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Granularity in banking and growth: Does financial openness matter? ☆

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ABSTRACT

We explore the impact of large banks and of financial openness for aggregate growth. Large banks matter because of granular effects: if markets are very concentrated in terms of the size distribution of banks, idiosyncratic shocks at the bank-level do not cancel out in the aggregate but can affect macroeconomic outcomes. Financial openness may affect GDP growth in and of itself, and it may also influence concentration in banking and thus the impact of bank-specific shocks for the aggregate economy. To test these relationships, we use different measures of de jure and de facto financial openness in a panel dataset for 79 countries and the years 1996–2009. Our research has three main findings: First, bank-level shocks significantly impact upon GDP. Second, financial openness tends to lower GDP growth. Third, granular effects tend to be stronger in financially closed economies.

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1. Motivation

This paper contributes to an improved understanding of links between the real and financial sector. We focus on granular effects in banking and how these effects are influenced by financial openness. Granular effects arise if markets are very concentrated. If a few large banks coexist with many small banks, idiosyncratic shocks to individual banks do not have to cancel out in the aggregate but can affect macroeconomic fluctuations. The importance of granular effects has been shown for aggregate fluctuations in the US (Gabaix, 2011), for international trade (Di Giovanni and Levchenko, 2009), and for domestic banking markets (Amiti and Weinstein, 2013, Bremus et al., 2013). Thus, besides issues of connectedness or moral hazard, large banks can affect aggregate growth simply by being large.

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Consequently, many current policy initiatives aim at restricting bank size by imposing bank levies with progressive tax rates or by imposing higher capital buffers on systemically important banks. At the same time, banking markets have become more segmented after the crisis.¹ Yet, we know little, both empirically and theoretically, on the interaction between size effects in banking, financial openness, and macroeconomic outcomes. Closing this gap is the purpose of this paper.

We use panel data for 79 countries and the years 1996–2009 to analyze how granular effects in banking and financial openness affect aggregate output. Our bank-level data are obtained from Bankscope. In line with Gabaix (2011), we measure granular effects – the “banking granular residual” – as the weighted sum of bank-specific shocks where the weights reflect banks’ market shares.

We account for the fact that the impact of bank-level shocks may differ for countries with different degrees of financial openness. In times of financial globalization and increasing international linkages between banks, it is important to analyze how idiosyncratic bank risk affects the macroeconomy and whether financial openness matters for this link. The debate about the

¹ Rose and Wieladek (2014) find that, after nationalization, foreign banks reduce the share of loans going to the UK, which can be interpreted as evidence for financial protectionism. In Europe, state support for banks was often conditioned on the requirements to close foreign affiliates. Also, banks’ sovereign debt portfolios in Europe have exhibited an increasing degree of “home bias” since the outbreak of the sovereign debt crisis (Pockrandt and Radde, 2012).

regulation of global systemically important banks (G-SIBs) illustrates that the concentration of ownership and the increase in the importance of large global banks has implications for financial and macroeconomic stability. For example, Vitali et al. (2011) demonstrate that ownership of transnational financial institutions is extremely concentrated. The ownership structure of global banks is a good proxy for the network of contractual ties between financial institutions, and hence for the complexity of the global financial system. Given the high degree of concentration of bank ownership at the global level and of bank assets in general, it is important to extend the analysis of individual bank risk and its macroeconomic consequences to the international level. To the best of our knowledge, this paper is a first step into this direction.

Our research has three main findings: First, idiosyncratic bank-level shocks are positively related to GDP growth. Second, a high degree of financial openness tends to lower growth. When analyzing this effect depending on different levels of financial depth, in line with previous literature, our results show that a higher degree of financial openness mitigates growth in countries where financial depth is low. As financial depth increases, more financial openness fosters growth though. And third, granular effects from the banking sector tend to be more pronounced in economies which have a low degree of financial openness.

Our work on the link between granular effects and financial openness is related to (i) the literature on the effects of financial openness on macroeconomic growth and volatility, and (ii) the literature on granular effects. Previous research has shown that the link between financial openness and aggregate outcomes is non-linear (Kose et al., 2011): At low levels of institutional or financial development, financial openness may harm growth. At high levels of institutional development, financial openness increases growth. Klein and Olivei (2008) show that capital account openness increases financial depth and thereby economic growth. The link between financial openness and growth volatility depends on the size of domestic credit markets in a non-linear way as well (Kose et al., 2003, 2009).

We complement this research by analyzing inter-linkages between granular effects in banking and financial openness. Granular effects reflect distortions in the domestic banking sector in the form of a dominance of large banks. In financially closed economies, firms have few substitutes to bank credit. They cannot easily switch to non-bank or foreign suppliers of finance. Hence, the effects of idiosyncratic shocks hitting large banks may be particularly severe. The impact of large banks may become less important for domestic macroeconomic developments if a country is financially more open.

Granularity in banking has, so far, been analyzed in closed-economy settings. Empirically, size distributions in banking resemble a fat-tailed power law distribution which is necessary to generate granular effects (Bremus et al., 2013). Moreover, granularity in banking matters for short-run output fluctuations in Eastern Europe (Buch and Neugebauer, 2011), and shocks to large banks affect the probability of default of smaller banks in Germany (Blank et al., 2009). Using credit registry data to isolate loan supply shocks, Amiti and Weinstein (2013) show that credit supply shocks matter for aggregate loan supply and investment in Japan.

Analyzing granular effects in open economies is a straightforward extension of previous work. In the international trade literature, Di Giovanni and Levchenko (2009) extend the original idea by Gabaix (2011) and show the implications of greater trade openness for macroeconomic volatility. They use a Melitz-type model of heterogeneous firms in which firm size distributions that follow a power law evolve (Melitz, 2003). The model can be used to show that macroeconomic volatility is a function of idiosyncratic shocks and of market structure, measured through an industry's Herfindahl index. Following the liberalization of external trade, large firms

emerge endogenously because the most productive firms get bigger and the least productive, smallest firms exit. This mechanism can explain the positive correlation between trade openness and output volatility found in many empirical studies (Di Giovanni and Levchenko, 2009).

Comparable models in international banking have been developed more recently. These models show that financial openness may affect market structure in banking markets. De Blas and Russ (2013) model financial openness through FDI of banks and through cross-border lending in the presence of heterogeneous banks. These two forms of financial openness may have different effects on the banking sector's Herfindahl index of concentration. Based on the model by De Blas and Russ (2013), Bremus (2015) shows that financial openness – both in the form of foreign bank entry and in the form of direct cross-border lending – coincides with lower bank concentration in many countries. In the model, cross-border lending puts competitive pressure on domestic banks, so that asset market shares become more similar, and the degree of concentration falls. If market contestability increases due to greater openness, banks absorb a larger part of idiosyncratic shocks by adjusting markups instead of lending rates. As a result, the pass-through of bank-level shocks to the real economy gets weaker. This mitigates granular effects. Foreign bank entry may increase or decrease concentration. If the most efficient banks from abroad merge with the most efficient domestic banks and if the smallest banks drop out of the market, the big banks get bigger. This would magnify the link between bank-level shocks and macroeconomic outcomes via increased concentration. But bank FDI may also decrease concentration if banks' market shares get more similar (Bremus, 2015). Hence, different types of financial openness can have different implications for the strength of granular effects. It ultimately remains an empirical question whether financial openness affects the strength of granular effects in banking.

In order to analyze these linkages, Part 2 introduces the data and explains how we measure granularity, growth, and financial openness. Part 3 has the empirical model and results, and Part 4 concludes.

2. Data and measurement of granular effects

In this paper, we analyze whether idiosyncratic shocks affecting large banks influence the aggregate economy and whether this link depends on the degree of financial openness. The hypothesis that we test is the following: *In countries which are more open to foreign bank lending, banking sector concentration is lower than in less financially open economies so that granular effects are weaker in more financially open economies.*

Countries which are more financially open tend to have a lower degree of concentration in the banking sector (Bremus, 2015). The negative link between banking sector openness and concentration can be observed both for direct cross-border lending and for foreign bank entry. According to the theory of granularity, a lower degree of bank concentration mitigates granular effects. The lower bank concentration, the weaker the relationship between bank-specific shocks and fluctuations at the macroeconomic level.

In addition, when considering lending via foreign affiliates of banks, recent studies have shown that foreign bank subsidiaries that have access to an internationally diversified internal capital market can be a more stable source of credit than local banks, especially in case of local crises (De Haas and van Lelyveld, 2006, 2010). Thus, a second channel through which granular effects from the banking sector can be mitigated in more open economies is the reduction in bank-specific fluctuations due to the access of foreign bank subsidiaries to internal sources of funding. Yet, the empirical literature which has focused on the global financial crisis has

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