1. Introduction

The recent financial crisis has triggered a debate on bank size as a determinant of systemic risk. There are a number of reasons why this debate takes place now. First, large banks were at the center of the recent crisis. Second, the size of large banks has increased substantially over the last two decades (Fig. 1). Third, large banks tend to have lower capital ratios, less stable funding, and more exposure to potentially risky market-based activities (Figs. 2–4; see also Laeven et al., 2014).

This stylized evidence gives rise to a number of economic questions that are critical for formulating effective policy vis-à-vis large banks. First, what exactly is the source of risk in large banks? Is it low capital, unstable funding, market-based activities, size per se, or a combination of the above? Second, do these potential risk factors drive systemic risk through their effect on standalone bank risk (and can be addressed by traditional, micro-prudential regulation), or is there an effect on systemic risk that goes above and beyond that on standalone bank risk, suggesting a need for additional, macroprudential measures? Finally, which of the risk factors are robust across countries, so that targeting them could be part of international policy arrangements such as the Basel regulatory framework?

Answering these questions is paramount for informing the policy debate. Without that, policy may be imprecise and lack consensus. Indeed, the views in the ongoing policy debate on large banks differ substantially. Some, including the Basel Committee, advocate capital-based measures – such as an additional surcharge of up to 2.5% capital on large banks (e.g., International Monetary Fund, 2010; French et al., 2010). Others, such as the Volcker Rule as contained in the Dodd–Frank Act in the U.S., or the Vickers (2011) and Liikanen (2012) proposals in Europe, advocate restrictions on risky bank activities. And some advocate outright limits on the individual size of banks. Yet others argue that such restrictive regulations would distort the allocation of banks’ resources, hurting the efficiency of capital allocation and imposing substantial costs to the real economy (Kashyap et al., 2010b; Aiyar et al., 2014). They propose to focus instead on reducing too big to fail subsidies through better resolution and contingent capital requirements (Farhi and Tirole, 2012; Kashyap et al., 2010a; Stein, 2013).

This paper studies the significant variation in the cross-section of systemic risk of large banks during the recent financial crisis in a broad sample of countries, with a view to identify bank specific factors that determine systemic risk. We use the crisis as a shock
to the banking system revealing the nature and size of systemic risk of individual banks. As proxies for systemic risk we use two recently developed measures of systemic risk, Adrian and Brunnermeier (2012)’s CoVaR and Brownlees and Engle (2012)’s SRISK. By simultaneously analyzing the role of banks size, capital, funding and activities, we are able to isolate the independent effects of these three key bank risk factors on systemic risk, and shed light on the ongoing debate on the merits of restricting bank size, imposing capital surcharges on large banks, and/or restricting their unstable funding and risky activities.

There are several theories supporting the view that large and complex banks contribute to systemic risk. According to one view, which we label the unstable banking hypothesis, large banks tend to engage more in risky activities (e.g., trading) and be financed more with short-term debt, which makes them more vulnerable to generalized liquidity shocks and market failures such as liquidity shortages and fire sales (Kashyap et al., 2002; Shleifer and Vishny, 2010; Gennaioli et al., 2013; Boot and Ratnovski, 2012).

According to another view, the too-big-to-fail hypothesis, regulators are reluctant to close or unwind large and complex banks, resulting in moral hazard behavior that leads banks to take on excessive risks in the expectation of government bailouts (e.g., Farhi and Tirole, 2012).

According to a third view, the agency cost hypothesis, large and complex banks that engage in multiple activities (e.g., combining lending and trading) suffer from increased agency problems and poor corporate governance that can translate into systemic risk (e.g., Bolton et al., 2007; Laeven and Levine, 2007). According to this view, banks have a natural tendency to take on excessive risks and to grow in size, while regulators, by focusing on microprudential regulation, did little to prevent the resulting build-up of systemic risk. As a result, large banks tend to share many of the risk factors that other theories have identified as being important drivers of systemic risk, such as high leverage, activity diversity, and interconnectedness.

Our analysis is not an attempt to test these theories, which are not mutually exclusive, but simply to identify the main drivers of systemic risk more generally. In the process, however, we also learn something about the relative merits of these theories in explaining variation in systemic risk.

We find strong evidence that systemic risk increases with bank size. Our results indicate that a one standard deviation increase in total assets increases the bank’s contribution to systemic risk by about one-third its standard deviation when measured by ΔCoVaR, and by about half its standard deviation when measured by SRISK. These are large effects. We also find evidence that systemic risk is lower in better-capitalized banks, with the effects particularly pronounced for large banks.
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