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Resolution of international banks: Can smaller countries cope?

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Abstract

The stability of a banking system ultimately depends on the strength and credibility of the fiscal backstop. While large countries can still afford to resolve large global banks on their own, small and medium-sized countries face a policy choice. This paper investigates the impact of resolution on banking structure. The financial trilemma model suggests that smaller countries can either conduct joint supervision and resolution of their global banks (based on single point of entry resolution) or reduce the size of their global banks and move to separate resolution of these banks' national subsidiaries (based on multiple point of entry resolution). Euro-area countries are heading for joint resolution based on burden sharing, while the United Kingdom and Switzerland have implemented policies to downsize their banks.

1 | INTRODUCTION

The Great Financial Crisis (GFC) of 2007–2009 highlighted that 'financial institutions may be global in life, but they are national in death' (Huertas, 2009, p. 6). National authorities were thus on their own to resolve the respective national parts of those global banks that were failing or under severe pressure. While there have been reforms to strengthen the governance of the international banking system, they have not succeeded in addressing this coordination failure in the resolution of international banks between national authorities.

A key element of the reform is a new resolution framework setting out the responsibilities of authorities to resolve failing financial institutions in an orderly manner, by protecting critical functions and without exposing the taxpayer to the risk of loss. For this purpose, the Financial Stability Board (FSB, 2014) has introduced key principles for the resolution of international banks. Although these principles encourage cooperation between national resolution authorities, they are non-binding

(Riles, 2014). As we witnessed during the GFC, as well as in earlier crises, authorities put non-binding agreements (like Memoranda of Understanding) aside in the heat of the moment when large sums are at stake.

There is a new literature emerging on resolution models for international banks, which applies game theory to analyse the cooperation between national authorities (Bolton & Oehmke, 2016; Faia & Weder di Mauro, 2016; Schoenmaker, 2013). A key insight is that a banking crisis can be considered as a rare event (one-shot game) with high financial stakes. The repeated game solution is thus not applicable to the non-cooperative equilibrium.

Bolton and Oehmke (2016) and Faia and Weder di Mauro (2016) analyse the two main resolution models for global banks. Under single point of entry (SPE) resolution, a global bank is recapitalized at the level of a single bank holding company that owns banking subsidiaries in multiple jurisdictions. The resolution losses are first allocated to the equity (and bond) holders of the parent holding and the authorities have statutory power to execute resolution at the parent holding. The underlying idea is that any remaining losses are shared across countries. Goodhart and Schoenmaker (2009) claim that only ex ante binding burden sharing agreements between governments can solve the coordination failure. Faia and Weder di Mauro (2016) label this solution as cooperative SPE, which generally minimizes losses since authorities internalize cross-country spillovers and is thus more cost-efficient.

By contrast, under multiple point of entry (MPE) resolution, separate resolutions are performed in each country (if necessary) with funds from national subsidiaries. The resolution losses are first allocated to the equity (and bond) holders of national subsidiaries. The host country has statutory power of resolution of national subsidiaries. Bolton and Oehmke (2016) show that MPE resolution is more applicable to decentralized global banks. The main contribution of Bolton and Oehmke (2016) and Faia and Weder di Mauro (2016) is to analyse the impact of the chosen resolution regime on the organizational form of banks. SPE is more inducive to centralized banks, while MPE leads to decentralized banks.

The contribution of this paper is to analyse the impact of the choice of resolution model on the structure of the banking system in a country. In my setting, authorities first choose to cooperate in resolution by providing a joint fiscal backstop under a binding burden sharing agreement, or not. Burden sharing (or loss allocation) facilitates joint supervision and cooperative SPE resolution. Without burden sharing, the home country has to carry the full burden of a possible bank recapitalization under SPE. But the fiscal capacity of the home country can be limited, which subsequently puts the SPE model into question for banks headquartered in these countries.

The paper develops a method to assess the potential fiscal costs for a country required to support its banking system. I apply this method to countries that are home to global systemic banks[1] and find that small and medium-sized countries cannot provide a credible fiscal backstop to large global banks. My hypothesis is that these countries can only maintain global banks if they organize a joint fiscal backstop through burden sharing. The empirical estimates suggest that medium-sized countries without burden sharing have started a policy-driven process of downsizing their banks, while countries with burden sharing have been able to preserve their banks. My method is helpful to explain the impact of resolution (cooperation or the lack of it) on banking structure.

The paper is organized as follows. Section 2 discusses the need for a fiscal backstop and provides some estimates for the required size of the backstop. Section 3 analyses the (in)stability of international banking and derives three outcomes for international coordination and banking structure. I argue that burden sharing is the most stable, albeit politically most difficult, outcome. Next, section 4 provides empirical evidence on these different outcomes. Finally, section 5 discusses policy implications and concludes.

2 | NEED FOR FISCAL BACKSTOP

A major reform after the GFC is the requirement to bail-in debt before a possible bailout of a failing bank can take place. The aim of the new bail-in regime is to reduce the costs of bank bailouts for taxpayers. While bail-in is appropriate for individual idiosyncratic failures, it may not be possible in cases of the failure of a systemically important bank or large parts of the banking system. Several academics (Avgouleas & Goodhart, 2015) and policy makers (Dewatripont, 2014) warn that bail-in of large banks might be adding to—instead of dampening—financial panic.[2]

In the case of a full-blown systemic crisis, there is thus still a need for a fiscal backstop by the government, either directly to recapitalize ailing banks, or indirectly as backstop for the central bank and the resolution and deposit insurance fund. The standing of a banking system depends on the strength and credibility of the fiscal backstop (Goodhart, 1998).

2.1 | Framework for fiscal capacity

Fiscal capacity refers to the ability of the state to extract revenues to provide public goods. Applying this concept to banking, Pauly (2014) defines fiscal capacity as a country's budget capacity to provide a credible fiscal backstop to its banking system. As bail-in or liquidation is feasible for small and mid-sized banks, the backstop is primarily needed for the large banks. Systemic bank failures tend to be clustered due to common factors, such as a severe economic downturn, a housing bust, and/or a currency crisis (Laeven & Valencia, 2013). The authorities may then need to backstop several large banks, as, for example, happened in France, the Netherlands, Switzerland, and the United Kingdom during the GFC (see Table 1). Using a conservative scenario, I assume that up to three of a country's largest banks might need to be recapitalized in a severe systemic crisis.[3] Recapitalization aims to restore the equity $E_{i,j}$ of bank i in country j, in the case that financial stability benefits exceed recapitalization costs. Dermine and Schoenmaker (2010) argue that a bank's equity E_i is good proxy for recapitalization costs. It is more precise than the often-used indicator of total assets, as not all value in assets is lost during a banking crisis. Next, a country's fiscal backstop is ex ante credible if the potential fiscal costs of bailing out the three largest of the population of n banks are below the hurdle rate for budget capacity B_j:

$$\sum_i \max_{(n;\ 1,2,3)} E_{i,j} \leq B_j \tag{1}$$

Laeven and Valancia (2013) calculate that the direct fiscal costs of banking crises during the 1970–2011 period are on average 4% of GDP for advanced countries. Hüttl and Schoenmaker (2016) provide a more granular overview with exact recapitalization amounts of European banks during the global financial crisis and subsequent euro-debt crisis. Figure 1 shows that the direct fiscal costs range from 40% of GDP in Ireland to 0.1% in Hungary, related mainly to the depth of the crisis and the size of the banking system in countries.

The first four countries with very high recapitalization costs needed external assistance from the IMF and the European Union. Belgium and Spain with recapitalization costs of about 8% are borderline cases with respect to external assistance. While Belgium could support the recapitalization of its banking system without outside help, Spain needed external assistance. This was also due to far worse macroeconomic conditions in Spain at the time. The recent crisis experience suggests that the hurdle rate for the credibility of the fiscal backstop hovers around 8% of GDP: $B_j = 8\%$. It should be acknowledged that this hurdle rate is indicative, because it does not take into account the fiscal space of individual countries and is largely based on the last crisis. Nevertheless, the indicative hurdle rate can also be regarded as an upper limit on the political willingness to spend large amounts (expressed as a percentage of the country's GDP) on bank recapitalization.

TABLE 1 Direct recapitalization of large E.U. and U.S. banks

#	Bank name	Total assets (EUR bn)	State aid (EUR bn)	State aid in % of total assets
Panel A: Direct recapitalization of E.U. banks (2008–2013)				
1	BNP Paribas (FR)	2,070.0	5.1	0.2
2	Royal Bank of Scotland (UK)	2,050.0	81.1	4.0
3	Crédit Agricole (FR)	1,740.0	6.0	0.3
4	Société Générale (FR)	1,075.0	3.4	0.3
5	Groupe BPCE (FR)	1,030.0	0.5	0.05
6	ING (NL)	960.0	15.0	1.6
7	Commerzbank (DE)	735.0	18.2	2.5
8	Lloyds Banking Group (UK)	715.0	28.3	4.0
9	Crédit Mutuel (FR)	580.0	2.4	0.4
10	BNP Paribas Fortis (BE)	530.0	10.8	2.0
11	Dexia (BE)	520.0	17.4	3.4
12	Nordea Bank (SE)	510.0	0.5	0.1
13	Landesbank Baden–Württemberg (DE)	410.0	14.0	3.4
14	ABN AMRO (NL)	380.0	16.9	4.4
15	Bayerische Landesbank (DE)	380.0	10.0	2.6
16	Hypo Real Estate Holding (DE)	345.0	10.7	3.1
17	KBC Group (BE)	340.0	10.8	3.2
18	NORD/LB (DE)	225.0	3.1	1.4
19	Banca Monte dei Paschi di Siena (IT)	215.0	5.8	2.7
20	HSH Nordbank (DE)	175.0	3.0	1.7
21	Bank of Ireland (IE)	170.0	7.1	4.2
22	Allied Irish Banks (IE)	150.0	21.4	14.1
	Average E.U. banks			2.7
	Lower and upper bound*			1.1–4.3
Panel B: Direct recapitalization of U.S. banks (2008–2012)				
#	**Bank name**	**Total assets (USD bn)**	**State aid (USD bn)**	**State aid in % of total assets**
1	JPMorgan Chase	2,175.0	25.0	1.1
2	Citigroup	1,940.0	45.0	2.3
3	Bank of America	1,820.0	45.0	2.5
4	Wells Fargo	1,310.0	25.0	1.9
5	Goldman Sachs	850.0	10.0	1.2
6	Morgan Stanley	770.0	10.0	1.3
7	PNC Financial Services Group	290.0	7.6	2.6

(Continues)

TABLE 1 (Continued)

Panel B: Direct recapitalization of U.S. banks (2008–2012)				
#	Bank name	Total assets (USD bn)	State aid (USD bn)	State aid in % of total assets
8	U.S. Bancorp	270.0	6.6	2.5
9	Bank of New York Mellon	240.0	3.0	1.3
10	SunTrust Banks	190.0	4.9	2.6
11	State Street	175.0	2.0	1.1
12	Ally Financial	170.0	17.5	10.2
13	Capital One Financial	165.0	3.6	2.1
	Average U.S. banks			2.5
	Lower and upper bound*			0.8–4.2

Notes: Direct recapitalization costs for the government are based on state-aid figures for direct recapitalization and asset relief. Large banks are defined as banks with assets above EUR 150 bn/USD 165 bn. * the lower and upper bound are based on a 99% confidence interval.
Source: Hüttl and Schoenmaker (2016).

As this paper examines international banks, I am interested in the recapitalization costs of large (inter)national banks, with assets over €150 billion (or $165 billion). Table 1 illustrates that the fiscal costs of recapitalization and asset relief of the 22 large European banks were on average 2.7% of these banks' total assets and of the 13 large U.S. banks on average 2.5% of total bank assets. Applying a 99% confidence interval, I find a range from 0.8 to 4.3% of total bank assets.

2.2 | Fiscal capacity for future bank bailouts

Which countries do have a credible fiscal backstop for future banking crises? Following Equation 1, I first need to determine the potential recapitalization costs for one bank E_i. Taking the upper limit for the recapitalization of E.U. and U.S. banks in Table 1 as a conservative estimate, I standardize

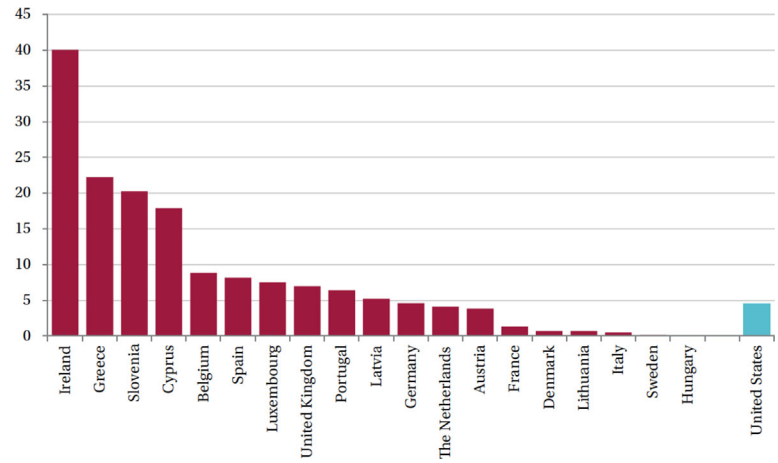

FIGURE 1 Recapitalization costs of E.U. and U.S. banking systems 2008–2014 (as % of GDP)
Source: Hüttl and Schoenmaker (2016)

recapitalization costs to restore equity at 4.5% of total assets. Next, Equation 1 requires calculating the recapitalization costs of the largest three banks to establish a country's total potential fiscal costs.

Table 2 shows that potential bailout costs for the top three banks range from 1.6 to 3.7% of GDP for large economies, such as China, the United States, and the euro area. Japan follows closely with 6.6% of GDP. These figures are sufficiently low to make a fiscal backstop for the large banks in these countries credible. Table 2 also shows that the potential fiscal costs for Germany, Italy, and Austria are within the 4–5% range, but these countries are not home to global banks with €2 to €3 trillion in total assets, with the exception of Deutsche Bank.

The other euro-area countries (with large banks) as well as the United Kingdom and Switzerland face potential fiscal costs for bailing out the largest banks ranging from 8.4 to 13.5%, which exceed the indicative hurdle rate of 8% of GDP. The credibility of the fiscal backstop for these countries can be questioned in terms of both budgetary and political capacity.

3 | STABILITY OF INTERNATIONAL BANKING

The provision of a credible fiscal backstop to international banks is challenging. The involved countries do not take into account any foreign externalities of a potential bank failure, and are only prepared to backstop their respective domestic part. More formally, the financial trilemma states that the objectives of (1) financial stability, (2) international banking, and (3) national financial policies for supervision and resolution are incompatible (Schoenmaker, 2011). Any two of the three policy objectives can be combined but not all three; one has to give. The choice of policy makers produces three outcomes for the structure of the international banking system, which differ in viability and stability. Figure 2 illustrates the outcomes of the financial trilemma. In a similar vein, Eatwell, Gossé, and Alexander (2014) develop similar, though slightly different, scenarios.

TABLE 2 Potential fiscal costs for major countries, 2015 (as a % of GDP)

Countries	Assets in $ billion	Recapitalization in $ billion	Fiscal costs % of GDP
Top 3 banks China	8,991	405	3.7
Top 3 banks United States	6,287	283	1.6
Top 3 banks Japan	6,023	271	6.6
Top 3 banks euro area	5,785	260	2.3
Top 3 banks France*	5,465	246	10.2
Top 3 banks Germany*	2,794	126	3.7
Top 3 banks Spain*	2,646	119	9.9
Top 3 banks the Netherlands*	2,064	93	12.3
Top 3 banks Italy*	1,854	83	4.6
Top 3 banks United Kingdom	5,288	238	8.4
Top 3 banks Switzerland	1,989	90	13.5

Notes: The largest three home country banks (i.e. headquartered in the home country) are chosen for each jurisdiction. Recapitalization is standardized at 4.5% of total assets. The fiscal costs represent the potential fiscal costs of recapitalizing the largest three banks as percentage of GDP. The countries indicated with an asterisk * are members of the European Banking Union.
Source: Assets from top 1000 World Banks, *The Banker* (July 2016), and GDP from Worldbank.

The purpose of this section is to analyse the ultimate consequences of countries' policy choice within the financial trilemma framework for the structure of the international banking system. In my analysis, the presence of large international banks is taken as given. The paper does not analyse the (dis)advantages of large banks or financial globalization.

3.1 | Outcome A—Global banks, headquartered in large countries

The first two outcomes concern centralized global banks. I first deal with global banks headquartered in large countries. As analysed in section 2, small and medium-sized countries have less fiscal capacity to support large global banks. Outcome A aims to achieve the policy objectives of international banking and national financial policies. While having the headquarters in a large country solves the fiscal capacity problem, it does not address the issue of incorporating foreign externalities [see also Herring (2007) and Riles (2014) on incentive problems in international banking]. Large countries are preoccupied with the domestic externalities of a possible failure and do not take into account cross-border externalities.

This raises questions about the credibility of foreign retail branches and the application of deposit insurance (from the home or host country?). In times of crisis, the home authorities may save the entire institution (e.g. the case of AIG with many foreign counterparties) or not. The basis for resolution, SPE, or MPE, is not clear. Even if the global bank states in its resolution plan that it will apply SPE, this is subject to time inconsistency. There are severe scenarios possible, whereby the home resolution authority and global bank jointly decide to rescue the home country part and to let the other parts go. The Fed, for example, provided bridge financing for only the U.S. part of Lehman Brothers. The Lehman case is thus instructive about the time inconsistency of SPE. Faia and Weder di Mauro (2016) label this model outcome as the uncooperative SPE approach.

Given the inherent uncertainty about home country support, host countries might want to ring-fence the host country operations (e.g. by demanding a separately licenced and capitalized subsidiary) and provide host country deposit insurance. We are then in outcome C with multinational banks (see section 3.3). Outcome A with global banks from large countries is thus not very stable for host countries. Eatwell et al. (2014) call outcome A U.S.–China hegemony. The United States and China are the largest economies, which can still afford to have large banks and also have the geopolitical power to

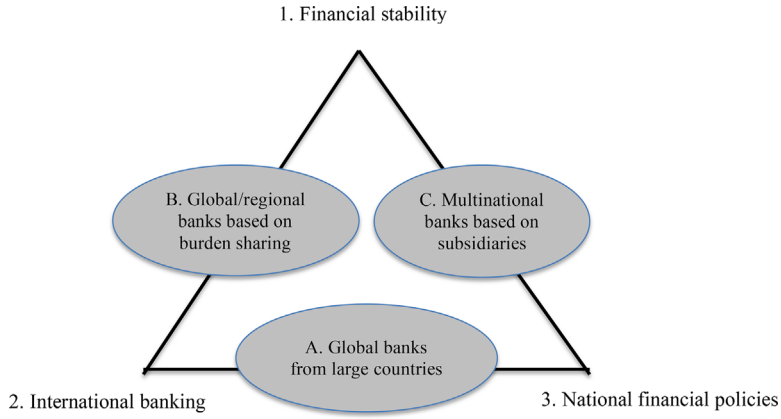

FIGURE 2 Outcomes of the financial trilemma
Source: Adapted from Schoenmaker (2011)

impose their preferred model. Nevertheless, host countries may in the long run not accept the unilateral approach of these large countries.

3.2 | Outcome B—Global or regional banks, based on burden sharing

The second outcome is global or regional banks, based on burden sharing between the countries in which the banks operate. This outcome aims to preserve financial stability and international banking. It gives up on national financial policies, as governments work together in supervision and resolution based on hard law. As countries cooperate and review these banks on a consolidated basis, the resolution strategy is structured on SPE and all externalities, both domestic and cross-border, are taken into account. The cooperation has to be hard-wired in a legally binding agreement for burden sharing. Goodhart and Schoenmaker (2009) sketch the various schemes for burden sharing, ranging from general burden sharing based on the relative size of participating countries (e.g. GDP or population) to specific burden sharing based on the relative presence of the failing bank (e.g. geographic segmentation of its assets). Faia and Weder di Mauro (2016) designate this model outcome as the cooperative SPE approach.

The technical solution of burden sharing addresses the problems of fiscal capacity and foreign externalities and is thus a stable outcome. The challenge is political. Are countries prepared to join forces in financial policies, and thus give up part of their sovereignty in this field? Unless or until fiscal authority moves to the level implied by globalizing markets, effective policy capacity and durable political legitimacy will remain in tension. Experimentalism and institutional innovations like the Basel process for banking supervision standards may help us live with such tensions (Pauly, 2014). Ad hoc arrangements during and after crises do give rise to reasonable expectations of future regulatory, monetary, and fiscal coordination.

Eatwell et al. (2014) distinguish between regional and global banks based on cooperation. Regional cooperation is possible at the level of the European Union, NAFTA extended to Central American and the Caribbean countries, and a Far East group centred on China and including Japan, Korea, and ASEAN countries. In the case of global banks, multipolar collaboration is conceivable at the level of the G-20 with the necessary supranational institutions to enforce the commonly agreed rules.

3.3 | Outcome C—Multinational banks, based on national subsidiaries

The third outcome is that of multinational banks, based on a string of national stand-alone subsidiaries. This outcome of decentralized international banks results from combining the policy objectives of financial stability and national financial policies. The principal idea is that the national financial authorities require that the subsidiaries are separately capitalized and managed.[4] If one of the subsidiaries or the parent bank fails, the other parts of the multinational bank can continue. The national authorities can deal with each part separately and financial stability is contained at the national level without further (international) contagion. The resolution strategy is based on MPE and deposit insurance, if any, is arranged by the respective home and host countries.

But is this outcome viable and realistic? Banks still want to exploit synergies, for example, from centralized risk management and one brand name. Next, foreign subsidiaries often use a parent guarantee to enhance their creditworthiness, which reduces funding costs and makes the subsidiary a stronger counterparty in derivative transactions. Freshfields Bruckhaus Deringer (2003), an international law firm, examines to what extent legal firewalls (separate legal personality and limited liability of subsidiaries) can help to reduce or prevent contagion risk within a financial group. They find that legal firewalls can help to protect from direct contagion (credit exposures arising from intragroup

transactions or operational risk from sharing of services), but are less effective in limiting indirect contagion (reputation and funding risks). This is because indirect contagion arises from perceptions and behaviour of (potential) counterparties and other market participants. The strategy of most major banks of developing and maintaining a global brand reinforces contagion risk.

In an empirical study, Anginer, Cerutti, and Soledad Martinez Peria (2017) examine the association between default risk of foreign bank subsidiaries and their parents. After controlling for common factors, they find a positive correlation of default of 0.2–0.3. Although the correlation is lower for subsidiaries operating in countries that impose higher capital and disclosure requirements and tougher restrictions on bank activities, host country policies cannot break the link between the default risk of the foreign bank subsidiary and that of its parent bank located in the home country.

From these legal and empirical studies, I conclude that externalities between national subsidiaries of a multinational bank and its parent bank cannot be eliminated completely. Supervisors and resolution authorities from the home and host countries will need to cooperate when these banks experience problems, if they want to prevent disorderly outcomes and maintain financial stability. But where are the incentives and/or binding arrangements for cooperation in this MPE approach? The financial trilemma model suggests that financial stability can only be managed at the national level in the case of truly stand-alone national banks, without further connections. So, the long run, outcome C is a multinational banking system, whereby the national authorities impose increasingly high ring-fencing requirements on national subsidiaries to limit contagion.

4 | INTERNATIONAL BANKING IN PRACTICE

The next step is to examine the existence of the three outcomes in the international banking landscape. The hypothesis is that global integrated banks (based on SPE) can only be supported by large countries (A) or by a group of smaller countries based on binding burden sharing (B). The alternative is organizing international banks as multinational banks based on MPE resolution (C) and/or downsizing the international banks.

4.1 | Global banks

The vast majority of international banks adopt the 'global bank' model. Global banks operate on a centralized business model and adopt an SPE resolution strategy (at least on paper). For analytical purposes, I distinguish three broad groups of global banks:

- Global banks from large countries, like the United States, China, and possibly Japan;
- Global banks from the euro area, which has adopted a banking union with some—albeit limited—forms of burden sharing;
- Global banks from mid-sized countries, like the United Kingdom and Switzerland, which are operating independently.

My hypothesis is that only large countries or smaller countries working together can still maintain global banks. By inclination, independently operating smaller countries have to downsize international banks headquartered in their jurisdiction. To test this hypothesis, we examine the development of the size of the global banks in the aftermath of the GFC. The relevant period is from the eve of the GFC at end-2007 until now at end-2015. We take the top 20 banks for both periods, as published by *The Banker* (July 2008, July 2016). Bank credit tends to grow in line with GDP, because it is an important funding

source for new investment and consumption. To examine the structural trend in banking in the aftermath of the GFC, we therefore correct for GDP growth. The structural trend is measured by the net annualized change, which is calculated as annualized asset growth minus annualized GDP growth.

Table 3 reports the results. My empirical results show that the largest Chinese and U.S. banks have still been growing largely in line with GDP at an annualized net rate of +1 and −1%, respectively, over the 2007–2015 period. Surprisingly, the large Japanese banks have grown faster than the economy at an annualized net rate of +5% over the same period. The large countries seem thus to be able to 'maintain' their large banks. Next, the largest euro-area banks have, like the United States, grown at an annualized net rate of −1%. The Banking Union appears thus to be instrumental in maintaining the large euro-area banks (see section 4.3).

By contrast, the large U.K. and Swiss banks have contracted at −5 and −11%, respectively. These mid-sized countries have enacted major reforms (both structural reforms and higher capital charges) with the official aim to increase the resilience of their banking system, and the intended side effect of downsizing their large banks and reducing their foreign activities at the same time. The new requirements have been disproportionally stringent on the largest banks compared to the rest of the banking system. A case in point is the Vickers separation of retail and wholesale banking, which affects the large U.K. banks. The main purpose of this separation is to limit the contingent liability of the U.K. taxpayer to support the British banking system (Goodhart, 2012). Moreover, the United Kingdom and Switzerland have imposed higher capital surcharges on their large banks than other countries.

I conduct a two sample *t*-test for equal means to examine whether the differences in bank size change between countries with and countries without a credible fiscal backstop are significant. Table 4 reports that the differences are significant at the 5% level ($p = .032$).

4.2 | Outcome A—Global banks from large countries

The first group of global banks are from the large countries. This is a viable and stable outcome insofar as these large countries can provide a credible fiscal backstop to their banking system. Table 3 confirms the trend that the leading global banks are based in the large countries. Looking at the top 20 banks in 2015, China, the United States, the euro area, and Japan are home to these banks, with still one major bank from the United Kingdom, namely HSBC, on the fifth position (the position of the other U.K. banks is swiftly declining with Barclays tumbling from 4 in 2007 to 15 in 2015 and RBS from 1 to 20). The Swiss banks dropped out altogether from the top 20. The same trend is visible in investment banking (Goodhart & Schoenmaker, 2016). The U.S. investment banks are about to surpass European investment banks in the European market. The Chinese investment banks are growing fast and have already overtaken the U.S. and European investment banks in the Asian-Pacific market.

In the aftermath of the GFC, the Dodd–Frank Act extended the FDIC's powers to resolve failing large systemic banks. Title II of Dodd-Frank created the Orderly Liquidation Authority (OLA), to be used only when the Fed, FDIC, and Treasury declare a financial emergency. The FDIC has implemented an SPE strategy to resolve large banks at the holding company level in the United States. While the FDIC and Bank of England (2012) have indicated that their preferred strategy is to resolve their large cross-border banks, with a presence in both countries, on an SPE basis at the holding company level, there are no legally binding requirements underpinning the intended cooperation.

Next, Title II of Dodd–Frank also established an Orderly Liquidation Fund (OLF)—housed in the U.S. Treasury—that is available to the FDIC to provide temporary funds [up to 10% of the troubled bank's assets according to Dodd–Frank Section 210(n)(6)] to a bridge company for the troubled bank. Although these funds are to be repaid either through recoveries on the assets of the troubled bank or through levies on eligible banks, the U.S. Treasury would provide initial liquidity and bear commensurate exposure.

TABLE 3 Development of global banks for the major countries, 2007–2015

	2007		2015		Change 2007–2015		
Banking groups	**Assets in $ billion**	**Asset rank**	**Assets in $ billion**	**Asset rank**	**Assets (%)**	**GDP (%)**	**Net (%)**
Top 5 Chinese banks	3,928		12,684		16	15	1
ICBC	1,189	20	3,422	1	14		
China Construction Bank	903	23	2,827	2	15		
Agricultural Bank of China	726	27	2,741	3	18		
Bank of China	820	25	2,591	5	15		
Bank of Communications	289		1,103	23	18		
Top 5 U.S. banks	7,943		8,879		1	3	−1
JPMorgan Chase	1,562	12	2,352	7	5		
Bank of America	1,716	10	2,147	9	3		
Wells Fargo[a]	1,358	29/41	1,788	11	3		
Citigroup	2,187	7	1,731	13	−3		
Goldman Sachs	1,120	21	861	28	−3		
Top 8 euro-area banks	14,578		11,807		−3	−1	−1
BNP Paribas	2,477	3	2,168	8	−2		
Crédit Agricole	2,253	6	1,847	10	−2		
Deutsche Bank	2,814	2	1,771	12	−6		
Banco Santander	1,335	17	1,457	17	1		
Société Générale	1,567	11	1,450	18	−1		
Groupe BPCE[b]	1,184	24/44	1,268	19	1		
UniCredit	1,494	15	935	25	−6		
ING Bank	1,453	16	911	26	−6		
Top 4 U.K. banks	10,600		6,492		−6	−1	−5
HSBC Holdings	2,354	5	2,410	6	0		
Barclays	2,443	4	1,672	15	−5		
RBS	3,771	1	1,207	20	−13		
Lloyds Banking Group[c]	2,031	18/33	1,204	21	−6		
Top 3 Japanese banks	4,344		6,023		4	−1	5
Mitsubishi UFJ	1,939	9	2,649	4	4		
Mizuho	1,551	13	1,718	14	1		
Sumitomo Mitsui	854	24	1,657	16	9		
Top 2 Swiss banks	3,211		1,781		−7	4	−11

(Continues)

TABLE 3 (Continued)

	2007		2015		Change 2007–2015		
Banking groups	**Assets in $ billion**	**Asset rank**	**Assets in $ billion**	**Asset rank**	**Assets (%)**	**GDP (%)**	**Net (%)**
UBS	2,009	8	952	24	−9		
Credit Suisse	1,202	19	829	31	−5		
Total 27 banking groups	44,604		47,667		1	3	−2

Notes: Total assets and assets rank are provided for the major banks in the top 20 both for 2007 and 2015. The change is calculated as an average annualized rate over the 2007–2015 period; the net change is annualized asset growth minus annualized GDP growth.
Sources: Assets from top 1000 World Banks, *The Banker* (July 2008; July 2016), and GDP from World Bank.
[a]Wells Fargo reports the combined assets of Wachovia and Wells Fargo in 2007.
[b]Groupe BPCE reports the combined assets of Groupe Caisse d'Epargne and Groupe Banques Populaires in 2007.
[c]Lloyds Banking Group reports the combined assets of HBOS and Lloyds TSB Group in 2007.

4.3 | Outcome B—Global/regional banks and burden sharing

The second group of global banks are based in the European Banking Union, with banks like BNP Paribas, Deutsche Bank, ING, and UniCredit. Table 2 shows that the potential fiscal costs can be large at the country level, from 10 to 12% of GDP for France, the Netherlands, and Spain. The credibility of the fiscal backstop to their banking system can be questioned for these countries. If the fiscal backstop were moved to the euro-area level, the costs would drop to 2% of GDP. The fiscal backstop will then be as credible as that of the United States and China.

The Banking Union countries thus face a political choice, which is not only important from a financial stability perspective, but also from a geopolitical perspective. If they want to stay at par with the other two world powers, these countries must organize the fiscal backstop at the euro-area level.

The European Stability Mechanism (ESM) is enshrined in an intergovernmental treaty (hard law) and based on a general form of burden sharing, with the burden sharing key based on an arithmetic average of countries' shares in population and GDP (Goodhart & Schoenmaker, 2009). The ESM was

TABLE 4 Impact fiscal backstop on bank size

Country	**Required fiscal backstop (as % GDP)**	**Credible?**	**Bank size change (as % banking assets)**
China	3.7	Yes	0.7
United States	1.6	Yes	−1.3
Euro area	2.3	Yes	−1.2
United Kingdom	8.4	No	−5.4
Japan	6.6	Yes	4.9
Switzerland	13.5	No	−11.3

Notes: The required fiscal backstop is calculated for the three largest banks (Table 2). The fiscal backstop is credible if the backstop is below the hurdle rate of 8% of GDP. The change in bank size measures the change of total assets of the largest banks from 2007 to 2015 (Table 3).
The *t*-test for equality of means is conducted to examine whether the differences in the means of bank size change are significant. The test statistics are as follows: $t = 3.227$; 4 degrees of freedom; $p = .032$.

created as a fiscal backstop to member countries. Under the current arrangements, it provides a very partial backstop to the Banking Union banking system. The main instrument is that a member country can receive an ESM loan to recapitalize its banks (the indirect recapitalization instrument of Article 15 ESM Treaty). Only when a member's fiscal sustainability is in danger (ESM, 2014) can the ESM directly recapitalize banks from that member country. But to invoke the direct recapitalization instrument, there are certain conditions, such as an own contribution of the member country and a bail-in of 8% of a bank's total liabilities. Moreover, unanimity of ESM member countries' votes is required, which might lead to protracted negotiations with an uncertain outcome. The current ESM Direct Recapitalization Instrument thus falls short of an ex ante credible fiscal backstop at the euro area level.

A first step to complete the ESM as a fiscal backstop to the banking system would be to enable direct bank recapitalization from the ESM, without first waiting for the country to go bankrupt and subsequently meeting prohibitive conditions and voting procedures. A second step is to establish a Single Resolution and Deposit Insurance Fund, with a credit line from the ESM, similar to the FDIC, which has a U.S. Treasury credit line (Gros & Schoenmaker, 2014).

In risk sharing terms, the ESM would then be behind the bank risk sharing, both directly by providing direct bank recapitalization and indirectly by providing a credit line to the Resolution and Deposit Insurance Fund. The European arrangements would then match the U.S. arrangements for bank risk sharing.

4.4 | Outcome C—Global banks without a credible fiscal backstop (multinational banks)

My analysis suggests that the third group of banks from mid-sized countries can no longer operate as integrated global banks, based on an SPE resolution strategy. As the fiscal backstop to these banks is less credible, outcome A of global banks is not sustainable for them. These banks end up by default in outcome C of multinational banks with MPE resolution.

HSBC, Santander, and BBVA are examples of large multinational banks, which have a decentralized structure with national subsidiaries and openly adopt the MPE approach. HSBC is a truly international bank, spanning the three main continents: the Americas, Europe, and Asia. At the global level, HSBC adopts an MPE approach with three main resolution hubs in the United Kingdom, the United States, and Hong Kong (see the U.S. Resolution Plan 2015 of HSBC filed at the Federal Reserve Board). The Spanish banks, Santander, and BBVA, have major foreign operations outside the Banking Union in the United Kingdom (only Santander), the United States, and Latin America. By getting local funding for their subsidiaries and adopting an MPE approach, they aim to compartmentalize the risks. The Chief Economist for Financial Regulation at BBVA proposes that an SPE approach might be suitable for the euro area, as that should be regarded as a single jurisdiction, combined with an MPE approach for third countries (Fernández de Lis, 2015).

Credit Suisse, one of the two large Swiss banks, has an SPE approach at the global level with bail-in debt at the group holding company. But below that Credit Suisse is in the process of implementing separate country subsidiaries for its major operations and two subsidiaries (one at the global level and one in the United States) for shared services functions. The main country subsidiaries are planned in Switzerland for its Swiss business, in the United States for all U.S. activities, and in the United Kingdom as hub for its European investment banking business (Credit Suisse, 2013).[5] This approach illustrates that while SPE is the preferred strategy, the planned legal structure allows for MPE resolution at country level if needed. This new legal structure thus reflects the limited credibility of the Swiss fiscal backstop.

It should be noted that the MPE approach with a segmented banking system is more expensive than the cooperative SPE approach with an integrated banking system (see also Bolton & Oehmke, 2016; Faia & Weder di Mauro, 2016). On the funding front, capital and liquidity are trapped at the national level and cannot be freely used within the group, which leads to higher overall holdings of capital and liquidity. On the resolution front, SPE allows for the less costly cooperation approach in resolution, whereby potential bailout costs for capital shortfalls are shared among the countries according to the burden-sharing key. By contrast, MPE forces separate resolutions. On the operational front, a bank with an MPE resolution strategy needs to establish a separate subsidiary for shared services to guarantee continued services to the surviving subsidiaries.

5 | POLICY IMPLICATIONS AND CONCLUSIONS

Much has been done to strengthen the stability of the banking system. Nevertheless, international financial stability remains elusive. National authorities have a natural tendency to focus on their national self-interest, which makes it difficult to supervise and resolve international banks in a joint spirit. Cooperation based on soft law may break down at times of crisis, as witnessed during the GFC. Nevertheless, this is still the prevailing governance approach (e.g. Crisis Management Groups based on Memoranda of Understanding) adopted by the FSB (Davies, 2015; Riles, 2014).

Hard law, underpinned by a binding burden sharing agreement, is needed to ensure cooperation for SPE resolution between national authorities and can thus provide a stable basis for international banking (Goodhart & Schoenmaker, 2009). The euro area is in the process of building a fiscal backstop for the Banking Union. The ESM, which is based on burden sharing, would then become available for direct recapitalization of banks and function as a backstop to a Single Resolution and Deposit Insurance Fund.

If the euro area were to establish such a fiscal backstop, it would be able to absorb banking shocks at the euro-area level and thus enhance financial stability. The euro area would also come up to par with the United States, China, and Japan, which are the only countries left with the fiscal capacity to support large global banks (operating on an SPE resolution model). The cooperative SPE model with an integrated banking system is more cost-efficient than the MPE model with a segmented banking system. The remaining mid-sized countries, such as the United Kingdom and Switzerland, would then play a secondary role in international banking with multinational banks operating on an MPE model.

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ENDNOTES

[1] Gandhi, Lustig, and Plazzi (2016) provide evidence that stock investors price the implicit government guarantee for large banks, but not for small ones.

[2] The European bail-in regime allows for a financial stability exception for government support under certain conditions (see Articles 32, 44, and 56, Bank Recovery and Resolution Directive, 2014/59/EU).

[3] France and Germany with five large banks in Table 1 still fit within the three largest banks scenario. France recapitalized all its largest banks during the crisis to avoid a bad signalling effect, but the aggregate amount of state aid is

small. Germany did not have to recapitalize its largest bank Deutsche Bank with assets of €2,814 bn (see Table 3). The combined assets of the last three large German banks in Table 1 (Bayerse, Hypo Real Estate, and HSH Nordbank) is smaller at €900 bn.

[4] The host country applies both capital and bail-in requirements to national subsidiaries (but not branches). The FSB proposes that each material sub-group maintains an internal total loss-absorbing capacity (TLAC) of 75–90% of the external TLAC requirement that would apply to the material sub-group if it were a resolution group (Principle 18 of TLAC Termsheet, FSB, 2015).

[5] Credit Suisse has opened a Dublin branch in 2015 (Credit Suisse Annual Report 2015). It is not clear yet what the impact of Brexit is on the U.K. passport and where Credit Suisse will move its European passport business.

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