016, global cross-border banking positions had contracted by around 15% compared with their peak in 2008, and this retrenchment was predominantly driven by European banks (see **Chart B.1**).¹⁵⁴ Banks located in the euro area and in the rest of the EU reduced their cross-border bank claims by around 25% over this period, while banks located elsewhere (in Canada and Japan, for instance), following an early retrenchment, had re-built their cross-border positions to surpass their pre-crisis peaks by early 2015.¹⁵⁵ At the same time, the

¹⁵⁰ See Hartmann, P., Huljak, I., Leonello, A., Marqués, D., Martin, R., Moccero, D., Palligkinis, S., Popov, A. and Schepens, G., “Cross-border bank consolidation in the euro area”, *Financial integration in Europe 2017*, ECB, May 2017, pp. 41-64; and “Is Europe Overbanked?”, *Reports of the Advisory Scientific Committee*, No 4, European Systemic Risk Board, June 2014.

¹⁵¹ For a detailed analysis of cross-border banking retrenchment in the EU, see Emter, L., Schmitz, M. and Tirpák, M., “Cross-border banking in the EU since the crisis: what is driving the great retrenchment?”, *Working Paper Series*, ECB, forthcoming.

¹⁵² See Lane, P.R., “Financial Globalisation and the Crisis”, *Open Economies Review*, Vol. 24(3), July 2013, pp. 555-580; and Milesi-Ferretti, G-M. and Tille, C., “The great retrenchment: international capital flows during the global financial crisis”, *Economic Policy*, Vol. 26(66), April 2011, pp. 289-346.

¹⁵³ See McQuade, P. and Schmitz, M., “The great moderation in international capital flows: A global phenomenon?”, *Journal of International Money and Finance*, Vol. 73, 2017, pp. 188-212.

¹⁵⁴ Based on the external claims of Bank for International Settlements (BIS) reporting banks on a locational basis. The original data reported by the BIS have been corrected for breaks and exchange rate variations following Cerutti, E., “Drivers of cross-border banking exposures during the crisis”, *Journal of Banking and Finance*, Vol. 55, 2015, pp. 340-357. The residence-based locational data on cross-border banking are used, as these are consistent with the other macro-financial variables used in this special feature and closely resemble private other financial flows recorded in the balance of payments statistics.

¹⁵⁵ The euro area sample among the BIS reporting countries consists of the 11 original euro area countries and Greece, while the “rest of the EU” reporting countries are Denmark, Sweden and the United Kingdom.

share of euro area-based banks in global cross-border bank claims fell from around 36% in 2008 to below 30% in 2016, while intra-euro area cross-border bank loans as a percentage of total euro area bank assets declined from around 8% to 6% over the same period.

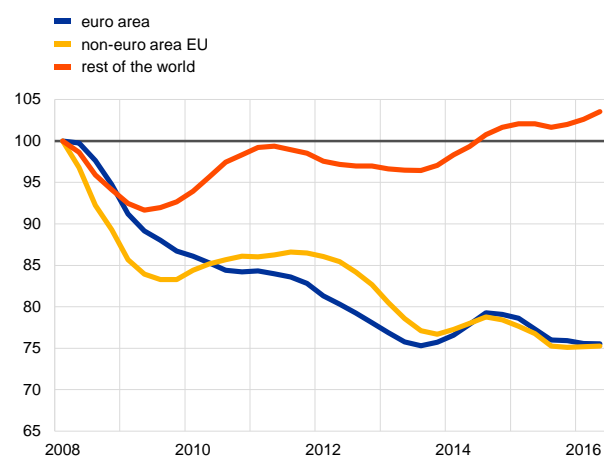
Euro area-based banks cut their cross-border exposures most significantly vis-à-vis counterparties located in other euro area countries and the rest of the EU. Between 2008 and 2012, euro area-based banks' cross-border exposures across different regions declined fairly uniformly by around 20%. Since then, however, intra-euro area exposures and especially exposures vis-à-vis the rest of the EU have continued to decline, whereas exposures to counterparties located outside the EU have partly recovered (see **Chart B.2**).¹⁵⁶

Chart B.1

Since the crisis EU-based banks have reduced their cross-border claims substantially

Cross-border bank claims by location of reporting bank

(index: Q3 2008 = 100; four-quarter moving averages)



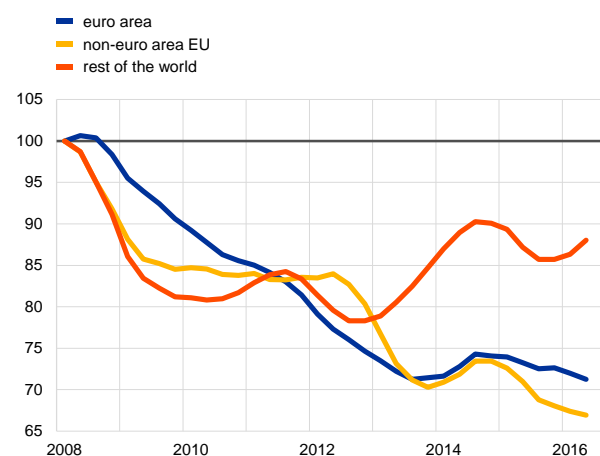
Sources: BIS locational banking statistics and ECB calculations.
Note: Total cross-border claims of banks based in BIS reporting countries.

Chart B.2

Intra-euro area cross-border retrenchment of euro area-based banks has been particularly pronounced

Cross-border bank claims of euro area banks by destination country

(index: Q3 2008 = 100; four-quarter moving averages)



Sources: BIS locational banking statistics and ECB calculations.
Note: Cross-border claims of banks based in euro area countries by counterparty country.

Within the euro area, banks have cut their cross-border interbank loans by around 40% and have shaved almost a third off their cross-border debt securities holdings since 2008. Cross-border lending to non-banks declined by less than 10% over the same period (see **Charts B.3** and **B.4**).¹⁵⁷ Strikingly, since the crisis, domestic loans for the euro area as a whole have remained above pre-crisis levels, suggesting an increasing home bias within the euro area. The great retrenchment of banks' cross-border exposures probably reflects the remnants of the euro area sovereign debt crisis, albeit evolving heterogeneously across counterparty

¹⁵⁶ Intra-euro area exposures of banks located in the euro area accounted for around 45% of total exposures in 2016, while exposures vis-à-vis the rest of the EU and vis-à-vis third countries accounted for around 24% and 31%, respectively.

¹⁵⁷ Loans and deposits are the most important component of intra-euro area cross-border exposures, with a share of around 55% of the total, while debt securities and other instruments (e.g. financial derivatives) account for around 31% and 14%, respectively.

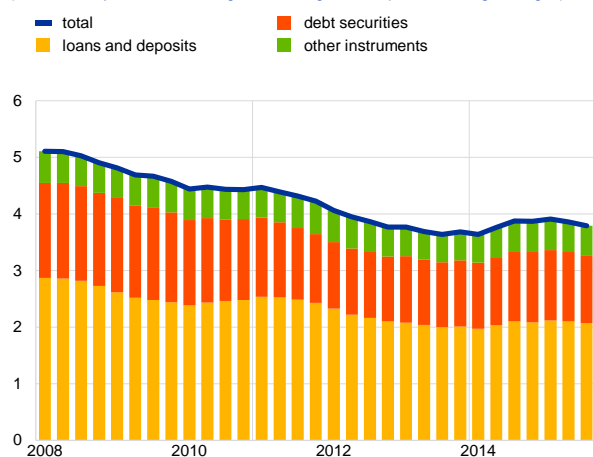
sectors. Moreover, at the country pair level within the euro area, developments in bilateral cross-border banking exposures have also been very divergent. This heterogeneity across various dimensions is exploited in the regression-based empirical analysis in this special feature in order to identify the potential drivers of the post-crisis retrenchment in euro area cross-border banking.

Chart B.3

Loans and deposits made the largest contribution to intra-euro area retrenchment...

Cross-border intra-euro area bank claims

(€trillions, adjusted for exchange rate changes, four-quarter moving averages)



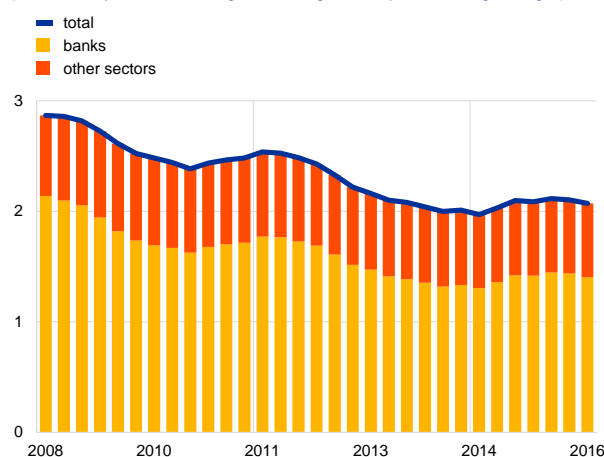
Sources: BIS locational banking statistics and ECB calculations.
Note: Cross-border intra-euro area claims of banks based in euro area countries.

Chart B.4

...largely driven by a decline in cross-border interbank loans

Cross-border intra-euro area bank claims in loans and deposits by counterparty sector

(€trillions, adjusted for exchange rate changes, four-quarter moving averages)



Sources: BIS locational banking statistics and ECB calculations.
Note: Cross-border intra-euro area claims in loans and deposits of banks based in euro area countries by counterparty sector.

Identifying the drivers of cross-border banking exposures in the euro area

In the aftermath of the global financial crisis, the global banking system was subject to a number of structural changes, including, among others, a tighter regulatory framework, more stringent supervision and higher taxation of banks. These structural changes took place alongside the sharp cyclical downturn, which weighed on banks' balance sheets in the form of substantial credit losses. The resulting financial "deglobalisation", which manifested itself in a striking retreat from cross-border banking, has been especially pronounced in the EU.¹⁵⁸ A number of studies suggest that several factors lay behind this cross-border banking

¹⁵⁸ See Forbes, K., "Financial 'deglobalization'?: capital flows, banks and the Beatles", speech given at Queen Mary University, London, November 2014.

retrenchment, such as banking sector vulnerabilities, regulatory tightening and government interventions.¹⁵⁹

This special feature further investigates whether these factors have contributed to the retrenchment of cross-border banking within the euro area.

To this end, a gravity model in a cross-country panel set-up for the period from 2008 to 2015 is estimated in which bilateral cross-border loans and deposits between two euro area countries are regressed on a set of standard gravity-type variables (e.g. distance, common language), macroeconomic controls (e.g. economic activity and interest rates) and our main variables of interest, including (i) an index of prudential policy stringency, (ii) a measure of the tax burden arising from levies on banks, and (iii) indicators of bank performance (e.g. NPL ratio, return on equity).¹⁶⁰ All variables are entered into the econometric model both for source and host countries and complemented with a comprehensive set of fixed effects to control for unobserved heterogeneity across countries and over time.¹⁶¹ Since a large portion of the cross-border banking retrenchment relates to interbank lending, the volume of liquidity provided by the Eurosystem to each national banking system is also controlled for.

The role of bank performance indicators

Since 2008 banks in the euro area have experienced, on average, an increase in NPLs amid gradually declining leverage and relatively subdued profitability.

Elevated NPL ratios can give rise to cross-border spillovers as banks, in an effort to shore up their balance sheets, cut their cross-border exposures. High NPLs can create deleveraging pressures, for instance as a result of higher risk weights. Similarly, weakened bank profitability leads to slower capital accumulation, thereby impeding banks' capacity to leverage, which – coupled with tighter regulation – may reduce banks' willingness to engage in risk-taking across borders. Indeed, there is evidence of a “pecking order” in banks' deleveraging in the EU after the global financial crisis, which focused on cutting cross-border assets, while largely sheltering domestic assets.¹⁶²

¹⁵⁹ See Giannetti, M. and Laeven, L., “Flight Home, Flight Abroad, and International Credit Cycles”, *American Economic Review*, Vol. 102(3), May 2012, pp. 219-24; Rose, A.K. and Wieladek, T., “Financial protectionism? First evidence”, *Journal of Finance*, Vol. 69(5), September 2014, pp. 2127-2149; Bremus, F. and Fratzscher, M., “Drivers of structural change in cross-border banking since the global financial crisis”, *Journal of International Money and Finance*, Vol. 52, April 2015, pp. 32-59; and Ichiue, H. and Lambert, F., “Post-crisis International Banking; An Analysis with New Regulatory Survey Data”, *IMF Working Paper*, No 16/88, April 2016.

¹⁶⁰ The gravity model was first introduced by Tinbergen (1962) to explain bilateral trade flows by the size of and distance between two countries – see Tinbergen, J., *Shaping the World Economy: Suggestions for an International Economic Policy*, Twentieth Century Fund, New York, 1962. Okawa and van Wincoop (2012) provide a formal theoretical framework to justify the use of gravity models in international finance by linking bilateral investment patterns to differences in transaction costs – see Okawa, Y. and van Wincoop, E., “Gravity in International Finance”, *Journal of International Economics*, Vol. 87(2), 2012, pp. 205-215.

¹⁶¹ More specifically, source country, host country and year fixed effects are included in the panel regression analysis.

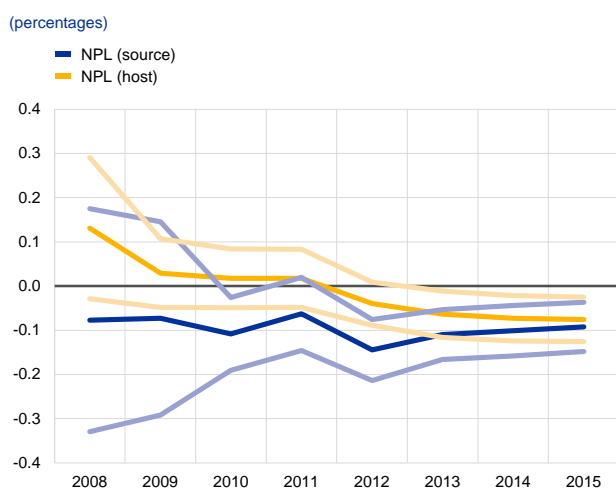
¹⁶² See the special feature entitled “EU bank deleveraging – driving forces and strategies”, *Financial Stability Review*, ECB, June 2012.

Elevated NPL ratios are significantly associated with a retrenchment in cross-border banking. For source countries, the estimated impact of higher NPL ratios on cross-border exposures is somewhat larger for interbank lending than for lending to other sectors. This may reflect the shorter maturity of interbank lending and therefore the greater flexibility in adjusting these exposures. In addition, banks might be less keen on reducing their positions vis-à-vis the real economy, as these are often subject to higher build-up costs. Moreover, the result for host countries suggests that higher NPL ratios are associated with less cross-border funding to the domestic banking sector, which could potentially aggravate credit supply constraints. This is further amplified by reduced cross-border borrowing by non-banks in high NPL host countries.

Chart B.5

NPLs have weighed persistently on cross-border interbank loans over the past years...

Time-varying coefficients on NPL ratios in source and host countries for cross-border interbank loans

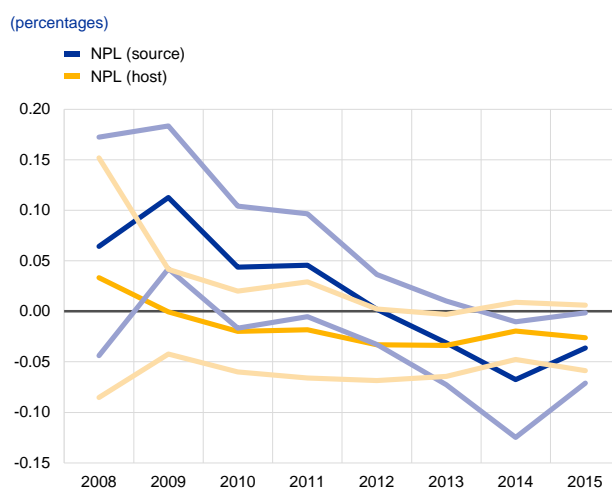


Source: ECB calculations.
Notes: The pale lines indicate 90% confidence intervals around the estimated coefficients. Time-varying coefficients are estimated using interaction terms between year fixed effects and the NPL ratio in source and host countries, respectively.

Chart B.6

...and more recently also on cross-border loans to other sectors

Time-varying coefficients on NPL ratios in source and host countries for cross-border loans to other sectors



Source: ECB calculations.
Notes: The pale lines indicate 90% confidence intervals around the estimated coefficients. Time-varying coefficients are estimated using interaction terms between year fixed effects and the NPL ratio in source and host countries, respectively.

Deteriorating asset quality has consistently been associated with lower interbank lending throughout the post-crisis period. However, for lending to non-banks, such a significant relationship has only been observed more recently (see **Charts B.5** and **B.6**). Similarly, higher NPL ratios in host countries have only been associated with reduced cross-border borrowing by both banks and non-banks to a significant extent since 2012. Worsening asset quality and the need to shore up banks' balance sheets are thus found to be important impediments to cross-border banking integration within the euro area.¹⁶³ This is consistent with the idea that high NPLs can create deleveraging pressures, thereby impeding banks' capacity to

¹⁶³ See McGuire, P. and von Peter, G., "The resilience of banks' international operations", *BIS Quarterly Review*, March 2016.

provide financing to the economy.¹⁶⁴ It is also consistent with the notion that “financial deglobalisation” in Europe is a reflection of banks responding to credit losses by shedding assets abroad.¹⁶⁵

Compared with asset quality, other bank performance indicators – such as the leverage ratio and return on equity – are more loosely associated with developments in cross-border banking. Profitability is significant only for interbank lending, as more profitable banks exhibit reduced exposures across borders. This could reflect the post-crisis macroeconomic environment, in which low interest rates and central bank liquidity provision – which the model controls for – give profitable banks less incentive to engage in interbank cross-border lending. The post-crisis decline in bank leverage across the euro area, which, on average, has been rather gradual, does not appear to be significantly correlated with the decline in cross-border exposures.

The role of prudential policies

Prudential policies were tightened across the euro area and globally in the aftermath of the crisis. This applies especially to capital requirements (the Basel requirements and their transposition into EU law in the Capital Requirements Directive (CRD IV) and Capital Requirements Regulation (CRR)), but also to other prudential instruments. To track the evolution of prudential policies, an index of prudential stringency is constructed using a database compiled by Cerutti et al. (2016) and information provided by the European Systemic Risk Board (ESRB).¹⁶⁶ The prudential policy index (PPI) is the cumulative sum of prudential policy changes and captures the level of “tightness” of prudential policy across euro area countries over time (see **Chart B.7**).¹⁶⁷

The impact of prudential policies on cross-border banking is ambiguous. Some studies highlight the role of regulatory arbitrage, which results in higher cross-border banking exposures to circumvent tighter domestic regulation, while others stress that adhering to more stringent rules is costly for banks, which therefore reduce their

¹⁶⁴ See Constâncio, V., “Resolving Europe’s NPL burden: challenges and benefits”, keynote speech at the event entitled “Tackling Europe’s non-performing loans crisis: restructuring debt, reviving growth” organised by Bruegel, Brussels, February 2017; and *Financial integration in Europe 2017*, ECB, May 2017.

¹⁶⁵ See McCauley, R.N., Bénétrix, A.S., McGuire, P. and von Peter, G., “Financial deglobalisation in banking?”, *BIS Working Papers*, No 650, June 2017.

¹⁶⁶ An annual index of prudential stringency is constructed by summing the quarterly changes in five types of commonly implemented prudential instrument (i.e. capital requirements, sector-specific capital buffers, interbank exposure limits, concentration limits and loan-to-value ratio limits) for each instrument in any given year and subsequently for all instruments. The information is retrieved from Cerutti, M., Correa, M., Fiorentino, E. and Segalla, E., “Changes in Prudential Policy Instruments – A New Cross-Country Database”, *IMF Working Paper*, No 16/110, June 2016, and from the [ESRB’s website](#).

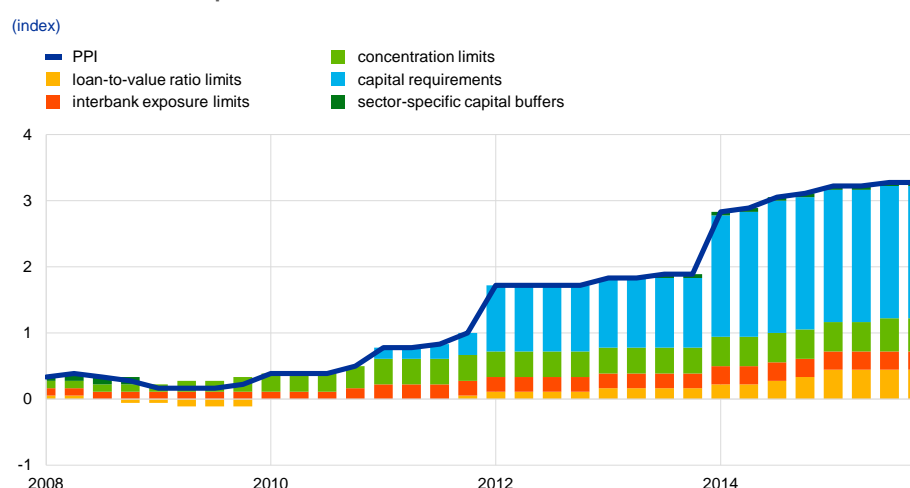
¹⁶⁷ A potential caveat of this approach is that changes in the instruments may have different qualitative implications in terms of intensity across countries and over time.

cross-border exposures.¹⁶⁸ As the international spillovers of prudential policies can vary significantly across types of instrument, prudential policies aimed at lenders (i.e. capital requirements, capital buffers, interbank exposure limits and concentration limits) and those aimed at borrowers (i.e. loan-to-value ratio limits) are controlled for separately.¹⁶⁹

Chart B.7

Prudential policies have tightened significantly in the euro area since the crisis

The PPI and its components for the euro area



Sources: Cerutti et al. (2016), ESRB and ECB calculations.

Notes: Cumulative index at quarterly frequency as of Q1 2000. The index equals one if in the respective quarter the respective prudential instrument became more stringent, zero if no change occurred, and minus one if the instrument became less stringent. Sector-specific capital buffer instruments include instruments regulating real estate credit, consumer credit and other credit.

There is no evidence that prudential policies are associated with retrenchment of cross-border banking in the euro area. When confronted with more stringent prudential policies aimed at them domestically, euro area banks increase their positions vis-à-vis banks located in the rest of the euro area. This suggests that there can be intra-euro area spillovers through leakages from tighter prudential policies aimed at banks. Changes in prudential policies that were common across euro area countries, reflecting the Basel requirements and their transposition into EU law in the CRD IV/CRR package, are absorbed econometrically by using time fixed effects. Exploiting the various dimensions of the PPI, there is evidence that the positive intra-euro area spillovers from prudential policies are driven by stricter concentration limits in source countries, which may incentivise diversification, including cross-border diversification. By contrast, stricter prudential measures aimed at borrowers show no such pattern, and the same applies to cross-border lending to non-banks for both

¹⁶⁸ See, among others, Bremus, F. and Fratzscher, M., "Drivers of structural change in cross-border banking since the global financial crisis", *Journal of International Money and Finance*, Vol. 52, April 2015, pp. 32-59; Houston, J.F., Lin, C. and Ma, Y., "Regulatory Arbitrage and International Bank Flows", *Journal of Finance*, Vol. 67(5), October 2012, pp. 1845-1895; and Ongena, S., Popov, A. and Udell, G.F., "When the cat's away the mice will play: Does regulation at home affect bank risk-taking abroad?", *Journal of Financial Economics*, Vol. 108(3), 2013, pp. 727-750.

¹⁶⁹ See Fahr, S. and Źochowski, D., "A framework for analysing and assessing cross-border spillovers from macroprudential policies", *Financial Stability Review*, ECB, May 2015; and Buch, C.M. and Goldberg, L., "Cross-Border Prudential Policy Spillovers: How Much? How Important? Evidence from the International Banking Research Network", *NBER Working Paper*, No 22874, December 2016.

groups of macroprudential policies. Finally, more stringent macroprudential policies in host countries have no significant impact on cross-border borrowing.¹⁷⁰

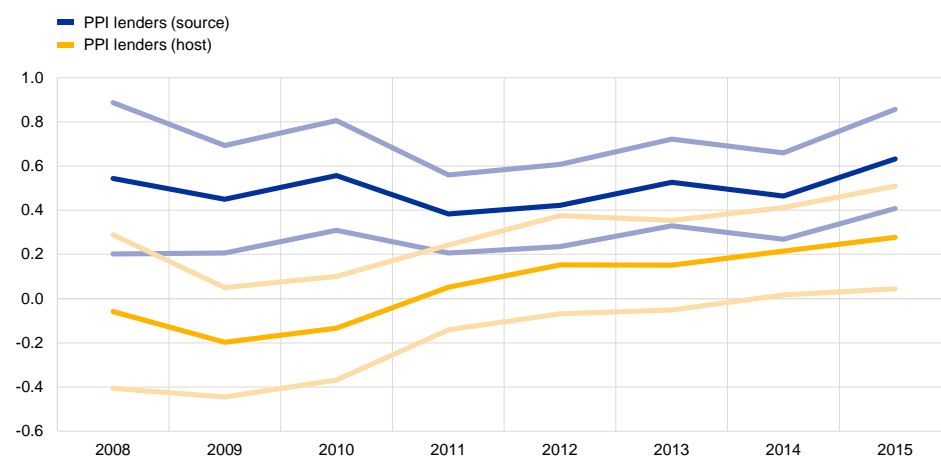
Banks facing tightened macroprudential policies at home tend to have been more engaged in cross-border interbank lending throughout the post-crisis period. Such behaviour may reflect intra-group lending, which, in contrast to lending to unrelated banks, has remained relatively resilient in the post-crisis period and may be associated with risk diversification benefits. **Chart B.8** suggests that a one point increase in the PPI for lenders is associated with an increase in cross-border interbank lending in the range of 0.4% to 0.6%.

Chart B.8

Tighter prudential policies aimed at lenders are associated with increased cross-border lending to banks

Time-varying coefficients on the PPI for lenders in source and host countries

(percentages)



Source: ECB calculations.

Notes: The pale lines indicate 90% confidence intervals around the estimated coefficients. Time-varying coefficients are estimated using interaction terms between year fixed effects and the PPI for lenders in source and host countries, respectively.

The role of bank levies

The introduction of bank levies – special taxes on banks – in several euro area countries does not appear to be significantly connected to the cross-border banking retrenchment. There are nine euro area countries in which governments have introduced bank levies, possibly with the objective of recouping some of the costs incurred during the crisis in order to support the domestic banking sector. These countries are Belgium, Germany, Ireland, the Netherlands, Austria, Portugal, Slovenia, Slovakia and Finland. The extent of cross-border potential spillovers from such bank levies depends on, among other factors, the underlying tax base and corresponding incentives for banks to adjust their lending activity.

¹⁷⁰ A relatively weak positive impact of tighter macroprudential policies aimed at lenders is found for cross-border borrowing by banks.

Box A

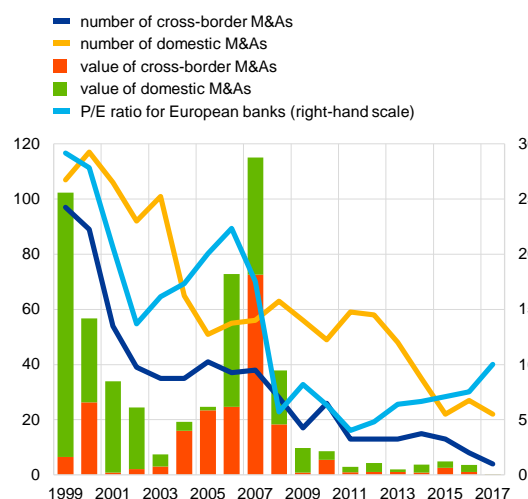
Cross-border mergers and acquisitions in the EU banking sector: drivers and obstacles¹⁷¹

Chart A

Lower bank valuations tend to discourage M&As

Bank M&A activity and bank valuations

(left-hand scale: number per year, € billions; right-hand scale: P/E ratio in multiples of earnings)



Sources: Dealogic and ECB.

Notes: M&A data cover the EU28. Values only include transactions for which data are available. The value spike in 2007 reflects one very large deal (the acquisition of ABN Amro by a consortium comprising Royal Bank of Scotland, Fortis and Santander).

The number of cross-border mergers and acquisitions (M&As) in European banking has been relatively low since the global financial crisis.

Cross-border M&As are relevant for financial stability because they can help banks to achieve economies of scale and diversify risks. In a monetary union, cross-border M&As could foster the integration of credit markets, thereby contributing to cross-country risk-sharing. Looking at the evolution of cross-border bank M&A activity in the current 28 EU Member States, a gradual downward trend can be observed since the turn of the century (see Chart A). Following a peak in around 1999-2000 and a stabilisation before the global financial crisis, the number of cross-border M&A transactions has come to a virtual standstill.

Moreover, their value has been low, following a peak in the years preceding the global financial crisis. Some of the weakness may be associated with a decline in bank stock price valuations, but the recent improvement in those

valuations has not been accompanied by a pick-up in M&A activity. Cross-border M&A activity has also remained relatively weak when compared with domestic M&A activity. Against this backdrop, the following question arises: what factors drive or inhibit cross-border bank M&As and how do these contrast with those for domestic M&A activity?

The bank-level analysis in this box is aimed at identifying the observable characteristics associated with becoming the target of a cross-border or a domestic bank acquisition.¹⁷²

Bank M&As can be undertaken for a variety of reasons, such as cutting costs, expanding into growth markets, taking advantage of funding synergies, and diversifying balance sheets. Obstacles to cross-border M&As may include business obstacles, regulatory and supervisory hurdles, and political uncertainty.¹⁷³ The characteristics on which the analysis in this box focuses include both bank-specific characteristics, such as the bank's operating performance, its capitalisation and size,

¹⁷¹ Prepared by Martin Bijsterbosch and Andrea Deghi.

¹⁷² The model specification is similar to, for example, Hernando, I., Nieto, M.J. and Wall, L.D., "Determinants of domestic and cross-border bank acquisitions in the European Union", *Journal of Banking and Finance*, Vol. 33(6), June 2009, pp. 1022-1032. An M&A transaction is defined as a deal that leads to an effective change in the ownership of the financial entity involved (defined here as an ownership stake of at least 20% before the transaction and at least 30% after the transaction). In the dataset there are 254 domestic and 106 cross-border transactions.

¹⁷³ See the special feature entitled "Cross-border bank consolidation in the euro area", *Financial integration in Europe 2017*, ECB, May 2017, which suggests that business obstacles, such as low economic growth and political uncertainty, may have created an unfavourable environment for bank M&As in recent years. Regulatory and supervisory hurdles, partly associated with a still incomplete banking union, seem to have added to these obstacles.

and characteristics relating to the jurisdiction in which the bank operates, such as prospects for growth, banking sector concentration and stock market volatility.

Drivers of and obstacles to M&As may differ depending on whether the transaction is domestic or cross-border. While many of the factors driving domestic and cross-border M&As are similar, Table 1 also shows some notable differences. Regarding the similarities, the probability of a bank being acquired increases with its size and its cost-to-income ratio for both domestic and cross-border M&As. The importance of a bank's size seems to reflect the existence of economies of scale or fixed costs in the M&A process, making the acquisition of a limited number of large banks more attractive than the acquisition of a larger number of smaller institutions. The significance of the cost-to-income ratio suggests that less efficient banks provide more scope for cost savings, increasing the potential benefits of an M&A deal. Moreover, in more concentrated banking systems (proxied by the Herfindahl-Hirschman Index), banks are less likely to be acquired, irrespective of whether the buyer is domestic or foreign.

Table A

Determinants of the probability of a bank being acquired in domestic and cross-border acquisitions

Determinant	Proxied by	Domestic	Cross-border
Size	Total assets	+++	+++
Capitalisation	Equity-to-assets ratio	-	
Liquid assets	Liquid assets-to-total assets ratio	--	-
Asset quality problems	NPL ratio	+++	
Profitability	Operating income-to-total assets ratio	--	++
Cost-efficiency	Cost-to-income ratio	+	+++
Macroeconomic conditions	Macroeconomic conditions	+	
Bank sector concentration	Herfindahl-Hirschman Index	---	--
Market volatility	Standard deviation of the country-specific MSCI stock price index		--
Expansion opportunities	Dummy variable for Member States that joined the EU in the 2000s		+++

Sources: Dealogic, SNL Financial, Fitch Connect, Thomson Reuters Datastream, Eurostat and ECB.

Notes: The results are based on multinomial logit regressions estimating the probability of a bank being acquired by a domestic or a foreign bank, using an annual panel of 6,013 banks in the EU28 for the period 1999-2016. The plus and minus signs represent the sign of the relationship between the explanatory variable and the probability of being acquired, and the number of signs (one, two or three) represents the degree of statistical significance (10%, 5% or 1%). All explanatory variables are lagged by one year. The models include time fixed effects. To control for the type of bank, the models include dummy variables for commercial banks, cooperative banks, savings banks and listed banks. The dummies for commercial and listed banks are significant, suggesting that it is primarily these types of banks that are involved in M&A transactions. Data on bank M&As from Dealogic and SNL Financial are matched with bank-specific time-series data from Fitch Connect. Data on country-level variables are from Thomson Reuters Datastream, Eurostat and the ECB.

Cross-border bank M&A activity seems to be driven more by expansion opportunities, while domestic acquisitions tend to focus more on seeking cost synergies. More specifically, domestic M&As are targeted at banks with weaker fundamentals, such as lower capital and liquidity buffers, weaker asset quality and lower profitability. The potential for efficiency gains seems to be more important for domestic deals, where there is more scope to streamline overlapping distribution networks or central functions. Such synergies are, however, typically less obvious for cross-border deals, where profitability and expansion opportunities tend to be more important drivers. The importance of the latter is illustrated by the strong statistical significance of the dummy variable representing whether a bank is located in a country that joined the EU during the 2000s, reflecting the fact that many cross-border acquisitions during that period were driven by the expansion opportunities in central and eastern Europe (although real GDP growth is somewhat more significant for domestic M&As than cross-border M&As). Moreover, cross-border M&As are

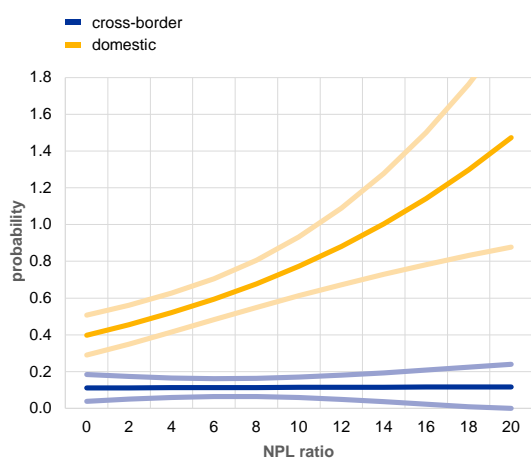
positively related to a bank's operating income, which can be seen as a proxy for a bank's profitability prospects.¹⁷⁴ Finally, the probability that a bank will be acquired by a foreign bank declines as domestic stock market volatility increases, which suggests that cross-border acquisitions tend to be more risk averse and more sensitive to market volatility.

Chart B

Higher NPL ratios increase the probability of domestic acquisitions, but not cross-border acquisitions

NPL ratio and probability of bank acquisition

(percentages)



Source: ECB calculations.

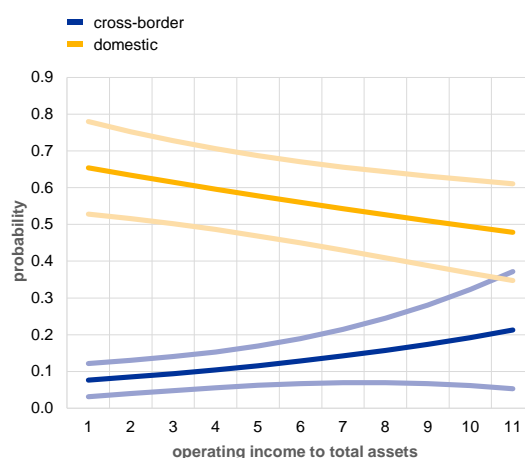
Notes: The shaded lines represent 95% confidence intervals. The probabilities are computed from a multinomial logit model of the probability of being acquired by a domestic or foreign bank.

Chart C

As profitability falls, cross-border acquisitions become less likely, but domestic acquisitions become more likely

Profitability and probability of bank acquisition

(percentages)



Source: ECB calculations.

Variations in the drivers of M&As have had a relatively strong downward impact on cross-border M&As in recent years. Charts B and C show how the probability of an acquisition varies with the target bank's NPL ratio and its profitability, respectively, using the same model as in Table A. In both charts, the probability of a domestic acquisition is consistently higher than that of an acquisition by a foreign bank, reflecting the fact that domestic M&As are more common than cross-border deals. While the probability of a domestic takeover increases substantially as the bank's NPL ratio rises, higher NPLs do not affect the likelihood of a cross-border takeover. This is in line with the finding above that domestic M&As tend to target relatively weakly performing banks. Chart C shows how changes in a bank's profitability affect the likelihood of a cross-border or domestic M&A. While the probability of an acquisition by a domestic bank tends to increase as a target bank's profitability weakens or it becomes loss-making, the likelihood of a cross-border acquisition declines.

To conclude, the weakness in cross-border M&A activity in recent years seems to reflect a lack of expansion opportunities and market perceptions of uncertain net benefits. While domestic acquisitions tend to be more driven by the scope for restructuring, cross-border M&As appear to be more targeted at growth opportunities and at more profitable banks. The absence of these is likely to have depressed cross-border bank M&A activity in Europe in recent years.

¹⁷⁴ Operating income, also referred to as recurring profit, excludes some relatively volatile income components and can thus be seen as a measure of "underlying" profitability.

Moreover, cross-border M&As seem to be relatively sensitive to changes in market sentiment, which is likely to have been an additional factor suppressing cross-border deals during the financial crisis. Looking ahead, an improvement in bank performance and lower uncertainty, supported, for example, by a completion of the banking union, could help support a pick-up in cross-border bank M&A activity.

Conclusion

This special feature shows a significant link between deteriorating asset quality and the great retrenchment in cross-border banking in the euro area since the crisis. This result holds for cross-border lending to both banks and other sectors and for the countries of both the lenders and the borrowers.

Conversely, tighter prudential policies and the introduction of bank levies do not contribute to explaining the reduction in cross-border banking activity. Banks facing stricter prudential policies at home are actually more engaged in cross-border interbank lending. This may be driven by stricter concentration limits, which may incentivise geographical diversification and thus be associated with enhanced risk diversification. For bank levies, there is no discernible link with the reduction in cross-border bank exposures in the euro area.

The euro area cross-border banking retrenchment was driven to a greater extent by source country factors, highlighting the spillovers from national banking sector conditions across the euro area. This is in line with the existing literature, which stresses that, during crisis times, cross-border bank flows are mainly affected by idiosyncratic supply shocks to creditor banks.¹⁷⁵

The analysis suggests that tackling the persistent asset quality problems in the euro area is pivotal in order to reap the potential benefits of cross-border banking. These benefits relate to risk diversification and risk-sharing within the euro area. Hence, the findings of this special feature make a case for completing the banking union. For instance, the rulebook for financial actors in the EU needs to be amended by adding a chapter on a harmonised approach to NPL resolution, complemented by country-specific elements in each high-NPL constituency, as stressed by Constâncio (2017).

¹⁷⁵ See Amiti, M., McGuire, P. and Weinstein, D.E., "Supply- and Demand-Side Factors in Global Banking", *Federal Reserve Bank of New York Staff Reports*, No 818, June 2017.