



## Financial integration, specialization, and systemic risk<sup>☆</sup>

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### ABSTRACT

This paper studies the implications of cross-border financial integration for financial stability when banks' loan portfolios adjust endogenously. Banks can be subject to sectoral and aggregate domestic shocks. After integration they can share these risks in a complete interbank market. When banks have a comparative advantage in providing credit to certain industries, financial integration may induce banks to specialize in lending. An enhanced concentration in lending does not necessarily increase risk, because a well-functioning interbank market allows to achieve the necessary diversification. This greater need for risk sharing, though, increases the risk of cross-border contagion and the likelihood of widespread banking crises. However, even though integration increases the risk of contagion it improves welfare if it permits banks to realize specialization benefits.

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## 1. Introduction

Large and complex financial institutions increasingly dominate the financial systems of industrial countries. Partly to further enhance scale, partly for domestic competition policy and partly for diversifying revenue streams and risks, these financial institutions transact more and more across borders. They link the financial systems of different countries and foster international financial integration. By diversifying their risks more they improve the resilience of the international financial system against idiosyncratic shocks. At the same time, however, the risk of financial contagion is extended from the national level to the international arena. Due to international integration a default of

one such institution can now have more severe negative externalities on financial intermediaries abroad. As the recent turbulence in the global financial system following the failure of Lehman Brothers in September 2008 vividly showed, these externalities may arise from direct exposures, from asymmetric information about them or from large failures causing liquidity dry-ups in key markets.<sup>1</sup> The increasing cross-border activities and risk exposures of major financial intermediaries are particularly challenging, as the main regulatory and supervisory setups in banking, securities and insurance business remain predominantly at the national level, and therefore may not be able to effectively address cross-border contagion risk.

Theoretical studies that deal with this trade-off between the benefits from diversification and the expected costs from financial contagion focus on the integration through the interbank market, because banks remain at the core of financial systems and tend to be particularly linked among each other.<sup>2</sup> The one and a half decades prior to the re-

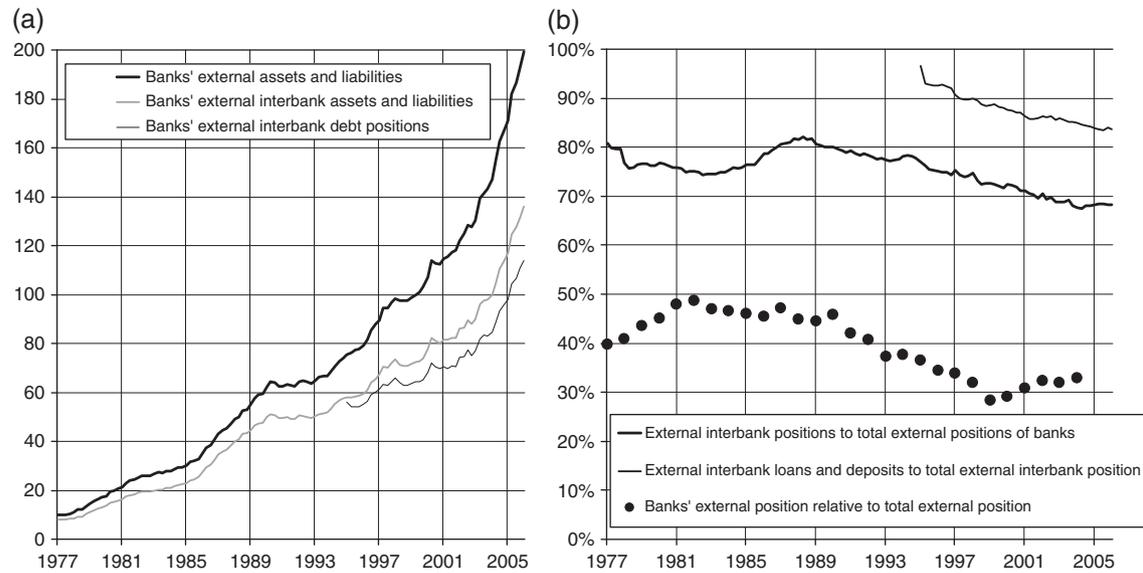
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<sup>1</sup> An early case of international financial contagion due to direct exposures was the Herstatt crisis in 1974. A more recent example of international systemic risk related to market illiquidity was the Long Term Capital Management (LTCM) crisis in 1998. For a discussion of these and many other cases, see [Basel Committee on Banking Supervision \(2004\)](#).

<sup>2</sup> For a number of reasons (large and complex financial conglomerates, trading links between different types of financial institutions, e.g., through new credit risk transfer markets, or banks' prime broker activities for hedge funds), however, the analysis carries over to other large financial intermediaries.



**Fig. 1.** Development and composition of banks' external assets and liabilities. Panel (a) reports the development of 1) banks' cross-border asset and liability holdings, 2) cross-border interbank assets and liabilities, and 3) cross-border interbank debt positions according to an index constructed based on the BIS Locational Banking Statistics, whereby cross-border asset liabilities held in 2000Q1 are set to 100. Panel (b) reports 1) banks' cross-border assets and liabilities according to the BIS Locational Banking Statistics relative to the sum of foreign assets and liabilities following Lane and Milesi-Ferretti (2007), 2) the share of cross-border interbank assets and liabilities in cross-border assets and liabilities of banks according to the BIS Locational Banking Statistics, and 3) the share of cross-border interbank debt claims in cross-border interbank assets and liabilities according to the BIS Locational Banking Statistics. Source: BIS Locational Banking Statistics predominately covers OECD countries' banking sectors. Source: BIS "Locational banking statistics", <http://www.bis.org/statistics/bankstats.htm>.

cent financial crisis have witnessed remarkable growth of cross-border bank activities (see Fig. 1). The overwhelming part of this is constituted of interbank assets and liabilities.

Previous studies of the welfare implications of integrated interbank markets, however, took the corporate lending behavior of banks as given. This implies that the distribution of idiosyncratic shocks across countries is not affected by financial integration.<sup>3</sup> This assumption is problematic because one should expect that the portfolios of financial institutions react to the openness of financial markets. In order to fully evaluate the allocative effects of financial integration one needs to endogenize the loan portfolios of domestic or international banks.

In this paper we follow this idea. We analyze the welfare effects of financial integration taking into account that the improved scope for risk sharing through integrated financial markets affects banks' specialization which in turn influences the cross-country distribution of bank specific shocks. More precisely, we develop a model in which each local bank has a comparative advantage in lending to a specific sector, because this sector is most productive in the respective bank's country.<sup>4</sup> Since the timing of loan repayments is uncertain across sectors a trade-off between specialization in lending and diversifying liquidity risks arises.

Integration through an interbank market allows banks to reallocate funds across borders and share their liquidity risks. As the scope for diversification through an interbank market improves, banks may

choose to increase their lending to the most profitable sector in their country, because the need to diversify through their loan portfolio diminishes. This endogenously raises banks' exposure to specific sectoral shocks and further increases the need for diversification through the interbank market. Thus, the more pronounced is the specialization in the loan book the greater is the need for risk sharing and the more reliant are financial institutions on a well-functioning integrated interbank market. But if banks rely to a larger extent on the interbank market to buffer liquidity shocks the risk of contagion grows. If the sector in which one bank is specialized suffers from an adverse liquidity shock, this bank might not be able to raise the needed liquidity in the integrated interbank market, if the foreign bank is at the same time hit by a domestic shock, for instance, due to an operational problem. In that way the failure of one bank as a consequence of a severe domestic shock is transmitted over an integrated interbank market to banks across borders and might ultimately destabilize banks that were initially not affected by the shock.<sup>5</sup>

These results match very well recent empirical evidence by Bonfiglioli (2008) on the role of financial integration for national productivity. According to her analysis, financial integration raises total factor productivity. Moreover, she finds that financial integration slightly raises the risk of financial contagion. Both observations are in line with the present theory.

We also analyze how financial integration affects overall financial stability and welfare. If banks already reap the benefits of specialization without the risk sharing opportunities of an integrated interbank market, then financial integration does not change the portfolio composition and bank specific liquidity shocks. However, an interbank market allows banks to pool these risks and might thus be welfare enhancing. If it is only financial integration that induces banks to specialize in their lending portfolio then the severity of idiosyncratic risk exposure increases. But the enhanced risk sharing through the interbank market compensates this. However, it also makes banks dependent on the liquidity provision from the cross-border banking market. This

<sup>3</sup> While Allen and Gale (2004a,b) and Fecht (2004) focus on interrelations between banks through the general asset market, Allen and Gale (2000), Freixas et al. (2000), Fecht and Grüner (2006), as well as Fecht et al. (2007) focus on the interbank deposit market. All of these studies assume a given distribution of the idiosyncratic shocks. In contrast, two papers analyze the impact of interbank markets on banks' investment choices, focusing on moral hazard problems and the incentives for peer monitoring. Rochet and Tirole (1996) assess the incentives for peer monitoring in order to draw conclusions about the scope for a system-wide banking crisis in this context. Freixas and Holthausen (2004) discuss the implications of greater asymmetric information about foreign compared to domestic banks for the structure and integration of an interbank market. None of these two papers, however, focus on the relationship between interbank market integration and cross-border contagion.

<sup>4</sup> See Acharya et al. (2006) for empirical evidence of these specialization benefits in banking.

<sup>5</sup> It is interesting to note that this channel of interbank contagion is not based on the loss of interbank deposits as in Allen and Gale (2000) or Freixas et al. (2000).

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