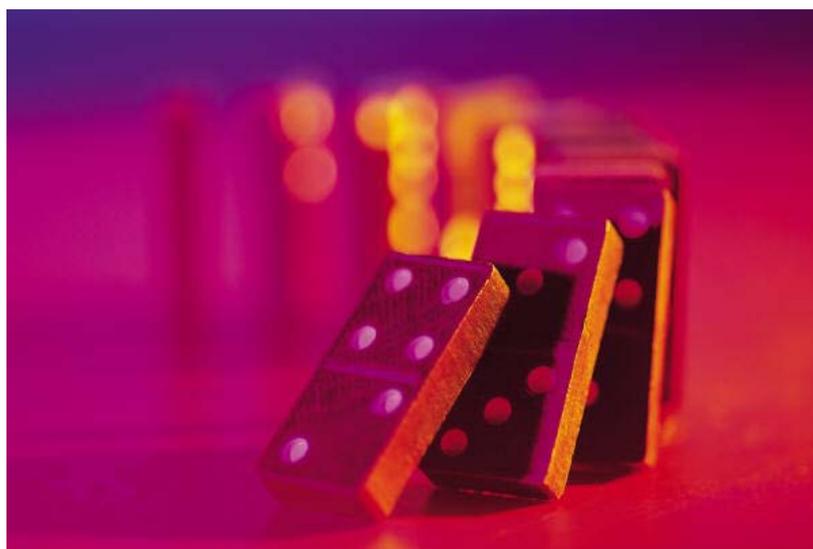


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FINANCIAL CONTAGION IN THE ERA OF GLOBALISED BANKING



Economics Department
Organisation for Economic Co-operation and Development

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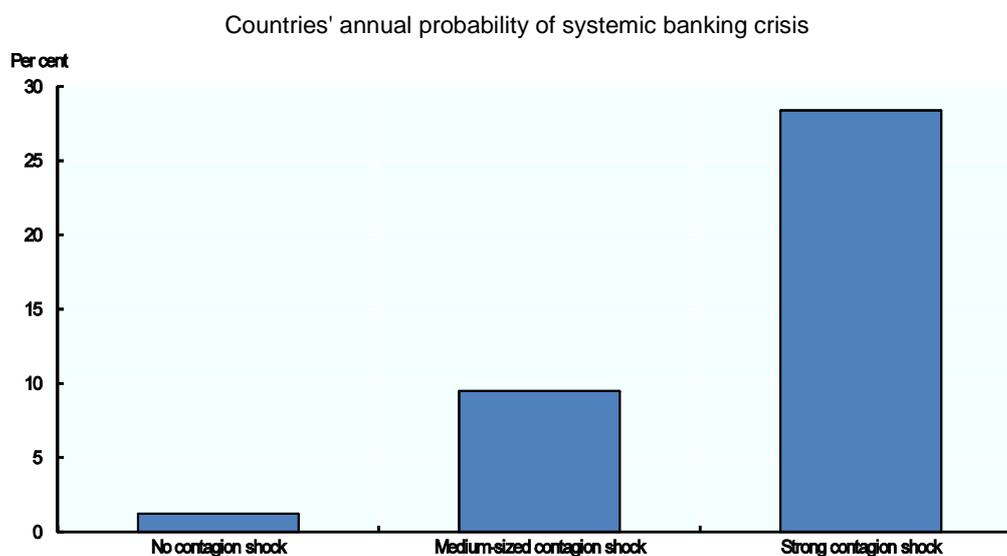
FINANCIAL CONTAGION IN THE ERA OF GLOBALISED BANKING

- One factor that made the recent financial crisis so deep and widespread is the extent and nature of international banking integration, which led to unprecedented transmission of financial instability.
- Financial contagion through international banking occurs e.g. when banks in a given country respond to deteriorations in their balance sheet by reducing cross-border loans, including *vis-à-vis* clients in countries that are not directly exposed to the initial financial shock.
- Initial deteriorations in a bank's balance sheet can result from an adverse shock to its home country's economy, but also from a deterioration in the quality of its loans *vis-à-vis* third party debtor countries. This implies that countries may suffer from shocks to countries with which they have no direct economic or financial connection.
- During the recent crisis, several Central and Eastern European countries that were particularly exposed to Western European banks saw their financial conditions deteriorate as the latter sought to repatriate loans to these countries in reaction to losses incurred on their asset portfolio in other countries.
- International financial integration is commonly seen as increasing economic efficiency and growth, but it may also increase countries' vulnerability to contagion. Not surprisingly, the more banks lend to each other through cross-border loans, the higher the risk of contagion. Larger roll-over risk due to shorter maturities of cross-border bank debt further increases vulnerability.
- Countries with better capitalised banking systems that finance credit to a larger degree by deposits have been less vulnerable to contagion.
- Inflow controls on credit operations can help mitigate bank-driven financial contagion, possibly by restraining cross-border bank debt or by lengthening its maturity.
- Vulnerability to contagion has been lower in situations of abundant global liquidity, underlining the importance of major central banks ensuring strong international liquidity at times of financial turmoil.

The global financial crisis has highlighted the potential risk to the global economy from financial contagion

1. Strong financial contagion was one of the key features of the global financial crisis as localised problems in certain segments of financial markets rapidly morphed into a crisis of global dimensions. Financial contagion shocks dramatically increase countries' risk of suffering a financial crisis: in periods where a country is not affected by financial contagion, its annual crisis probability is slightly above 1%, but rises to more than 28% in periods when it is hit by a strong contagion shock (Figure 1).

Figure 1. Financial contagion shocks strongly increase countries' crisis risk



Note: Bars represent, for three different levels of bank balance-sheet contagion shocks, a country's annual probability of suffering a systemic banking crisis. Observations are split into three groups based on the relative size of bank balance-sheet shocks. Periods without contagion shock are defined as the bottom decile of contagion shocks for each country, periods of medium-sized contagion shock as the range between the first and last decile of contagion shocks, and periods of strong contagion shock as the upper decile of contagion shocks.

Source: OECD calculations based on Ahrend and Goujard, 2011.

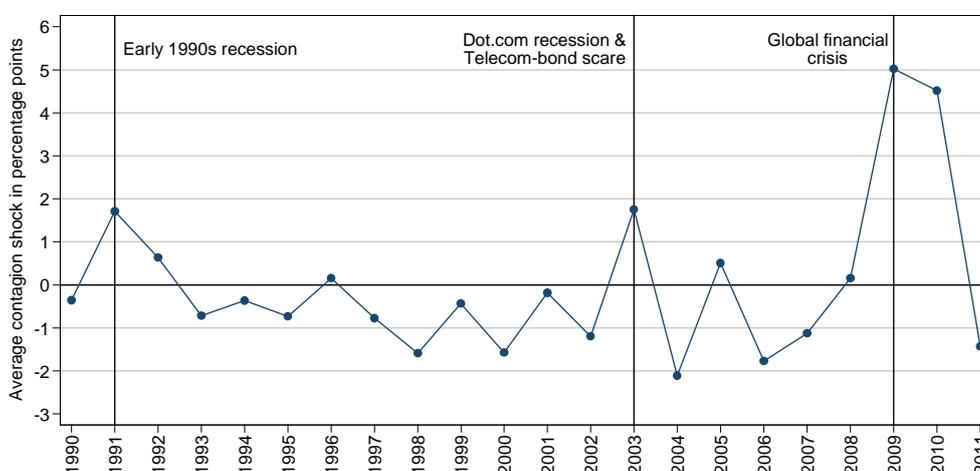
Balance sheets of financial intermediaries are vectors of cross-border contagion

2. Financial instability can spread across countries via balance sheets of financial intermediaries. A hit to the balance sheet of banks or other leveraged financial institutions can push them to sell external assets or to recall cross-country loans. This reaction could be prompted, for example, by internal rules or by prudential regulations such as capital requirements or maximum leverage ratios. The result is that financial instability spreads to countries in which banks have significant asset holdings or to which they have lent money. Consequently, borrowers may find their access to credit restricted even in a situation where their own and their country's credit risk has remained unchanged.

Bank balance-sheet contagion reached unprecedented heights during the recent global financial crisis

3. The importance of contagion shocks can be gauged by skilfully combining information on banks' cross-border lending and on countries' credit ratings. New OECD analysis confirms that bank-driven financial contagion has been an important driver of financial crises even prior to the recent global financial crisis. However, during the recent global financial crisis, bank balance-sheet driven contagion shocks have dwarfed previously observed levels of contagion (Figure 2), with the observed levels implying a more than six-fold increase in the annual probability of suffering a systemic banking crisis which is roughly 2½ percent for a typical OECD country.

Figure 2. Financial contagion via the bank balance-sheet channel reached unprecedented heights during the global financial crisis



Note: The average contagion shock is measured as the unweighted average of countries' contagion shocks. Each country's contagion shock is calculated as the aggregated sovereign rating downgrade of its creditors.

Source: Ahrend and Goujard, 2011.

Bank balance-sheet contagion can take different forms...

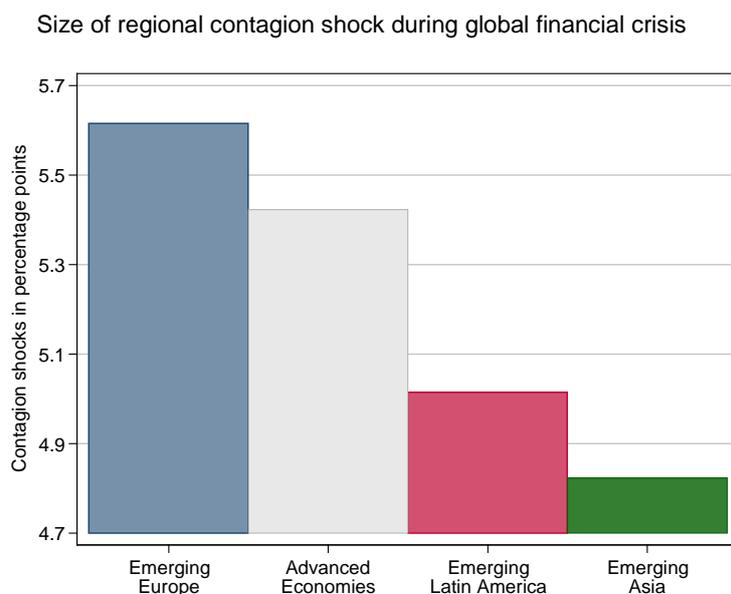
4. Bank balance-sheet driven contagion can be direct or indirect. *Direct* financial contagion – referred to as “lending-country spillovers” – results, for example, from being indebted to a creditor country with a deteriorating risk profile. *Indirect* contagion through the international banking system – referred to as “common-creditor contagion” – arises, for example, as banks cut back on loans to a country in response to suffering losses on loans to another country. Part of the contagion of the 1997-98 Asian crisis has been attributed to a “common creditor” effect, with Japanese and European banks the common creditors in this case. Similarly, indirect contagion is often cited as the causal link between the 1998 Russian crisis and the following crisis in Brazil. Empirically, increases in financial crisis risk have usually been considerably larger for common-creditor contagion than for lending-country spillover shocks. The empirical estimates presented in this note refer to both channels taken together.

... with varying impact across regions

5. Historically, average levels of bank balance-sheet driven contagion were relatively high during the global recession of the early 1990s, as well as in the early 2000s in a situation where global economic weakness in the wake of the dot.com boom combined with fears that large telecom companies might default on bonds issued to acquire UMTS licences (Figure 2). While the 1997-98 Asian crisis or the 1995 Mexican crisis did not lead to visible contagion at the global level, at the regional level and for certain emerging economies outside the region strong contagion effects were clearly visible at the time. During the recent global financial crisis all countries suffered from strong contagion, but the regional patterns were different from the earlier crises of the 1990s. This time, Latin American and Asian economies were among the least affected, whereas advanced economies and European emerging countries were those exposed to the strongest contagion shocks (Figure 3). In particular, Eastern and Central European countries suffered from the strongest common-creditor contagion shocks. This reflected large exposure to Western European banks and investors which cut their exposure to Eastern and Central Europe as a result of the losses they incurred on their international asset portfolios. The low degree of banking integration among Eastern and Central European countries may also have played a role. A comparatively high degree of intra-regional

banking integration probably amplified the Asian and Mexican crises in the respective region they originated in, but was an advantage during the global financial crisis which originated in, and mainly affected, the most advanced economies.

Figure 3. Contagion affected emerging European and advanced economies relatively more during the recent crisis



Note: Each bar represents the contagion shock a region has been subjected to, calculated as the aggregated sovereign rating downgrade of its creditors. The percentage point increases in the size of the contagion shocks shown on the y-axis correspond to equivalent percentage point downgrades in sovereign ratings which are coded on a scale from 0 to 100. See Ahrend and Goujard (2011) for further details.

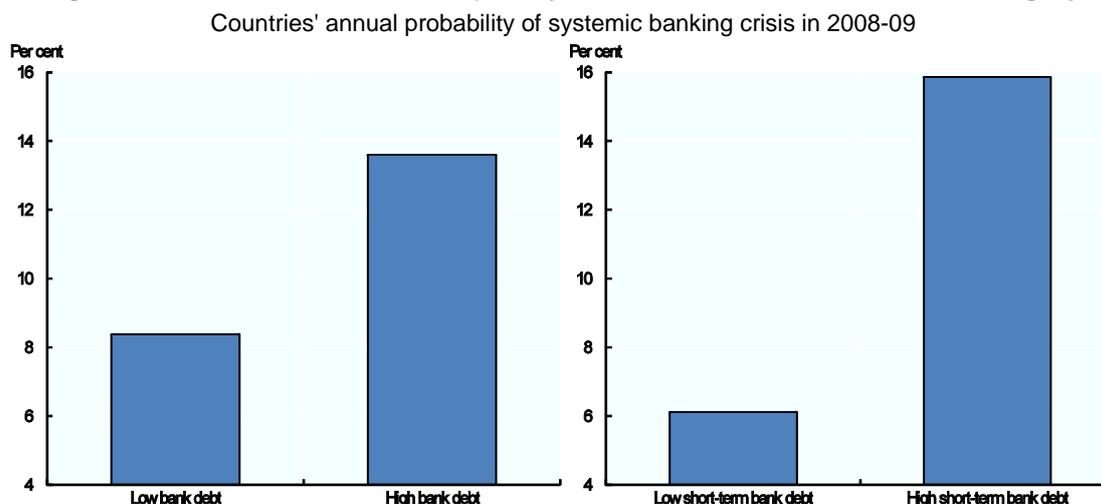
Source: OECD calculations based on Ahrend and Goujard, 2011.

Effects of bank-driven financial contagion – what determines them?

Cross-border lending of banks has increased the vulnerability to bank-balance sheet contagion...

6. International financial integration is commonly seen as increasing economic efficiency and growth, but it may increase the probability of suffering a systemic banking crisis by transmitting international shocks via bank balance sheets. Empirical analysis finds not surprisingly strong evidence that bank balance-sheet contagion has indeed been amplified by exposure to borrowing from cross-border banks (Figure 4, left panel). Such strong contagion effects through the bank balance-sheet channel are also consistent with results from bank-level micro-econometric studies.

Figure 4. Cross-border bank debt, especially when short-term, increases financial fragility



Note: Bars represent, for two different levels of (short-term) bank debt, a country's annual probability of suffering a systemic banking crisis when hit by the median-sized bank balance sheet shock observed in 2008-09 during the global financial crisis. OECD countries are split into two equally-sized groups based on the size of their (short-term) bank debt. Low (short-term) bank debt is defined as the average across the low (short-term) bank debt group, with high (short-term) bank debt being defined correspondingly.

Source: OECD calculations based on Ahrend and Goujard (2012).

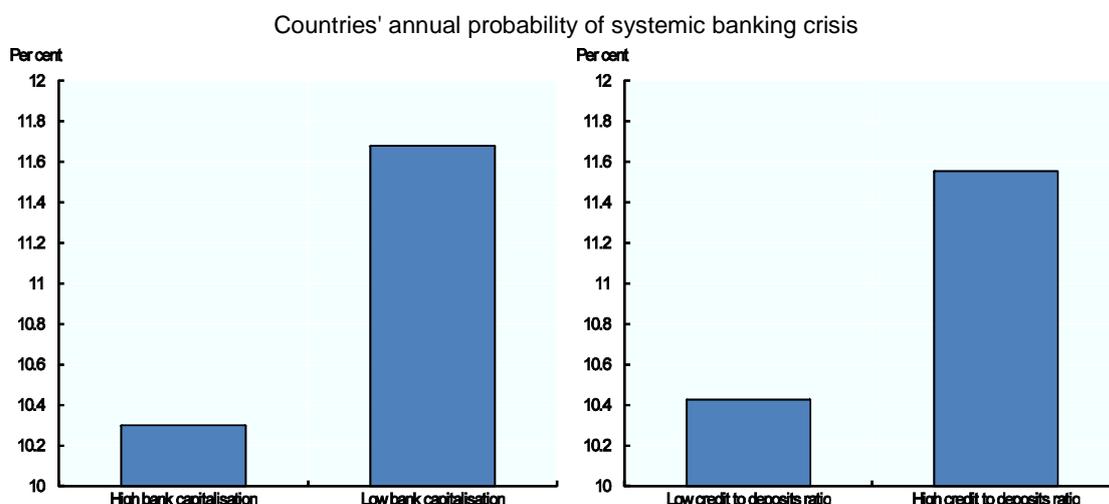
... and especially so when the maturity of cross-border bank debt is short

7. *Short-term* borrowing from cross-border banks may pose additional external funding risk beyond the size of total cross-border bank debt. For a given level of external debt, refinancing needs rise with a shorter maturity structure of the outstanding debt. A sudden inability to refinance external funding positions may force borrowers to liquidate assets not only earlier than planned, but typically in distressed market conditions, and resulting losses may render them insolvent. Indeed, the impact of *short-term* cross-border bank debt on annual financial crisis risk via international contagion has been almost twice as large as the impact of overall cross-border bank debt over the same channel. For example, in 2008-09 a country with low cross-border bank debt (*e.g.* Australia) had an annual crisis probability that was roughly 5 percentage points lower than a country with high cross-border bank debt (*e.g.* Iceland). For short-term bank debt this difference was 8 percentage points (Figure 4, right panel), implying for instance that just through its level of cross-border short-term bank borrowing, Ireland already had a three times larger annual risk of suffering a systemic banking crisis in 2008-09 than Poland or Mexico. These large increases in crisis probability underline the important role of cross-border bank debt, and in particular of short maturities, for spreading financial turmoil.

Higher banking sector capitalisation and larger reliance on deposits have reduced vulnerability to financial contagion, as have some forms of capital controls

8. More stringent legal capital adequacy requirements have limited capital flow reversals in 2008-09 during the financial crisis, and actual levels of banking sector capitalisation confirm the importance of capital for mitigating contagion (Figure 5, left panel). Similarly, countries where banks have funded credit to a larger degree through deposits have had a lower risk of bank balance-sheet driven contagion leading to a banking crisis (Figure 5, right panel). Bank balance-sheet shocks affecting deposits less than alternative sources of funding, such as cross-border lending, is in line with evidence from bank-level studies that banks which relied more on deposits were less affected during the global financial crisis. Finally, inflow controls on credit operations have mitigated the impact of bank balance-sheet contagion shocks, possibly by restraining (short-term) cross-border bank debt.

Figure 5. Higher banking sector capitalisation and larger reliance on deposits have reduced financial vulnerability in 2008-09



Note: Bars represent, for two different levels of the ratio of bank capital to assets (the credit-to-deposits ratio), a country's annual probability of suffering a systemic banking crisis when hit by the median-sized bank balance sheet shock observed in 2008-09 during the global financial crisis. OECD countries are split into two equally-sized groups based on the size of their bank capitalisation (credit-to-deposits ratio). Low bank capitalisation (a low credit-to-deposits ratio) is defined as the average across the low bank capitalisation (low credit-to-deposit ratio) group, with high bank capitalisation (a high credit-to-deposits ratio) being defined correspondingly.

Source: OECD calculations based on Ahrend and Goujard (2012).

Banking sector structure and global liquidity conditions also have affected vulnerability to financial contagion

9. While financial integration through banking debt increases contagion risk, the exact impact depends on the structure of the banking sector in the borrowing country. In particular, direct borrowing from international banks has been riskier than lending channelled through branches or subsidiaries of international banks because the former type of lending is more strongly affected than the latter in times of financial turmoil. Finally, bank balance-sheet driven contagion has particularly raised a country's likelihood of suffering a systemic banking crisis when US or global interest rates have been high, or global liquidity has been low. For example, during the global financial crisis (2008-09), a one percentage point reduction in global interest rates (defined as a weighted average of European, Japanese and US policy rates) is associated with countries' probability of financial crisis being reduced by one percentage point. This implies that the reduction in global interest rates observed during the crisis reduced the number of countries affected by systemic banking crises by roughly one-third, underlining the importance of central banks ensuring strong international liquidity at times of financial turmoil.

Suggested further reading

The main papers providing the background to this note are:

Ahrend, R. and A. Goujard (2011), "International Capital Mobility and Financial Fragility: Part 1. Drivers of Systemic Banking Crises: The Role of Bank-Balance-Sheet Contagion and Financial Account Structure", *OECD Economics Department Working Papers*, No. 902, OECD Publishing.

Ahrend, R. and A. Goujard (2012), "International Capital Mobility and Financial Fragility: Part 3. How do Structural Policies Affect Financial Crisis Risk? Evidence from Past Crises Across OECD and Emerging Economies", *OECD Economics Department Working Papers*, No. 966, OECD Publishing.

OECD (2012), "International Capital Mobility: Which Structural Policies Reduce Financial Fragility?", *OECD Economic Policy Papers*, No. 2, OECD Publishing.

Additional related papers include:

Ahrend, R. and C. Schweltnus (2011) “International Capital Mobility and Financial Fragility: Part 2. The Demand for Safe Assets in Emerging Economies and Global Imbalances: New Empirical Evidence”, *OECD Economics Department Working Papers*, No. 903, OECD Publishing.

Ahrend, R. and C. Schweltnus (2012) “International Capital Mobility and Financial Fragility: Part 4. Which Structural Policies Stabilise Capital Flows when Investors Change their Mind? Evidence from Bilateral Bank Data”, *OECD Economics Department Working Papers*, No. 967, OECD Publishing.

Ahrend, R. and C. Schweltnus (2012) “International Capital Mobility and Financial Fragility: Part 5. Do Investors Disproportionately Shed Assets of Distant Countries under Increased Uncertainty? Evidence from the Global Financial Crisis”, *OECD Economics Department Working Papers*, No. 968, OECD Publishing.

Ahrend, R. and A. Goujard (2012), “International Capital Mobility and Financial Fragility: Part 6. Are all Forms of Financial Integration Equally Risky in Times of Financial Turmoil? Asset Price Contagion during the Global Financial Crisis”, *OECD Economics Department Working Papers*, No. 969, OECD Publishing.

Ahrend, R. and C. Valdivia (2012) “International Capital Mobility and Financial Fragility: Part 7. Enhancing Financial Stability: Country-specific Evidence on Financial Account and Structural Policy Positions”, *OECD Economics Department Working Papers*, No. 970, OECD Publishing.

OECD, (2011), “Getting the Most Out of International Capital Flows”, *OECD Economic Outlook*, Vol. 2011/1, OECD Publishing.

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