

**CORPORATE STRUCTURES, TRANSPARENCY AND RESOLVABILITY OF
GLOBAL SYSTEMICALLY IMPORTANT BANKS**

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Table of Contents

Introduction and overview	iii
Chapter 1 Bank corporate structures, complexity and the implications for financial stability	1
1.1 Introduction.....	1
1.2 If not constrained by regulations and taxes, what degree of corporate complexity would G-SIBs prefer?	4
1.2.1 Asymmetric information and transactions costs.....	5
1.2.1.1 Asymmetric information: shareholders vs. creditors.....	5
1.2.1.2 Asymmetric information: shareholders vs. managers and internal agency problems.....	6
1.2.1.3 Information asymmetry: customer concerns about conflicts of interest.....	8
1.2.2 Costs of financial distress: protecting the group from a risky subsidiary.....	9
1.2.3 Costs of financial distress: protecting a subsidiary from the rest of the group.....	12
1.2.4 The legacy of mergers and acquisitions.....	14
1.2.5 Tax frictions	17
1.3 Regulatory constraints	18
1.4 Implications of corporate complexity for safety and soundness of the financial system	21
1.5 The collapse of Lehman Brothers and the impetus for reform	24
1.6 Policy reforms to deal with G-SIBs: an overview	27
1.6.1 Global initiatives.....	28
1.6.2 The US response	31
1.7 Concluding comment	37
Chapter 2 Mapping corporate structures of Global Systemically Important Banks	41
2.1 Global Systemically Important Banks and complexity	41
2.2 The role and contribution of resolution plans in mapping bank corporate structures	47
2.2.1 Introduction: the peculiar absence of resolution policy from the pre-crisis Basel agenda.....	47
2.2.2 The Lehman Brothers collapse	49
2.2.3 Lessons and policy consequences from the Lehman collapse	55
2.2.4 Resolution plans in the US response.....	60
2.2.5 How informative are public sections of living wills?.....	64
2.2.6 Why resolution policy remains uncertain	75
Appendix 2.A The EU approach to bank recovery and resolution plans.....	80
Appendix 2.B Methodology for the identification of large subsidiaries not listed by banking groups as “material entities” in the public section of resolution plans	84
Appendix 2.C Selected corporate structure charts officially published by banking groups.....	86
Appendix 2.D The rejection of living wills by the FED and the FDIC in August 2014	92
Appendix 2.E Geographical breakdown of majority-owned subsidiaries of selected G-SIBs as of yearend 2013	97
Chapter 3 Evolution of bank corporate structures over time.....	106
3.1 Complexity of G-SIBs: historical trends.....	106
3.1.1 Complexity of G-SIBs in 2007 (pre-crisis) and 2013.....	107
3.1.2 Historical evolution of G-SIBs’ subsidiaries: a new dataset.....	110
3.2 Data issues regarding bank corporate structures.....	117
3.3 Concluding comments	122
Appendix 3.A Literature review on bank corporate structures: previous key empirical contributions.....	124

Chapter 4 Orderly resolution and the corporate structure of G-SIBs	131
4.1 Introduction.....	131
4.2 What are the key attributes of an effective resolution regime?	133
4.3 What are the key obstacles to an effective resolution?	138
4.3.1 <i>Obstacles to an orderly resolution regardless of the G-SIB's corporate structure.....</i>	<i>139</i>
4.3.2 <i>Why complexity of legal structures may impede an orderly resolution.....</i>	<i>141</i>
4.4 Why do G-SIBs adopt such complex legal structures?.....	145
4.4.1 <i>External restrictions and incentives.....</i>	<i>145</i>
4.4.1.1 <i>The role of regulations.....</i>	<i>146</i>
4.4.1.2 <i>The role of taxation.....</i>	<i>147</i>
4.4.1.3 <i>Accounting policies.....</i>	<i>148</i>
4.4.2 <i>Why do G-SIBs adopt such complex legal structures? Internal objectives</i>	<i>150</i>
4.5 Concluding comment	152
 Chapter 5 Tools for simplifying bank corporate structures: capital requirements, living wills and subsidiarization	 154
5.1 Introduction.....	154
5.2 Current policy initiatives.....	155
5.2.1 <i>Capital requirements</i>	<i>155</i>
5.2.2 <i>Enhanced supervision</i>	<i>158</i>
5.2.3 <i>Structural restrictions</i>	<i>159</i>
5.2.4 <i>Living wills.....</i>	<i>159</i>
5.3 If these measures are not sufficient, what next?	161
5.3.1 <i>Divestitures</i>	<i>161</i>
5.3.2 <i>Bank corporate structures, orderly resolution and the subsidiarization option.....</i>	<i>163</i>
5.4 Single Point of Entry vs. Multiple Points of Entry	173
5.5 Concluding comment	176
Appendix 5.A The corporate structure of Santander	179
 Chapter 6 Brief summary of policy recommendations	 180
6.1 Introduction.....	180
6.2 Data and disclosure issues	181
6.3 Reforming public policies that encourage corporate complexity	185
6.4 Subsidiarization.....	186
 References.....	 188

Introduction and overview

Before the global 2008 financial crisis, most officials appeared not to have anticipated the problems that would need to be addressed if a large cross-border bank should need to be resolved. During and after the financial crisis, this issue surged to the top of the policy agenda. Events made clear that several institutions had become too big and too complex to fail: new rules were needed to make resolution of global banks possible, without cost to taxpayers or damaging spillovers to the economy. After the crisis, the G-20 gave the Financial Stability Board (FSB) a mandate to identify Global Systemically Important Banks (G-SIBs) and to ensure that each had a credible recovery and resolution plan.

This study investigates the complexity of the 29 institutions that have been designated as G-SIBs in 2013. Eight of these are headquartered in the United States. The size, complexity and global reach of these institutions can be illustrated by noting that G-SIBs had:

- an average of \$1.587 trillion in assets (with a high of \$3.100)
- an average of 1,002 majority-owned subsidiaries (with a high of 2,460)
- nearly half the subsidiaries classified as non-financial
- an average of 60% of subsidiaries located outside the headquarters country (high of 95%)
- at least one majority-owned subsidiary in 44 different countries (a high of 95)
- an average of 12% of subsidiaries located in off-shore centers (with a high of 28%)

The complex structure and opaque connections among G-SIBs impeded oversight by the authorities before the crisis and greatly complicated crisis management. The study examines the various factors influencing the complexity of banks, presents measures of the evolution of complexity and discusses various policy reforms aimed at simplifying and improving the transparency of G-SIBs.

Chapter 1 examines why G-SIBs prefer to adopt a considerable amount of legal complexity and emphasizes the credibility challenge facing the authorities in persuading markets that G-SIBs are not too big (or too complex or too interconnected) to be resolved in a way that does not cause loss to taxpayers. It concludes that better disclosure is needed to enable the public to monitor progress, which would enhance the credibility of the considerable efforts underway to improve resolution policy.

Chapter 2 presents data on the global and industrial structure of G-SIBs, provides a detailed analysis of bank resolution plans and investigates the implications of complexity for cross-border resolution policy. Despite substantial efforts by the FSB and the national regulators to enhance resolution policies and procedures, the cross-border aspects of resolution remain a challenge.

Chapter 3 presents new data showing how the corporate structure of G-SIBs evolved from 2002 to 2013. On average, complexity as measured by the number of majority-owned subsidiaries has doubled since 2002 and has not declined since 2007 (the year before the crisis). Indeed, the complexity of several G-SIBs has increased markedly because of the mergers and acquisitions encouraged by the authorities. Although the broad patterns of the evolution of the complexity of G-SIBs are evident, troubling gaps and inconsistencies remain in the available data.

Chapter 4 focuses on the FSB's Key Attributes of Effective Resolution Regimes for Financial Institutions. Assuming (optimistically) that the attributes of effective resolution policies are adopted, serious obstacles remain. These include the size of G-SIBs, the degree of interconnectedness among G-SIBs, the difficulty customers would experience in finding substitutes for the services provided by a G-SIB, the complexity of a G-SIB's assets and off-balance-sheet positions, and the extent of cross-jurisdictional activity. The complexity of legal structures adopted by G-SIBs presents additional obstacles including misalignments of

the legal structure with lines of business, interdependencies among subsidiaries within the G-SIB, the number of jurisdictions in which the various entities reside, and the opacity of the organizational structures to regulators and the market.

Chapter 5 reviews several recent policies which may be expected to encourage G-SIBs to reduce their corporate complexity (and perhaps their size) over time. These include the requirement for more and higher quality regulatory capital, an increase in the risk weights in the risk-adjusted capital ratio, and the international adoption of a leverage ratio. The most important innovation focused on G-SIBs, however, is the capital surcharge applied to each designated G-SIB proportional to its perceived systemic threat. In the United States enhanced supervision, particularly the CCAR requirement, has increased the cost of operating through complex corporate structures and the Volcker rule may force some divestitures. The living will requirements provide a structure for direct conversations between G-SIBs and the resolution authorities regarding the impediments to an orderly resolution.

Chapter 6 summarizes policy recommendations from the study. First, increased efforts should be made to collect and disclose data in a way that facilitates understanding of bank corporate structures and monitoring of progress in enhancing the resolvability of G-SIBs. Second, emphasis should be placed on removing the incentives that encourage banks to adopt complex structures. Although efforts are underway to induce G-SIBs to simplify their corporate structures, regulatory and tax incentives that encourage and sometimes require that G-SIBs create a substantial number of separate entities have been largely ignored. While each tax or regulation may have had a logic when introduced, the cumulative impact is remarkably byzantine and undoubtedly exacerbates the complexity of G-SIBs. Third, subsidiarization may enhance the clarity of the corporate structures of G-SIBs and facilitate an orderly resolution, but it cannot provide a complete solution to the problem of corporate complexity. Subsidiaries can be organized on the basis of their location (which facilitates resolution by

the host authority) or on the basis of the kind of business conducted (which facilitates resolution by the home country authority), but these approaches often conflict. While the trend toward subsidiarization may help clarify some of the cross-border challenges, officials must still find some reliable (and predictable) mode of cooperation and make a convincing case that G-SIBs can be subject to resolution like other smaller, less complex, less global institutions.

Since this project was completed in August 2014, the FSB has issued several consultation papers that have implications for the development of cross-border resolution policy. Among these the proposal for Total Loss Absorbency Capacity (TLAC) may have far ranging consequences if implemented. Unfortunately, it has not been feasible to analyze and integrate these developments in the current document. That will remain an important challenge for future work.

Chapter 1

Bank corporate structures, complexity and the implications for financial stability¹

1.1 Introduction

In the second half of the 2000s, before the global 2008 financial crisis, the issue of large, complex financial institutions (LCFIs) had just begun to catch the attention of some policy makers.² In general, however, officials appeared not to have anticipated the problems that would need to be addressed if one of these institutions should need to be resolved, much less considered whether the complex corporate structures of such institutions would impede or even prevent an orderly resolution.

During and after the financial crisis of 2008-2009, these issues surged to the top of the policy agenda. Events made clear that several institutions had become too big to fail (TBTF).³ One of the first actions of the G-20 after the crisis was to transform the Financial Stability Forum into the Financial Stability Board (FSB) and give it the mandate to identify Global Systemically Important Banks (G-SIBs) and to ensure that each G-SIB filed a credible recovery and resolution plan. The principal accomplishment of the FSB has been to negotiate a set of key attributes of effective resolution regimes that each member country should implement (FSB 2011a, 2012a, 2013a, 2013b, 2013c). Moreover, it has set up a peer review system to monitor the progress of individual member countries in meeting these attributes (FSB, 2013d).

¹ This Chapter draws heavily from Herring and Carmassi (2015).

² For example, both the Bank of England and the IMF had identified 16 LCFIs that were crucial to the functioning of the world economy. See Herring and Carmassi (2010) for a discussion of this classification approach. The thirteen of the sixteen LCFIs that survived the crisis are included in the sample of G-SIBs, which are the focus of this chapter.

³ Although in common use, this term is regrettably inaccurate because size is one, but not the only attribute of such institutions. It should be interpreted as a proxy for institutions that are also too interconnected, too complex or too important to be resolved in an orderly fashion.

With the increased official scrutiny of G-SIBs, one might assume that more public data would be available to analyze their corporate structures. Alas, this is not the case. Despite the emphasis in official documents on greater market discipline, publicly available information remains fragmented and difficult to compare across institutions and sources because of differing definitions and reporting criteria and thresholds.⁴

Deregulation and technological innovation (Frame and White, 2015) have facilitated a remarkable degree of globalization among large financial institutions. These forces have transformed the scale, scope and complexity of international banks over the past twenty-five years.⁵ The result has been a larger and vastly more complicated financial system with much greater concentration of assets in the G-SIBs. From 1990 to 2007, the market share of the three largest US banks grew from 10% to 40% of total domestic deposits and the three largest banks in France, Germany, Switzerland and the United Kingdom all control from two-thirds to three-quarters of total deposits in their home markets (Haldane 2012). Not only are these institutions large, most are also conglomerates in the sense that they combine at least two of the three traditionally distinct functions of banks, securities firms or insurance companies. The growth and increasing complexity of these G-SIBs have raised the question of whether these institutions have become TBTF. In effect, if one of the G-SIBs should falter, would the anticipated damage to the rest of the financial system be so great that the authorities feel obliged to put taxpayer funds at risk to prop up the G-SIB?

While excessive risk-taking and leverage may have caused the crisis, institutional complexity and opaque interconnections impeded effective oversight by the authorities *ex ante* and greatly complicated crisis management and the resolution of institutions *ex post*. The

⁴ The US authorities missed an important opportunity to improve the transparency of the organizational structure of G-SIBs. Their guidance for the public section of living wills permitted banks to limit their disclosures to information that was already publicly available. And banks were not required to employ common definitions or methodologies (Carmassi and Herring, 2013).

⁵ On the rise of international banking see, for example, CGFS (2010a) and Claessens et al. (2010); on foreign banks' behavior and impact see, among others, Claessens and van Horen (2012).

failure of Lehman Brothers provided clear evidence of the dangers inherent in complex, opaque legal structures that span multiple national borders and bear little relationship to how the business is managed. As Huertas (2009) has observed, “The Lehman bankruptcy demonstrates that financial institutions may be global in life, but they are national in death. They become a series of local legal entities when they become subject to administration and/or liquidation.” The challenges of coordinating, much less harmonizing, scores of legal proceedings across multiple jurisdictions proved to be insuperable. Once the financial group had been dissolved into separate legal entities, information became so fragmented that it was virtually impossible to preserve any going concern value the group may have had.

Despite the notable collapse of several major institutions during the crisis, the overall trend toward bigger and more complex financial institutions has continued (often encouraged by publicly subsidized mergers). Although some firms have made some progress in rationalizing and simplifying their corporate structures, other firms have greatly increased their complexity so that, on average, the overall degree of complexity (as measured by the number of subsidiaries)⁶ has not decreased since the crisis.

Our central premise is that the complexity of the corporate structures that most international financial conglomerates have developed is itself a significant source of systemic risk. In the event of bankruptcy, hundreds or even thousands of legal entities would need to be resolved. Since most of these firms are managed in an integrated fashion along lines of business with only minimal regard for legal entities, national borders, or functional regulatory domains, and with substantial and complex intragroup relationships, simply mapping an institution's business activities into its legal entities presents a formidable challenge.

⁶ This is a very simplistic indicator of corporate complexity, but it remains the only indicator that can be measured with any degree of accuracy and even that is far from perfect. In this work we have relied on Bankscope data because they follow a clear methodology that is consistent across countries and across banks. Alternative sources such as SEC filings and the FED/National Information Center data follow different methodologies and provide different results (which also differ from each other; see Chapter 3). However, the general trends in the data are usually highly correlated.

Moreover, these legal entities would be subject to numerous different national regulatory and bankruptcy procedures, many of which conflict.

The current legal structures of G-SIBs are heavily influenced by tax and regulatory policies, but undoubtedly groups would want to adopt some degree of corporate separateness within the group even in the absence of tax and regulatory incentives. First we will consider those factors and then some of the (largely unintended) consequences for corporate structure of tax and regulatory policies. We will analyze some of the challenges this corporate complexity poses to an orderly winding down of an international financial conglomerate and consider some of the policy reforms that have been implemented to deal with the problem. A brief comment on the challenges that remain concludes this chapter.

1.2 If not constrained by regulations and taxes, what degree of corporate complexity would G-SIBs prefer?

In the absence of tax and regulatory constraints, how much corporate complexity would G-SIBs choose to adopt? The formation of subsidiaries can be costly. In addition to the start-up costs of obtaining a charter and creating a governance structure, there are ongoing costs for accounting, financial reporting, and tax filings. Nonetheless, G-SIBs have adopted a considerable amount of corporate complexity even within some countries where they are under no regulatory obligation to do so. What are the perceived, compensating benefits that justify the formation of corporate subsidiaries?

In the frictionless world of Modigliani and Miller (1958), a firm's choice of capital structure and, by extension, its corporate structure, cannot affect its value. But financial institutions lack any rationale in such a world and so research on financial institutions generally begins with the assumption of imperfections such as asymmetric information, transactions costs, costs of financial distress, taxes and regulation (Berger et al., 1995). We

will examine how each of these imperfections may influence a financial institution's choice of corporate structure.

1.2.1 Asymmetric information and transactions costs

Asymmetric information problems appear to afflict financial institutions more seriously than many other kinds of firms.⁷ Asymmetric information problems arise when one party to a transaction or relationship has information that the other does not, and it is too costly to write, monitor, and enforce a contract that would compensate adequately for the imbalance in information. When the firm's objectives differ from those of its creditors, counterparties or customers, firms incur agency costs to deal with concerns about adverse selection – the fear the better-informed party will take advantage of the less-informed party by misrepresenting the quality of the product or service – or moral hazard – the fear that, once the transaction takes place, one party will covertly shift risk to the other's disadvantage. Financial firms have devised many different ways of mitigating these costs, including, sometimes, the creation of separate subsidiaries. The degree of asymmetric information exacerbates conflicts of interest, which may arise between shareholders and creditors, between shareholders and managers, and between the firm and its customers. We will consider each in turn.

1.2.1.1 Asymmetric information: shareholders vs. creditors

The fundamental conflict of interest between shareholders and creditors springs from differences in their payoff functions. After debt-servicing costs have been paid, shareholders reap all the upside returns. They participate in the downside losses, however, only to the extent of their equity stake. In contrast, the upside return of creditors is limited to the promised return, while they may lose all that they have lent. Creditors will, thus, generally

⁷ Morgan (2002) presents evidence that financial institutions are inherently more opaque than other firms based on disagreements among bond rating agencies.

prefer safer investments than shareholders. With asymmetric information, creditors will be concerned that shareholders may engage in risk shifting after the terms of a loan have been set by substituting riskier assets for the safer assets. To safeguard against this possibility creditors may charge a higher premium and attempt to constrain the firm by insisting on a number of contractual clauses or, perhaps, even refusing to lend. Kahn and Winton (2004) have shown that the choice of a corporate structure can ease this problem. By forming a risky subsidiary, the firm provides a commitment that limits its incentive to engage in risk shifting. Placing safer assets in a separate subsidiary increases the safe subsidiary's net returns in bad states of the world and reduces its incentives to engage in risk shifting. It may also improve terms on which the safe subsidiary can obtain external financing. Although the firm may still have an incentive to engage in risk shifting in the riskier subsidiary, Kahn and Winton (2004) argue that this limits the amount of risk shifting that can take place within the conglomerate.⁸

1.2.1.2 Asymmetric information: shareholders vs. managers and internal agency problems

International financial conglomerates generally have broadly dispersed shareholders with no one dominant owner. This separation of ownership from managerial control means that shareholders face an asymmetric information problem *vis-à-vis* the managers of a firm. This is a classic principal-agent problem in which managers may be tempted to pursue their own objectives, such as empire building or the enjoyment of lavish corporate perquisites, rather than serving the interests of shareholders. This may lead to several different kinds of resource misallocations that diminish share values. Managers may be excessively risk-averse and seek to protect their entrenched positions by underinvesting in risky, positive net present value projects (Smith and Stulz, 1985). Or managers may take advantage of free cash flows

⁸ For an opposing view, see Merton and Perold (1993).

to overinvest in value-destroying, negative net present value projects (Jensen, 1986). More broadly, managers may shirk.

Senior managers face similar issues with regard to managers lower down the corporate hierarchy. These internal agency costs include managerial entrenchment, misallocations of resources, and rent-seeking behavior (Fulghieri and Hodrick, 2005). Although a number of corporate governance mechanisms deal with these problems, the choice of organizational form can also be used as an instrument to control the behavior of multiple agents and better align the incentives of owners and managers. For example, if a particular line of business has compensation practices or a culture that is very different from other lines of business in the conglomerate, segregation of that line of business into a separate entity may facilitate oversight and control.

Despite massive investments in management information systems, integrated financial conglomerates may find it difficult to track and evaluate the performance of individual lines of business. Informal, internal capital markets sometimes contribute to the blurring of performance and result in unintended cross subsidies (Rajan et al., 2000).⁹ A degree of corporate separateness may be introduced to sharpen strategic focus and improve monitoring.

Occasionally a firm may take the additional step of partially spinning-off a subsidiary so that it has a separate listing and can be publicly traded. As Habib, Johnsen, and Naik (1997) observe, this enlists the help of capital markets in generating information that should improve the quality of investment decision. It may also reduce the uncertainty of uninformed investors regarding the value of the subsidiary. Both effects should increase the value of the firm.

⁹ Holod and Peek (2006), however, provide evidence that internal capital markets in multibank holding companies may enhance the efficiency of secondary loan markets. In particular, internal secondary loan markets avoid the asymmetric information problems faced by participants in the external secondary loan market and thus mitigate financial constraints faced by individual subsidiaries.

Firms may achieve some of the incentive benefits by simply forming a separate entity even though the spinoff never actually occurs. Aron (1991, p. 505) notes that “The possibility of a future spinoff induces the divisional manager to act as if he were being monitored and evaluated by the capital market, even though the capital market's evaluation is observed only if a spinoff actually occurs.”

1.2.1.3 Information asymmetry: customer concerns about conflicts of interest

Conflicts of interest are ubiquitous even in specialized financial institutions, but, as Walter (2003, p. 21) notes, “the broader the range of clients and products, the more numerous are the potential conflicts of interest and the more difficult is the task of keeping them under control – and avoiding even larger franchise losses.” Customers fear that a firm may use its informational advantage to their detriment. Firms invest substantial resources to reassure clients and potential customers that they will not be disadvantaged *vis-à-vis* the firm or other clients. Such efforts include the erection of ‘Chinese walls’ restricting the flow of information across lines of business, the adoption of codes of conduct reinforced with compliance audits, and disclosures of potential conflicts.¹⁰ Sometimes firms take the additional step of segregating activities into separate subsidiaries. For example, investment advisory services may be provided by a separate entity from the underwriter and broker/dealer. Or, management consulting services may be offered through a separate entity in a separate location from the parent to reassure customers that confidential information would not be used in lending decisions or to aid other firms in which the parent might have an ownership position. Equally, corporate separateness may provide greater flexibility for operating units that would otherwise be constrained by conflict-of-interest concerns or burdensome reporting requirements.

¹⁰ For a detailed study on conflicts of interest in the financial industry, see Walter (2004).

Kroznor and Rajan (1997) found evidence of this behavior in the way in which US banks organized their investment banking operations before the 1933 Glass-Steagall Act forced a separation between commercial and investment banking. During this period, some banks organized their investment banking operations as an internal department within the bank, while others formed separately incorporated affiliates with separate boards of directors. They found that the market attached a higher risk premium to issues underwritten by internal departments. Kroznor and Rajan (1997, p. 475) conclude that this is consistent with “investors discounting for the greater likelihood of conflicts of interest when lending and underwriting are within the same structure” and that a separate affiliate structure is “an effective commitment mechanism” to reassure customers that the underwriter will not abuse its information advantage.

1.2.2 Costs of financial distress: protecting the group from a risky subsidiary

When costs of financial distress are substantial, firms may prefer to segregate risky activities in separately incorporated subsidiaries even though information is shared equally between corporate insiders and capital markets. A holding company structure, in which subsidiaries are separately funded, can limit the damage to the rest of the group from financial distress in one of its affiliates. Corporate separateness provides the option of partial liquidation when losses in one of the subsidiaries would otherwise jeopardize the solvency of the rest of the group. Bianco and Nicodano (2002) show that both shareholders of the financial group and the rest of society are better off when external debt is raised through separately incorporated subsidiaries instead of through the holding company and then down-streamed to the subsidiaries.¹¹ In either case, gains from coinsurance could be realized: the

¹¹ The choice on where to raise external funding is one of the key features impacting the level of centralization or decentralization of the banking business model (CGFS, 2010b); two other relevant factors are the centralization/decentralization of risk management and the choice to expand through branches or subsidiaries (Schoenmaker, 2013). On internal funding for US global banks see Cetorelli and Goldberg (2012a, 2012b); on

holding company may choose to rescue a faltering subsidiary with profits from the rest of the group. But, if funding is primarily from the holding company, a group-threatening loss that hits a subsidiary will certainly inflict the costs of financial distress on the rest of the group. In contrast, if subsidiaries are separately funded in external capital markets, the loss could be stopped at the subsidiary directly affected, reducing the costs of financial distress to the rest of the group. Of course, the providers of debt will charge a higher risk premium when they lend to the subsidiary. But, as long as the premium does not include a substantial, adverse-selection premium, both shareholders and society should be better off. (Of course, this depends crucially on the authors' assumption of full information. If lenders are concerned that they are less-well-informed about risk, then the Kahn and Winton model discussed above is more relevant.)

It is sometimes asserted that a financial group could not afford to walk away from a faltering subsidiary because it would undermine confidence in the rest of the group (Baxter and Sommer, 2005, p. 187). While it is true that a loss of reputation may be more costly to financial firms than to other, less leveraged firms, limited liability does have option value. In some instances, banks have walked away from insolvent subsidiaries without notable detrimental impact on the rest of their business (Dermine, 2006; Herring and Schuermann, 2005).

Moreover, banks sometimes appear to isolate riskier activities in separate subsidiaries. Dermine (2006) and Cerutti, Dell'Ariccia, and Martinez-Peria (2007), for example, have observed that banks tend to prefer to organize as subsidiaries (rather than branches) in riskier countries. Herring and Santomero (1990) reported that some banks chose to join clearing and settlement schemes that had open-ended loss-sharing agreements with separately capitalized

internal capital markets and lending by multinational bank subsidiaries see De Haas and Van Lelyveld (2010); on the choice between branches and subsidiaries see Fiechter et al. (2011). Note too that the Bianco-Nicodano result suggests that the Single Point of Entry resolution strategy proposed by the regulators may impose substantial costs.

subsidiaries in order to limit potential losses. The panic that swept through Asian securities markets after the collapse of Barings stemmed, in part, from the fear that a number of institutions would abandon their subsidiaries if losses should exceed their capital investments in memberships in some of the exchanges (Herring, 2003). But, in other cases – for example in dealing with troubled Special Investment Vehicles (SIVs) or Special Purpose Vehicles (SPVs) – financial institutions have provided additional funds to protect their reputations even though they were under no legal obligation to do so.

In some jurisdictions, moreover, the limited liability option is constrained by regulation. The Federal Reserve Board has long held that the failure of a parent bank holding company to act as a source of strength to a troubled banking subsidiary would be considered ‘an unsafe and unsound banking practice’ (Ashcraft, 2004). The source-of-strength doctrine is intended to enhance the position of the bank within a holding company. It implies that during periods of financial stress, the regulatory authorities should be permitted to use the resources of the holding company and its subsidiaries to support the bank. In essence, the source-of-strength doctrine would give the regulatory authorities an option on the assets of the rest of the holding company to prevent the default of the bank. Nonetheless, the Fed's attempt to enforce this doctrine in the Mcorp case was thwarted by the courts and the Federal Deposit Insurance Corporation settled two cases where the parent of a failed bank sued the receivership to recover funds and assets that were down-streamed by the holding company to a faltering bank subsidiary. But, subsequently, Congress enacted two laws that enhanced the ability of the regulatory authorities to force bank holding companies to act as a source of strength in some circumstance. First, the Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) of 1989 contained a cross-guarantee provision that permitted the FDIC to charge off any expected losses from a failing banking subsidiary to the capital of non-failing affiliate banks. Second, under the prompt corrective action section of the Federal Deposit Insurance

Corporation Improvement Act (FDICIA) of 1991, the Federal Reserve Board was given authority to force a parent bank holding company to guarantee the performance of a troubled affiliate as part of a capital restoration plan. Finally, the Dodd-Frank Act transformed the Fed source of strength doctrine into law (Sec. 616(d)).

1.2.3 Costs of financial distress: protecting a subsidiary from the rest of the group

The growth of securitization has led to a proliferation of special purpose vehicles (SPVs),¹² which are designed to be financially insulated from the rest of the group. An SPV is a legal entity set up by a corporate sponsor for a specific, limited purpose. It buys pools of assets, usually originated by the sponsor, and issues debt to be repaid by cash flows from that pool of assets. It is tightly bound by a set of contractual obligations that ensure the activities of the entity are essentially predetermined at the inception of the vehicle. SPVs tend to be thinly capitalized, lack independent management or employees, and have all administrative functions performed by a trustee who receives and distributes cash according to detailed contracts. Most SPVs involved in securitization are organized as trusts, although they may also be organized as limited-liability companies, limited partnerships, or corporations. For some kinds of transactions substantial tax benefits can be achieved if an SPV is domiciled offshore – usually in Bermuda, the Cayman Islands, or the British Virgin Islands (Gorton and Souleles, 2006).

G-SIBs have been at the heart of the growth of the structured credit markets and have dominant shares in arranging residential mortgage-backed and other asset-backed securitizations that rely heavily on SPVs. SPVs are constructed to be bankruptcy remote. The objective is to reassure investors in the SPV that their rights to the promised cash flows will not be compromised by financial distress or insolvency in the sponsor or its affiliates.

¹² The term ‘Special Purpose Entity’ (SPE) is used more or less interchangeably.

Similarly, the SPV itself is structured so that it cannot be taken through bankruptcy. Typically, any shortfall of cash that would otherwise cause an event of default will trigger, instead, an early amortization of the pool of assets. The benefit of this structure is that it should avoid the deadweight costs of financial distress and so the debt issued by the SPV should not be subject to a bankruptcy premium. By separating the control rights over assets from the financing of these assets, the SPV reduces the costs of financial distress and thus the cost of debt financing (Gorton and Souleles, 2006).

Although the desire to avoid the deadweight costs of financial distress may be the primary motive for securitizing assets, Tufano (2006) notes that other factors may also be important. For example, SPVs may be formed to achieve more favorable accounting treatment for the sponsor, to increase tax efficiency, to avoid regulatory capital requirements, to tap new pools of capital through changing the risk characteristics of a pool of assets, or to reduce the deadweight costs of information asymmetry by separating the funding of a more transparent pool of assets from the rest of the sponsor's balance sheet.

Protection of the bankruptcy-remote status of SPVs requires that the sponsor refrain from making any commitment to support the SPV. The concern is that a legal commitment might undo the bankruptcy-remote structure. If a sponsor should enter a bankruptcy proceeding, the judge might recharacterize the sale of assets to the SPV as a secured financing, which would bring the assets back onto the sponsor's balance sheet. Attempts to minimize this possibility account for a considerable amount of the complexity of securitization vehicles. For example, sponsors often employ a two-tiered SPV structure to provide an extra layer of insulation between the claims of the investors and the sponsor (Gorton and Souleles, 2006, p. 558).

If SPVs are, in fact, bankruptcy-remote, would they complicate the unwinding of a G-SIB? Perhaps not, but Gorton and Souleles (2006) present evidence that sponsors have

supported their SPVs and, based on the pricing of debt issued by SPVs and the credit rating of the sponsoring institution, conclude that investors rely on this implicit support. Gorton and Souleles (2006) argue that this implicit commitment is essential to deal with moral hazard and adverse selection problems implicit in the asymmetric information between the originator of the assets and investors in the SPV. Nonetheless, the efforts by several LCFIs to support their SIVs and asset-backed commercial paper (ABCP) conduits during the turmoil in financial markets in the latter half of 2007 appear to have surprised shareholders and some regulators. In any event, this disconnect between explicit and implicit contracts complicates any analysis of how the existence of SPVs might affect the resolution of a G-SIB experiencing extreme financial distress. Moreover, many of the innovative securitization structures have not been tested in a bankruptcy proceeding. Although these bankruptcy-remote structures may well turn out to be ‘bulletproof’, they are likely to complicate the resolution of a faltering G-SIB, nonetheless.

1.2.4 The legacy of mergers and acquisitions

Mergers and acquisitions may have a significant impact on the degree of complexity of corporate structure. Relative to a firm of equal size that has grown organically, an acquisitive financial conglomerate is likely to have many more subsidiaries, if only because it may be costly to close or consolidate them. G-SIBs have engaged in a large number of mergers, some of them exceptionally large. For example, since 1990, Bank of America, Deutsche Bank, JPMorgan Chase, and UBS have implemented mergers in which the target institution was larger than 10 percent of the acquiring firm's total assets (Thomson Securities Data Company).

The acquiring firm may choose to retain a considerable amount of corporate separateness in the target firm for two reasons. First, it may perceive value in the brand and

hope to retain the reputational capital of the target firm. Second, the willingness to retain the existing corporate structure may facilitate acceptance of the merger. As Dermine (2006) notes, by committing to keep a local structure and staff in place, local shareholders and the board of directors of the target may be reassured about the future of the target firm. Also, as we discuss below, host country regulatory authorities sometimes require that the acquiring bank maintain the target bank as a separate, locally chartered corporation.

Dermine (2006) observes, however, that the decision to maintain a separate entity is often tactical rather than strategic. Over time, G-SIBs generally decide to build a global brand identity, which may be inconsistent with the retention of separate subsidiaries bearing legacy names. Based on his interviews with ING and Nordea, Dermine (2006) found that even though both firms initially left many legacy organizations intact, they were also committed to building a global brand over time.

It may simply take a significant amount of time to rationalize the structure of the larger group. For example, litigation involving the legal entity may oblige the acquirer to maintain it as a separate entity until the litigation is resolved. Finally, since simplification of the structure may be costly and time-consuming, it may sometimes be easier to create a new legal entity than to identify and make use of an existing one. As a result, some of the proliferation of subsidiaries may simply be attributable to lackadaisical housekeeping of corporate structures. To the extent that growth in complexity may have been the result of inadequate attention to the growing complexity of corporate structures, the living will process should be effective in encouraging banking groups to simplify and rationalize their corporate structures.

JPMorgan Chase provides a good example of how mergers may increase corporate complexity. The current organization is the result of a series of mergers of very large banks that began in 1991 with the merger of Chemical Bank Corporation and Manufacturers Hanover Corporation. This merger resulted in a near doubling of the size of the surviving

institution, Chemical Bank, and, in 1996, was followed by the merger of Chemical Bank with The Chase Manhattan Corporation. The resulting institution merged with JPMorgan & Co., forming JPMorgan Chase & Co. (JPMC) in 2000. This series of mergers culminated in July 2004 with the merger of JPMC and Bank One Corporation (BOC) before the crisis and during the crisis included mergers with Bear Stearns and acquisition of the assets of Washington Mutual. According to Federal Reserve/National Information Center data, at yearend 2003 JPMC had 1,569 subsidiaries; after acquiring BOC, it had 3,406 subsidiaries at yearend 2004, an increase of 117%. At yearend 2007 JPMC had 3,683 subsidiaries. After the acquisitions of Bear Stearns and of the assets of Washington Mutual in 2008, the figure rose to 5,384, a 46% increase. Subsequently, JPMC has undergone a process of simplification of its structure. By June 2013, it had succeeded in reducing its number of subsidiaries to 4,059, a 25% reduction. A similar pattern can be observed for Bank of America, with a doubling of the number of subsidiaries after the 2008 acquisitions, followed by a significant reduction (about -25% from yearend 2009 to June 2013).

The efforts to reduce corporate complexity are consistent with evidence presented by Klein and Saidenberg (2010) that bank holding companies with many subsidiaries are valued at a discount relative to similar bank holding companies with fewer subsidiaries. Although this conglomerate discount has sometimes been attributed to inefficient internal capital markets, they find that affiliated banks benefit from access to internal capital markets by lending more and holding less capital than comparable unaffiliated banks. Since activity and geographic diversification is broadly similar for their sample of affiliated and unaffiliated banks, they infer that the valuation discount is attributable mainly to greater complexity of organizational structure rather than diversification. Laeven and Levine (2007) adopt a different approach, but also find a diversification discount in large complex financial institutions. They identify agency problems and insufficient economies of scope as probable

causes. This finding may help explain why several large banks have attempted to simplify their corporate structures. These efforts notwithstanding, continuing merger activity undoubtedly adds to corporate complexity.

1.2.5 Tax frictions

Taxes can have a major impact on the choice of corporate structure for all firms, especially international financial firms, because they tend to have more flexibility to shift profits from one entity to another (Demirgüç-Kunt and Huizinga 2001, p. 430). The choice of corporate structure, including the location and organizational form of SPEs, may be influenced by income taxes (and the details of permissible deductions and credits), capital gains taxes, taxes on interest and dividends, value-added taxes, withholding taxes, transactions taxes and stamp duties.¹³

Tax considerations are especially important for internationally active financial groups. Because home countries often tax groups on their consolidated worldwide income and, at the same time, most host countries tax locally generated income as well, cross-border transactions are usually subject to double taxation. The imposition of multiple taxes could stifle cross-border transactions completely without some sort of relief.

When foreign source income is not exempt from taxation in the home country, firms are often permitted to credit foreign taxes paid against domestic tax owed. Generally, the foreign tax credit is limited by the amount of taxes that the firm would have paid if the income had been earned at home. Thus, firms have a strong incentive to reduce the average tax rate on foreign source income by shifting profits from relatively high-tax countries to tax havens (permissible foreign tax credits may be constrained in other ways as well; see Demirgüç-Kunt and Huizinga (2001) for restrictions imposed on profit-shifting by the US).

¹³ Banks are often subject to a number of implicit taxes as well, which may include the obligation to hold required reserves at the central bank at less than the market rate of interest or deposit insurance premiums that exceed the fair value of insurance.

A crude indication of the extent to which tax issues may have contributed to the corporate complexity of G-SIBs may be seen in the number of entities located in tax havens. Our list of tax havens is based on the forty-two countries/territories/jurisdictions classified by the Financial Stability Forum as Offshore Financial Centers (Financial Stability Forum, 2000 and International Monetary Fund, 2000). The list includes countries/territories/jurisdictions which provide low or zero taxation, moderate or light financial regulation, and/or banking secrecy and anonymity. Of course, the impact of tax issues on organizational complexity is much more pervasive and complex than can be represented by a count of the number of subsidiaries in these centers. Nonetheless, this number is substantial for some of the G-SIBs (see Table 2.1 in Chapter 2). As of May 2013, nine of our G-SIBs each had more than 100 subsidiaries located in these booking centers. Moreover, 6 of the G-SIBs had 20 percent or more of their subsidiaries in tax havens.

1.3 Regulatory constraints

All of the preceding rationales for corporate separateness – asymmetric information problems, insulation against risk, the legacy of mergers and acquisitions, and taxes – apply to large corporations in general, not just financial groups. But financial groups are subject to an additional source of constraints that complicates their corporate structures – regulation. This may help explain, at least in part, why they have a substantially greater number of subsidiaries than non-financial groups of comparable size. On average, the number of majority-owned subsidiaries of the 28 G-SIBs identified by the Financial Stability Board as of November 2012 was 2.6 times the number of majority-owned subsidiaries of the biggest 28 non-financial firms by market capitalization (as of yearend 2012).¹⁴

¹⁴ Number of subsidiaries of G-SIBs as of May 2013 (source: Bankscope); number of subsidiaries of the non-financial firms as of August 2013 (source: Osiris).

Banks are among the most regulated institutions in every country, although countries differ with regard to the constraints imposed on banks' expansion into other lines of business. Broadly, three different regulatory models can be discerned: (1) complete integration; (2) parent bank with non-bank operating subsidiaries; and (3) holding company parent with bank and non-bank affiliates.¹⁵ Universal banking countries tend to follow the first model, with only minimal corporate separateness imposed for regulatory reasons. For example, Germany allows the combination of bank and securities businesses in a single legal entity, while the third model is dominant in the US, where the corporate separateness imposed on bank holding companies and financial services holding companies is reinforced by restrictions on the flows of credit between different functional units and the bank, set out by Sections 23A and 23B of the Federal Reserve Act and the Gramm-Leach-Bliley Act.

In a survey of 143 countries Čihák et al. (2012, p. 31) find that of 93% of countries that permit banks to engage in some securities activities, 43% impose some form of corporate separateness on these activities. Of the 83% of countries that permit banks to engage in the insurance business, 78% impose some form of corporate separateness. Finally, of the 60% of countries that permit banks to engage in the real estate business, 44% require some form of corporate separateness.

Different functional regulators may require that the activities which they regulate be conducted in separate legal entities. This not only facilitates oversight, but makes it easier to ring-fence those activities should it become necessary to intervene.¹⁶ Thus, even without consideration of the complexities introduced by international expansion, financial conglomerates may be required to adopt a certain amount of corporate separateness for regulatory purposes.

¹⁵ See Herring and Santomero (1990) for a more detailed discussion of these models and their variations.

¹⁶ In some jurisdictions it is possible to ring-fence entities that are not separately incorporated; for example, the US regulatory authorities can ring-fence a foreign branch.

G-SIBs have established subsidiaries in numerous countries (see column 10 in Table 2.1) and international expansion may require substantial additional corporate complexity for two reasons. First, host countries that apply some variation of model three to domestic financial conglomerates generally impose the same restrictions on foreign firms to maintain a level playing field. The fact that the US, the largest market in the world for financial services, applies model three to domestic and foreign firms can account for a significant amount of the complexity of the corporate structure of G-SIBs headquartered outside the US.

Second, even if the host country has not adopted a variation of model three for domestic firms, it may require that foreign-owned firms incorporate locally to ensure that the domestic authorities can intervene to protect domestic residents. New Zealand, where more than 85 percent of the banking system is controlled by foreign-owned banks, provides perhaps the most extreme example of the second rationale (Woolford and Orr, 2005).

Čihák et al. (2012, p. 25) find that in their sample of 143 countries only 4% of countries prohibit entry by foreign subsidiaries, but 14% prohibit entry by foreign branches. Moreover, even if foreign branch entry is not prohibited, host countries often impose stricter regulatory requirements on foreign branches that make the formation of a separate subsidiary relatively attractive.

Functional and national regulators frequently employ corporate separateness as a means of regulating, supervising, and monitoring the part of a financial conglomerate that falls in their bailiwick. While this may enhance local regulatory oversight, an unintended consequence may be that international financial conglomerates may have significantly more complex corporate structures than domestic firms of comparable size.

More broadly, G-SIBs often respond to new regulations with still more corporate complexity. Kane (1977; 1981; and 1984) has characterized this dynamic as a regulatory dialectic, in which regulators impose a rule (or implicit tax) and the regulated firms react

within their constrained environment to minimize the burden of the implicit tax. The regulators in turn react to perception of regulatory avoidance with still more regulations. This kind of dynamic has undoubtedly increased the corporate complexity of G-SIBs.¹⁷ In the event of financial distress, however, this complexity could impede an effective regulatory response.

1.4 Implications of corporate complexity for safety and soundness of the financial system

Despite their corporate complexity, G-SIBs tend to be managed in an integrated fashion along lines of business with only minimal regard for legal entities, national borders, or functional regulatory authorities. Moreover, there are often substantial interconnections among the separate entities within the financial group. Baxter and Sommer (2005) note that, in addition to their shared (although possibly varying) ownership structure, the entities are likely to be linked by cross-affiliate credit, business and reputational relationships.

What would happen should one of these G-SIBs experience extreme financial distress? Quite apart from the difficulty of disentangling operating subsidiaries that provide critical services to other affiliates and mapping an integrated firm's activities into the entities that would need to be taken through a bankruptcy process, the corporate complexity of such institutions would present significant challenges. The fundamental problem stems from conflicting approaches to bankruptcy across regulators, across countries, and, sometimes,

¹⁷ See Tröger (2013) for a discussion of how regulation may create incentives to change corporate structures in order to maximize efficiency or adjust to the new regulatory environment: he observes that some large European banks have recently undergone a process of transformation of subsidiaries into branches through a cross-border merger of the foreign subsidiaries into the parent banks. Banks claim that the main driver for such changes in organizational structures is efficiency and simplification of their corporate structures, but the transformation also provided an effective means of avoiding host country regulation and supervision. In the United States the Dodd-Frank Act imposed heavier regulatory requirements on foreign bank holding companies. Shortly after these measures were announced, some foreign banking groups reorganized their legal structure in the United States to end their status as bank holding companies. They accomplished this reorganization by transferring the ownership of deposits to a branch of the parent bank, leaving only non-depository business with the US subsidiary.

even within countries. There are likely to be disputes over which law and which set of bankruptcy procedures should apply. Some authorities may attempt to ring-fence the parts of the G-SIB within their reach to satisfy their regulatory objectives without necessarily taking into account some broader objective such as the preservation of going concern value or financial stability. At a minimum, authorities will face formidable challenges in coordination and information sharing across and among jurisdictions. Losses that spill across national borders will intensify conflicts between home and host authorities and make it difficult to achieve a cooperative resolution of an insolvent financial group. Experience has shown that in times of stress information-sharing agreements are likely to fray (Herring, 2007).

Despite more than thirty years of harmonization initiatives by the Basel Committee on Banking Supervision (BCBS), approaches to bank resolution differ substantially across countries. For example, countries differ with regard to the point at which a weak bank requires resolution and to what entity initiates the resolution process. Clearly cross-border differences in regard to how and when the resolution process is initiated can cause delays that may be costly in a crisis.

The choice of jurisdiction may also have important implications for the outcome of the insolvency proceedings. Most countries have adopted a universal approach to insolvency in which one jurisdiction conducts the main insolvency proceedings and makes the distribution of assets, while other jurisdictions collect assets to be distributed in the main proceedings. But the US follows a more territorial approach with regard to US branches of foreign banks and will conduct its own insolvency proceedings based on local assets and liabilities. Assets are transferred to the home country only after (and if) all local claims are satisfied. The choice of jurisdiction will also determine a creditor's right to set off claims on the insolvent bank against amounts that it owes the bank. The BCCI case revealed striking differences across members of the BCBS (BCBS, 1992). Similarly, the ability to exercise close-out

netting provisions under the International Swap Dealers Association (ISDA) Master Contracts may vary from jurisdiction to jurisdiction although ISDA has achieved a remarkable degree of international harmonization.

The outcome of insolvency proceedings will also depend on the powers and obligations of the resolution authority, which may differ from country to country. For example, does the resolution authority have the power to impose ‘haircuts’ on the claims of creditors without a lengthy judicial proceeding? Does the resolution authority have the ability (and access to the necessary resources) to provide a capital injection? With regard to banks, is the resolution authority constrained to choose the least costly resolution method, as in the US? Or is the resolution authority obliged to give preference to domestic depositors as the law requires in Australia and the US? More fundamentally, what is the objective of the supervisory intervention and the resolution process? The priority that supervisors will inevitably place on domestic objectives in the event of insolvency is the essential source of conflict between home and host authorities.

Three asymmetries between the home and host country may create additional problems even if procedures could be harmonized. First is asymmetry of resources: supervisory authorities may differ greatly in terms of human capital and financial resources, implying that the home supervisory authority may not be able to rely on the host supervisory authority (or vice versa) simply because it may lack the capacity to conduct effective oversight. Second, asymmetries of financial infrastructure may give rise to discrepancies in the quality of supervision across countries. Weaknesses in accounting standards and the quality of external audits may impede the efforts of supervisors just as informed, institutional creditors and an aggressive and responsible financial press may aid them. The legal infrastructure matters as well. Inefficient or corrupt judicial procedures may undermine even the highest quality supervisory efforts.

Perhaps the most important conflict, however, arises from asymmetries of exposures: what are the consequences if the entity should fail? Perspectives may differ with regard to whether a specific entity jeopardizes financial stability. This will depend on whether the entity is systemically important in either or both countries and whether the foreign entity is economically significant within the parent group.

1.5 The collapse of Lehman Brothers and the impetus for reform

The collapse of Lehman Brothers (LB) on September 15, 2008 demonstrated that these potential conflicts are not just theoretical. After trying to broker a merger of LB with other, stronger institutions, the US authorities declined to bail it out and sent the holding company, Lehman Brothers Holdings Inc. (LBHI), to the bankruptcy courts for protection under Chapter 11 of the US bankruptcy code. This became the largest (and undoubtedly the most unprepared) bankruptcy in US history. Although LB was only the 4th largest U.S. investment bank it was of sufficient systemic importance that its collapse led to substantial spillovers on global and national capital markets.

In its bankruptcy petition Lehman reported assets totaling \$634 billion; it had more than 25,000 employees and over 7,000 subsidiaries in more than 40 countries (Lehman Brothers, 2009). Interestingly, during the bankruptcy proceedings courts determined that fewer than 1,000 subsidiaries had any active relationship to ongoing business. Lehman operated in such an integrated fashion that employees were largely ignorant about which legal entity employed them. A trader on the New York equities desk might book trades with a Lehman entity anywhere in the world (Miller and Horwitz, 2012). This corporate complexity greatly impeded the orderly resolution of the firm and led to significant spillovers to other institutions and markets.

The fundamental problem was that LB was managed as an integrated entity with minimal regard for the legal entities that would need to be taken through the bankruptcy process. LBHI issued the vast majority of unsecured debt and invested the funds in most of its regulated and unregulated subsidiaries. This approach is typical of global corporations and is designed to facilitate control over global operations, while reducing funding, capital, and tax costs. LBHI, in effect, served as banker for its affiliates, running a zero-balance cash-management system. LBHI lent cash to its operating subsidiaries at the beginning of each day and then swept the cash back to LBHI at the end of each day. The bankruptcy petition was filed before most of the subsidiaries had been funded on September 15th and so most of the cash was tied up in court proceedings in the US and the subsidiaries had no choice but to declare bankruptcy or be put in administration.

Lehman also centralized its information technology so that data for different products and different subsidiaries were co-mingled. This was an efficient way of running the business as a going concern, but presents an enormous challenge in global bankruptcy proceedings. LB stored data in 26,666 servers, 20,000 of which contained accumulated emails, files, voicemail messages, instant messages, and recorded calls that were necessary for ongoing operations and for allocating assets and liabilities in bankruptcy. The largest data centers were in New York, London, Tokyo, Hong Kong, and Mumbai. The UK Administrator closed down one of Lehman's critical information and operational systems, which disrupted the rest of the information network and impeded retrieval of essential information to identify assets and liabilities. Moreover, LB used approximately 2,700 proprietary, third-party, and off-the-shelf programs, each of which interacted with or created transactions data.

The bankruptcy administrators have the responsibility to preserve, extract, store, and analyze data relevant to the entities they are charged with resolving. This challenge was exacerbated by the success of the administrators of LBHI in selling two important entities

that were rapidly declining in value because of losses of human capital: its investment banking operations and its asset management business, which owned much of the critical data.

Most of the US investment banking operations – the assets, not the legal entities – were sold to Barclays. This necessitated bringing a Securities Investor Protection Corporation (SIPC) proceeding, which put all the accounts of LBI, the U.S. broker/dealer subsidiary, under the control of the SIPC Trustee and permitted the broker-dealer to be liquidated. Nomura bought most of the investment banking business in Asia and continental Europe and LB's asset management business was sold in a management buyout. But this meant that the data were owned by Barclays, Nomura, and the now independent asset management division and so bankruptcy administrators were dependent on the new owners for access to data to determine the assets and liabilities of each legal entity. The administrator of the four London subsidiaries complained that nine weeks after the bankruptcy, he had yet to receive a confirmation of the assets owned by these subsidiaries.

The US administrators expressed the optimistic view that they would be able to complete the resolution within eighteen to twenty-four months, but the presiding judge reminded the administrator that the biggest impediments to a timely completion of the administration are the timetables of the other insolvency fiduciaries around the world. The administrators in London warned that it may take years for creditors to get their money back, noting that they were continuing to work on Enron, which failed seven years earlier, which was about one-tenth the size and complexity of Lehman (Hughes, 2008). Today there are more than 100 insolvency proceedings involving various remnants of Lehman underway in at least 16 different jurisdictions.

Although members of the G-7 had expressed the view that the US authorities should have bailed out Lehman, they began to realize that bailouts create expectations of still greater

bailouts and may create huge taxpayer liabilities that cannot be justified on political or economic grounds. Haldane (2009) estimated that at the height of the crisis over \$14 trillion (about one-quarter of world GDP) had been committed by the United States, the United Kingdom and the Euro Area to support their banking systems.

By the time of the first meeting of the G-20, a consensus had formed that a policy of too big to fail had become too expensive to sustain. The rallying cry was that taxpayers should never again be put at risk of such loss. And leaders began to realize that they lacked effective tools to deal with a faltering financial giant. Without an effective resolution policy they were left with two bad choices: a bailout or the risk of widespread financial disorder. This perception proved a turning point with regard to policy toward large, complex financial institutions. In the next section we will review some of the policy reforms initiated to ameliorate the too big to fail problem.

1.6 Policy reforms to deal with G-SIBs: an overview

The most notable change since the 2008 global financial crisis is that the issue of size and complexity has risen from obscurity to the top of the policy agenda. A virtual cascade of proposals and regulations has flowed from international organizations and from the regulatory authorities in the US, the EU, and many other countries. The sheer quantity and range of such proposals have been so vast that this overview must be very selective, focusing only on those initiatives directed explicitly at the too-complex/too-big-to-fail problem at the international level and in the United States.¹⁸

¹⁸ We will touch on some policy proposals in the European Union, focused on insulating retail banking from riskier businesses within a banking group, but space constraints prevent us from discussing the broader European banking union project. It should be noted that the European Union is attempting to resolve many of the cross-border problems we have highlighted within the context of the eurozone. For further discussion of the European banking union see, for example, Constâncio (2014), Goddard et al. (2015), Herring (2013a) and Howarth and Quaglia (2014).

1.6.1 Global initiatives

At the international level the Basel Committee on Banking Supervision responded quickly to the mounting evidence that Basel capital rules had not worked. The definition of capital in the numerator was much too broad including many instruments that could not serve as going-concern capital. Risks in the denominator were underweighted and the required minimums were much too low. The Committee began work immediately on a new Basel III framework to address these problems. Some adjustments were made to increase risk weights and especially to strengthen them for complex instruments in the trading book. Since G-SIBs account for a disproportionate amount of trading activity, this increased the regulatory measure of risk for them. Similarly, the measures to push out derivatives activity from banks to exchanges by increasing the risk weights on such exposures that remain off banks' balance sheets will have particular impact on the G-SIBs, which account for most of the activity in over-the-counter derivatives trading.

The most important change, however, was in the numerator. The BCBS determined that banks should have more and higher quality capital. The focus was on Tier 1 equity capital, which tended to be what the market monitored once it became clear that regulatory measures were unreliable. This higher quality capital then became the basis for additional layers of capital requirements. The minimum common equity Tier 1 capital was increased to 4.5% of risk-weighted assets (RWA), an additional conservation buffer of 2.5% was added, and a discretionary, countercyclical buffer varying from 0-2.5% could be required by a national authority that was concerned about excessively rapid credit expansion. These capital requirements applied to all internationally active banks. But, in addition, a surcharge was aimed directly at G-SIBs: this additional Tier 1 equity capital charge can vary from 1% to 3.5%. Each November, when G-SIBs are identified, they are allocated into five different buckets according to the degree of systemic risk they pose. So far the 3.5% bucket has been

left empty, but is held out as a potential sanction to deter institutions from becoming more systemically important.

This is a complete reversal of the philosophy underlying Basel II. In Basel II the risk-weighting scheme was designed to reduce risk-weighted assets for large institutions in order to give them an incentive to adopt the most advanced approaches to risk measurement and management (SRC, 2013a). These weights were calibrated to give a lower risk weight than if the Standardized Approach were used. Of course, this approach completely neglected the fact that very large institutions are likely to pose a greater systemic risk than smaller institutions and should be required to hold higher, not lower capital buffers. Thus the Basel III reforms impose a penalty on banks that become more systemically important.

In addition, the BCBS has proposed a 3% Tier 1 leverage capital ratio. This will be a constraint for several of the largest banks that had operated on leverage ratios as high as 50:1. The leverage ratio will also provide a safeguard against the manipulation of internal models to lower risk weights (Admati and Hellwig, 2013; Bair, 2013; Carmassi and Micossi, 2012; Hoenig, 2013; SRC, 2013b; SRC, 2013c). Some very large banks will be compelled to raise significantly more equity or downsize their balance sheets. In addition, the denominator of the leverage ratio is being redefined to take into account off-balance-sheet exposures as well as on balance-sheet exposures. This, too, will raise the hurdle for the G-SIBs, which conduct much more of their business off-balance sheet than most other banks.

While the BCBS focused on capital requirements, the FSB concentrated on resolution policies. Perhaps its most important accomplishment has been the agreement on “Key Attributes of Effective Resolution Regimes for Financial Institutions” and the development of a methodology for assessing the degree to which member countries have adopted these attributes. An effective resolution regime should (FSB, 2011a):

- ensure continuity of systemically important functions;

- protect insured depositors and ensure rapid return of segregated client assets;
- allocate losses to shareholders, unsecured and uninsured creditors in a way that respects payment priorities in bankruptcy;
- deter reliance on public support for solvency and discourage any expectation that it will be available;
- avoid unnecessary destruction of value;
- provide for speed, transparency and as much predictability as possible based on legal and procedural clarity and advanced planning for orderly resolution;
- provide legal mandate for cooperation, information exchange and coordination with foreign resolution authorities;
- ensure that non-viable firms can exit the market in an orderly fashion;
- achieve and maintain credibility to enhance market discipline and provide incentives for market solutions.

During the crisis many countries found that they had no coherent resolution regime and so these key attributes set very ambitious goals and have been quite influential as countries have begun to establish or reform their resolution regimes. To encourage progress in meeting these goals the FSB monitors each country's progress (FSB, 2013d) and makes an annual report to the G-20 (FSB, 2013e). The Financial Stability Board, chaired by Mark Carney, made the optimistic assessment that "Good progress has been made in putting this international policy framework in place and there are signs that firms and markets are beginning to adjust to authorities' determination to end 'too-big-to-fail'" (FSB, 2013f). But it goes on to observe that many jurisdictions have not yet undertaken the necessary reforms to meet the standards set by the Key Attributes.

1.6.2 The US response

The main response of the United States to the financial crisis was passage of the sprawling and complex Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA) in July 2010. The DFA, 2,319 pages of legislation, required that agencies make 500 rules and prepare 81 studies and 93 reports. Even now scarcely half of these provisions of the law have been implemented. We will focus on aspects of the DFA that are aimed particularly at G-SIBs.

Although the DFA abolished one regulatory agency, it created a new Financial Stability Oversight Council (FSOC), Chaired by the Secretary of the Treasury, with the responsibility to identify threats to financial stability and gaps in regulation. FSOC also designates the non-bank financial companies that are deemed systemically important and thus should be subject to heightened supervision by the Fed. The DFA defined the threshold for bank holding companies to be designated as SIFIs (Systemically Important Financial Institutions), setting the hurdle at \$50 billion, which most observers consider to be much too low.

FSOC is also charged with limiting the size and complexity of SIFIs. It can recommend heightened regulatory standards for institutions that grow in size and complexity and it must approve (by a 2/3rds majority) any decision by the Fed to compel asset sales by SIFIs that have failed to submit satisfactory resolution plans.

The DFA attempted to reduce the scope for discretion that the authorities exercised during the crisis by establishing a new two-tier resolution regime.¹⁹ Congress wanted to discourage the presumption that any SIFI was too big to fail, by requiring that every SIFI demonstrate that it could be taken through the bankruptcy process like any other firm. Each SIFI is required to file an annual “living will” describing how it could be taken through

¹⁹ For a discussion of the new US approach to bank resolution see Tarullo (2013). For a discussion on the current state of resolution planning in the US see Norton (2013).

bankruptcy without creating intolerable spillovers. If a particular SIFI's living will is not persuasive the Fed and FDIC are required to return it with suggestions for improvement that may include selling businesses, consolidating subsidiaries or other measures to make the SIFI easier to resolve in bankruptcy. If the SIFI is unresponsive these suggestions may become requirements.

Although bankruptcy is the preferred mode of resolution, Congress provided for the possibility of an administrative alternative misleadingly titled the Orderly Liquidation Authority (OLA). The intent of this administrative process is not to liquidate the group, but rather to preserve going concern value by executing a rapid good bank/bad bank split in which the assets with going concern value along with the liabilities ranking highest in repayment priority are transferred to a new bridge institution. The bridge institution would continue the systemically important operations of the group until all or parts of the business can be sold to third parties or wound down in an orderly fashion. The bad bank would be liquidated over time with the intent of maximizing the value of the assets for the creditors left behind in the bad bank. In many respects this approach is parallel to that which has been and will continue to be employed by the FDIC to resolve insured depository institutions. Indeed, the OLA represents an expansion of the FDIC's traditional powers to enable it to manage the process for potentially any financial institution. Its powers under the OLA, however, differ in some important respects from those it has exercised over insured banks: the OLA is intended to be used only in extreme cases involving turbulent financial conditions. Congress intends that no financial institution should know *ex ante* that it will be resolved under the OLA rather than bankruptcy (and, it does not relieve SIFIs from the responsibility of conducting their businesses so that they can be subjected to the normal bankruptcy processes). Congress has attempted to impose some high procedural hurdles that must be surmounted before the OLA can be used. Before the FDIC can be appointed as receiver, the Secretary of the Treasury (in

consultation with the President) must make three determinations supported by 2/3rds of the Federal Reserve Board and 2/3rds of the FDIC Board. First, the financial company is in default or in danger of default. Second, resolution under bankruptcy would have serious adverse effects on financial stability in the United States. Third, no viable private sector alternative to default can be found. If the board of the company in financial distress consents, the FDIC can be appointed as receiver. If the board does not consent it can challenge the Secretary of the Treasury in a secret proceeding before the US District Court in Washington D.C., but only on the narrow grounds of whether the institution is a financial institution within the meaning of the DFA and whether it is in default or in danger of default. The Court must reach a decision within 24 hours.

Once it is appointed as receiver the FDIC has considerable scope for cherry-picking assets and liabilities that will be transferred to the bridge institution, but its actions are limited by the requirement that creditors left behind will be at least as well off as they would have been under a Chapter 7 Liquidation proceeding. To limit moral hazard in the exercise of OLA powers the FDIC is required to remove the management and board, which may be harsher than the treatment managers and some board members might receive under bankruptcy.

In order to fund the bridge institution the FDIC may borrow from the Treasury an amount no greater than it expects to receive from the ultimate disposition of the bridge institution. In the event the loan cannot be repaid from this source, the shortfall will be covered by a special assessment on firms with more than \$50 billion in assets. This is intended to provide assurances that the taxpayers will not be put at risk through exercise of OLA authority.

Two other features of the DFA have particular relevance for G-SIBs. First, the Collins Amendment establishes a floor for both risk-based and leverage capital requirements equal to the ratios in effect when the DFA was passed. Since the US had not yet adopted Basel II, this

means that risk-weighted assets calculated under the Advanced Approaches (expected to be used by the largest institutions) can be no lower than they would be under the Standardized Approach (expected to be used by most other institutions). This means that the Basel III capital requirements in the US can be more stringent, but must be no less stringent than the capital requirements in effect during July 2010. In addition, the Collins Amendment requires that regulators raise capital requirements for firms with significant activity in derivatives, securitization products, financial guarantees, securities borrowing and lending and repos. Higher capital requirements must also be imposed on firms with concentrations of assets for which reported values depend on internal models. These are all characteristics that tend to distinguish the G-SIBs and other larger SIFIs from smaller banks and so the Collins Amendment effectively mandates US regulators to impose higher capital requirements on the larger SIFIs. The Fed has announced the way in which it will implement Basel III and has introduced a new leverage ratio that is significantly higher for large banks and for large bank holding companies (Switzerland and Great Britain have also increased capital requirements by substantially more than the Basel minimums).

Second, the Volcker Rule, which has not yet been implemented, was focused on limiting the scope and scale of large SIFIs. The Volcker Amendment was not part of the original DFA, but was inserted by the Administration in response to exit polls which showed that voters were so angry with perceived lenient treatment of Wall Street, that they elected a Republican to the Senate seat that had been held for decades by a Kennedy. The principal rationale for the Volcker Rule was to protect insured deposits from activities that were thought to be especially risky. The Volcker Rule prohibits proprietary trading but permits trading to serve the interests of customers. This distinction has proved difficult to transform into an implementing regulation and has delayed adoption of the Rule for more than three years. The Volcker Rule also limits investments in and sponsorship of hedge funds and

private equity funds: SIFIs can invest no more than 3% of their Tier 1 capital in such funds and their investment can account for no more than 3% of the financing in any given fund.

The basic intent of the Volcker rule is to limit the benefits of public guarantees of deposits to core banking services that are believed to be systemic and to shield them from riskier activities. Implicitly, the Volcker Rule takes the view that some activities are so risky and so complex to monitor that they should be prohibited. Regulators in the United Kingdom and European Union have also sought to shield a core set of activities from activities that are thought to be riskier, but they have chosen to rely on subsidiarization (or corporate separateness) buttressed by constraints on intra group exposures. The Vickers report has sought to ring fence retail banking by pushing other activities out of the deposit taking institution. But these activities can continue to be conducted by affiliates so long as they do not take retail deposits in the UK. The EU's Liikanen report (HLEG, 2012) and the ensuing EU Commission proposal would prohibit depository institutions from engaging in market making, proprietary trading, and investment in hedge funds and private equity, but other subsidiaries in the same banking group would be free to conduct these lines of business.

The French and German governments have adopted a somewhat weaker version of the Liikanen model that allows depository institutions to engage in market making. All of these approaches attempt to protect the depository institutions from shocks to other activities, but the details of each approach are quite different.²⁰ This is, in fact, characteristic of virtually every aspect of bank regulation and especially resolution policy. That is why the FDIC has faced a special challenge in implementing OLA in a way that would be effective for cross-border banks.

This is an important challenge because all of the largest US SIFIs have substantial operations outside the United States. If the FDIC cannot specify how OLA can work across

²⁰ For a detailed overview of structural bank regulation initiatives see Gambacorta and van Rixtel (2013); they also provide an in-depth analysis of the closely related issue of economies of scale and scope in banking.

borders, it will lack credibility. The FDIC has been actively engaged in supervisory colleges and crisis management groups organized by the BCBS and it has signed several Memoranda of Understanding with their counterparts (when they can be identified) in other countries. But it is unclear whether any of these measures will be effective under the stress of an actual crisis. One solution might be to harmonize resolution regimes across the world. The Key Attributes approach is, in fact, a step in that direction, but when the question of allocating losses arises few people have confidence that this approach would hold up. Countries are understandably reluctant to allocate losses ex ante – no country is willing to make an open-ended fiscal commitment. And cross-border losses will be even more difficult to allocate ex post since it will always be possible to argue that the losses would not have occurred if home country supervision had been more effective. There is probably no better example of this problem than the reluctance of the EU to even consider the possibility of a common deposit insurance fund. Yet, so long as the safety of a deposit depends on the strength of the deposit insurance system and the creditworthiness of the country where the deposit was placed the lethal link between bank risk and country risk cannot be broken. One reaction to this lack of a robust cross-border system for resolving G-SIBs is to prepare to ring-fence the parts of the banking group that are within one country's borders. The US has required that foreign banks with substantial operations in the United States establish a US holding company that would be subject to prudential rules in the US, including capital adequacy requirements, and could, in principle, be resolved in the US if the home country's resolution procedures do not seem to treat US interests fairly.

But the FDIC, in cooperation with the Bank of England (FDIC and Bank of England, 2012), has proposed an alternative that might finesse the issues of corporate complexity and differences in national resolution regimes, by requiring the top level entity in the group (in the US, the bank holding company) to hold sufficient capital to recapitalize its subsidiaries in

the event of a near default. In essence, the holding company would be taken through bankruptcy court and the rest of the group would be placed in a bridge institution and continue operation under the supervision of the FDIC. All of the operating entities would continue to function. Of course, this approach depends on at least three important assumptions: (1) that the top level holding company is sufficiently well capitalized to recapitalize the rest of the group; (2) that counterparties of the subsidiaries would not deem the change in control to be an event of default that would enable them to net and close-out their existing contracts; and (3) that host country governments would be confident that the subsidiaries operating in their country would continue in operation without imposing loss on local creditors or counterparties. This, however, places the FDIC in a very tricky position. To make the Single Point of Entry (SPE) approach work creditors, counterparties and foreign regulators of the subsidiaries must believe that the bridge institution can and will continue to operate the subsidiaries. But the FDIC cannot make such a guarantee, particularly if resources at the holding company level are not sufficient. If it should issue such a guarantee, the opponents of OLA would justifiably claim that OLA was yet another way to subsidize large SIFIs. In essence, the DFA would have failed to remove the special access of large SIFIs to government resources (even if such resources are to be repaid by levies on the remaining large banks in the end). If the FDIC does not make such a guarantee, however, each creditor, counterparty and regulator of a foreign subsidiary will question whether the subsidiary with which they are dealing will be supported. Given the lack of transparency of such groups, the suspicion that a subsidiary might fail could precipitate behavior that will ensure that it does.

1.7 Concluding comment

We can no longer claim that the authorities have ignored the issue of complexity. The problem is now widely recognized and numerous initiatives have been taken at both the

international and national levels to reduce corporate complexity and constrain the size of G-SIBs. Higher capital requirements, heightened supervision, restrictions on activities, and improved resolution regimes accompanied by living wills should help reduce the problem. All of these new policies take time to implement, but financial institutions usually try to achieve compliance with new regulations even before the date they are effective because markets will reward financial institutions that are prepared for the new regimes. Nonetheless, our analysis of what little public data there is regarding complexity (see Chapter 2) suggests that progress has been quite uneven. Some institutions appear to have simplified their structures and downsized, while others have become still larger and more complex. This raises several questions about whether the new policies will succeed.

One issue the authorities must face is whether markets believe they will implement the new policies rigorously. Here they face an enormous credibility gap. Despite decades of rhetoric asserting that no institution was too big to fail, the only instance in which the doctrine was applied, the bankruptcy of Lehman Brothers, was widely criticized as hugely disruptive to world financial markets. Moreover, when it became clear that several banks were too big to save without placing impossible financial burdens on their home countries, these countries chose to bailout their banks even at the cost of serious damage to their own credit ratings. In addition, when faced with an actual crisis, the authorities proved reluctant to use the powers they already had. In the US, even subordinated debtors at troubled institutions were protected (except in the case of Lehman Brothers). Whether the authorities have the will to use the new powers they have been given remains an open question. Perhaps this doubt can only be resolved by a crisis of just the right size in which the authorities can demonstrate that they have the will and ability to carry out their new powers without disrupting markets. So far, credit rating agencies and markets appear to have significant doubts.

Will the crisis management groups, memoranda of understanding and resolution strategies like the SPE withstand the strain of crisis? Here again experience during the crisis leads one to be skeptical. Perhaps the most obvious example is the collapse of Fortis, a large bank that was owned by interests in Belgium, the Netherlands, and Luxembourg – a trio of countries known as the Benelux group that had maintained a currency union long before the euro was introduced. When faced with the challenge of resolving Fortis in a way that might conserve its going concern value, however, cooperation collapsed and each country grabbed the assets that it could control. If an SPE regime is adopted and if the home country has the resources and will to implement it, this problem might be overcome. But so far, it is a clever, but untested idea.

What is most troubling in the progress to date is the complete lack of public disclosure. This means that markets lack the information to discipline banks that have excessively complex structures or, indeed, to monitor whether regulators are implementing their new powers. The US has led the way in disclosure by requiring a public section of living wills, but it is of little value because it contains no new data. Other countries, however, have not even taken this limited step. Worse still, markets lack a clear understanding of how each G-SIB would be resolved. If resolution regimes are to succeed they should enlist market discipline ex ante. Creditors and counterparties should know how resolution plans will be implemented in order to price claims appropriately. This could strengthen regulatory efforts markedly. Equally importantly, the resolution should not surprise the market when it is implemented. It is unwise to surprise creditors ex post by imposing unexpected losses on them. Although regulators are often enamored with the doctrine of “constructive ambiguity”, one of the clear lessons of the crisis is that when regulators surprise the market by taking unexpected actions that cause loss (or by failing to act when expected to prevent loss), financial instability is intensified. Investors will tend to flee to safety and secondary markets

will evaporate until investors once again believe they understand the rules of the game. Of the key objectives for effective resolution regimes, the one that appears to have received the least attention is to “Achieve and maintain credibility to enhance market discipline and provide incentives for market solutions.” Although this appears last on the list of key objectives, it is most certainly not last in importance.

Finally, the authorities should take this opportunity to examine their own regulations and tax laws. It is clear that these provide strong incentives for overly complex transactions and corporate structures. The authorities should continually question whether their objectives can be accomplished with taxes and regulations that cause fewer distortions and less counter-productive behavior.

Chapter 2

Mapping corporate structures of Global Systemically Important Banks²¹

2.1 Global Systemically Important Banks and complexity

The 2008 financial crisis clearly indicated that some financial institutions may be regarded as TBTF because they perform services that are critical for the functioning of the financial system. Their failure would be expected to jeopardize the stability of the financial system and the real economy. After the crisis, policy-makers have tried to identify the key factors that make these firms “systemic”. They have agreed on criteria to identify “Systemically Important Financial Institutions” (SIFIs)²². The Basel Committee on Banking Supervision (BCBS) has also agreed on a methodology to identify G-SIBs, the subset of SIFIs in which banking operations dominate. In July 2011 the BCBS published a consultative document outlining an indicator-based approach comprising five broad categories: size, interconnectedness, lack of readily available substitutes or financial institution infrastructure, global (cross-jurisdictional) activity and complexity²³. The analysis in this section focuses on the 28 G-SIBs identified by the FSB on the basis of these criteria in November 2012.

G-SIBs have developed a remarkable degree of corporate complexity. In what follows we focus on the number of majority-owned subsidiaries as an indicator of corporate

²¹ This Chapter draws heavily from Carmassi and Herring (2013).

²² Critics have charged that naming systemically important financial institutions might increase moral hazard rather than reduce it. The argument turns on whether the market believes that the authorities have the will and the means to resolve such institutions even when it requires imposing loss on some creditors. See Elliott and Litan (2011).

²³ Three indicators are used to measure complexity: notional amount of OTC derivatives; Level 3 assets and trading and available-for-sale securities. Each of the five indicators has a 20% weight in the calculation of an index of systemic importance. The final rules were published in November 2011 (BCBS, 2011, with an update in July 2013, BCBS, 2013). On the basis of the BCBS methodology the Financial Stability Board first identified 29 Global Systemically Important Banks in November 2011 (FSB, 2011b). It then published updated lists comprising 28 G-SIBs in November 2012 (FSB, 2012b) and 29 G-SIBs in November 2013 (FSB, 2013g); the list is to be updated every year.

complexity. Of course, this is a somewhat arbitrary, possibly misleading and regrettably superficial measure of corporate complexity. Unfortunately, publicly available data do not permit us to distinguish shell corporations, transaction entities or other inconsequential subsidiaries and so our data undoubtedly overstate the number of systemically important operations.²⁴ Moreover, it would be useful to supplement this simple quantitative measure with an indication of each entity's importance in the overall financial group including the balance sheets and income statements, intra-affiliate transactions, cross-guarantees, the provision of key services to the rest of the group and, more generally, the role of the entity in the overall business structure. Unfortunately, such information is not readily available to the public.²⁵ Nonetheless, the number of majority-owned subsidiaries is an indication of the magnitude of the legal challenge that would confront the authorities in taking a G-SIB through bankruptcy.

Table 2.1 presents an overview of the 28 G-SIBs, with data on subsidiaries, branches and the assets²⁶ and income of the entire group.

²⁴ However, it should be noted that the NIC/FED data on total subsidiaries often report much higher figures than the Bankscope majority-owned subsidiaries. For an analysis of corporate structures of US bank holding companies based on NIC/FED data see Avraham et al. (2012).

²⁵ Opencorporates is an organization focused on building an open database for every company in the world. The founders have noted that “[w]e’ve often heard company hierarchies and networks referred to as the Holy Grail of business information. That’s not just a recognition of the value and importance of this data. It’s also that it’s really difficult to find... and to collect, and to make usable too.” (<http://blog.opencorporates.com/2013/07/11/open-corporate-network-data-not-just-good-but-better/>).

²⁶ Unfortunately, we have not been able to make adjustments for the differences between US GAAP and International Financial Reporting Standards. These differences are especially important with regard to the treatment of derivatives and the classification of assets as available for sale or held to maturity.

Table 2.1: Overview of Global Systemically Important Banks (ranked by 2012 total assets)

		Total assets 2012 (USD mln)	Total assets 2007 (USD mln)	% of foreign assets, 2012	% of foreign net revenues, 2012	Total subsidiaries (May 2013)	% of domestic subsidiaries (May 2013)	% of foreign subsidiaries (May 2013)	Number of countries (May 2013)	Subsidiaries in OFCs, % (May 2013)	Branches, 2012	% of foreign branches, 2012
1	HSBC	2,692,538	2,354,266	65%	87%	1,565	21%	79%	69	27%	*	*
2	Deutsche Bank	2,655,138	2,833,804	73%	64%	2,124	24%	76%	61	27%	2,984	35%
3	Crédit Agricole	2,649,627	2,268,310	17%	19%	1,255	55%	45%	59	9%	11,300	20%
4	BNP Paribas	2,516,546	2,494,412	48%	68%	2,592	17%	83%	88	8%	*	*
5	Mitsubishi UFJ	2,407,111	1,824,397	31%	58%	112	46%	54%	21	4%	*	*
6	JPMorgan Chase	2,359,141	1,562,147	33%	12%	1,095	45%	55%	57	10%	*	*
7	Barclays	2,351,777	2,459,149	66%	70%	1,739	37%	63%	58	21%	*	*
8	Bank of America	2,209,974	1,715,746	14%	13%	1,910	72%	28%	48	10%	*	*
9	Royal Bank of Scotland	2,070,846	3,807,892	31%	44%	799	40%	60%	36	13%	3,700	41%
10	Bank of China	2,016,124	820,198	8%	3%	116	72%	28%	16	15%	*	*
11	Citigroup	1,864,660	2,187,631	64%	58%	2,297	39%	61%	95	10%	*	*
12	Mizuho	1,839,477	1,495,285	25%	39%	103	62%	38%	16	7%	*	*
13	Santander	1,675,192	1,343,905	72%	85%	605	25%	75%	37	7%	14,392	68%
14	Société Générale	1,650,212	1,577,745	23%	57%	913	47%	53%	74	8%	*	*
15	Sumitomo Mitsui	1,578,522	1,124,788	15%	12%	165	59%	41%	20	18%	455	4%
16	ING Groep	1,541,934	1,932,151	58%	66%	764	32%	68%	44	4%	*	*
17	BPCE	1,514,080	n.a.	8%	16%	1,448	65%	35%	70	6%	*	*
18	Wells Fargo	1,422,968	575,442	5%	*	1,549	93%	7%	27	4%	*	*
19	UBS	1,373,808	2,021,227	64%	57%	458	17%	83%	45	8%	*	*
20	Unicredit	1,222,889	1,504,134	54%	57%	2,216	41%	59%	67	3%	9,322	54%
21	Credit Suisse	1,008,379	1,208,956	78%	63%	242	10%	90%	37	21%	*	*
22	Goldman Sachs	938,555	1,119,796	35%	41%	420	29%	71%	24	11%	*	*
23	Nordea	893,665	572,728	79%	78%	220	5%	95%	19	4%	978	76%
24	BBVA	841,516	739,296	50%	70%	415	30%	70%	29	4%	7,978	56%
25	Morgan Stanley	780,960	1,045,409	25%	23%	1,311	41%	59%	45	20%	*	*
26	Standard Chartered	636,518	329,871	87%	94%	118	42%	58%	32	8%	*	*
27	Bank of New York Mellon	358,990	197,656	28%	36%	279	35%	65%	22	17%	*	*
28	State Street Corporation	222,582	142,543	25%	40%	155	26%	74%	14	28%	*	*
Average		1,617,633	1,528,107	42%	49%	964	40%	60%	44	12%	6,389	44%
Median		1,614,367	1,504,134	34%	57%	782	40%	61%	41	10%	5,839	48%
Range		2,469,956	3,665,349	82%	91%	2,489	88%	88%	81	25%	13,937	72%

*We were unable to find data for these groups to make consistent, meaningful comparisons. For six G-SIBs (Barclays, BNP Paribas, BPCE, Citigroup, JPMorgan Chase and Société Générale) we could only find data on retail branches. Sources: Bankscope, SNL database and annual reports for total assets; Bankscope for subsidiaries (majority-owned subsidiaries for which the G-SIB is the ultimate owner with a minimum control path of 50.01%); annual reports and other official bank documents for foreign assets and revenues and for branches.

The 28 G-SIBs are large, complex and geographically diversified banking groups. Sixteen G-SIBs are headquartered in Europe, 8 in the US, 3 in Japan and 1 in China. The average size is about \$ 1,600 billion in total assets. Shares of foreign assets and income tend to be large in many G-SIBs. Most earn more than 50% of their revenues/income from their foreign operations. On average, the number of majority-owned subsidiaries per bank is about 1,000, of which 60% reside in foreign countries.²⁷ And, on average, the G-SIBs have subsidiaries in more than 40 countries, but the range extends from Citigroup with a presence in 95 countries to State Street, which operates in only 14 countries (data on subsidiaries in Table 2.1 are as of May 2013; in Appendix 2.E we report the geographical breakdown of subsidiaries as of yearend 2013).

Although information on branch networks is much less readily available, G-SIBs appear to have very large branch structures ranging from about 450 to over 14,000 branches. It should be noted that for purposes of resolution planning, foreign branches should be taken into account. In the event of trouble the host country may ring-fence the branch and treat it as if it were a subsidiary²⁸. The lack of detailed and easily accessible data on global branch networks for many banking groups is a notable gap in disclosure policy. For these institutions, data on branches appear to be not available, or they are mingled with other figures related to the network of the group, which are not strictly branches but may include “offices”, “stores”, “agencies”, “locations”, “banking centers” and the like; thus, disentangling data on branches cannot be done from publicly available sources. Or, in some cases, data are available for retail branches, but not for wholesale branches, which may be the main source of systemic concerns. Inconsistencies in the methodology used by different G-

²⁷ These data are from BankScope as of May 2013. Data reported by official bank documents confirm the magnitude of the numbers of subsidiaries, even though criteria for calculating the number may be different. For example, in its 2013 resolution plan submitted to the Federal Reserve and the FDIC Deutsche Bank states that “The DB Group consists of approximately 2,906 active legal entities” as of December 31, 2012 (Deutsche Bank, 2013, p. 20).

²⁸ For example, New York State ring-fenced the branch of BCCI when it collapsed (Herring, 1993).

SIBs to report the information on their network can impede comparisons, unless the exact figures on branches and their locations are reported. For this reason, in Table 2.1 we have included data on branches only when we found numbers that explicitly refer to foreign and domestic branches. Collecting information on the size of branches appears even more arduous, if possible at all.

Table 2.2 illustrates the breakdown by industry (as of December 2007 and May 2013) of the majority-owned subsidiaries for the 13 G-SIBs that had been designated as LCFIs before the crisis and survived the crisis. Data show that only a minimal share of legal entities are banks and insurance companies, while trusts and vehicles, other financial companies and non-financial companies represent a very high percentage of the total number of subsidiaries; and these percentages appear to be quite stable over time, at least with regard to the two points in time considered in the table. It is evident from Table 2.2 that trusts may represent a very substantial number of subsidiaries for each of the 13 G-SIBs: some of these trusts are SPVs, but most securitization vehicles are unlikely to be included in our count of majority-owned subsidiaries because sponsors generally seek to avoid the appearance of voting control.²⁹

²⁹ For example, in its 2013 resolution plan Deutsche Bank (2013, p. 20) reported to have 1,541 Special Purpose Entities.

Table 2.2: Breakdown by industry of subsidiaries of G-SIBs, 2013 (2007 in parenthesis)

	Banks	Insurance companies	Mutual & pension funds/nominees/trusts/trustees	Other financial subsidiaries¹	Non-financial subsidiaries²	Total subsidiaries
Bank of America	72 (32)	17 (24)	584 (396)	322 (282)	915 (673)	1,910 (1,407)
Barclays	54 (49)	16 (21)	465 (309)	380 (239)	824 (385)	1,739 (1,003)
BNP Paribas	103 (88)	68 (74)	323 (102)	760 (433)	1,338 (473)	2,592 (1,170)
Citigroup	111 (101)	41 (35)	456 (706)	650 (584)	1,039 (1,009)	2,297 (2,435)
Credit Suisse	30 (31)	4 (4)	89 (91)	52 (63)	67 (101)	242 (290)
Deutsche Bank	68 (54)	8 (9)	541 (458)	618 (526)	889 (907)	2,124 (1,954)
Goldman Sachs	15 (7)	10 (4)	74 (48)	121 (151)	200 (161)	420 (371)
HSBC	89 (85)	37 (37)	309 (246)	298 (381)	832 (485)	1,565 (1,234)
JPMorgan Chase	54 (38)	13 (17)	305 (229)	205 (145)	518 (375)	1,095 (804)
Morgan Stanley	19 (19)	12 (22)	245 (225)	236 (170)	799 (616)	1,311 (1,052)
Royal Bank of Scotland	33 (31)	5 (29)	162 (168)	206 (450)	393 (483)	799 (1,161)
Société Générale	95 (81)	20 (13)	97 (93)	405 (270)	296 (387)	913 (844)
UBS	28 (29)	4 (2)	108 (121)	152 (66)	166 (199)	458 (417)
Total by industry	771 (720)	255 (310)	3,758 (3,490)	4,405 (4,263)	8,276 (6,729)	17,465 (15,512)
% by industry	4% (5%)	1% (2%)	22% (22%)	25% (27%)	47% (43%)	100% (100%)

Note: May 2013 and December 2007.

Source: Bankscope. Majority-owned subsidiaries.

¹ ‘Other financial subsidiaries’ include hedge funds, private equity and venture capital subsidiaries.

² ‘Non-financial subsidiaries’ include all companies that are neither banks nor insurance companies nor financial companies. They can be involved in manufacturing activities but also in trading activities (wholesalers, retailers, brokers, etc.). We have allocated foundations and research institutes to this category as well.

2.2 The role and contribution of resolution plans in mapping bank corporate structures

The requirement that banks prepare and submit to regulators their resolution plans – or that resolution authorities prepare such plans, as envisaged by the new European bank resolution rules – is one of the new key regulatory requirements introduced by post-crisis financial reforms. Their content includes important information on bank corporate structures: for this reason we develop in next sections an in-depth analysis of resolution plans.

2.2.1 Introduction: the peculiar absence of resolution policy from the pre-crisis Basel agenda

Although international efforts to enhance the safety and soundness of the banking system date back to the mid-seventies, the focus has been on harmonizing international banking supervision (e.g., the Basel Concordat and successive efforts to delineate best practices in supervision) or on negotiating increasingly complex, risk-based prudential capital requirements (e.g., Basel I, II, and III). These efforts aimed to prevent banks from failing – without, however, considering what might need to be done if a bank should fail.

The inadequacy of these efforts can be seen in the record of failures from 1989 through 2009. Ranking the top 100 banks by assets each year and counting the number of this group that failed³⁰, the implied failure rate was 1.3% (Kuritzkes, 2010) – a failure rate roughly equivalent to that of BB-rated corporate bonds. Worse still, the lack of an effective framework for unwinding the affairs of a large international financial institution meant that official interventions were usually improvised over sleepless weekends and often involved a substantial public subsidy to facilitate the merger of the faltering institution with another larger institution in a desperate and costly attempt to avert damaging spillovers.

³⁰ Direct bankruptcies, conservatorships, or substantial government interventions were counted as failures. They numbered 26 over these two decades.

This contributed to the rapid growth of increasingly large, ever more complex financial institutions. The outcome has been an expanding number of financial institutions that are each too large and/or too complicated to be resolved without jeopardizing financial stability.³¹ Indeed, quite apart from these subsidized mergers, the absence of a credible resolution mechanism has given banks an incentive to become bigger and more complex to benefit from an implicit subsidy (in the form of a lower cost of funds) based on the beliefs of creditors that they would be protected from loss in the event of trouble. This weakening of market discipline may also have led to increased risk taking by these institutions.

Nonetheless, resolution policy was simply absent from the international supervisory and regulatory agenda – until 2008. A series of hastily improvised rescues of large financial institutions preceded the failure of a relatively large investment bank despite the attempt by the authorities to devise a rescue package over a frantic weekend in mid-September 2008.³²

We review in Section 2.2.2 how the Lehman Brothers cross-border organization contributed to value destruction under existing bankruptcy laws in the US and abroad. Lessons and policy consequences from the Lehman Brothers collapse are discussed in Section 2.2.3. These consequences include the rise in policy makers' interest in living wills. The US policy with respect to living wills is described and discussed in Section 2.2.4. Thereafter in Section 2.2.5 we ask how informative the public portions of living wills are. We emphasize the ambiguity and divergence in banks' interpretation of 'material entities' in their disclosures. The lack of clarity with respect to the definition of a material entity undermines information value of the resolution plans. Section 2.2.6 concludes that much uncertainty remains with respect to resolution of large, complex international banking groups.

³¹ For example (Dudley, 2012), in the mid-1990s, the top five banks in the United States had total assets of \$1 trillion or about 14% of GDP. By the end of 2007, the top five banks had assets of \$6.8 trillion or 49% of GDP. Similarly, in the mid-1990s, the top securities firms had total asset equal to about 9% of GDP. By the end of 2007, these had grown to \$3.8 trillion, about 27% of GDP.

³² The resolution process was much more orderly for smaller banks that were entirely subject to FDIC administrative procedures.

2.2.2 *The Lehman Brothers collapse*

When Lehman Brothers collapsed in September 2008 it was the 4th largest investment bank in the US, nearly twice as large and complex as Bear Stearns, which had agreed to a subsidized, shot-gun merger with JPMorgan Chase in March of 2008 when it was unable to meet calls for additional collateral. The Lehman Brothers group, with more than 25,000 employees, consisted of over 6,000 subsidiaries in more than 40 countries (Miller and Horwitz, 2013), many of which were subject to host country national regulation as well as supervision by the Securities and Exchange Commission.³³

In 2006 Lehman made a deliberate decision to embark on an aggressive growth strategy and to take on greater risk by substantially increasing its leverage³⁴ and making concentrated bets on commercial real estate, leveraged lending and private-equity-like investments. These were far riskier than its usual line of business because rather than brokering risk, they were holding substantial amounts of risk on their balance sheet, financed largely by short-term repurchase agreements often amounting to hundreds of billions of dollars per day. In the words of one Lehman employee, they had shifted from the “moving business” to the “storage business” (Valukas, 2010). They had, in essence, taken on the risk profile of a commercial bank without the protection of the bank safety net. When the subprime crisis erupted, they saw it as an opportunity to double-down on their bets rather

³³ This is an unusually clear example of the law of unintended consequences. The EU threatened to force the large American investment banks to form holding companies in Europe if they did not submit to consolidated supervision by a competent authority. Although it had no prior experience, the SEC somehow convinced the EU that it was a competent supervisory authority and in 2004 the five largest investment banks became voluntary Consolidated Supervised Entities (CSEs) subject to Basel II-like capital regulation. When they measured their required capital under Basel-like rules that had been extended to the net capital computation for the broker-dealer, the five CSEs discovered that they had considerable excess regulatory capital and quickly increased their leverage, which was surely not what the EU intended. See Lo (2012, p.34) for an analysis of the regulatory change, emphasizing that before 2004, the holding companies of the broker/dealers had not been subject to any oversight or leverage constraint. Lo also raises doubts about the magnitude of the impact of the change in rules on leverage. Kwak (2012), however, notes that Lo’s analysis fails to emphasize a key point: the SEC’s intent was to permit the large broker/dealers to substitute mathematical models for traditional risk weights so that the net-capital calculation would “probably be lower.”

³⁴ Lehman’s debt to equity ratios often exceeded 40:1, and during the middle of any reporting period might go up to 60:1 (Miller and Horwitz, 2013).

than a threat and consistently violated their declared risk appetite and risk limits to position themselves for a market rebound.³⁵

Just after the acquisition of Bear Stearns by JPMorgan Chase, Lehman announced its first loss since going public in 1994. Nonetheless, it was able to raise \$6 billion in new capital. Secretary of the Treasury Paulson, in a private communication to the CEO of Lehman, warned that this was not enough and that if Lehman were to announce a loss in the third quarter without having a buyer or a definitive survival plan in place, its existence was in jeopardy (Valukas, 2010, p. 5). Unfortunately, the Administration did not prepare a plan of action for such a contingency either.

Lehman Brothers did not succeed in finding a merger partner nor did the firm develop a survival plan. Instead it resorted to window dressing its public disclosures and regulatory filings by arbitraging accounting requirements³⁶ and it overstated its liquidity pool by including “comfort deposits” that it held with its clearing banks in order to continue clearing operations with them.³⁷ It is noteworthy that so many market participants expressed surprise when Lehman failed. It seems likely that the surprise was more due to the perception of an abrupt change in the US policy of providing support for any large financial institution rather than to confidence in Lehman’s strength. Many market participants believed that if the authorities managed to find \$29 billion to arrange a merger for Bear Stearns, an investment bank little more than half the size of Lehman, they should be willing to advance at least \$60 billion for Lehman. Analysis of market prices indicates that many market participants knew that Lehman was insolvent and had been so at several times during the summer. Figure 2.1 below shows the implied market value of Lehman’s assets relative to its total liabilities.

³⁵ Lehman exceeded its risk limits by margins of 70% with regard to commercial real estate and 100% with regard to leveraged loans (Valukas, 2010, p. 50).

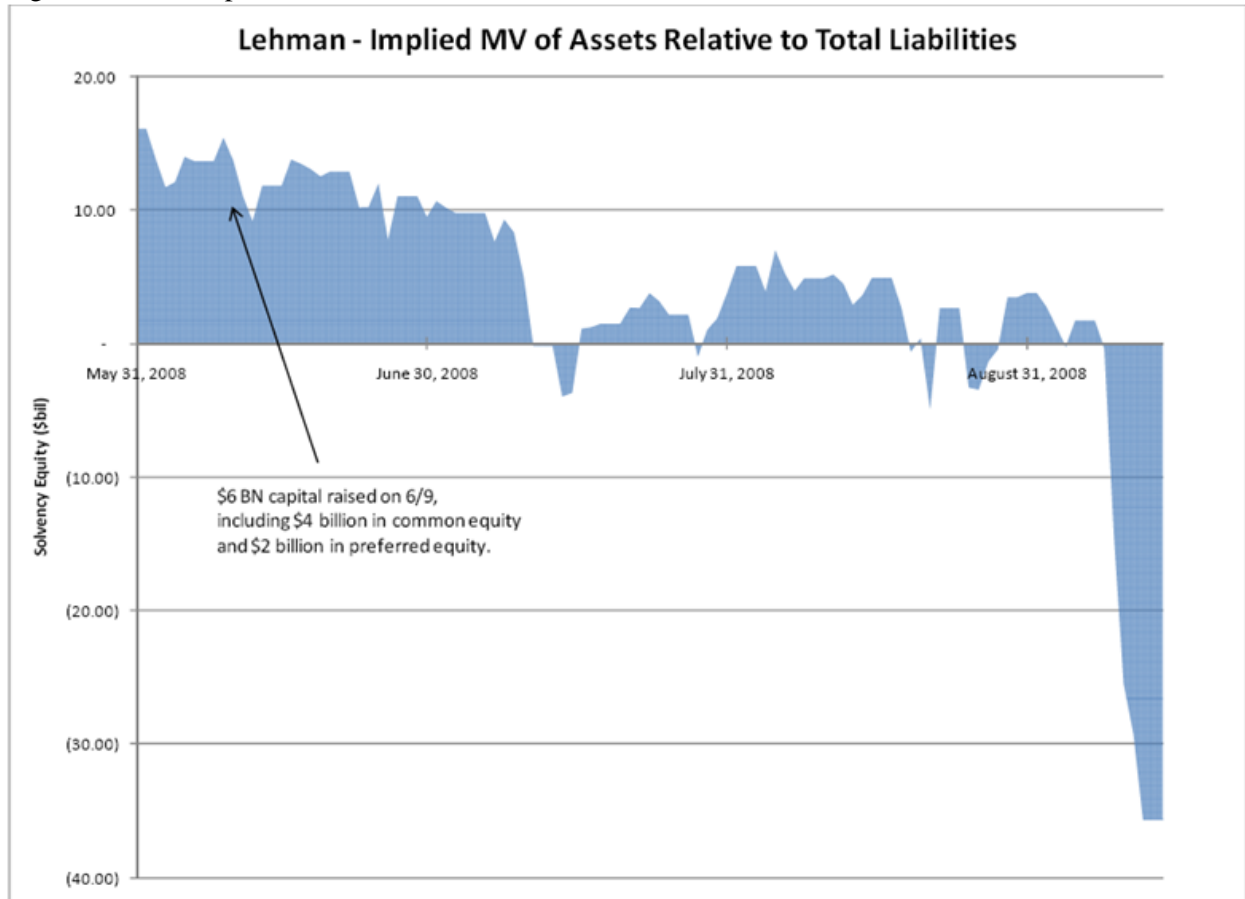
³⁶ Valukas (2010) gives a full account of the so-called 105 repo transactions that could be reported as sales rather than borrowings.

³⁷ By September 12, 2008, two days after reporting \$41 billion in its liquidity pool, Lehman had less than \$2 billion of readily monetizeable assets (Valukas, 2010, p. 10).

Nonetheless, the collapse seemed to catch officials and some market participants unawares. Over the weekend of September 12-14, 2008, US authorities met with CEOs of leading financial institutions from around the world to try to broker a merger or at least raise a fund to subsidize a merger for Lehman (much as they had accomplished for Long Term Capital Management in 1998). At one point on Sunday afternoon they believed they had struck a deal with Barclays Capital Management that would be subsidized by many of Barclays' competitors, but the Financial Services Authority in the UK refused to waive the requirement for shareholder approval. Thus with no buyer and (the authorities claimed) no way of funding a Lehman rescue³⁸, the head of the SEC encouraged Lehman's board to file for bankruptcy immediately, before it would be unable to meet its cash obligations when markets opened in Asia. On September 15, 2008, at 1:45 a.m. Lehman Brothers Holdings Inc. (LBHI) filed for protection under Chapter 11 of the Bankruptcy Act, becoming the largest bankruptcy in US history. The administrators of the Lehman bankruptcy in the US have estimated that at least \$75 billion have been wasted because of the complete lack of preparation for bankruptcy (Cairns, 2009).

³⁸ The authorities claimed that they lacked legal authority to make a direct investment in Lehman and that Lehman's assets were insufficient to support a loan large enough to avoid collapse.

Figure 2.1: The implied market value of Lehman's assets relative to its total liabilities



Source: Valukas (2010, p. 1580). The implied market value of assets is equal to the market value of equity plus the promised value of its liabilities.

While the US authorities refused to support LBHI, they did support Lehman Brothers Inc. (LBI), the US broker-dealer subsidiary, for another five days until it could enter the Securities Investor Protection Act trusteeship on September 19. At this point its prime brokerage activities and a substantial portion of its clients' assets and obligations were sold to Barclays Capital Inc. and others. This removed one of chief systemic concerns in the US. The other concern, Lehman's leading role in the opaque OTC derivatives market, turned out not to be a major problem. Most derivatives were closed-out and netted under ISDA Agreements.

Although counterparties were not necessarily happy with the prices they received, no knock-on effects could be attributed to the unwinding of the derivatives book.³⁹

The only domestic impact that could be labeled systemic was due to a “moral hazard” play by managers of the \$62 billion Reserve Primary Fund, a wholesale money market fund that was forced to break the buck because of its outsized holdings of Lehman’s commercial paper. News that one of the oldest money market mutual funds had broken the buck started a run on other money market mutual funds, which led to large sales of corporate commercial paper to meet the demand for cash withdrawals. The collapse of prices in the secondary market caused the primary market for commercial paper to shut down. Because commercial paper is the primary means of finance for much of corporate America, the Treasury hastily provided insurance for money market mutual funds. Later the Federal Deposit Insurance Corporation increased the deposit insurance ceiling for banks from \$100,000 to \$250,000 and provided an unlimited guarantee for all non-interest transactions accounts to reassure depositors and attempt to level the playing field between money market mutual funds and banks.

Still many observers interpreted this as a successful application of bankruptcy rules to a large, complex financial institution (Ayotte and Skeel, 2010). Apart from the unanticipated spillover to the wholesale money market and knock-on effect on the commercial paper market, the US had shown that the economy could get on perfectly well without Lehman Brothers.

This relatively orderly outcome contrasted with the chaos created abroad. The immediacy of the impact was largely due to the tight integration of the lines of business of the Lehman group. The operational structure bore little resemblance to its legal corporate structure. Like many other global firms Lehman managed substantially all of the cash

³⁹ It should be noted that this relatively benign result was unlikely to have happened if not for the substantial liquidity provided to the broker/dealer by the Federal Reserve while it was being prepared for a SIPC resolution.

resources centrally at the holding company. Since LBHI declared bankruptcy before cash could be swept out again to the subsidiaries, they found themselves suddenly illiquid and unable to continue operation. Uncoordinated bankruptcy proceedings were initiated in a variety of jurisdictions including Australia, Japan, Korea, and the United Kingdom. Ultimately, the LBHI chapter 11 case precipitated insolvency actions throughout the world and the appointment of receivers or administrators in over 80 insolvency proceedings.

Because London was Lehman's largest center of activity outside the United States, many of the most complex problems emerged there. The London subsidiaries, including Lehman Brothers International Europe, its largest broker-dealer in Europe, filed for bankruptcy and turned to PwC for administration. British law made no provision for debtor in possession financing and so the administrators had to struggle to find money to keep minimal functions such as security, housekeeping, or the canteen going. PwC was confronted with forty-three thousand trades that were still "live" and would need to be negotiated with each individual counterparty.

The integration of the group was such that a trade performed in one affiliate could be booked in another, without the client necessarily being aware that the location of the asset had shifted. Recordkeeping fell into disarray when LBHI filed for bankruptcy. At the time of filing, Lehman maintained a patchwork of over 2,600 software systems and applications, many of which were outdated or arcane. These systems were highly interdependent, but difficult to decipher and not well documented. Moreover, most systems to cover operating functions, trading, valuation, financial accounting and other data had been transferred to Barclays in the sale and Barclays had integrated its own proprietary and confidential data into some of the systems. Thus other Lehman affiliates experienced enormous difficulties even in determining what their balance sheets were at the time of insolvency and who owed what to whom.

Although arrangements were ultimately negotiated with Barclays for access to some essential information, the delay made it almost impossible to salvage much going-concern value out of the rest of the group (with the exception of the sale of the foreign equity business to Nomura). In London, where much of the prime brokerage business had shifted, it was permissible to mingle clients' funds with the firm's own funds and so several hedge funds suddenly became illiquid and faced close-out netting procedures that added further downward pressure on prices in some already illiquid markets.

The fragmented data system impeded the salvaging of going-concern value from the remainder of the Lehman group. Different parts of any particular line of business were lodged in different subsidiaries in various parts of the world with no way of reintegrating them even if they had been viable. Clearly, significant value was destroyed by the lack of cooperation in the unwinding of the Lehman group. The process (and costs) may continue for a decade.⁴⁰

2.2.3 Lessons and policy consequences from the Lehman collapse

The Lehman collapse focused the attention of world leaders on the lack of preparedness of regulators and supervisors to manage financial crises. First, Lehman provided yet another example of the inadequacy of the Basel II capital ratios.⁴¹ Although Lehman had not technically violated its capital requirements, the denominator failed to capture the risks to which Lehman was exposed and the numerator clearly was inadequate to absorb Lehman's losses and permit it to remain as a going concern.

⁴⁰ Desmos (2010) reported that the total fees paid to lawyers, administrators and other advisers in the Lehman bankruptcy through October 2010 totaled nearly \$2 billion. At least 1,300 people have been working on the Lehman bankruptcy since it began. This, of course, was merely an interim report.

⁴¹ Luckily, many of the world's largest banks had not yet made a full transition from Basel I to Basel II, so that when the crisis hit these banks had a somewhat greater ability to absorb losses than if they had been fully authorized to operate under the Basel II advanced internal models approach. See Carmassi and Micossi (2012) and Micossi (2013) for a detailed criticism about the Basel risk-weighted approach to bank capital rules and a proposal of a new regulatory framework based on a straight leverage ratio.

Second, it showed the ineffectiveness of supervisors in constraining the risk-taking of a firm determined to take greater risks. Lehman violated its own internal risk constraints and engaged in accounting arbitrage to overstate its balance sheet strength without detection. When warned by the Secretary of the Treasury to raise more capital or prepare a recovery plan, it simply ignored the warning. Lehman did not formulate a resolution plan, but, even more remarkably, neither did the regulatory authorities. This and the inadequacy of capital requirements were indications that despite roughly thirty years of effort, the international supervisory authorities had failed to implement effective prudential measures.

Third, the Lehman collapse also highlighted the complete absence of any international attention to the resolution of internationally active financial institutions even though a casual analysis of insolvencies of international institutions since the mid-seventies would have foreshadowed all of the problems revealed in the Lehman collapse (see Herring, 2002).

Since neither Lehman nor the regulatory authorities had made any plans for the resolution of the group, the last-minute filing for bankruptcy was chaotic. Even though Lehman was active in at least 40 countries, this action was taken without consultation or cooperation with any foreign government. Moreover it demonstrated the first-mover advantage in seizing assets. In this case, the US gained control over all of Lehman's liquid assets because of the timing of the bankruptcy filing. Eighty uncoordinated insolvency proceedings quickly followed.

Fourth, the lack of congruence between Lehman's lines of business and its legal corporate structure made it virtually impossible to salvage going-concern value in most of the rest of the world. This problem was exacerbated by the fact that Lehman's management information systems for valuation, accounting, risk management and even the location of assets were centralized and quickly sold to Barclays Capital Management and this meant that other resolution authorities could gain access to vital information only with a substantial lag.

In addition, Lehman had engaged in regulatory arbitrage to mingle clients' funds with the firm's own funds so that many clients were surprised to find themselves general creditors of the firm.

The disorderly collapse of Lehman Brothers focused international attention on the lack of a coherent framework for dealing with the insolvency of a financial institution with substantial international operations. The Group of Twenty (G20) heads of State met in Washington just after the Lehman bankruptcy. In the Communiqué issued after meeting, they agreed that as a matter of priority (White House, 2008, p. 6): "National and regional authorities should review resolution regimes and bankruptcy laws in light of recent experience to ensure that they permit an orderly wind-down of large complex cross-border financial institutions." Thus the issue of cross-border resolution of large complex financial institutions rose from obscurity to a prominent place on the policy agenda.

At the same meeting the leaders of the G20 expanded the membership in the Financial Stability Forum (FSF) to include the members of the G20 and in the follow-up meeting in London in 2009 rechristened the FSF as the Financial Stability Board (FSB). This was the first international institutional innovation of the G20 since the crisis. The FSB was given broad responsibility to help implement the G20 recommendations on strengthening the safety and soundness of the international financial system. At the request of the G20 during their meeting in Seoul in November 2010, the FSB (2011a) set out an agreement on "Key Attributes of Effective Resolution Regimes for Financial Institutions," which attempted to fill the obvious gap in the international prudential framework highlighted by the crisis.

The FSB identified nine essential features that should be part of an effective resolution regime for banks (FSB 2011a, p.3):

1. ensure continuity of systemically important financial services and payment, clearing and settlement functions;

2. protect, where applicable and in coordination with the relevant insurance schemes and arrangements such as depositors, insurance policy holders and investors as are covered by such schemes and arrangements, and ensure the rapid return of segregated client assets;
3. allocate losses to firm owners and unsecured and uninsured creditors in a manner that respects the hierarchy of claims;
4. not rely on public solvency support and not create an expectation that such support will be available;
5. avoid unnecessary destruction of value, and therefore seek to minimize the overall costs of resolution in home and host jurisdictions and, where consistent with the other objectives, losses for creditors;
6. provide for speed and transparency and as much predictability as possible through legal and procedural clarity and advanced planning for orderly resolution;
7. provide a mandate in law for cooperation, information exchange and coordination domestically and with relevant foreign resolution authorities before and during a resolution;
8. ensure that non-viable firms can exit the market in an orderly way; and
9. enhance market discipline by providing credible incentives for market-based solutions.

Many of these features can be read as attempts to establish a new regime that would prevent another disorderly, Lehman-like bankruptcy. The emphasis is on planning, sharing of information, cross-border cooperation, the protection of systemically important functions and avoiding the unnecessary destruction of value. All of these goals will be difficult to achieve, especially because many of the G20 countries have not established special resolution regimes for complex, international financial institutions. Perhaps the greatest challenge, however, is to achieve credibility. The authorities tend to be judged by what they do, not what they say, and most of the interventions and resolutions that occurred during the crisis were chaotic without the benefit of careful planning for an orderly liquidation or restructuring process, failed to

allocate losses to unsecured and uninsured creditors, involved major commitments of public funds, and showed little evidence of substantial cross-border cooperation. None of these interventions could be described as speedy, transparent or predictable.

The effort to establish credibility, however, is not advanced by the vague way in which the FSB (2011a, p.7) describes the point at which resolution should take place: “Resolution should be initiated when a firm is no longer viable or likely to be no longer viable, and has no reasonable prospect of becoming so.” Although the clear intent is for the authorities to intervene before equity is wiped out, the clause “has no reasonable prospect of becoming so” can be very permissive. Given the demonstrated tendency of managers, accountants and supervisors to take an overly-optimistic view of a firm’s prospects for recovery, this clause seems to provide scope for delaying intervention until long after a firm’s equity has been destroyed. Deep insolvencies increase the likelihood of an ad hoc improvised resolution to offset the market reaction to the realization that early intervention has not worked.

One of the most significant new requirements was that each jurisdiction should ensure systemically important financial institutions file a “robust” recovery and resolution plan. The resolution plan should include: 1) identification of financial and economic functions for which continuity is critical; 2) suitable resolution options to preserve those functions or wind them down in an orderly manner; 3) data describing the firm’s business operations, structures, and systemically important functions; 4) potential barriers to effective resolution and actions to mitigate those barriers; 5) actions to protect insured depositors and ensure the rapid return of segregated client assets; 6) clear options or principles for the exit from the resolution process; and 7) assurance that key service level agreements can be maintained in crisis situation and in resolution, and that underlying contracts include a provision that

prevents terminations triggered by recovery or resolution events and facilitates transfer of contracts to a bridge institution or a third party acquirer.

Although the *Key Attributes* proclaim the intent to enhance market discipline and to provide incentives for market-based solutions, no mention is made of public disclosure of recovery or resolution plans. How market discipline is to be enhanced in the absence of such information is far from clear.

2.2.4. Resolution plans in the US response

At more or less the same time that the FSB *Key Attributes* were being negotiated the Dodd-Frank Act (DFA) reforms were being implemented in the US.⁴² A key provision under Title I of the DFA requires that all large, systemically important financial companies submit resolution plans⁴³ to demonstrate how they would be resolved under the Bankruptcy Code. This is particularly noteworthy because the US has long had an administrative procedure for the FDIC to resolve a failing bank and, when appropriate, establish a bridge bank to continue systemically important functions. The *Key Attributes* advocate that other countries adopt a similar set of powers, but Congress wanted to make clear that an institution should not count on intervention from the FDIC. Although the FDIC would continue to resolve all insured depository institutions, it would manage the resolution of the group only under Title II of the DFA (Orderly Liquidation Authority). They emphasized this point in Title I of the DFA by insisting that groups prepare for a resolution under Chapter 11 of the Bankruptcy Code in their resolution plans.

⁴² See Appendix 2.A for a summary of the EU rules on bank recovery and resolution plans, contained in the directive harmonizing bank crisis resolution tools and procedures (European Parliament and Council of the European Union, 2014a).

⁴³ Although “resolution plan” is the official name for such documents, they are commonly referred to as a “living will” or, more sardonically, a “funeral plan.” In the remainder of the text we will generally use the terms “resolution plans” and “living wills” interchangeably.

Section 165(d) of the DFA requires that each nonbank financial company supervised by the Federal Reserve Board (FRB) and each bank holding company with at least \$50 billion in assets (which together are termed “covered companies”) present a plan for rapid and orderly resolution to the FRB and the FDIC. Foreign banking groups with US operations must also comply with this requirement. The plan must include (US Congress, 2010): “(A) information regarding the manner and extent to which any insured depository institution affiliated with the company is adequately protected from risks arising from the activities of any nonbank subsidiaries; (B) full descriptions of the ownership structure, assets, liabilities, and contractual obligations of the company; (C) identification of the cross-guarantees tied to different securities, identification of major counterparties, and a process for determining to whom the collateral of the company is pledged.” This resolution plan is to be accompanied by a credit exposure report.

The implementation details were left to the FRB and FDIC. They published the implementing regulation on November 1, 2011 (FDIC and FRB, 2011a), that emphasized living wills should indicate how the covered company can be sold, broken up, or wound down quickly and effectively without jeopardizing US financial stability.

Living wills must include: 1) an executive summary with a strategic analysis describing the firm’s plan for a rapid and orderly resolution (without, however, defining what period of time qualifies as “rapid”); 2) a description of how resolution planning is incorporated in the firm’s corporate governance structure; 3) a description of the group’s overall organizational structure that includes a hierarchical list of all material entities, as well as jurisdictional and ownership information and mapping of core business lines and critical operations into corporate entities; 4) a description of management information systems that support the covered company and its material entities, including a detailed inventory and description of key applications along with identification of the legal owner or licensor and

related service level agreements; 5) a description of interconnections and interdependencies among a covered company and its material entities and the covered company's critical operations and core business lines along with a description of how service levels would be sustained during a material financial distress or insolvency; and 6) identification of supervisory authorities and regulators that oversee the covered company.

For the largest and most complicated banking groups that have thousands of subsidiaries, the third requirement has been onerous. It demands not only a mapping of lines of business into corporate entities, but also details regarding material entities, critical operations and core businesses that, at a minimum, describe types and amounts of liabilities. It also requires details about the booking of trading and derivatives activities, as well as an identification of major counterparties including descriptions of any interconnections or interdependencies of the group with counterparties. Finally, it requires that covered companies list all material trading, payment, clearing and settlement systems in which they participate. Most of these requirements can be seen as attempts to minimize the prospect of a Lehman-Brothers-like disorderly bankruptcy by ensuring that both covered companies and regulators have thought through the end game in advance.

The compliance costs for both covered companies and the regulatory authorities have been very heavy.⁴⁴ Eleven firms submitted living wills in 2012. Several of the submissions were reported to be thousands of pages in length. Based on an early evaluation of these submissions, William Dudley, President of the Federal Reserve Bank of New York, concluded that "this initial exercise has confirmed that we are a long way from the desired situation in which large complex firms could be allowed to go bankrupt without major

⁴⁴ The Advance Notice of Proposed Rulemaking (FDIC and FRB, 2011b) estimated that averaged over the 124 covered companies, the initial burden of compliance would be 12,400 hours. For the largest institutions, the number of hours required to comply with the regulation was surely a substantial multiple of this amount. The burden on the supervisory agencies to analyze and evaluate the data has undoubtedly been quite substantial as well.

disruptions to the financial system and large costs to society. Significant changes in structure and organization will ultimately be required for this to be achieved.” (Dudley, 2012).

While the DFA generally supports greater market discipline, it does not address the issue of public disclosure of resolution plans. The FRB and FDIC, however, have required disclosure of a public section of the plan containing an executive summary that describes the business of the covered company including: “(i) the names of material entities; (ii) a description of core business lines; (iii) consolidated or segment financial information regarding assets, liabilities, capital and major funding sources.”

During the comment period following the Advance Notice of Proposed Rulemaking (ANPR), the FRB and FDIC received many expressions of concern from the industry regarding the possibility that details of the resolution plan might be made public through the Freedom of Information Act (FDIC and FRB, 2011a, p. 67326). The ANPR dealt with the issue by requiring that any covered company that desired confidential treatment of the information file a request for confidential treatment under the general rules of the FRB and the FDIC (FDIC and FRB, 2011b, p. 22660). This was essentially an opt-out approach that left the institutions with the burden of justifying whether some information should be confidential.

In the commentary preceding the final rule, the FRB and FDIC (FDIC and FRB, 2011a, p. 67332) tried to ease these fears and added their own concern that “release of this information would impede the quality and extent of information provided by covered companies and could significantly impact the efforts of the Board and the Corporation to encourage effective and orderly unwinding of the covered companies in a crisis.” The upshot was a disclosure requirement observing that (FDIC and FRB, 2011a, p. 67332): “While the information in the public section of a resolution plan should be sufficiently detailed to allow the public to understand the business of the covered company, such information can be high

level in nature and based on publicly available information.” In effect, this creates a safe harbor for an institution that does not wish to disclose any non-public information.

If the information is already publicly disclosed, it’s not clear what value this requirement adds. This timid approach represents a significant lost opportunity. If the authorities had been serious about enhancing market discipline, they should have required disclosure of information that would enable potential creditors and counterparties of the covered company to understand the statutory hierarchy of claims on the various entities in resolution, and precisely how the authorities propose to conduct a resolution. In the absence of such information, creditors and counterparties cannot be expected to price claims efficiently. Moreover, some of the information in the first round of disclosures falls short of the more modest goal of helping the public understand the business of the covered company because it is difficult to reconcile with other publicly available information. The next section summarizes and analyzes the data provided by the eleven banking groups that submitted resolution plans during 2012. The final section argues that the lack of agreement on how cross-border firms will be resolved casts a huge uncertainty over how an international insolvency would be dealt with.

2.2.5 How informative are public sections of living wills?

The eleven banking groups that submitted their living wills in 2012⁴⁵ include seven US institutions – Bank of America, Bank of New York Mellon, Citigroup, Goldman Sachs, JPMorgan Chase, Morgan Stanley, State Street Corporation – and four foreign banking groups - Barclays, Credit Suisse, Deutsche Banks, UBS.⁴⁶ In their implementing regulation, the FRB and FDIC specified the format that each resolution plan should follow. We focus on

⁴⁵ Many more banking groups submitted their resolution plans in 2013 and 2014. Our analysis of the public sections of living wills was conducted during 2013 and so we focus mainly on the 2012 submissions.

⁴⁶ The resolution plans filed by foreign banking groups are mainly focused on US operations and entities.

aspects of the public section of the living will that might have improved market discipline if they had been more rigorously specified and carefully implemented.⁴⁷

A major weakness of the disclosure format is the vague way in which the authorities have defined material entities: “*material entity* means a subsidiary or foreign office of the covered company that is significant to the activities of a critical operation or core business line” (FDIC and FRB, 2011a, p. 67335)⁴⁸. Critical operations, in turn, are defined as “those operations of the covered company, including associated services, functions and support, the failure or discontinuance of which, in the view of the covered company or as jointly directed by the Board and the Corporation, would pose a threat to the financial stability of the United States” (FDIC and FRB, 2011a, p. 67335). No specific asset or income threshold has been set for identifying material entities, which may be either branches or subsidiaries.⁴⁹ This may be appropriate in cases in which a key entity that services the group, such as providers of information technology or risk management services, has been set up as a separate entity. In fact, such entities are material even though their income and balance sheets may be negligible.

Although we have no systematic way of identifying material entities that have negligible income statements or balance sheets, it is possible to check whether the material entities that the banking groups chose to list include all of the entities that have a balance

⁴⁷ We will not, for example, comment on the institution’s responsibility to provide a high-level resolution plan because in most instances the information was so high-level as to be uninformative. In addition, we have sympathy with the reluctance of institutions to specify to whom they might sell various lines of business because the grounds for maintaining confidentiality about this sort of information seem self-evident on competitive grounds.

⁴⁸ This definition was elaborated in a guidance issued in 2013 (FDIC and FRB, 2013, p. 10) to explain that “Material Entities should encompass those entities including foreign offices and branches that are significant to the maintenance of a Core Business Line. If the abrupt disruption or cessation of a Core Business Line might have systemic consequences to U.S. financial stability, the entities essential to the continuation of such Core Business Line should be considered for Material Entity designation.” Although the section of the guidance goes on to give several examples of entities that might be designated as “Material,” it falls short of a crisp definition that could be verified by an external expert.

⁴⁹ Luciano and Wihlborg (2013) emphasize that the practical distinction between a subsidiary and a branch in cross-border banking is often quite blurred. Some countries oblige foreign branches to meet liquidity and capital requirements within the host country as if they were separately incorporated subsidiaries.

sheet size exceeding the \$50 billion threshold.⁵⁰ To determine whether entities that exceed the \$50 billion threshold have been omitted, we have used Bankscope data from May 2013, data from SEC filings as of yearend 2011, Federal Reserve/National Information Center data as of June 2012, information available in the banks' annual reports and other information published on their websites.⁵¹

The results (see Table 2.3) indicate that eight of the eleven banking groups did not identify a few large subsidiaries with assets greater than \$50 billion as material entities. Table 2.3 displays the number of material entities reported by each of the eleven banking groups and the number and name of subsidiaries with more than \$50 billion that were not identified as material entities in the public section of the resolution plan. Most “missing” material entities are intermediate holding companies, but in the absence of additional information about where such holding companies sit in the legal organization structure of the group, it is impossible to tell whether such information might be redundant because all of the material entities that are subsidiaries of an holding company – or its parent holding company – have been reported. Of course, even if all of the main subsidiaries, or controlling entities, of the holding company are reported, information about an omitted holding company may be important as well, especially if it issues debt or makes guarantees to other affiliates.

⁵⁰ Under the DFA, bank holding companies with at least \$50 billion in consolidated assets are defined as systemically important banking groups and are required to file a resolution plan.

⁵¹ See Appendix 2.B for details regarding the statistical benchmarks.

Table 2.3: Material entities in resolution plans

	Number of material entities reported in public section of 2012 resolution plan	Large majority-owned subsidiaries (total assets of at least US\$ 50 bn)* not included in material entities list
Bank of America¹	7	4 BAC North America Holding Company (US); BANA Holding Corporation (US); Merrill Lynch UK Holdings (UK); NB Holdings Corporation (US) ³
Bank of New York Mellon	14	0
Barclays (US)²	6	0
Citigroup	17	7 Citicorp (US) ⁴ ; Citigroup Financial Products Inc. (US); Citigroup Funding Inc. (US); Citigroup Global Markets Europe Limited (UK); Citigroup Global Markets Holdings Inc. (US); Citigroup Korea Inc. (KR); Citigroup Overseas Holdings GK (JP)
Credit Suisse	16	1 Credit Suisse Investments (UK) (UK)
Deutsche Bank (US)²	7	1 Taunus Corporation (US) ⁵
Goldman Sachs	22	1 Goldman Sachs Group Holdings (U.K.) (UK)
JPMorgan Chase	25	2 CMC Holding Delaware Inc. (US); J.P. Morgan Equity Holdings, Inc. (US) ⁶
Morgan Stanley	18	2 Morgan Stanley (the group holding company) (US) ⁷ ; Morgan Stanley International Limited (UK)
State Street Corporation	11	0
UBS (US)²	11	1 UBS Americas Inc (US)

* As reported by the Bankscope database, as of May 2013; majority-ownership defined as a minimum ownership of 50.01% in each step of the ownership chain. ¹ The bank acknowledges that the reported list of material entities is not exhaustive. ² Only material entities relevant for US resolution are reported in the resolution plan. ³ The latest available consolidated financial data for BAC North America Holding Company, BANA Holding Corporation and NB Holdings Corporation date back to 2005 or 2006, with total assets well above \$50 billion for all three entities. Unconsolidated data reported in Federal Reserve form FR Y-9LP (June 2012) confirm that all three companies are still well above the

\$50 billion threshold, even without taking into account consolidation.⁴ No recent consolidated data are available for Citicorp, but its unconsolidated total assets are well above \$50 billion. Citicorp is not among the material entities identified, but it is indicated as one of the three main management segments: it holds the core business segments of the group, Global Consumer Banking businesses and Institutional Clients Group.⁵ Taunus Corporation is mentioned as the company controlling other material entities, but it is not separately indicated as a material entity.⁶ The latest available consolidated financial data for CMC Holding Delaware Inc. and J.P. Morgan Equity Holdings, Inc. date back to 2005, with total assets above \$50 billion for both entities. CMC Holding Delaware Inc. controls, among other subsidiaries, Chase Bank USA NA, a depository subsidiary with about \$116 billion in total assets as of June 2012; and J.P. Morgan Equity Holdings, Inc. controls CMC Holding Delaware Inc.. On this ground, we have considered the two entities to be still above the \$50 billion threshold.⁷ The Morgan Stanley parent is repeatedly mentioned throughout the resolution plan, but it is not included in the list of material entities. Sources: elaborations on data of banks' 2012 resolution plans, banks' annual reports, Bankscope, Federal Reserve/National Information Center, Orbis database, SEC, SNL database.

The FDIC/FRB implementing rule requires that each group provide a hierarchical list of material entities. Oddly, these appear to have been omitted from the public section. No organization or corporate structure tree chart is provided,⁵² much less information about the percentage of ownership in each subsidiary. Presumably, the confidential section of the plan contains such information, but no clear case has been made about why such information should be excluded from the public portion of the plan. This information can be gleaned from other public documents for some banking groups, but it is not readily available in a format that is easy to compare across institutions.

At least some of these “missing” material entities might be regarded as material. For example, both Bank of America and Citigroup have disclosed high level organizational structure trees on their websites. These are purported to include the material holding companies of each group, but some of these holding companies are not included in the public sections of their resolution plans. In Figure 2.2.a and 2.2.b, we have circled the large subsidiaries (all holding companies) that are missing from the relevant public section of each living will.⁵³ In some cases such entities could have important interactions with other affiliates in the group.

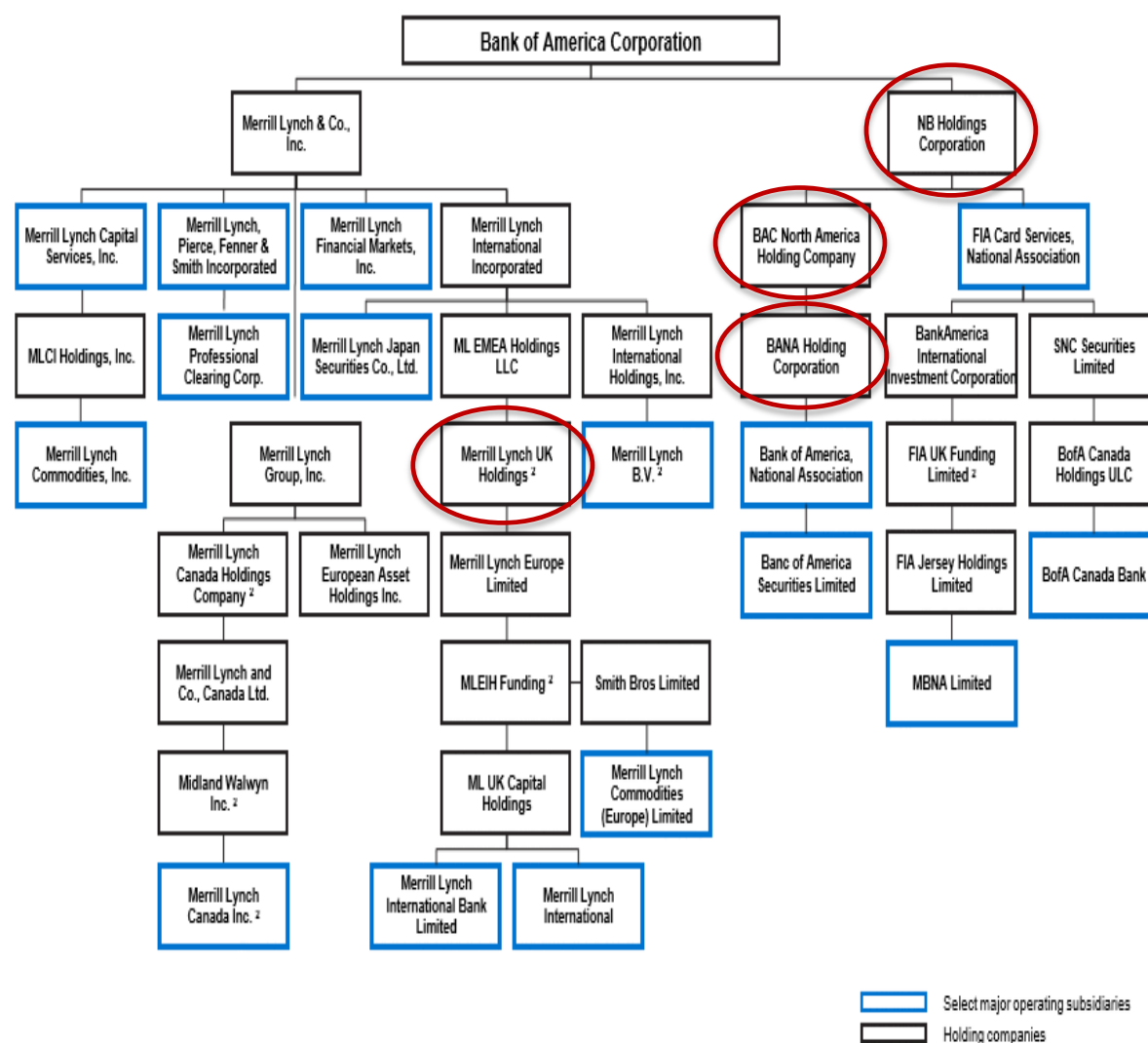
⁵² With the partial exception of Morgan Stanley's submission for the depository institution (Morgan Stanley, 2012, p. 24).

⁵³ Three "missing" material entities of Citigroup are not displayed in Figure 2.2.b: Citigroup Funding Inc., Citigroup Korea Inc. and Citigroup Overseas Holdings GK. Citigroup Funding Inc. was merged into Citigroup

Figure 2.2.a: The corporate structure of Bank of America*

Bank of America Corporation: Select Major Subsidiaries ¹

As of April 17, 2013



¹ This chart includes only select major operating subsidiaries and associated material holding companies of Bank of America Corporation. Not all subsidiaries of Bank of America are represented.

² Reflects a majority-owned subsidiary.



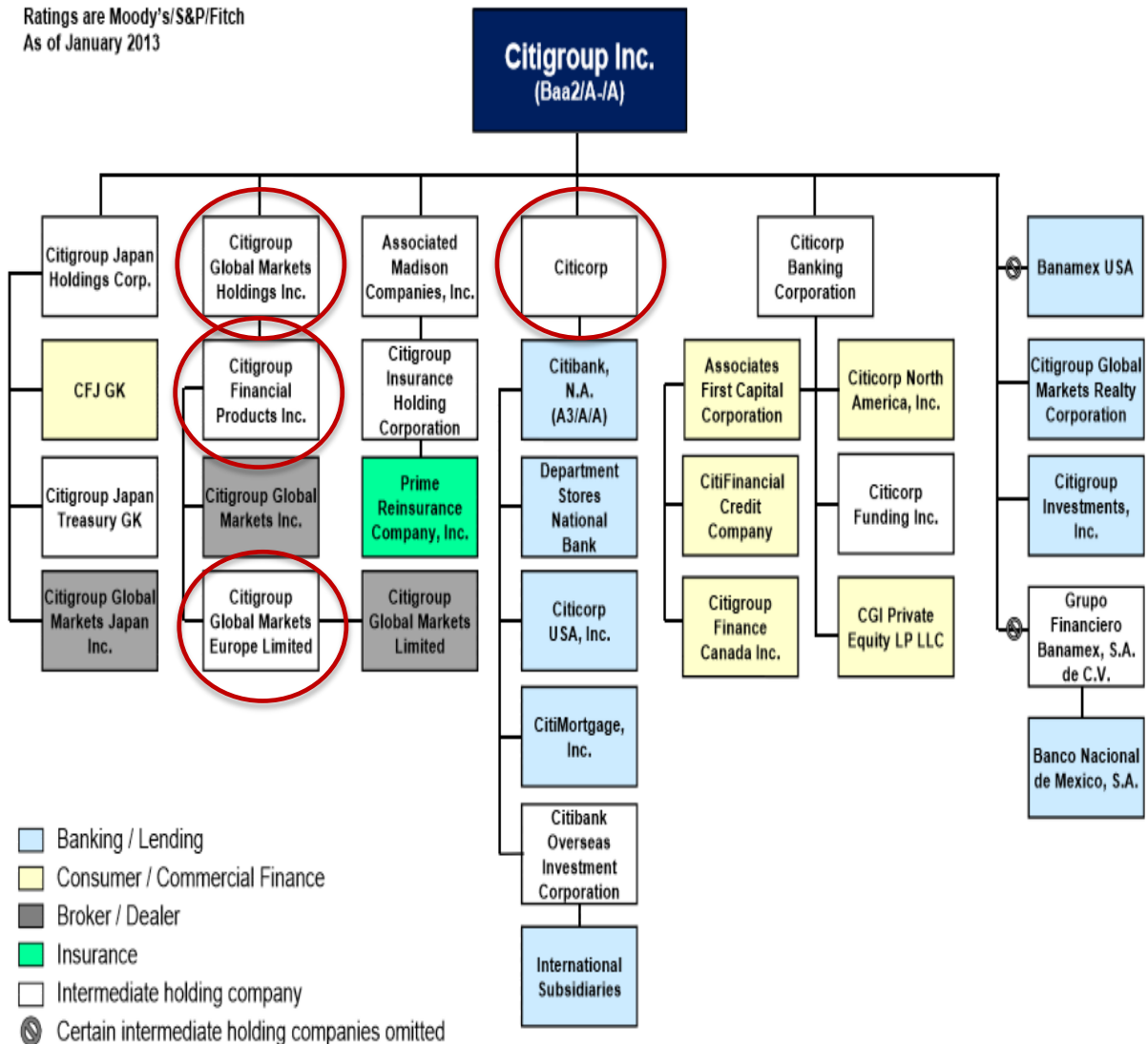
*Red circles indicate the large subsidiaries not included in the material entities list in the public section of Bank of America resolution plan submitted in 2012. Source: Bank of America website, own elaborations.

Inc. and ceased to exist on December 31, 2012, which explains why it is not included in Figure 2.2.b, which is referred to January 2013.

Figure 2.2.b: The corporate structure of Citigroup*

Citigroup Organization (1)

Ratings are Moody's/S&P/Fitch
As of January 2013



(1) For a list of ratings for Citigroup Inc and certain subsidiaries, please see the Citigroup Investor Relations website: <http://www.citigroup.com/citi/investor/rate.htm>



*Red circles indicate the large subsidiaries not included in the material entities list in the public section of Citigroup resolution plan submitted in 2012. Source: Citigroup website, own elaborations.

One can only speculate about why such entities are omitted from the public sections of living wills, but this does raise troubling questions about the criteria that have been employed to select the reported entities. Interestingly, in its 2014 resolution plan, Bank of

America has now included BAC North America Holding Company in the material entities list, describing it as an intermediate holding company owning BANA Holding Corporation, which in turn currently owns several Material Entities, including the large depository subsidiary Bank of America National Association (Bank of America, 2014). As we have observed, BAC North America Holding Company was not in the 2012 (and in the 2013) list of material entities in the resolution plan, despite being a very large entity. Bank of America certainly deserves credit for the inclusion of this intermediate holding company in the list of material entities. However, the detailed criteria and rationales underlying the classification of entities as "material" remain unclear, much less why the list of such entities should change over time. A crisper regulatory definition of "material entity" would facilitate greater transparency. The clarity and consistency of resolution plans should be strengthened over time.

Surely investors would gain a better understanding of a group's business and structure if it were required to provide detailed explanations about its decision criteria and an organizational chart including, at a minimum, the type of business, the legal form, the location, total assets and the percentages of ownership for each entity displayed. Without more quantitative and qualitative details on material entities and the methodology to select them, the public sections of the living wills are less informative than they should be. If there is a strong rationale for regarding such data as proprietary then it should be stated and defended.

Although it is crucial to have better information about the reported material entities, the other entities that are implicitly deemed "non-material" should not be ignored altogether, if only because of their magnitude. For example, Citigroup listed seventeen material entities in its 2012 resolution plan, but in fact it had 2,307 subsidiaries according to the Federal Reserve/National Information Center data as of June 30, 2012. While many of these

subsidiaries may be irrelevant for understanding how an institution would be resolved, the living will should at least categorize these subsidiaries by the kind of activity they conduct and explain why the category is not relevant to the orderly resolution of the group.

More broadly, much of the other information contained in the public section of the living wills seems far more general than it should be if the objective is to enhance public understanding of the group's business or enhance market discipline. Table 2.4 summarizes the information provided regarding the number of core business lines, the number of entities with balance sheet or income statement data reported, the number of material payment, clearing and settlement systems in which the group participates and the number of supervisory authorities that oversee the firm.

In virtually every case, the lack of specificity in the “material entity” concept undermines the usefulness of the other information disclosed and the resulting differences across institutions can be very large. For example, the number of core lines of business varies from State Street Corporation, which lists 2, to JPMorgan Chase, which identifies 30. The average for the eleven institutions is eight. While business models across the eleven banking groups do differ significantly in many respects, one is left with the uncomfortable feeling that differing definitions of “core business lines” may also play a role.⁵⁴ Although the groups report basic information about the business conducted by each material entity, it is generally left to the reader to map lines of business into material entities and, even then, it is not clear how these might be preserved in the bankruptcy process.

Financial data about material entities are very sparse, usually including only the assets and liabilities (and sometimes income data) of the largest depository institution, which must

⁵⁴ The FDIC/FRB regulation defines core business lines as “those business lines of the covered company, including associated operations, services, functions and support that, in the view of the covered company, upon failure would result in a material loss of revenue, profit, or franchise value” (FDIC and FRB, 2011a, p. 67334).

disclose its balance sheets periodically in any event.⁵⁵ While this is consistent with the FRB/FDIC requirement, it leaves huge gaps in a reader's understanding of the material entities and how they operate.

Table 2.4: Overview of selected information provided by banking groups in the public portion of resolution plans

	Number of core business lines	Number of entities with individual balance sheet/income data reported	Number of material payment, clearing and settlement systems	Number of material supervisory authorities ²
Bank of America	5	2 (depository institutions)	15	8
Bank of New York Mellon	4	1 (depository institution)	15	11
Barclays (US) ¹	4	2 (1 depository branch, 1 broker-dealer)	18	19
Citigroup	12	1 (depository institution)	16	10
Credit Suisse	11	0	11	18
Deutsche Bank (US) ¹	10	0	16	10
Goldman Sachs	4	1 (depository institution) ³	19	45
JPMorgan Chase	30	2 (depository institutions)	18	11
Morgan Stanley	3	1 (depository institution)	19	19
State Street Corporation	2	0	10	13
UBS (US) ¹	7	0	n.a.	14

¹ Information largely related to US operations. ² Bold indicates that the bank reports only supervisory authorities of material entities. We have included in our calculations only supervisors explicitly named. ³ Included in the resolution plan for the depository institution submitted as a separate document. Source: public section of banks' 2012 resolution plans.

⁵⁵ Moreover, banking groups also have to submit to the FDIC a resolution plan for their depository institutions with at least \$50 billion in total assets, as required by a January 2012 FDIC rule. In most cases the public section of this plan was incorporated in the same public document with the resolution plan for the banking group.

The systemically important financial institutions were required to indicate the number of “material” payment, clearing and settlement systems in which they participate, as well as the number of “material” supervisors and regulators with whom they must interact. This information is often used as a proxy for the complexity and interconnectedness of a financial institution, two different aspects of systemic risk.

Clearly the groups have taken the materiality guideline quite seriously in reporting these two dimensions of proxies for systemic risk. Citigroup is reported to be a participant in 550 clearing and settlements systems in another source (Herring, 2013b). While many of these may not be material, it is crucial to understand what standard of “materiality” is being applied. Similarly, the largest number of material supervisory authorities, 45, is reported by Goldman Sachs, which is by no means the largest or most complicated group. Indeed, many of these groups are active in more than 45 countries and so it is difficult to infer what standard of materiality has been employed and what the information implies about the difficulty of resolving the firm.

In short, the FDIC/FRB regulation set up guidelines for the public section of living wills that permitted groups to avoid providing any new information even if it were critical to understanding the difficulty in resolving an institution. Our examination of the actual public sections of the reports indicates that most groups took full advantage of their discretion to maintain confidentiality of information that is crucial to understanding how easily they could be resolved without, in many cases, any plausible rationale for holding such details in confidence. Nonetheless, even if the groups had been more forthcoming with information, investors and creditors would still be unable to price claims efficiently because officials have not yet agreed on how to handle cross-border resolutions.

2.2.6 Why resolution policy remains uncertain

The crisis revealed the US lacked a coherent regime for resolving systemically important global financial institutions. In this it was not alone. The Basel Committee on Banking Supervision (BCBS, 2010) concluded that no country had a framework for adequately addressing the problems that arise in the resolution of a purely domestic banking conglomerate, much less a cross-border or global systemically important institution.

The DFA reforms were intended to enhance the ability of the authorities to resolve a purely domestic institution. Since the new regime remains untested, it is too early to judge whether it is sufficient to resolve a large institution without cost to taxpayers and without threatening financial stability. The cross-border aspects of resolution policy remain a challenge and the obstacles are formidable.

A cross-border resolution is bound to involve multiple supervisory authorities with differing statutory powers and responsibilities. Some may be charged with taking financial stability into account, others may simply be responsible for taking whatever measures they can to protect the customers of the part of the group they oversee. In addition to these differences in objectives, bankruptcy and administrative processes differ markedly, as do the competencies and powers of individual supervisory and regulatory authorities. The sheer number of authorities whose actions must be coordinated is mindboggling. One moderately large foreign bank, not large enough to be included on the FSB list of Global Systemically Important Banks, held a meeting of its key national and international regulators to discuss its resolution plan and was obliged to convene the meeting in a large hotel ballroom.

Since November 2010, the members of the FSB have been developing resolution strategies, operational resolution plans and firm-specific cross-border cooperation agreements that establish a process for cooperation and information sharing. In its April 2013 progress report, however, the FSB (2013e, p. 1) concluded that “[P]rogress has been relatively slow

both because the issue is complex and because in many jurisdictions the powers necessary for implementing a preferred resolution strategy have not yet been provided.”

This is particularly worrisome with regard to the European Union because it is home to a large number of G-SIBs and several of these institutions hold more assets outside their home country than within. Of the 8 G-SIBs based in the US, only Citigroup has more assets outside than inside the US.

Table 2.5: Large international banking groups with >50% of assets outside home country, yearend 2011

Banking groups	Total assets	World assets rank	Home country	Rest of region	Rest of world
	in US\$ billion		as % of total assets	as % of total assets	as % of total assets
1. Deutsche Bank (Germany)	2,800	1	34%	32%	34%
2. HSBC (UK)	2,556	3	35%	11%	54%
3. BNP Paribas (France)	2,543	4	49%	34%	17%
4. Barclays (UK)	2,417	7	34%	27%	39%
5. Citigroup (US)	1,874	14	36%	21%	43%
6. Banco Santander (Spain)	1,619	17	27%	41%	32%
7. UBS (Switzerland)	1,508	19	36%	20%	44%
8. ING Bank (Netherlands)	1,244	23	40%	38%	22%
9. UniCredit (Italy)	1,199	24	42%	56%	2%
10. Credit Suisse Group (Switzerland)	1,115	25	21%	26%	53%
11. Nordea Group (Sweden)	927	27	21%	74%	5%
12. Standard Chartered (UK)	599	41	15%	4%	81%

Source: Schoenmaker (2013, p. 62).

Table 2.5 lists 11 European banking groups and one US banking group (Citigroup) that have less than half of their assets in the home country. In order for the market to function properly, it needs to understand not only living wills, but also what the authorities will do in a

crisis. In the absence of firm, credible and binding cooperation agreements, it must remain a matter of speculation.

The problem is complicated by the fact that the authorities have not achieved a consensus on the appropriate model for cross-border resolution. Idealists favor a universalist approach in which insolvency laws are harmonized and an insolvent firm's assets are pooled in one proceeding and shared equitably across claimants without regard to where they reside or which part of the group they have dealt with. Cynics consider this approach to be the Esperanto of resolution policies and believe that no matter what officials say they will ring fence those parts of the failing institution that they can control in the end.

These extremes are reflected to some extent in two approaches that are widely discussed: a single point of entry strategy (SPE) and a multiple point of entry strategy (MPE). The Bank of England and the FDIC (BoE and FDIC 2012, FDIC 2013) have developed a SPE strategy. This approach attempts to leapfrog the seemingly hopeless task of harmonizing national bankruptcy laws and resolution procedures by vesting resolution powers in a single resolution authority that is responsible for overseeing the top holding company or parent company in a G-SIB. The responsibility of the single resolution authority would be to ensure that the top level institution would be restructured in such a way that it would serve as a source of strength by recapitalizing subsidiaries and down-streaming liquidity as necessary. The hope is that this would finesse most cross-border problems by preserving the assets and operations of subsidiaries on a going concern basis.

This presumes that the top level entity will be required to be sufficiently well-capitalized to absorb losses throughout the group – and, indeed, that the group is structured in such a way that there is a clear top-level entity. Of course, this can only work if the single resolution authority has access to sufficient resources to maintain the subsidiaries in the group while the restructuring of the top level institution takes place, which may be an issue in

several countries that are host to institutions with liabilities that are a substantial multiple of domestic GDP. Moreover, in the case of the US it appears to assume that resolution will take place under the administrative procedures of Title II of the DFA rather than the bankruptcy resolution plans required in the living wills.

This approach raises tricky issues in a scenario in which a foreign subsidiary is the major source of losses and should be liquidated. The authorities, of course, do not want to be in the position of propping up an institution that has no going-concern value. But once they admit the possibility that some foreign subsidiaries may not be protected, creditors have reason to be concerned about all of the foreign subsidiaries and it may not be possible to implement the resolution without creating unwanted spillovers as creditors engage in a flight to quality.

In addition to the hope that foreign authorities can be convinced to forbear and leave the resolution to the headquarters authority, the laws underlying many financial contracts will need to be changed or the single resolution authority will need to have the ability to impose a stay. Otherwise the initiation of resolution proceedings with regard to the top-level entity can be interpreted as an event of default that permits counterparties to terminate their financial contracts. This could destabilize markets and frustrate the attempt of the single resolution authority to ensure the continuity of operations.

A MPE strategy involves the application of resolution powers by multiple authorities to multiple parts of the group and the break-up of the group into separate parts along national, regional or functional lines. Unless the multiple authorities have firm agreements about how to coordinate their actions and allocate losses, this approach amounts to ring fencing.⁵⁶ This

⁵⁶ New Zealand has taken this position and attempted to apply it more rigorously than any other national authority. It has tried to ensure that even if the foreign parents of their four largest banks should fail, the New Zealand subsidiaries could continue to operate (see Mayes, 2013).

approach is opposed by many G-SIBs because they believe it would reduce the efficiency with which they can allocate capital and liquidity within the group.

It is difficult to imagine both approaches operating simultaneously without causing enormous uncertainty – not unlike the current situation. The key point, however, is that how the cross-border resolution will be conducted is a critical factor that must be taken into account in valuing the claims on any entity within the group. When this uncertainty is considered in conjunction with the meager public disclosures in living wills, market discipline cannot be expected to reinforce and support regulatory discipline.

Despite an enormous amount of effort, one must conclude that we do not yet have the framework to undertake the orderly resolution of a G-SIB. This means that these institutions are likely to enjoy an implicit subsidy that is completely unrelated to their efficiency or the quality of their services. Too-big-to-fail may be too-costly-to-continue, but a solution to the problem remains elusive.

Appendix 2.A

The EU approach to bank recovery and resolution plans

In the European Union, the European Commission presented in June 2012 a proposal for a directive on bank recovery and resolution, with the goal of introducing new bank crisis management and resolution tools to facilitate orderly resolution and avoid bailouts (European Commission, 2012). This Bank Recovery and Resolution Directive (BRRD) has been formally adopted in 2014 (European Parliament and Council of the European Union, 2014a).

The BRRD aims to harmonize policy instruments and procedures to deal with banking crises across EU countries and to improve the ability to manage the crisis and failure of cross-border banks.⁵⁷ The directive includes provisions on preparation and prevention, early intervention and resolution tools and powers. Preparation and prevention measures include the requirement for banking groups and individual institutions within a group to prepare recovery plans, and for authorities to draw up resolution plans for them. Colleges of resolution authorities are also introduced, in which home and host countries resolution authorities participate under the lead of the group (home) resolution authority; the European Banking Authority (EBA) will participate too, promoting the efficient functioning of colleges. Finally, the BRRD also requires the creation of national resolution funds to bear the costs related to resolution procedures (e.g. provide capital for a bridge bank), but never to bail out banks. These funds would have to be financed to a large extent by risk-based fees paid ex-ante by banks.

The directive introduces a requirement for banking groups to prepare and submit a recovery plan to their consolidating supervisor, which will transmit it to resolution authorities. The plan should include measures for the stabilization of the group as a whole in

⁵⁷ For an analysis of the relations between EU Member States and third-country resolution authorities in the context of the BRRD and of the European banking union see Nieto (2014).

case of distress, indicating also arrangements for intra-group financial support. The preparation and submission of the recovery plans shall have at least an annual frequency, and an updated version should be presented in case of changes to the legal or organizational structure of the institution, its business or its financial situation. The plans must include a wide range of information, including: a communication and disclosure plan outlining how the firm intends to manage any potentially negative market reactions; a range of capital and liquidity actions required to restore the institution's financial position; the identification of critical functions; a detailed description of the processes for determining the value and marketability of the core business lines, operations and assets of the institution; arrangements and measures to reduce risk and leverage, to restructure liabilities and business lines, to maintain the continuous functioning of the institution's operational processes, including infrastructure and IT services; preparatory arrangements to facilitate the sale of assets or business lines in a timeframe appropriate for the restoration of financial soundness. EBA is required to develop guidelines further specifying the information to be contained in recovery plans.

Competent authorities, after consultation with relevant foreign authorities, must assess the effectiveness of the measures proposed in the recovery plan to rapidly restore viability without producing adverse effects on the financial system; EBA will develop guidelines specifying minimum criteria to be followed for such assessment. If competent authorities are not satisfied with the plan, they may request the institution to revise the plan: if it fails to submit the revised plan or changes are not considered satisfactory, then authorities may direct the institution to take corrective measures, such as a reduction of the risk profile of the bank, timely recapitalization, changes to the funding strategy or to the governance structures.

While banks are required to draw up recovery plans, resolution authorities are entrusted with the preparation of resolution plans, outlining the resolution measures that will

be adopted if the bank is taken through resolution.⁵⁸ Resolution authorities, however, may require the banks to assist them in the preparation and updating of the resolution plan, and their requests may concern a number of issues including the following: a detailed description of the institution's organizational structure including a list of all legal entities; the identification of the direct holder and the percentage of voting and non-voting rights of each legal entity; the location, jurisdiction of incorporation, licensing and key management associated with each legal entity; a mapping of the institution's critical operations and core business lines by reference to legal entities; a detailed description of the components of the institution's and all its legal entities' liabilities, separating at a minimum by types and amounts of short term and long term debt, secured, unsecured and subordinated liabilities; a description of the off-balance sheet exposures of the institution and its legal entities, including a mapping to its critical operations and core business lines; the identification of the major or most critical counterparties of the institution as well as an analysis of the impact of the failure of major counterparties on the institution's financial situation; each payment, clearing or settlement system of which the institution is directly or indirectly a member, including a mapping to the institution's legal entities, critical operations and core business lines; an identification and mapping of the legal entities and the interconnections and interdependencies among the different legal entities (e.g. capital, funding and liquidity arrangements, cross-guarantee arrangements).

As for recovery plans, resolution plans must be updated at least annually or earlier if changes to the legal or organizational structure of the institution, its business or its financial position might have an impact on the plan. The latter shall include a demonstration of how critical functions and core business lines could be legally and economically separated from

⁵⁸ Under the Single Resolution Mechanism, proposed by the European Commission in July 2013 and adopted in 2014 (European Parliament and Council of the European Union, 2014b), a newly established European resolution authority, the Single Resolution Board, will play a key role in the drawing up of resolution plans, in cooperation with national authorities.

other functions so as to ensure continuity upon the failure of the institution; a description of the processes for determining the value and marketability of the critical functions, core business lines and assets of the institution; an explanation by the resolution authority about how the resolution options could be financed without any extraordinary public financial support; a detailed description of the different resolution strategies that could be applied according to the different possible scenarios; a description of critical interdependencies; a description of essential operations and systems for maintaining the continuous functioning of the institution's operational processes.

If resolution authorities identify significant impediments to the resolvability of a group, they may require the institution to take measures in order to facilitate its resolvability. Such measures might include a reduction of complexity through changes to legal or operational structures in order to ensure that critical functions can be legally and economically separated from other functions; the drawing up of service agreements to cover the provision of critical functions; limits to maximum individual and aggregate exposures; imposition of reporting requirements; restrictions of activities and new business lines or products; requirement to issue additional convertible capital instruments.

Appendix 2.B

Methodology for the identification of large subsidiaries not listed by banking groups as “material entities” in the public section of resolution plans

Table 2.3 displays the number of material entities listed by the eleven banking groups⁵⁹ in the public portion of their 2012 resolution plans as well as the number, name and location of large subsidiaries which have not been included in the list of material entities. To identify these “missing” material entities we have first collected information on large subsidiaries provided by the Bankscope database (as of May 2013): we have chosen \$ 50 billion of total assets as the size threshold to select large entities and selected all subsidiaries that Bankscope reported to have surpassed such threshold, based on the latest financial data indicated by Bankscope in the list of subsidiaries. To obtain the Bankscope list of subsidiaries we have used the 50% majority-ownership filter made available by the database: companies included in the list of subsidiaries are only those that the banking group owns with at least a 50.01% stake in every single piece of the ownership chain.

Second, we have excluded some large subsidiaries included by Bankscope but not active any longer (e.g. due to bankruptcy or merger): for this purpose, we have used information provided by Bankscope in other sections of their database and by the Orbis database (which follows the same criteria and format of Bankscope but has a wider coverage with regard to details on subsidiaries).

⁵⁹ These groups were required to submit their resolution plans by July 1st, 2012 as their nonbank assets (US nonbank assets for foreign covered companies) were at least equal to \$ 250 billion. A second group of banks, with total nonbank assets between \$ 100 billion and \$ 250 billion, had to submit their plans by July 1st, 2013. Finally, covered companies with less than \$100 billion in total nonbank assets had to submit their plans by December 31st, 2013. In our analysis we have focused on the resolution plans submitted in the first round in 2012.

Third, we have checked whether any large subsidiary included by Bankscope was not in the material entities list provided by banking groups in the resolution plan, finding a few “missing” entities for 8 out of the 11 banking groups of our sample.

Fourth, in order to double-check our results with official regulatory sources and to make sure that large subsidiaries identified by Bankscope as of May 2013 were existing at the time of submission of the resolution plans, we have verified whether the missing entities were included by banking groups in the list of subsidiaries displayed in the SEC 10-K form for US groups and in the SEC 20-F form for foreign groups; we used data for year-end 2011 because this is the most recent date before the submission of the resolution plans for which SEC data were available. For a couple of foreign banking groups we were not able to find the list of subsidiaries in the SEC 20-F form and double-checked our data with 2011 annual reports or other official documents published by the banks.

Moreover, we have performed this double check also with Federal Reserve data on banks’ organization hierarchy made publicly available through the National Information Center database. Since these data can be retrieved for any point in time, we have used the end of June 2012 data, corresponding to the timing of submission of resolution plans.

Our missing entities were included in both the SEC and the Federal Reserve data, or in documents published by the banks. (In one case a subsidiary was included in the Fed data as of June 2012, but not in the SEC list as of yearend 2011. Nonetheless, it had been included in the SEC list for yearend 2010).

Appendix 2.C

Selected corporate structure charts officially published by banking groups

Below we include corporate structure charts made publicly available by several G-SIBs.⁶⁰ By intent (and necessity) these charts present a highly simplified view of corporate complexity. They do illustrate some aspects of complexity nonetheless. In particular, they show the key role of intermediate holding companies in most corporate structures.

Some banks present particularly informative charts (e.g. Unicredit). But, at a minimum all of the charts should indicate the assets in each material entity and the line of business. Moreover, standardization of these charts across G-SIBs would facilitate comparisons.

⁶⁰ Many of these charts are published on banks' websites. In the case of Barclays and Deutsche Bank, the charts are taken from the public sections of their 2014 US resolution plans. Consequently, the organization charts for Barclays and Deutsche focus on their material entities for purposes of US resolution plans rules.

Figure 2.3: Simplified corporate structure of Bank of America (as of 30 June 2014)

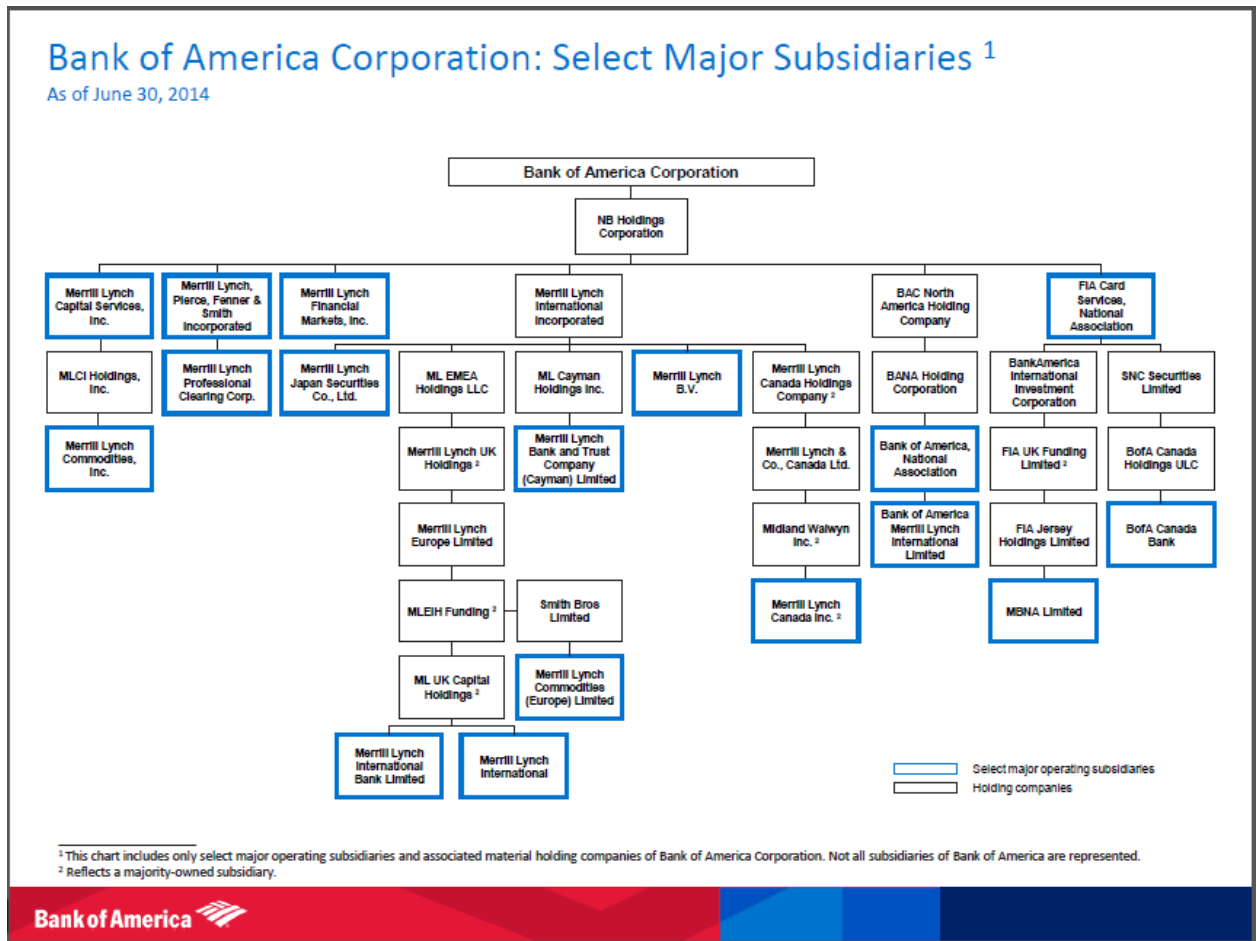


Figure 2.4: Simplified corporate structure of Barclays (as of yearend 2013, focused on material entities under US resolution plan rules)

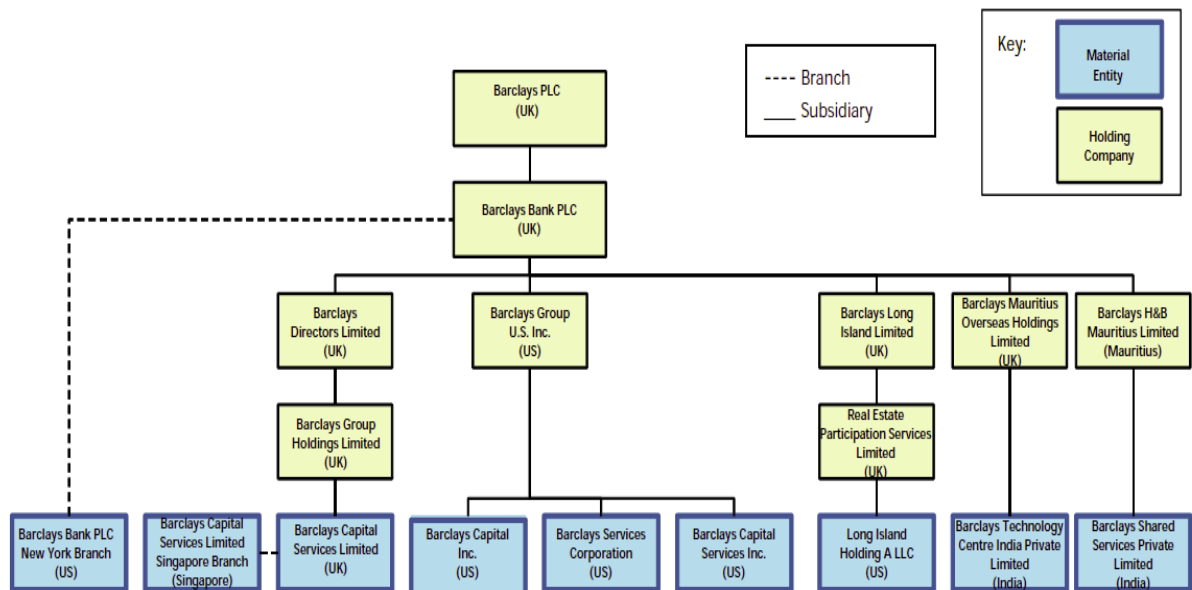


Figure 2.5: Simplified corporate structure of Citigroup (as of December 2013)

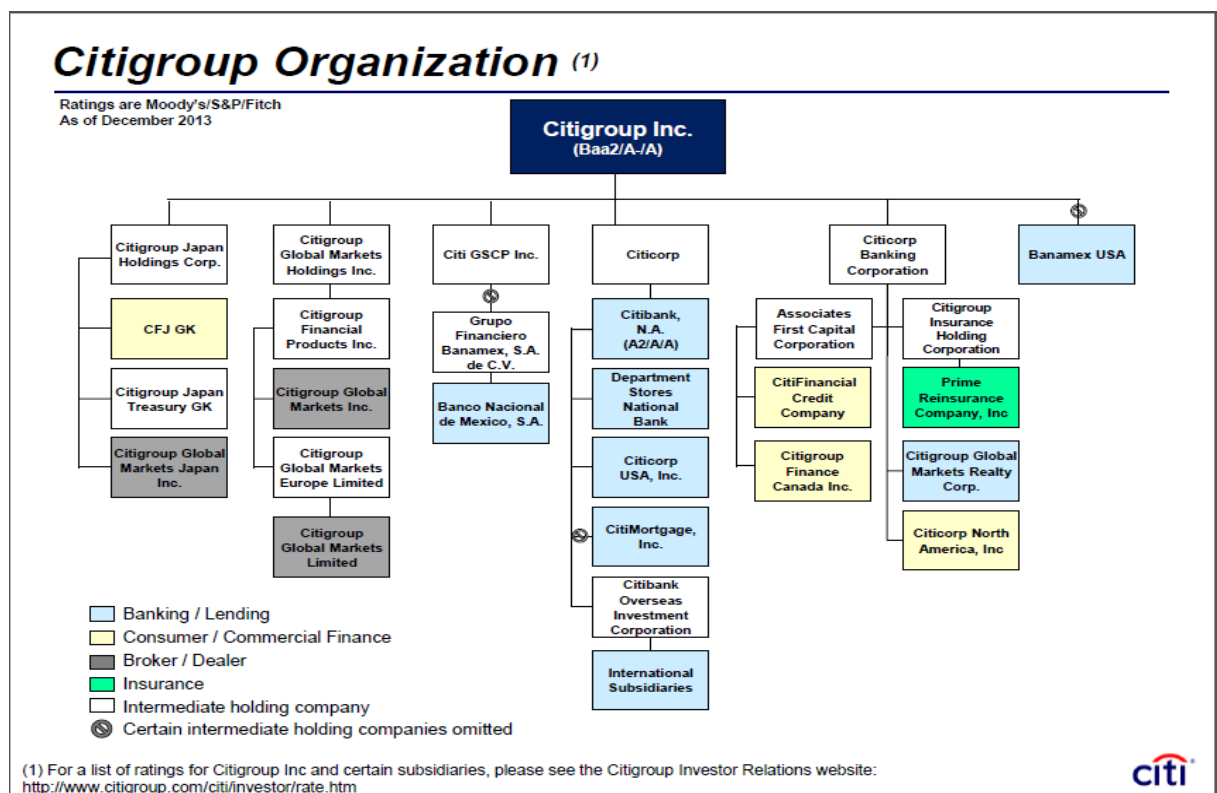


Figure 2.6: Simplified corporate structure of Deutsche Banks (focused on material entities under US resolution plan rules)

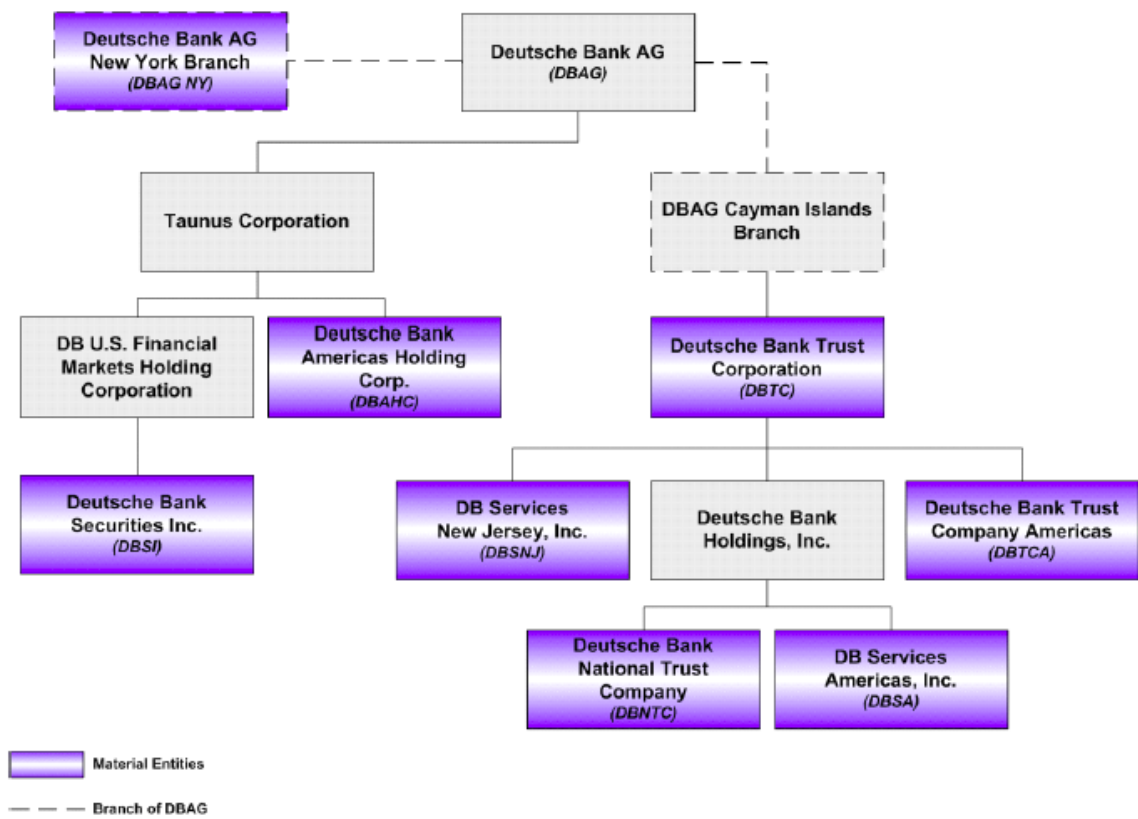


Figure 2.7: Simplified corporate structure of HSBC (as of yearend 2013)

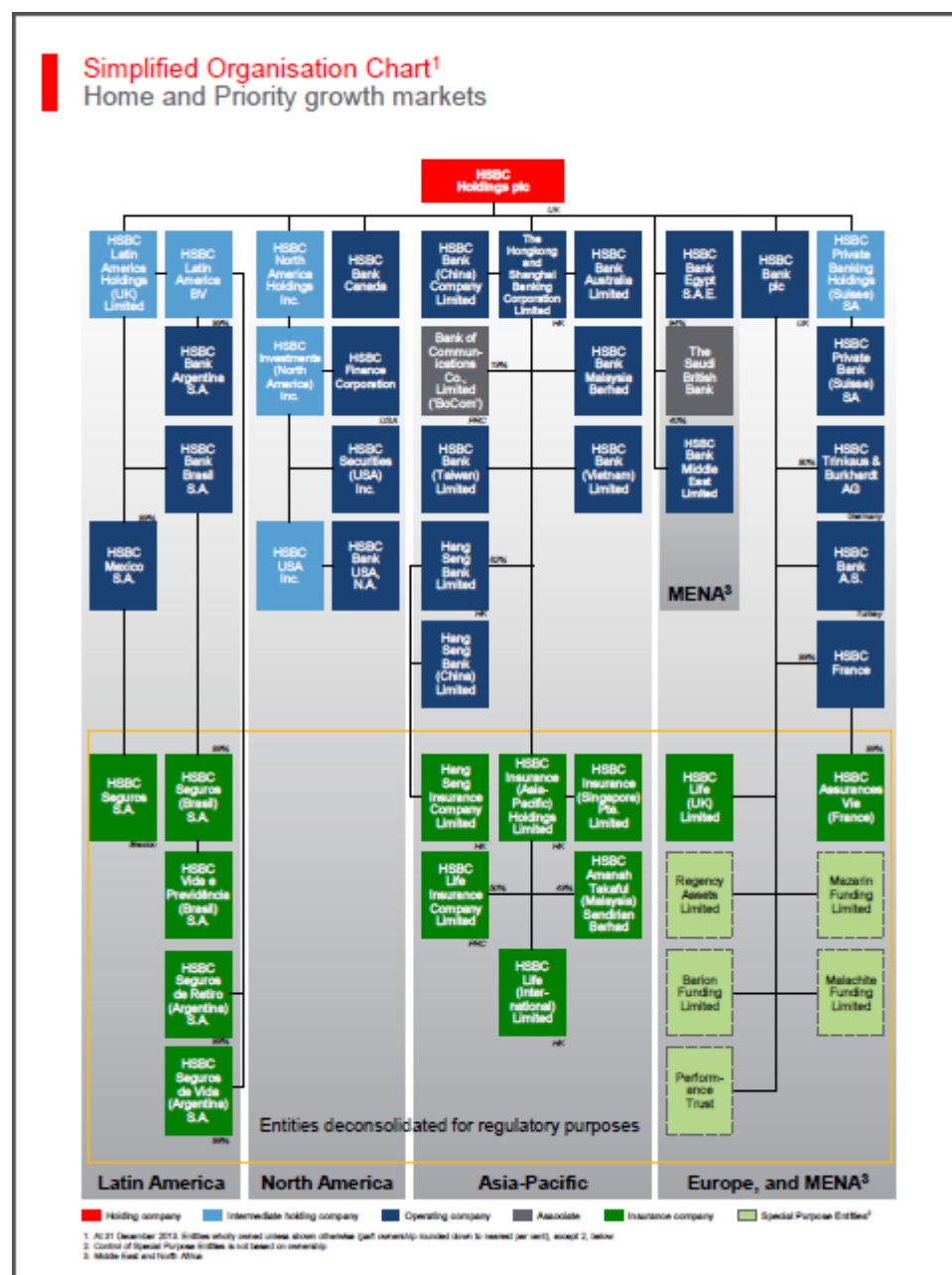
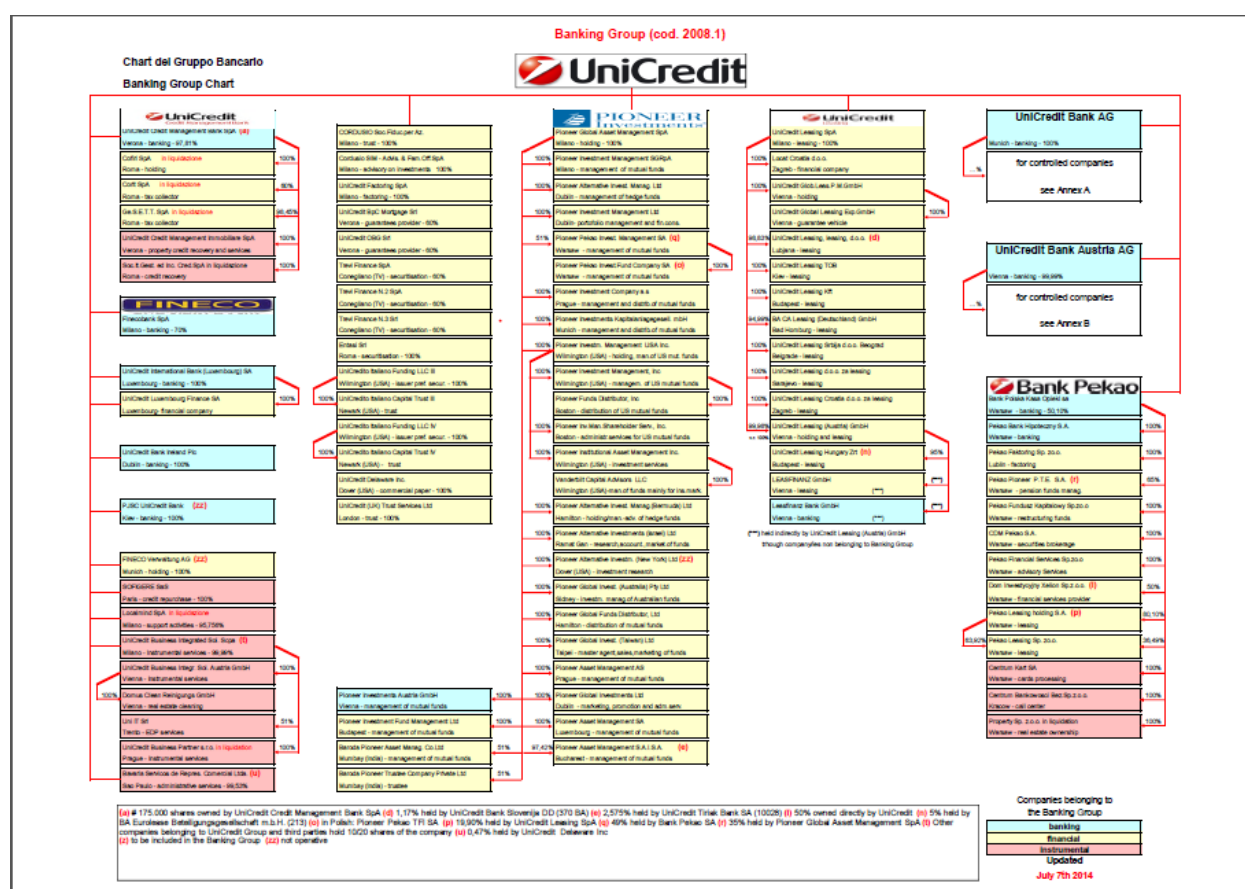


Figure 2.8: Simplified corporate structure of Unicredit (as of July 7, 2014)



Appendix 2.D

The rejection of living wills by the FED and the FDIC in August 2014

On August 5, 2014, US banking regulators, the Federal Reserve (FED) and the Federal Deposit Insurance Corporation (FDIC), rejected the "living wills" of 11 large banking groups, the so-called first wave filers. The living wills are one of the main regulatory instruments introduced after the 2008 global financial crisis to tackle the "too-big-to-fail" problem and make the failure of financial institutions, even of the largest and most complex ones, possible without triggering a systemic crisis and at no cost for taxpayers.

The disorderly and systemic failure of Lehman Brothers in September 2008 had highlighted the need to provide ex-ante regulators and resolution authorities with information, measures and tools that may allow them to intervene timely and effectively in the event of crisis of financial institutions, especially if they are of systemic importance. In the United States, Title I of the 2010 Dodd-Frank Act (DFA) introduced for both US and non-US systemic financial institutions the requirement to prepare and submit to the FED and the FDIC their "resolution plans", also known as living wills: such plans must describe in detail banks' corporate structures and business, and indicate the measures that will be taken in case of crisis to promote orderly and rapid resolution. In living wills, financial institutions are required to illustrate ex ante strategies and resolution mechanisms based on ordinary bankruptcy procedures; only if ordinary procedures prove ineffective or insufficient, authorities may decide to resort to the special resolution procedure provided for Title II of the DFA, the Orderly Liquidation Authority (OLA); the latter is managed by the FDIC, which in case of need may also draw funds from the Treasury (which must be repaid, also with ex-post contributions of banks).

Section 165(d) of DFA mandates that resolution plans include a description of ownership structures, assets, liabilities and contractual obligations; information on how

deposit-taking subsidiaries will be protected from the risks produced by non-banking entities of the group; the identification of cross-guarantees, major counterparties and processes to determine to which entities the group pledges collateral. The DFA also entrusts regulators with the power to require banks to modify the submitted resolution plans and even, if changes are not satisfactory, to impose more stringent regulatory requirements or even assets divestiture.

The FED and the FDIC published in November 2011 the implementing rules, on which the structure and content of living wills are based: the plans must contain detailed information on the strategy for rapid and orderly resolution; the corporate structure of the group, the main legal entities, their geographical location and their interconnections within the group; key balance sheet data; business lines and their mapping into legal entities; key operations and essential services provided by different entities within the group, and how these vital functions would be preserved in case of resolution; information management systems; authorities that supervise the various legal entities of the group; and the measures that will be adopted in case of resolution.

The FED/FDIC implementing regulation also introduced a transparency requirement, envisaging a public section of living wills. However, based on concerns to protect the proprietary and confidential nature of certain information and the fear of possible destabilizing effects of a full disclosure of living wills documents, regulators have opted for a compromise: public sections may include only general, high-level information, and information that is already public and available through other sources.

US regulators have divided the firms subject to the living wills requirement into three groups, based on dimensional criteria, and have set for each of these groups a different timing for the submission of their plans. The first group, including the largest firms, is composed by seven US banks (Bank of America, Citigroup, JP Morgan Chase, Goldman Sachs, Morgan

Stanley, Bank of New York Mellon and State Street) and four European banking groups (Barclays, Deutsche Bank, Credit Suisse and UBS): these institutions have submitted the first version of their living wills in July 2012, then a second version in October 2013 and finally a third one in July 2014.

Significant shortfalls in the resolution plans submitted by banks were already evident in the first round of 2012: in particular, the information appeared not sufficiently detailed on many aspects, including the mapping of corporate structures, the indication of main legal entities, interconnections between the different entities of the group and the description of resolution strategies. For example, some legal entities with assets exceeding \$ 50 billion – the threshold set by DFA for the identification of systemic banking groups! - were not indicated as "material entities, and the mapping of business lines into legal entities was, at best, very weak. In addition, most of the information provided in the public sections of the living wills was already available in other public documents (annual reports, websites, etc.) – but, as recalled, this is actually permitted by the implementing regulation.⁶¹ It should also be noted that public sections typically have a length of a few dozen pages, while the living wills documents in their full version consist of thousands of pages.

In April 2013 US regulators had published some guidelines to improve resolution plans, on the basis of first round submissions. The FED and the FDIC have now evaluated negatively and rejected the living wills submitted by the 11 banking groups in the second round (October 2013), despite some improvements; the FDIC stated that they are not credible, do not facilitate an orderly resolution based on the bankruptcy code and are not sufficient to realistically exclude the need of a direct or indirect public support in case of a crisis.⁶² Despite some degree of heterogeneity across the living wills of different banks, the

⁶¹ For a detailed analysis of the resolution plans of 2012, cf. Carmassi and Herring (2013).

⁶² The independent statements by the two agencies split over the decision about next steps. The Fed decided to warn these G-SIBs that if they did not take "immediate action to improve their resolvability and reflect those improvements in their 2015 plans," the Fed would join the FDIC in finding that the living wills do not meet the

FED and the FDIC have identified some common weaknesses, including: i) unrealistic assumptions about the behavior of customers, counterparties, investors, central clearing facilities and regulators, and (ii) failure to adopt (or even to identify) measures to change structures and practices, that would be necessary to make an orderly resolution feasible.

The 11 banking groups must therefore, by July 1, 2015, adopt a series of measures to strengthen their resolution plans and meet regulators' requests, thus avoiding their intervention in terms of additional regulatory requirements or asset divestiture. These measures include: i) a simplification of corporate structures, trying to align as much as possible legal entities and business lines in order to facilitate resolution; ii) the adoption of a holding company structure that supports resolvability; iii) the safeguard, in the resolution phase, of the continuity of functions and services that support critical operations and major lines of business; iv) the amendment of some financial contracts, to ensure their "stay" in the event of insolvency; v) a demonstration of operational capabilities in terms of preparation for resolution, for example with regard to the ability to rapidly generate reliable information.

In conclusion, resolution plans could – and should – play three crucial functions: (i) provide ex-ante supervisors and resolution authorities with a detailed overview of the structure and operation of financial institutions, which may serve as a "guide" in resolution; ii) increase transparency and strengthen market discipline; iii) encourage banks to reduce their complexity and simplify their corporate structures. The August 2014 living wills rejection by the FED and the FDIC suggests that there is still a long way to go to achieve these three objectives.

With regard to the second objective, that of transparency, the public sections of the living wills could play a very important role in improving the quality and quantity of information available for creditors and counterparties, thus strengthening market discipline.

requirements of the Dodd-Frank Act. The FDIC Board voted to make that finding immediately, deeming the submissions "not credible". This matters because the finding sets the clock ticking as a prelude to regulatory intervention under the Dodd-Frank Act, but it must be a joint decision of both the Fed and the FDIC.

This function is particularly important given that financial institutions that must submit the living wills include those deemed potentially "too-big-to-fail", which according to several studies benefit from an implicit subsidy in terms of would lower cost of funding, thanks to their "too-big-to-fail" status. Increased transparency, vis-à-vis complex and opaque corporate structures, could certainly help creditors to price risk better and thus contribute to tackle "too-big-to-fail". The FED and the FDIC now appear to be sensitive to this type of problem: in their communiqué they stated they will evaluate the option of strengthening the public sections of living wills, always taking into account an appropriate balance between transparency, on the one hand, and confidentiality of proprietary and supervisory information on the other hand.

In Europe, resolution plans have been introduced by the directive on bank recovery and resolution and the regulation establishing the Single Resolution Mechanism; the European Banking Authority (EBA) is currently drafting the implementing rules.⁶³ So far, unlike in the United States, there seems to be no requirement to publicly disclose at least parts of the living wills. The US experience with living wills may certainly provide valuable indications for both national and European policy makers and the scientific debate in the academic community.

⁶³ See, for example, EBA (2014).

Appendix 2.E

Geographical breakdown of majority-owned subsidiaries of selected G-SIBs as of yearend 2013

Barclays

UNITED KINGDOM	617
UNITED STATES	371
CAYMAN ISLANDS	172
SOUTH AFRICA	140
LUXEMBOURG	41
IRELAND	34
SPAIN	22
FRANCE	14
GERMANY	12
HONG KONG	11
NETHERLANDS	11
SINGAPORE	9
DENMARK	8
CANADA	7
INDIA	7
ZIMBABWE	7
AUSTRALIA	6
ITALY	6
JAPAN	6
KENYA	6
MAURITIUS	6
SWITZERLAND	5
MEXICO	5
VIRGIN ISLANDS, BRITISH	5
BRAZIL	4
INDONESIA	4
MONACO	4
ZAMBIA	4
ARGENTINA	3
BERMUDA	3
BOTSWANA	3
GIBRALTAR	3
N.A.	3
TANZANIA, UNITED REPUBLIC OF	3
UGANDA	3
BELGIUM	2
BAHAMAS	2
KOREA, REPUBLIC OF	2
MOZAMBIQUE	2
NIGERIA	2

PHILIPPINES	2
PORTUGAL	2
SEYCHELLES	2
AUSTRIA	1
CHINA	1
COLOMBIA	1
EGYPT	1
GHANA	1
LIBERIA	1
MAURITANIA	1
MALTA	1
MALAYSIA	1
NAMIBIA	1
ROMANIA	1
RUSSIAN FEDERATION	1
SAUDI ARABIA	1
THAILAND	1
TAIWAN, PROVINCE OF CHINA	1
UKRAINE	1
TOTAL	1,597
NUMBER OF COUNTRIES	58

Source: Bankscope. “N.A.” indicates that the jurisdiction of subsidiaries is not reported by Bankscope (even though in some cases it may be indicated by the name of the entities).

BNP Paribas

ITALY	852
FRANCE	424
UNITED KINGDOM	206
UNITED STATES	130
BELGIUM	91
LUXEMBOURG	70
SPAIN	63
NETHERLANDS	56
GERMANY	52
BRAZIL	41
IRELAND	24
UKRAINE	23
AUSTRALIA	21
MOROCCO	21
POLAND	20
TURKEY	19
ROMANIA	18
HONG KONG	17
SWITZERLAND	15
HUNGARY	15
SINGAPORE	15
PORTUGAL	13
CZECH REPUBLIC	12
INDIA	12
AUSTRIA	10
N.A.	10
ARGENTINA	9
CYPRUS	9
MEXICO	9
DENMARK	8
GREECE	8
JAPAN	8
RUSSIAN FEDERATION	8
CANADA	7
CHINA	7
INDONESIA	7
SWEDEN	7
CHILE	6
FINLAND	6
CAYMAN ISLANDS	6
TAIWAN, PROVINCE OF CHINA	6
COSTA RICA	5
PERU	5
SLOVAKIA	5
COLOMBIA	4
NORWAY	4

PHILIPPINES	4
VIRGIN ISLANDS, BRITISH	4
BULGARIA	3
BAHAMAS	3
ALGERIA	3
CROATIA	3
MOLDOVA, REPUBLIC OF	3
MALTA	3
NEW ZEALAND	3
PANAMA	3
UNITED ARAB EMIRATES	2
BAHRAIN	2
BERMUDA	2
CÔTE D'IVOIRE	2
ESTONIA	2
EGYPT	2
GUATEMALA	2
HONDURAS	2
KOREA, REPUBLIC OF	2
MALAYSIA	2
SENEGAL	2
SOUTH AFRICA	2
ALBANIA	1
BOSNIA AND HERZEGOVINA	1
BURKINA FASO	1
BRUNEI DARUSSALAM	1
GUINEA	1
COMOROS	1
KAZAKHSTAN	1
LITHUANIA	1
LATVIA	1
MONACO	1
MONTENEGRO (WO SERBIA)	1
MALI	1
NICARAGUA	1
SERBIA AND MONTENEGRO	1
SAUDI ARABIA	1
SLOVENIA	1
SAN MARINO	1
EL SALVADOR	1
THAILAND	1
URUGUAY	1
TOTAL	2,460
NUMBER OF COUNTRIES	87

Source: Bankscope. "N.A." indicates that the jurisdiction of subsidiaries is not reported by Bankscope (even though in some cases it may be indicated by the name of the entities).

Citigroup

UNITED STATES	858
JAPAN	165
UNITED KINGDOM	156
MEXICO	67
CANADA	56
AUSTRALIA	53
GERMANY	47
HONG KONG	35
CHINA	30
BRAZIL	27
CAYMAN ISLANDS	27
BAHAMAS	24
TAIWAN, PROVINCE OF CHINA	23
POLAND	21
BERMUDA	19
MALAYSIA	18
ARGENTINA	17
SINGAPORE	17
FRANCE	15
IRELAND	15
INDIA	15
LUXEMBOURG	14
EL SALVADOR	14
CHILE	13
COSTA RICA	12
NEW ZEALAND	12
N.A.	11
SWITZERLAND	10
COLOMBIA	9
PHILIPPINES	9
VIRGIN ISLANDS, BRITISH	9
SPAIN	8
HONDURAS	8
MAURITIUS	8
GREECE	7
KOREA, REPUBLIC OF	7
NETHERLANDS	7
THAILAND	7
BELGIUM	6
PORTUGAL	6
URUGUAY	6
GUATEMALA	5
PERU	5
RUSSIAN FEDERATION	5
TURKEY	5

SOUTH AFRICA	5
CZECH REPUBLIC	4
DOMINICAN REPUBLIC	4
ECUADOR	4
HUNGARY	4
INDONESIA	4
JAMAICA	3
PANAMA	3
PUERTO RICO	3
UKRAINE	3
ARUBA	2
BOLIVIA	2
CÔTE D'IVOIRE	2
EGYPT	2
ITALY	2
KAZAKHSTAN	2
MOROCCO	2
MONACO	2
NIGERIA	2
TRINIDAD AND TOBAGO	2
VENEZUELA	2
ZAMBIA	2
UNITED ARAB EMIRATES	1
AUSTRIA	1
BARBADOS	1
BANGLADESH	1
BAHRAIN	1
BRUNEI DARUSSALAM	1
CONGO, DEMOCRATIC REPUBLIC	1
CAMEROON	1
DENMARK	1
FINLAND	1
GABON	1
GIBRALTAR	1
HAITI	1
JORDAN	1
KENYA	1
LITHUANIA	1
NICARAGUA	1
NORWAY	1
PAKISTAN	1
PARAGUAY	1
ROMANIA	1
SWEDEN	1
SLOVAKIA	1
SENEGAL	1
SWAZILAND	1
TUNISIA	1
TANZANIA, UNITED REPUBLIC OF	1
UGANDA	1
TOTAL	1,997
NUMBER OF COUNTRIES	94

Source: Bankscope. "N.A." indicates that the jurisdiction of subsidiaries is not reported by Bankscope (even though in some cases it may be indicated by the name of the entities).

Deutsche Bank

UNITED STATES	487
GERMANY	480
IRELAND	327
UNITED KINGDOM	215
CAYMAN ISLANDS	91
LUXEMBOURG	65
ITALY	54
AUSTRALIA	52
N.A.	36
JAPAN	24
BRAZIL	18
CANADA	18
CHINA	16
NETHERLANDS	16
SINGAPORE	15
NEW ZEALAND	14
HONG KONG	12
INDIA	12
SPAIN	11
MEXICO	11
RUSSIAN FEDERATION	9
SWITZERLAND	8
MAURITIUS	8
POLAND	8
SOUTH AFRICA	8
CHILE	7
GIBRALTAR	7
ARGENTINA	6
MALAYSIA	5
PORTUGAL	5
AUSTRIA	3
FRANCE	3
MALTA	3
PHILIPPINES	3
THAILAND	3
TURKEY	3

VIRGIN ISLANDS, BRITISH	3
BELGIUM	2
CZECH REPUBLIC	2
GREECE	2
INDONESIA	2
ISRAEL	2
KOREA, REPUBLIC OF	2
KAZAKHSTAN	2
PERU	2
ROMANIA	2
TAIWAN, PROVINCE OF CHINA	2
URUGUAY	2
BARBADOS	1
BERMUDA	1
COLOMBIA	1
CYPRUS	1
FINLAND	1
CROATIA	1
CAMBODIA	1
NIGERIA	1
PANAMA	1
SAUDI ARABIA	1
UKRAINE	1
UGANDA	1
VENEZUELA	1
TOTAL	2,101
NUMBER OF COUNTRIES	60

Source: Bankscope. “N.A.” indicates that the jurisdiction of subsidiaries is not reported by Bankscope (even though in some cases it may be indicated by the name of the entities).

Goldman Sachs

UNITED STATES	106
UNITED KINGDOM	84
AUSTRALIA	43
CAYMAN ISLANDS	24
JAPAN	17
BRAZIL	15
GERMANY	13
NEW ZEALAND	10
IRELAND	6
HONG KONG	5
MAURITIUS	5
NETHERLANDS	5
SPAIN	3
CZECH REPUBLIC	2
INDIA	2
LUXEMBOURG	2
RUSSIAN FEDERATION	2
SINGAPORE	2
VIRGIN ISLANDS, BRITISH	2
BERMUDA	1
CANADA	1
SWITZERLAND	1
FRANCE	1
ITALY	1
KOREA, REPUBLIC OF	1
MEXICO	1
PORTUGAL	1
TOTAL	356
NUMBER OF COUNTRIES	26

Source: Bankscope.

HSBC

UNITED KINGDOM	395
UNITED STATES	291
HONG KONG	220
FRANCE	218
VIRGIN ISLANDS, BRITISH	164
N.A.	134
CHINA	106
MEXICO	98
GERMANY	77
CANADA	67
MALTA	59
BRAZIL	55
SINGAPORE	45
PANAMA	43
BERMUDA	38
BAHAMAS	28
CAYMAN ISLANDS	27
MALAYSIA	24
ARGENTINA	19
LUXEMBOURG	18
SWITZERLAND	17
INDIA	16
MAURITIUS	15
NEW ZEALAND	14
AUSTRALIA	12
INDONESIA	10
PHILIPPINES	10
UNITED ARAB EMIRATES	9
IRELAND	8
NETHERLANDS	8
TAIWAN, PROVINCE OF CHINA	8
TURKEY	7
KAZAKHSTAN	6
POLAND	6
EGYPT	5
LEBANON	5
BARBADOS	4
MONACO	4

MACAO	4
BELGIUM	3
SPAIN	3
IRAQ	3
KOREA, REPUBLIC OF	3
NORWAY	3
URUGUAY	3
SOUTH AFRICA	3
AUSTRIA	2
COLOMBIA	2
CYPRUS	2
GREECE	2
JAPAN	2
SRI LANKA	2
OMAN	2
VIET NAM	2
ARMENIA	1
BAHRAIN	1
BRUNEI DARUSSALAM	1
CÔTE D'IVOIRE	1
CHILE	1
ECUADOR	1
LAO PEOPLE'S DEMOCRATIC REPUBLIC	1
MOROCCO	1
NAMIBIA	1
NIGER	1
NIGERIA	1
PERU	1
PARAGUAY	1
RUSSIAN FEDERATION	1
SAUDI ARABIA	1
THAILAND	1
VENEZUELA	1
TOTAL	2,348
NUMBER OF COUNTRIES	70

Source: Bankscope. “N.A.” indicates that the jurisdiction of subsidiaries is not reported by Bankscope (even though in some cases it may be indicated by the name of the entities).

JPMorgan Chase

UNITED STATES	598
UNITED KINGDOM	253
AUSTRALIA	44
CANADA	28
CAYMAN ISLANDS	23
IRELAND	20
BRAZIL	19
N.A.	19
MEXICO	16
MAURITIUS	15
SINGAPORE	14
NETHERLANDS	13
GERMANY	12
SPAIN	12
HONG KONG	12
AUSTRIA	11
FRANCE	10
INDIA	9
LUXEMBOURG	9
CHINA	6
VIRGIN ISLANDS, BRITISH	6
SOUTH AFRICA	6
CROATIA	5
JAPAN	5
TAIWAN, PROVINCE OF CHINA	5
BARBADOS	4
BELGIUM	4
BERMUDA	4
COLOMBIA	4
ITALY	4
MALAYSIA	4

SERBIA AND MONTENEGRO	4
RUSSIAN FEDERATION	4
THAILAND	4
SWITZERLAND	3
CHILE	3
INDONESIA	3
PHILIPPINES	3
POLAND	3
ARGENTINA	2
BULGARIA	2
CYPRUS	2
CZECH REPUBLIC	2
KOREA, REPUBLIC OF	2
ROMANIA	2
SAUDI ARABIA	2
TURKEY	2
UNITED ARAB EMIRATES	1
ANTIGUA AND BARBUDA	1
BAHAMAS	1
GUATEMALA	1
HUNGARY	1
MACEDONIA, THE FORMER YUGOSLAV REPUBLIC OF	1
NORWAY	1
PANAMA	1
PAKISTAN	1
TOTAL	1,246
NUMBER OF COUNTRIES	55

Source: Bankscope. “N.A.” indicates that the jurisdiction of subsidiaries is not reported by Bankscope (even though in some cases it may be indicated by the name of the entities).

Morgan Stanley

UNITED STATES	575
CAYMAN ISLANDS	166
UNITED KINGDOM	111
LUXEMBOURG	54
NETHERLANDS	31
CANADA	25
AUSTRALIA	21
GIBRALTAR	19
JAPAN	19
CHINA	18
GERMANY	16
HONG KONG	14
INDIA	11
SINGAPORE	11
SPAIN	9
BRAZIL	8
N.A.	7
FRANCE	6
IRELAND	6
MAURITIUS	6
MEXICO	6
ITALY	5
BERMUDA	4
PHILIPPINES	4
RUSSIAN FEDERATION	4
SWITZERLAND	3
CYPRUS	3

THAILAND	3
SOUTH AFRICA	3
HUNGARY	2
INDONESIA	2
KOREA, REPUBLIC OF	2
MALTA	2
PORTUGAL	2
SWEDEN	2
UKRAINE	2
UNITED ARAB EMIRATES	1
CHILE	1
CZECH REPUBLIC	1
DENMARK	1
ISRAEL	1
MALAYSIA	1
PANAMA	1
PERU	1
SAUDI ARABIA	1
TURKEY	1
TAIWAN, PROVINCE OF CHINA	1
URUGUAY	1
TOTAL	1,194
NUMBER OF COUNTRIES	47

Source: Bankscope. “N.A.” indicates that the jurisdiction of subsidiaries is not reported by Bankscope (even though in some cases it may be indicated by the name of the entities).

Santander

BRAZIL	148
SPAIN	146
UNITED KINGDOM	123
MEXICO	95
UNITED STATES	54
POLAND	23
CHILE	18
PORTUGAL	16
ITALY	15
IRELAND	12
GERMANY	11
ARGENTINA	9
NETHERLANDS	9
N.A.	8
BAHAMAS	6
CAYMAN ISLANDS	5
LUXEMBOURG	5
URUGUAY	5
SWITZERLAND	4
FRANCE	4
AUSTRIA	3
CANADA	3
COLOMBIA	3
PERU	3
RUSSIAN FEDERATION	3
BELGIUM	2
CHINA	2
PANAMA	2
CZECH REPUBLIC	1
FINLAND	1
HUNGARY	1
MOROCCO	1
NORWAY	1
PUERTO RICO	1
SWEDEN	1
VENEZUELA	1
TOTAL	745
NUMBER OF COUNTRIES	35

Source: Bankscope. “N.A.” indicates that the jurisdiction of subsidiaries is not reported by Bankscope (even though in some cases it may be indicated by the name of the entities).

Chapter 3

Evolution of bank corporate structures over time

3.1 Complexity of G-SIBs: historical trends

In Chapter 2 we have illustrated the data on corporate complexity (number of majority-owned subsidiaries) for G-SIBs as of May 2013. The goal of this Chapter is to examine the evolution of bank corporate complexity over time. Previous empirical studies have focused almost exclusively on data regarding corporate complexity at single point. We believe that data we have collected are the first available that permit some analysis of the evolution of the number of subsidiaries of G-SIBs.

The analysis of the historical evolution of bank complexity is divided into two sections. First, we will look at two specific points in time: December 2007, i.e. right before the 2008 global financial crisis, and May 2013, the most recent data available when we began this analysis. We hope that this comparison will present a picture of the extent that the massive wave of reregulation (see Chapter 5 for details) has begun to affect the complexity of the corporate structure of G-SIBs. A reduction in corporate complexity has been a top priority of policy-makers and regulators since the crisis of 2007-2008, and this comparison provides some indication of the extent there have been early signs of success.⁶⁴

Second, we will enlarge our analysis to show data on majority-owned subsidiaries of G-SIBs over the period from 2002 to 2013. The key results of the two analyses are consistent and indicate that on average complexity has not been reduced since 2007 and has doubled since 2002.

⁶⁴ As we have emphasized earlier, the number of subsidiaries is only one aspect of complexity and perhaps not the most important one. Although even this aspect is not easy to measure, tracking other dimensions such as interconnectedness is even more difficult.

3.1.1 Complexity of G-SIBs in 2007 (pre-crisis) and 2013

In this subsection, we compare the number of controlled subsidiaries as of December 2007 and May 2013 for the 13 banking groups that were in the 2007 list of Large and Complex Financial Institutions (LCFIs) used by the Bank of England and the International Monetary Fund before the 2008 financial crisis and that are also included in the current list of G-SIBs published by the FSB⁶⁵. We have obtained all data on majority-owned subsidiaries through the Bankscope database. These entities are controlled by the parent with a control path of at least 50.01% at each step in the chain of control (please see section 3.2 for further methodological details). We found that the number of subsidiaries has increased by an average of 23% since yearend 2007, and the average number of subsidiaries per bank has risen from 1,088 to 1,343. Ten banking groups have increased their number of subsidiaries, while three have reduced their number of subsidiaries (see Figure 3.1). For BNP Paribas, the increase in the number of subsidiaries has been 122%; for Barclays the increase was 73%; Bank of America and JPMorgan Chase both had a 36% increase⁶⁶. In terms of the number of subsidiaries, BNP Paribas experienced the largest increase (+1,422), followed by Barclays (+736) and Bank of America (+503). Most of these banks have all made significant acquisitions since 2008.⁶⁷ Some of the groups did manage to reduce their number of controlled subsidiaries. Citigroup, which had the highest number of subsidiaries in 2007, decreased the number by 6% and Credit Suisse achieved a reduction of 17%, but the most significant drop was for Royal Bank of Scotland, which is currently owned by the UK

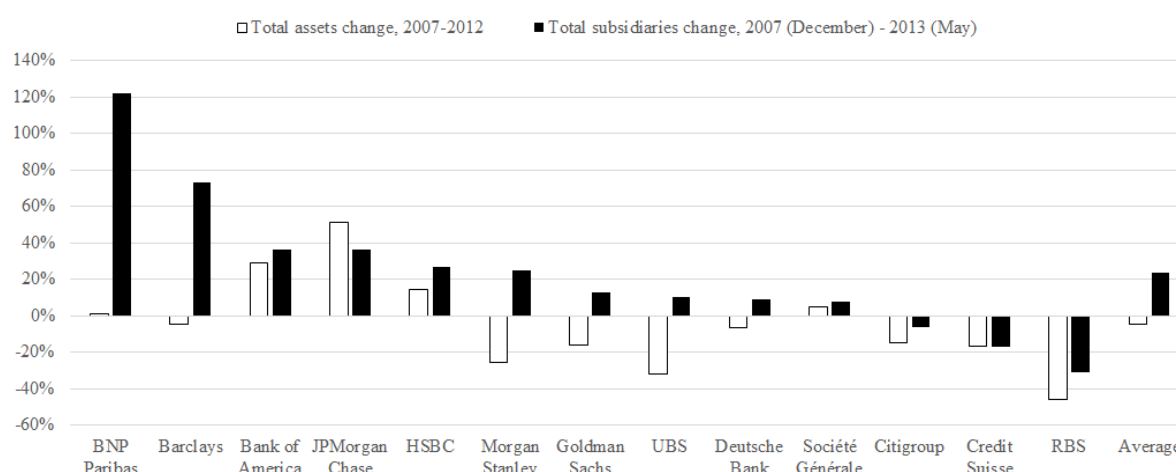
⁶⁵ Note that the G-SIB designation did not exist in December 2007. All 2007 LCFIs are also in the November 2013 FSB list of G-SIBs, with three exceptions: Lehman Brothers, that collapsed in September 2008; ABN AMRO, which was first acquired in 2007 by a consortium of three banks, Royal Bank of Scotland, Santander and Fortis – and after the collapse and bailout of Fortis the Dutch activities were taken over by the Dutch government; Merrill Lynch, which was rescued and acquired by Bank of America in September 2008.

⁶⁶ Based on NIC/FED data, however, Bank of America and JPMorgan Chase have both significantly reduced the number of their subsidiaries relative to the post-crisis peak, which is remarkable because both firms implemented very large mergers during the intervening period.

⁶⁷ BNP Paribas acquired the banking business of the Belgian group Fortis; Bank of America acquired Merrill Lynch and Countrywide Financial; JPMorgan Chase acquired Bear Stearns and the banking operations of Washington Mutual.

government, with a 31% decline. These findings illustrate one of the observations made by Herring and Carmassi (2010): increased corporate complexity is often the result of acquisitions.

Figure 3.1: Evolution of size and complexity of 13 G-SIBs since 2007 (ranked by change in the number of subsidiaries)



Source: computations based on Bankscope data.

Despite the significant role played by acquisitions, an increase in the corporate legal complexity can also be observed in some groups that were not involved in significant acquisitions. If we eliminate the banks that engaged in the largest mergers – Bank of America, BNP Paribas and JPMorgan Chase – from the overlap group of 13, the average number of majority-owned subsidiaries has still increased by 10% from 2007 to 2013; within this subset of 10 G-SIBs Citigroup had the highest number of subsidiaries in both 2007 (2,435) and 2013 (2,297), while Credit Suisse had the lowest figure in both 2007 (290) and 2013 (242). Thus, although acquisitions play an important role in explaining the expanding number of subsidiaries, they are not the only factor.

Complexity (as measured by the number of majority-owned subsidiaries) has often increased as balance sheets increased: total assets for the entire sample of G-SIBs⁶⁸ grew by an average of 23% from 2007 to 2012. Nonetheless, for our sample of 13 G-SIBs size *decreased* on average by 5%, while the number of subsidiaries *increased* on average by 23%. For some banks the change in the number of subsidiaries mirrored the change in size; yet, for a number of banks (e.g. Barclays, Goldman Sachs and Morgan Stanley), the number of subsidiaries increased despite a shrinking balance sheet (see Figure 3.1). And subsidiaries of BNP Paribas increased by 122% despite a 1% increase of total assets. Clearly balance sheet growth alone cannot explain the proliferations of subsidiaries.

To sum up, the comparison of December 2007 and May 2013 data indicates that on average G-SIBs have not reduced the complexity of their corporate structures, although they have reduced the size of their balance sheets by 5%. Several important caveats should be stressed. First, the focus here is only one aspect of complexity, the number of subsidiaries, ignoring other relevant aspects of complexity such as the interactions of subsidiaries with the rest of the group, interconnectedness with the financial system and provision of critical services to the group. Moreover, this measure undoubtedly overstates the extent of corporate complexity because it includes transactional or shell subsidiaries that would pose no systemic threat in the event of the collapse of the group. But, it understates the extent of complexity given that significant foreign branches are not included, because in the event the group should falter, many of these branches would be ring-fenced and treated as if they were subsidiaries. Unfortunately, publicly available data do not permit a deeper analysis.

⁶⁸ BPCE is not included since it was formed in 2009.

3.1.2 Historical evolution of G-SIBs' subsidiaries: a new dataset

In order to strengthen our analysis of the evolution of complexity over time, we have collected through Bankscope archives⁶⁹ the data on the majority-owned subsidiaries of Global Systemically Important Banks in the years from 2002 to 2013 (Table 3.1).

Data analysis has been extremely lengthy and complex, but we have been able to assemble a dataset that is built with a consistent methodology for all G-SIBs and for all years. To our knowledge, this is the first dataset showing the evolution over time of the number of majority-owned subsidiaries of the largest global banks in a thirteen years period. To date, other empirical studies on the count of international banks' subsidiaries had only focused on figures at a specific time. While we are aware of methodological issues (see section 3.2), we think that the results provide robust information about the evolution of the complexity of bank structures over time.

In this analysis we have used the November 2013 list of 29 G-SIBs published by the FSB, which adds the Chinese banking group ICBC (which first appeared on the list in November 2013). Data clearly show that, on average, complexity has approximately doubled in the period considered, albeit with significant differences across G-SIBs.⁷⁰ The average number of subsidiaries rose from 500 in 2002 to about 1,000 in 2013. Clearly, there is a huge difference (quite stable over time, if not increasing) between the magnitude of complexity of the most and least complicated G-SIBs. After 2005, the difference in terms of the number of subsidiaries between the most complex and the least complex G-SIB has always exceeded 2,000 subsidiaries at all points considered. And, even if Asian G-SIBs, whose corporate structure appears to be much simpler, are not taken into account, large differences remain

⁶⁹ While these data were publicly available to subscribers when they were published, earlier observations are dropped when new data are posted and so historical data are not available to subscribers. We are grateful to Bankscope for having pulled data from their archives to make this study possible.

⁷⁰ Although we have cross-checked the data with every available source, in the end we have relied on Bankscope for the accuracy of the numbers reported. In some cases, abrupt changes from one point in time to another can be easily explained, for example in case of large M&A deals; in other cases the interpretation may be more difficult.

between some firms with “only” few hundred subsidiaries and institutions with a number of subsidiaries which is close or higher than 2,000. However, it should also be taken into account that even banks which tend to operate with a comparatively low number of subsidiaries may rely on a very large network of branches, which adds to complexity: this is the case, for example, of BBVA and Santander, which have been operating in recent years with about, respectively, 400 and 700 subsidiaries, but have 8,000 and 14,000 branches, of which more than half are located in foreign countries (see Table 2.1).

It is also very important to remember (see Chapter 2) that banking subsidiaries, while representing the large majority of each G-SIB consolidated total assets, are a small proportion of the total number of subsidiaries. The majority of legal entities are vehicles/trusts, other financial subsidiaries and, interestingly, non-financial subsidiaries (which include a huge variety of businesses, ranging from energy business to hotels). The latter category is the largest, accounting for over 40% of the total number of subsidiaries.

In Chapter 1 we have discussed the drivers that are likely to produce an increase of complexity (asymmetric information, SPVs, taxation, regulatory constraints, etc.). Looking at the data, a number of possible interpretations occur although unfortunately data publicly disclosed do not make it possible to confirm or refute these conjectures. For example, the boom of securitization and the related proliferation of SPVs in the run-up to the 2008 global financial crisis may have played a role in the increasing complexity of the corporate structures of G-SIBs. But public disclosures do not reveal the number of securitization-related SPVs for each G-SIB. Indeed, SPVs have often been designed so that they will not be consolidated.

Another factor that undoubtedly contributed to the near doubling of the number of subsidiaries over the period is the legacy of the numerous mergers and acquisitions executed by most of these G-SIBs (for additional discussion of this point and some examples see

Chapter 1). A factor that is undoubtedly related to the cumulative impact of mergers and acquisitions is the growing assets of most G-SIBs. On average total assets have almost doubled, from around \$600 billion in 2002 to about \$1.5 trillion in 2013 (Table 3.2). Size is strongly correlated with the number of subsidiaries, but it undoubtedly serves as a proxy for several other forces that are difficult to measure.⁷¹

Moreover, the number of subsidiaries may differ substantially across G-SIBs at any given size and so the influence of corporate strategy and home and host country regulations should not be ignored. Figure 3.2.a depicts the average of majority-owned subsidiaries and the average of total assets of the 29 G-SIBs sample from 2002 to 2013. Figure 3.2.b shows the log of the two averages and indicates that a 1% change in total assets produces a 0.826% change in the number of majority-owned subsidiaries. It is apparent that at any given size, G-SIBs may have substantially different numbers of subsidiaries. The finding on the relation between size and complexity is consistent with the results obtained by previous econometric analyses (Avraham et al. 2012, Cetorelli and Goldberg 2014). But prior work has focused solely on cross-sectional data. The current results are based on both cross-sectional data and time series data and indicate that the relationship between asset size and complexity seems to be robust over time.

On the basis of this measure of corporate complexity, the number of subsidiaries and how it evolved over the time within an individual G-SIB and across G-SIBs, it is not possible to draw generalizations about which structures proved more resilient during the financial crisis. Certainly some of the G-SIBs with a large and growing number of subsidiaries performed poorly during the crisis, but others, with roughly the same number of subsidiaries,

⁷¹ In principle, a G-SIB might double its assets without changing its corporate structure, but this would, of course, depend on how it chose to grow. Growth through acquisition or growth through expansion in the range of activities would be likely to increase the number of subsidiaries, as would expansion into countries that demand that foreign firms establish local subsidiaries.

performed relatively well. By the same token, G-SIBs with the least corporate complexity on this measure (leaving aside the Asian giants) did not necessarily perform better.

A G-SIB's concentration in particular lines of business or the geographic distribution of its activities probably mattered more than its number of subsidiaries. For example, a bank's core profitability was much less threatened during the 2007-2008 crisis if it had strong retail franchises in Asia and Latin American than if it specialized in underwriting securitized debt in globalized capital markets.⁷² Of course other aspects of corporate complexity that we have not been able to measure may have had a much more important influence on the G-SIBs than the number of their subsidiaries. All that can be inferred from these data is that this measure of corporate complexity does not provide much insight into which G-SIB weathered the crisis more successfully.

⁷² One should bear in mind as well, that the results might have been different if we had experienced a different sort of crisis. In this respect, the performance of Santander, the largest bank in Spain, was impressive because it maintained its equilibrium through two serious crises, one involving its home country. Spain's second largest banking group, BBVA, also weathered the double crises impressively. Both have a relatively small number of subsidiaries, but other G-SIBs with a roughly comparable number of subsidiaries stumbled badly in the 2008-2009 crisis.

Table 3.1: Majority-owned subsidiaries of Global Systemically Important Banks, 2002-2013 (ranked by December 2013 number of subsidiaries)

	G-SIBs	December 2013	December 2012	December 2011	December 2010	December 2009	December 2008	November 2007	December 2006	October 2005	December 2004	December 2003	November 2002
1	BNP Paribas	2,460	2,813	2,936	2,766	1,993	1,316	1,163	1,248	1,043	1,054	903	931
2	HSBC	2,348	1,902	1,799	2,010	1,807	1,111	1,182	1,248	686	989	651	650
3	Unicredit	2,189	2,044	2,409	2,222	1,562	1,560	932	1,444	185	183	170	102
4	Deutsche Bank	2,101	2,156	2,176	2,040	2,052	1,988	1,918	1,746	632	989	1,008	1,879
5	Citigroup	1,997	2,325	3,490	2,626	2,733	3,030	2,374	2,696	497	1,382	1,552	.
6	Bank of America	1,891	2,103	2,191	2,210	2,745	1,457	1,410	1,840	1,146	790	.	.
7	Royal Bank of Scotland	1,818	1,516	1,796	1,237	949	1,110	1,155	1,277	1,218	860	777	675
8	Barclays	1,597	1,242	1,398	1,380	1,038	1,090	1,017	1,006	796	476	483	468
9	Wells Fargo	1,570	1,557	1,890	2,120	2,646	838	910	1,316	621	590	.	.
10	BPCE SA	1,435	1,442	938	.	763	.	.	.	.	.	.	.
11	Crédit Agricole SA	1,272	1,187	1,570	812	.	768	762	591	126	119	122	183
12	JPMorgan Chase	1,246	1,190	972	923	831	1,000	829	946	532	678	393	364
13	Morgan Stanley	1,194	1,344	1,481	1,650	1,691	1,299	1,008	1,194	788	.	.	.
14	ING Groep	1,107	1,427	1,749	1,762	1,739	1,720	1,383	1,566	1,409	1,925	1,401	1,392
15	Société Générale	860	927	941	1,016	1,037	963	846	743	672	630	554	382
16	Santander	745	596	651	670	999	687	539	584	535	396	310	308
17	UBS	458	474	382	364	320	334	412	568	385	301	.	.
18	BBVA	422	417	380	484	507	402	352	399	344	422	345	344
19	Standard Chartered	366	249	238	281	161	122	102	70	49	48	55	65
20	Goldman Sachs	356	440	402	298	307	424	446	191	136	70	56	47
21	Credit Suisse	340	265	273	262	303	330	286	470	361	440	427	436
22	Bank of New York Mellon	238	301	356	270	428	258	.	.	.	.	.	.
23	Nordea	227	182	218	193	224	181	206	180	206	228	154	192
24	Sumitomo Mitsui	182	165	135	147	148	241	76	10	67	61	73	.
25	Mizuho	175	104	97	129	137	109	77	37	18	12	5	.
26	State Street Corporation	167	147	142	95	85	83	72	70	51	47	.	.
27	Mitsubishi UFJ	129	110	103	139	147	145	104	198	104	92	87	82
28	Bank of China	106	108	113	108	106	108	103	104	.	.	.	.
29	ICBC	56	30	23	21	35	31	18	11	.	.	.	.
	Average	1,002	992	1,078	1,008	982	811	729	806	504	533	476	500
	Median	860	927	938	741	797	728	762	591	497	431	369	364
	Range	2,404	2,783	3,467	2,745	2,710	2,999	2,356	2,686	1,391	1,913	1,547	1,832

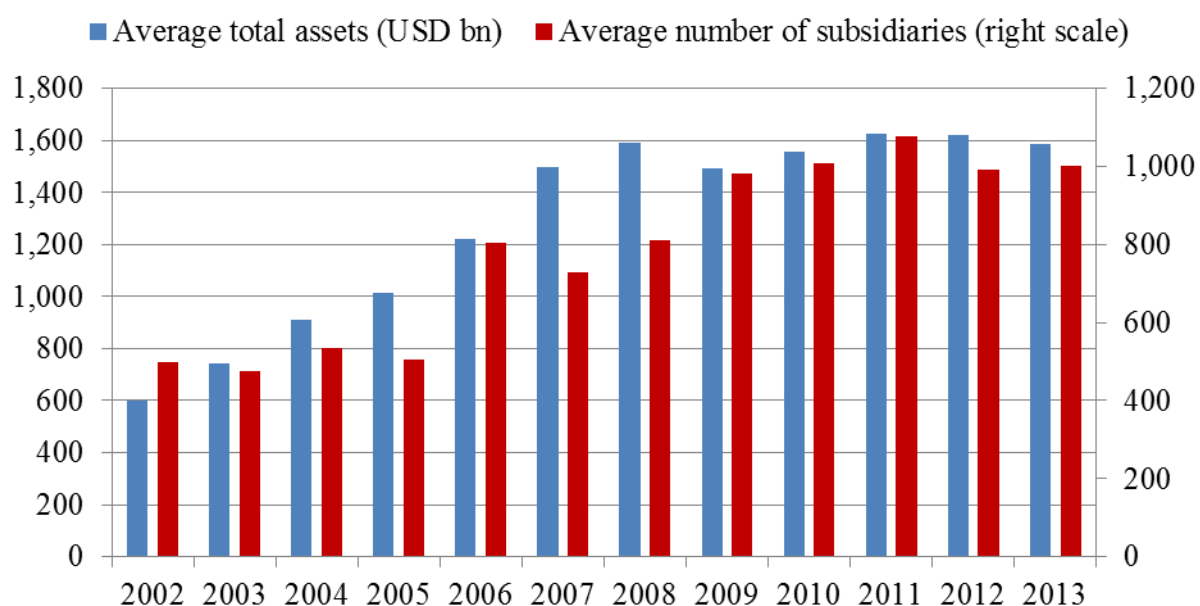
Source: Bankscope. Majority-owned subsidiaries for which the G-SIB is the ultimate owner with a minimum control path of 50.01% in each piece of the control chain. Please see section 3.2 on data issues on bank corporate structures for methodological details. Missing values are not available either because the current G-SIB was not existing in a specific year, or because Bankscope does not report the data.

Table 3.2: Total assets of Global Systemically Important Bank, USD million, 2002-2013 (ranked by 2013 total assets)

	G-SIBs	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
1	ICBC	3,100,051	2,789,083	2,456,295	2,032,134	1,725,938	1,427,610	1,188,800	961,588	799,996	609,188	550,576	577,093
2	HSBC	2,671,318	2,692,538	2,555,579	2,454,689	2,364,452	2,527,465	2,354,266	1,860,758	1,501,970	1,279,974	1,034,216	758,605
3	BNP Paribas	2,482,608	2,516,427	2,542,739	2,669,907	2,964,299	2,888,527	2,494,412	1,896,935	1,484,161	1,233,969	988,881	744,867
4	Mitsubishi UFJ	2,428,851	2,407,111	2,572,388	2,384,446	2,093,482	1,928,635	1,824,397	1,504,061	1,519,015	1,727,303	1,750,950	1,445,412
5	JPMorgan Chase	2,415,689	2,359,141	2,265,792	2,117,605	2,031,989	2,175,052	1,562,147	1,351,520	1,198,942	1,157,248	770,912	758,800
6	Bank of China	2,273,581	2,016,124	1,877,476	1,579,348	1,281,735	1,017,130	820,198	682,271	587,352	515,341	480,056	427,213
7	Deutsche Bank	2,222,314	2,668,261	2,799,978	2,546,272	2,161,842	3,065,094	2,833,804	2,070,022	1,174,917	1,144,157	1,014,845	795,151
8	Barclays	2,161,178	2,348,643	2,417,327	2,331,943	2,233,156	2,992,813	2,459,149	1,956,710	1,591,661	1,039,441	791,045	648,728
9	Crédit Agricole SA	2,119,532	2,134,093	2,230,053	2,129,248	2,243,491	2,300,772	2,081,883	1,660,125	1,252,189	1,113,384	992,656	530,325
10	Bank of America	2,102,273	2,209,974	2,129,046	2,264,909	2,223,299	1,817,943	1,715,746	1,459,737	1,291,803	1,110,457	719,483	660,458
11	Citigroup	1,880,382	1,864,660	1,873,878	1,913,902	1,856,646	1,938,470	2,187,631	1,884,318	1,494,037	1,484,101	1,264,032	1,097,590
12	Société Générale	1,703,575	1,650,467	1,528,493	1,512,656	1,474,733	1,572,616	1,577,745	1,260,162	1,000,881	818,744	681,216	525,789
13	Royal Bank of Scotland	1,692,816	2,070,846	2,329,726	2,275,479	2,747,435	3,501,103	3,807,892	1,710,636	1,337,627	1,345,276	812,302	663,114
14	Mizuho	1,664,893	1,839,478	1,964,454	1,890,274	1,636,567	1,516,647	1,495,285	1,235,864	1,227,052	1,296,209	1,285,738	1,081,043
15	Sumitomo Mitsui	1,568,600	1,572,041	1,727,016	1,641,656	1,318,959	1,072,635	826,623	881,618	896,946	950,483	844,970	.
16	Santander	1,538,599	1,675,155	1,619,260	1,626,805	1,599,818	1,460,763	1,343,905	1,098,212	954,507	905,097	437,509	334,554
17	Wells Fargo	1,527,015	1,422,968	1,313,867	1,258,128	1,243,646	1,309,639	575,442	481,996	481,741	427,849	387,798	349,259
18	ING Groep	1,490,310	1,538,714	1,655,102	1,666,228	1,676,332	1,853,264	1,932,151	1,615,049	1,366,851	1,179,853	983,545	751,227
19	Unicredit	1,166,513	1,222,889	1,181,999	1,241,966	1,337,962	1,455,170	1,504,134	1,084,267	928,762	361,590	300,652	226,638
20	UBS	1,132,765	1,374,424	1,505,965	1,401,923	1,300,862	1,894,157	2,021,227	1,922,775	1,567,564	1,535,099	1,253,279	851,686
21	BPCE SA	988,072	1,023,467	1,029,536	990,669	869,897	.	.	.	.	.	.	.
22	Credit Suisse	979,031	1,008,379	1,115,065	1,098,345	1,000,900	1,100,263	1,208,956	1,029,219	1,018,833	962,783	812,021	740,668
23	Goldman Sachs	911,507	938,555	923,225	911,332	848,942	884,547	1,119,796	838,201	706,804	531,379	403,799	355,574
24	Nordea	869,444	881,618	926,645	776,108	731,163	659,765	572,728	456,855	384,052	342,988	302,235	261,765
25	Morgan Stanley	832,702	780,960	749,898	807,698	771,462	658,812	1,045,409	1,120,645	898,523	775,410	602,843	529,499
26	BBVA	803,441	819,464	754,092	738,560	770,809	751,335	739,296	542,495	462,904	448,732	356,921	288,311
27	Standard Chartered	674,380	631,208	592,686	516,542	436,653	435,068	329,871	266,047	215,096	141,688	120,202	112,953
28	Bank of New York Mellon	374,310	358,990	325,266	247,259	212,224	237,512	197,656	.	.	.	.	.
29	State Street Corporation	243,291	222,582	216,827	160,505	157,946	173,631	142,543	107,353	97,968	94,040	87,534	85,794
	Average	1,586,863	1,622,009	1,626,885	1,558,156	1,493,677	1,593,444	1,498,682	1,219,979	1,016,376	908,585	741,860	600,081
	Median	1,568,600	1,650,467	1,655,102	1,626,805	1,474,733	1,488,705	1,499,709	1,235,864	1,018,833	962,783	770,912	612,911
	Range	2,856,760	2,566,501	2,583,151	2,509,402	2,806,353	3,327,472	3,665,349	1,962,669	1,493,693	1,633,263	1,663,416	1,359,618

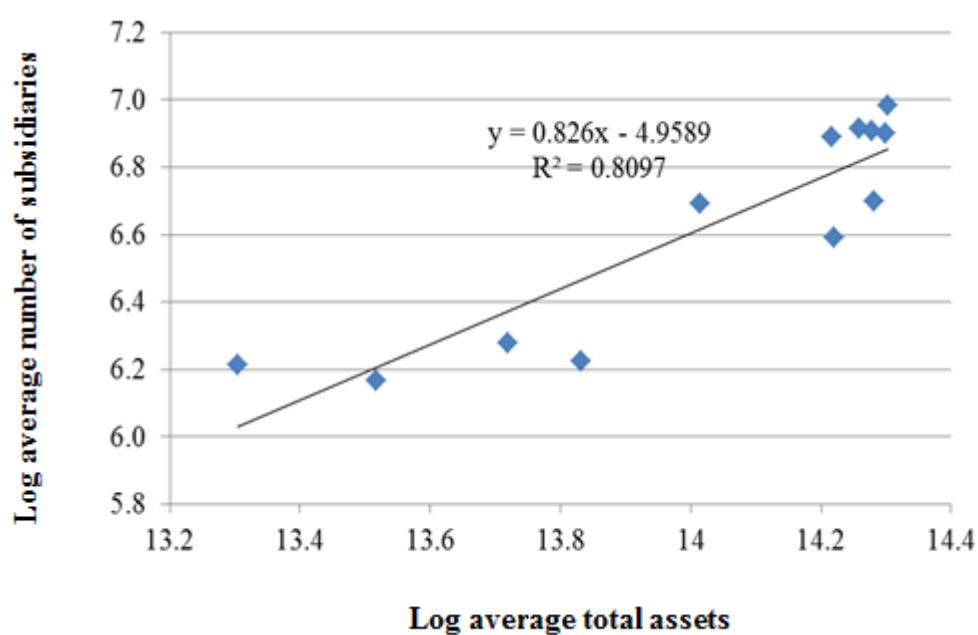
Source: Bankscope. Missing values are not available because the G-SIB had not yet been formed or had just been organized. For BPCE and Crédit Agricole, data reported here refer to the largest banking entity of the groups (BPCE SA and Crédit Agricole SA).

Figure 3.2.a: Evolution of the average of majority-owned subsidiaries and the average of total assets for the sample of 29 G-SIBs, 2002-2013



Source: analysis of Bankscope data.

Figure 3.2.b: Relationship between the average of majority-owned subsidiaries (log) and the average of total assets (log) for the sample of 29 G-SIBs, 2002-2013*

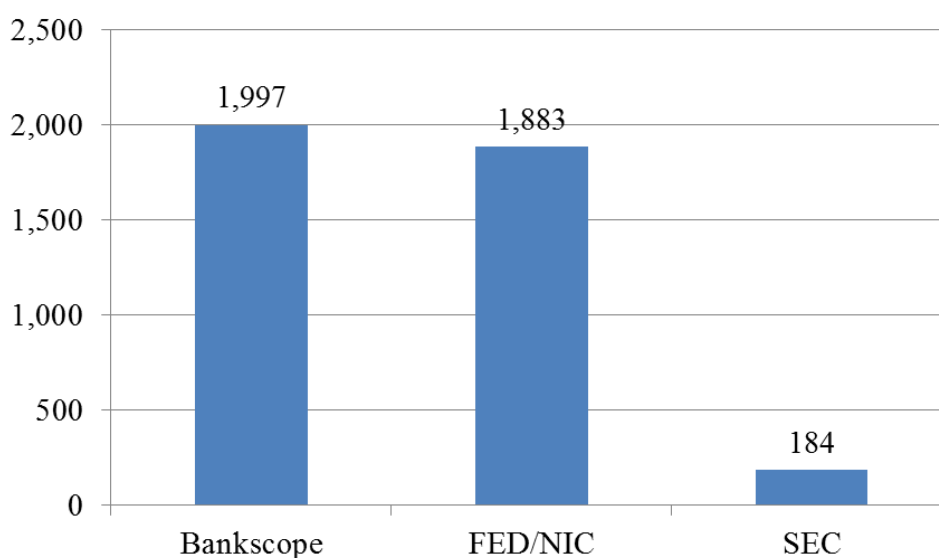


*Each diamond corresponds to one year/point in time. Source: computations on Bankscope data.

3.2 Data issues regarding bank corporate structures

It should be relatively easy to compare the corporate structures across G-SIBs and over time, but unfortunately gaps in disclosures and inconsistent definitions present formidable hurdles. One reason is that we lack an official data source with comprehensive and consistent data for all banking institutions around the world. Data provided by different sources (often based on different regulatory or accounting criteria) may differ significantly in some cases raising troubling questions about consistency. Figures 3.3.a and 3.3.b illustrate this problem.⁷³

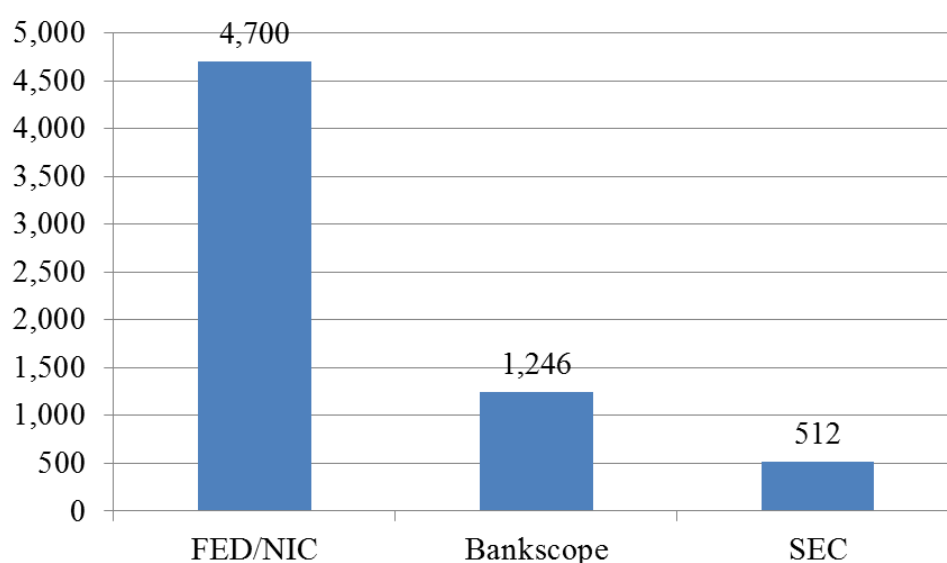
Figure 3.3.a: Number of subsidiaries of Citigroup as of yearend 2013



Sources: Bankscope (majority-owned subsidiaries), National Information Center/Federal Reserve, Citigroup 10-K SEC filing for 2013 (Exhibit 21.01).

⁷³ As shown by the figures, in some cases two different sources may provide quite similar figures, with a third source giving very different results, while in other cases there may be significant differences among multiple sources.

Figure 3.3.b: Number of subsidiaries of JPMorgan Chase & Co. as of yearend 2013



Sources: Bankscope (majority-owned subsidiaries), National Information Center/Federal Reserve, JPMorgan Chase & Co. 10-K SEC filing for 2013 (Exhibit 21).

Nonetheless, despite the inconsistencies across sources of data and uncertainties that may remain about the precise number of subsidiaries for each G-SIB, the totals are high – with hundreds or even thousands of legal entities for each institution. This measure of complexity would be even higher if we were able to add data on foreign branches to our analysis (which may be appropriate for considering resolution policy as indicated in Chapter 2), but unfortunately these data are often not available. Of course, a simple count of subsidiaries is not a complete indicator of the complexity of G-SIBs, but the number of subsidiaries does indicate a key challenge to an orderly resolution.

Our analysis of bank corporate structures largely relies on the Bankscope database, produced by Bureau Van Dijk, because it: i) provides a clear and quite simple criterion to identify majority-owned subsidiaries,⁷⁴ defined as those controlled by the parent with at least

⁷⁴ “Ultimately-owned subsidiaries” is the Bankscope definition.

a 50.01% percentage along all steps of the control chain;⁷⁵ ii) provides consistent coverage of all banking groups worldwide, which is essential given that the group of G-SIBs include US, EU and Asian firms; iii) includes data on financials of subsidiaries (total assets, income, number of employees, although these data are not always available); iv) includes a classification of subsidiaries by industry (bank, insurance, trusts/vehicles, other financial firms, non-financial firms)⁷⁶; and v) data can be downloaded in Excel, which facilitates analysis. Bankscope also reports the level of ownership of each legal entity (calibrated from 1 to 10 based on the number of legal entities between the parent and the subsidiary, indicating the length of the chain of control between the parent and each majority-owned legal entity). We have included in our count of subsidiaries all majority-owned subsidiaries, regardless of the length of the chain of control.⁷⁷

Other sources, such as the Federal Reserve/National Information Center data and SEC filings, do not provide all these details. For example, FED/NIC data on organizational structures, based on confidential forms submitted by banks (e.g. form FR Y-10), are focused on US banks and on US operations of non-US banks. This omits a considerable amount of useful information on the non-U.S. corporate structures of European and Asian G-SIBs. Moreover, publicly available FED/NIC data do not report the financials of subsidiaries, and the categorization of the business/industry is much less specific than the Bankscope classifications.⁷⁸ Moreover, the FED/NIC data are only available in pdf files, which are less amenable to statistical analysis with standard software.

⁷⁵ It should be noted that a lower threshold to define control would yield a higher number of subsidiaries. Of course, if other ownership shares are widely dispersed or placed in the hands of passive investors, control can be exercised even when the group owns a minority stake.

⁷⁶ NAICS industry codes, which provide more detailed information, are also reported, but with many gaps.

⁷⁷ Cetorelli and Goldberg (2014) show that a very large share of subsidiaries are not directly controlled by the parent (Level 1), but are controlled indirectly through other subsidiaries (being thus classified as Level 2, 3, 4 etc. subsidiaries): thus, most of the organizational complexity appears to be related to indirectly controlled subsidiaries.

⁷⁸ For example, the FED/NIC database refers to “domestic entity other”, “international nonbank subs of domestic entities”, and “foreign entity other”.

The main criterion for the inclusion of legal entities in the FED/NIC organizational hierarchy is a definition of control under Regulation Y, which is essentially a 25% control.⁷⁹ However, additional entities that meet FR Y-10/10F “reportability criteria” are included, as well as entities for which the relationship is “of interest to the Federal Reserve”. These latter two conditions make it very difficult for an external analyst to compare these data with data available from other sources.⁸⁰ But the FED/NIC data also have strong points: first, they provide information on the level of ownership and hierarchy of control for each subsidiary; second, it appears to be the only database that provides corporate structure trees at any given time.

The exhibits of SEC filings reporting the list of subsidiaries (in 10-K for US firms, in 20-F for non-US firms) only indicate, as of yearend, the name and jurisdiction of subsidiaries. The minimum percentage of control for each may be indicated in an explanatory note

⁷⁹ The lower threshold relative to the Bankscope methodology we have used (50.01%) might at least partially explain why NIC/FED numbers are often higher. This is the definition of control provided by Regulation Y (Bank Holding Companies and Change in Bank Control), 12 CFR 225.2(e):

“(1) Control of a bank or other company means (except for the purposes of subpart E of this part):

- (i) Ownership, control, or power to vote 25 percent or more of the outstanding shares of any class of voting securities of the bank or other company, directly or indirectly or acting through one or more other persons;
- (ii) Control in any manner over the election of a majority of the directors, trustees, or general partners (or individuals exercising similar functions) of the bank or other company;
- (iii) The power to exercise, directly or indirectly, a controlling influence over the management or policies of the bank or other company, as determined by the Board after notice and opportunity for hearing in accordance with § 225.31 of subpart D of this part; or
- (iv) Conditioning in any manner the transfer of 25 percent or more of the outstanding shares of any class of voting securities of a bank or other company upon the transfer of 25 percent or more of the outstanding shares of any class of voting securities of another bank or other company.

(2) A bank or other company is deemed to control voting securities or assets owned, controlled, or held, directly or indirectly:

- (i) By any subsidiary of the bank or other company;
- (ii) In a fiduciary capacity (including by pension and profit-sharing trusts) for the benefit of the shareholders, members, or employees (or individuals serving in similar capacities) of the bank or other company or any of its subsidiaries; or
- (iii) In a fiduciary capacity for the benefit of the bank or other company or any of its subsidiaries.”

⁸⁰ These broader criteria for inclusion of legal entities in the NIC/FED organizational hierarchy are likely to produce a significant impact. Specifically, we have noticed that the NIC/FED list of subsidiaries is particularly long for two of the largest firms, Goldman Sachs and Morgan Stanley, respectively with 14,814 and 8,998 entities as of 31 December 2013. The entities that meet the FR Y-10 reportability criteria are outside of the scope of Regulation Y definition of control and do not need to fall under such definition: Large Merchant Banking Investments are included in this category, and this might explain the very high number of entities for Goldman Sachs and Morgan Stanley.

preceding the list.⁸¹ Unfortunately, the SEC lists provide no information on the financial profile of the subsidiary or its principal line of business. Moreover, unlike Bankscope and FED/NIC data, the SEC filings do not provide an indication on the ownership/hierarchical structure (i.e. the chain of control from the top of the group to each of the subsidiaries). Most troubling, the SEC permits reporting firms to omit “non-significant” subsidiaries,”⁸² which, in comparison to other sources of data, may be a very large number of subsidiaries that could pose an obstacle to an orderly resolution. Finally, the SEC exhibits do not provide lists of subsidiaries in a format that may be easily analyzed with standard statistical software.

Annual reports of banks and other official documents published by banks on their websites often include a list of subsidiaries. However, the criteria used to build these lists may vary significantly across institutions and across countries, which will inevitably give rise to inconsistencies. Moreover, relevant information related to each of the subsidiaries such as the financial profile, sector of activity, and ownership level, are seldom included. Even the public sections of living wills submitted to the US regulators by US and non-US banking groups do not include a full list of subsidiaries, but focus on material entities; and, as we have discussed earlier, this information on material entities is generally insufficient and inadequate

⁸¹ For most, the ownership share is above 50%, indeed, often above 90%.

⁸² Regulation S-K envisages the possibility that groups of subsidiaries are omitted on ground that they are not significant if considered in the aggregate (Regulation S-K, Standard instructions for filing forms, 17 CFR 229.601(b)(21) (ii)). Regulation S-X (Form and content of and requirements for financial statements, 17 CFR 210.1-02(w)), defines significant subsidiary as “a subsidiary, including its subsidiaries, which meets any of the following conditions:

(1) The registrant's and its other subsidiaries' investments in and advances to the subsidiary exceed 10 percent of the total assets of the registrant and its subsidiaries consolidated as of the end of the most recently completed fiscal year (for a proposed combination between entities under common control, this condition is also met when the number of common shares exchanged or to be exchanged by the registrant exceeds 10 percent of its total common shares outstanding at the date the combination is initiated); or

(2) The registrant's and its other subsidiaries' proportionate share of the total assets (after intercompany eliminations) of the subsidiary exceeds 10 percent of the total assets of the registrants and its subsidiaries consolidated as of the end of the most recently completed fiscal year; or

(3) The registrant's and its other subsidiaries' equity in the income from continuing operations before income taxes, extraordinary items and cumulative effect of a change in accounting principle of the subsidiary exclusive of amounts attributable to any non-controlling interests exceeds 10 percent of such income of the registrant and its subsidiaries consolidated for the most recently completed fiscal year.”

for an external observer to evaluate the kinds of obstacles the group's legal structure would present to an orderly resolution.

Other sources (e.g. the SNL database, or the new website www.opencorporates.com) do report bank corporate structures information, albeit with different degree of detail, but they generally provide less comprehensive information, and they do not seem as helpful as other sources for our statistical analysis.

For all the above discussed reasons, we have chosen to rely on Bankscope as the primary source of information on the corporate structures of G-SIBs. Nonetheless, we used other sources as well to evaluate the consistency of information across sources. Some internal experts in various G-SIBs emphasize that Bankscope data may often be flawed; however, in the absence of stronger, more consistent disclosure regulations these are the best data publicly available for our purposes.

Since at any point Bankscope makes current data on bank corporate structures available, but not the historical data, we have also used Bankscope historical discs to get the information and data on majority-owned subsidiaries for past years, going back to 2002. The latter is the oldest year for which data on subsidiaries reported by Bankscope appear to have the same coverage as current and most recent data and for which numbers on subsidiaries can be consistently analyzed, and it enables us to use the 50.01% filter for majority-owned subsidiaries for all G-SIBs and for all years from 2002 to 2013.

3.3 Concluding comments

All in all our work with different sources of data on bank corporate structures has highlighted that troubling gaps and inconsistencies remain. Moreover, existing data are highly fragmented and difficult to combine accurately. Given the high priority that officials have placed on simplifying the corporate structures of G-SIBs and enhancing the

transparency of disclosures, efforts should be made to develop a consistent data profile for all banking groups, especially for G-SIBs. These data should be based on clear and consistent criteria in a format that can be readily analyzed. Both G-SIBs and the resolution authorities would benefit from greater transparency. Without reliable, consistent data an external analyst has great difficulty in monitoring what progress has been made in reducing obstacles to an orderly resolution. Because the G-SIB designation is an official responsibility of the FSB, it is the logical place to develop and disclose an improved database. Indeed, the FSB should have access to such data to form and update their list of G-SIBs. Providing public access to such data could help bolster confidence in the resolution process. Lack of public confidence in resolution procedures can be a substantial obstacle to implementing an orderly resolution.

Appendix 3.A

Literature review on bank corporate structures: previous key empirical contributions

Corporate structures of banking groups have dramatically evolved over the last few decades, following deregulation, conglomeration, consolidation and globalization processes. Three decades ago banks were operating with some degree of corporate complexity, but such complexity has ballooned ever since. Academics and policy makers have started to focus on complexity as a key dimension of the too-big-to-fail problem only in recent times, notably after the great 2008 global financial crisis. Therefore, the strand of empirical research on corporate structures of banks – and their complexity – is relatively small and has evolved largely after the crisis.

Herring and Santomero (1990) analyzed the corporate structures of financial institutions in their paper focused on the benefits and costs of financial conglomerates, defined as “a category including universal banks, multi-product bank holding companies and other diversified financial firms which perform basic banking functions”. First, they distinguished between “legal separateness” and “operational separateness”, with the former entailing legally separate corporate entities, each with its own management, accounts, board of directors and capital. Despite legal separation, business conducted under different legal entities may still be managed in a coordinated and integrated way, allowing to reap the advantages of an integrated firm, such as economies of scale and scope. On the other hand, operational separateness implies regulatory or self-imposed restrictions (e.g. Chinese walls) which impede the integrated production of financial products and services and may restrict the flows of credit and information within the group; these kinds of constraints may impede the realization of economies of scale and scope.

Herring and Santomero (1990) note that different degree of separateness, and different combinations of the two types of separateness, may produce four basic different corporate

structure models for a financial conglomerate: i) complete integration (German model), under which the firm may engage in all activities through a single corporate entity (a variation of this model with a mild form of separation is complete integration with collateralized deposits, with assets pledged against deposits); ii) bank parent conducting the banking business and subsidiaries engaged in non-bank business (British model); iii) holding company parent (US model), with all activities conducted by banking and non-banking subsidiaries (with a variation based on the source-of-strength doctrine, under which regulators are allowed to use resources of the holding company and of non-bank subsidiaries to support the banking entities in times of crisis); iv) holding company model plus complete operational separateness. After discussing the possible corporate structure models, Herring and Santomero (1990) move on to compare the domestic corporate structure of Deutsche Bank, Citicorp and UBS. They found that Citicorp, despite having a market capitalization close to that of UBS and lower than Deutsche Bank, was operating with many more domestic subsidiaries: 521, versus 30 for Deutsche Bank and 35 for UBS. While they argue that stricter US regulatory constraints at that time certainly played a role, they also observe that Deutsche Bank and UBS chose to operate with some degree of corporate complexity, despite the lack of any legal requirement to do so: therefore, they pose the question of what may drive the choices on corporate complexity aside from and beyond regulatory constraints.

First, they note that corporate separateness and the related accounting separateness may facilitate independence between activities in terms of operation, financing and information flows. Second, limited liability may protect the group from shocks hitting only one part of it. Tax benefits related to unconsolidated reporting of income can be a third rationale. Fourth, firms might choose to allow acquired subsidiaries to maintain their corporate identity and name in order to preserve their reputational capital. Finally, corporate separateness might serve the purpose of facilitating managerial control, better dealing with different business

cultures (e.g. investment bankers vs commercial bankers) and reassuring customers about conflicts of interest. Herring and Santomero (1990) conclude that regulation certainly is a key driver of corporate complexity, as shown by the Citicorp case, and it is likely to impose an unnecessary burden on firms and lead to competitive disadvantages. However, they also note that even without those regulatory constraints banking firms would still choose to operate with some degree of corporate separateness, rather than with a completely integrated structure.

Ten years after the 1990 paper by Herring and Santomero, the financial regulatory and industry landscape had dramatically evolved, especially in the United States, where the 1999 Gramm-Leach-Bliley Act (GLBA) removed the sectoral regulatory barriers and constraints on commercial banks' engagement in other financial segments imposed by the 1933 Glass Steagall Act, de facto making it possible for US banks to adopt a universal bank model. Financial conglomerates and universal banking, allowed in Europe since the 1989 Second Banking Directive, began to appear in the United States as well. Herring (2002, 2003) discusses the implications of financial conglomerates for bank insolvency regimes, observing that these firms were rapidly growing in size, global reach and complexity, and they were playing a central role in the booming OTC derivatives market; most importantly for complexity analysis, they were operating through hundreds of different legal entities operating in scores of countries. Herring (2002, 2003) reviews the collapse of Bankhaus Herstatt, Drexel Burnham Lambert, BCCI, Barings and LTCM – all firms smaller than large conglomerates – to highlight the formidable challenges that resolution of a large, international financial conglomerate would pose. Therefore, in the early 2000s the issue of bank corporate complexity – and its implications for resolution regimes – was discussed but had not yet appeared on the international regulatory and supervisory agenda.

Over the last ten years, much has happened: in particular, the 2008 global financial crisis obliged regulators and policy-makers around the world to place the too-big-to-fail problem on top of their agenda. Because of the perception that too-big-to-fail was too expensive to continue, the massive wave of banking and financial re-regulation in the United States and in Europe has aimed to develop tools that will make it possible to resolve even a Systemically Important Financial Institution (SIFI) without systemic spillovers or costs for taxpayers. The strengthening of capital requirements and the design of new resolution regimes for SIFIs have been two key instruments to achieve that goal. However, “too-big-to-fail” is a misleading expression because size is only one the various factors that can make a financial institution systemically relevant, albeit the factor that is easiest to measure. Other factors include interconnectedness, substitutability, cross-country activity, and complexity – the latter has thus now become a priority in the regulatory agenda and also a focus in the academic debate.

Despite the post-crisis attention to complexity, relatively little empirical work has been published. This section reviews key findings of these contributions and highlights some new contributions to this relatively recent research field, with a specific focus on the Global Systemically Important Banks (G-SIBs) identified by the Financial Stability Board. The focus of the analysis will largely be on subsidiaries, but it should be noted that foreign branches matter as well and are key to full understanding of the obstacles corporate structure poses for an orderly resolution. Data on foreign branches are even more difficult to collect than data on subsidiaries (Herring and Carmassi, 2015). We are not aware of any study that has compiled consistent data on corporate structures of G-SIBs including foreign branches.

Herring and Carmassi (2010) documented the huge number of majority-owned subsidiaries of 16 Large, Complex Financial Institutions (LCFIs) just before the 2008 crisis. Using Bankscope data on majority-owned subsidiaries (subsidiaries that are controlled with a

minimum path of 50.01% along the entire control chain), they showed that, at yearend 2007, LCFIs were operating with a vast and complex network of legal entities, ranging from 267 to 2,435. On average only a small share of subsidiaries for each LCFI was engaged in the banking (5%) or insurance (2%) business, while most subsidiaries were trusts and vehicles (22%), other financial companies (27%) and non-financial/industrial companies (43%).

Herring and Carmassi (2010) report that, on average, at yearend 2007 the 16 LCFIs had about 2.5 times the number of majority-owned subsidiaries of the largest 16 non-financial companies (based on market capitalization), signaling the presence of some relevant bank-specific driver of complexity. While most of the identified possible causes of complexity are not bank-specific, regulation is bank-specific and deserves special consideration. As illustrated by Herring and Santomero (1990), regulatory constraints include the requirement to operate with a bank parent controlling non-bank operating subsidiaries, or to establish a bank holding company controlling bank and non-bank subsidiaries (the dominant model in the United States). More broadly, regulators may impose some form of corporate separateness on bank activities in securities, insurance and real estate business. For banking firms operating worldwide such requirements may be imposed not just by the home country, but by a significant number of host jurisdictions, contributing to further increase complexity. Herring and Carmassi (2010) discuss the formidable implications of complexity for systemic risk by showing its effects on the bankruptcy of Lehman Brothers, which was by no means the most complex of the institutions on the list of LCFIs. They conclude that concerns about corporate complexity should focus on the root causes of complexity, including regulation and taxation.

Avraham et al. (2012) focused on the corporate structure of US bank holding companies, showing their increase in size, complexity and geographical scope over the last two and a half decades. They report that the four most complex firms in terms of number of

legal entities had over 2,000 subsidiaries as of February 2012 (with two of them being above 3,000); in contrast, based on their data, only one firm was operating with more than 500 subsidiaries in 1991 (they rely on data of Federal Reserve filings). After discussing the various factors that have driven the increase in size, complexity, scope and consolidation of BHCs over time, their econometric analysis of cross-sectional data indicates that size is significantly correlated with complexity, although the relationship is not proportional: a one percent increase in size is likely to be correlated with a less than one percent increase in the number of subsidiaries. Other factors, such as industry or geographical diversification or the share of domestic commercial bank assets are positively correlated with complexity, but the relationship is not statistically significant.

Cetorelli and Goldberg (2014) deepen the analysis of Avraham et al. (2012) and refer to three different concepts of complexity: i) organizational complexity, referring to the number of affiliates; ii) business complexity, referring to the types and variety of activities conducted and iii) geographical complexity, referred to the globally diversified scale of operations. Their empirical study focuses on banking groups headquartered in the US and on non-US banking groups with significant operations in the United States. They also find a significant, positive relationship between the size of the banking groups and the number of their subsidiaries. Moreover, they find that geographical diversification and the weight of nonbanking affiliates relative to banking subsidiaries have a positive and significant correlation with the number of subsidiaries.

The analyses of Avraham et al. (2012) and of Cetorelli and Goldberg (2014) are based on a cross-sectional of data. Unlike Avraham et al., Cetorelli and Goldberg use the Bankscope database and data definitions consistent with those adopted by Herring and Carmassi (2010, 2015). They report correlations, but not econometric estimates. Cetorelli and Goldberg (2014) also show that a very large share of subsidiaries are not directly controlled

by the parent (Level 1), but are controlled indirectly through other subsidiaries (being thus classified as Level 2, 3, 4 etc. subsidiaries): most of the organizational complexity is thus related to indirectly controlled subsidiaries.⁸³ Furthermore, their results on the industry breakdown of subsidiaries are consistent with Herring and Carmassi (2010), concluding that most subsidiaries are in the “other financial” and “non-financial” sectors. Finally, while confirming the correlation between size and organizational complexity, Cetorelli and Goldberg (2014) do not draw conclusions about the drivers of complexity, observing that “it is not clear what might be the drivers of the build-up in bank complexity”.

Much remains to be understood in the domain of bank corporate structures. There is evidence on a number of facts: the sheer increase in complexity over the last few decades; the relationship between size and complexity; the non-banking and often even non-financial nature of most legal entities within a large banking group. Previous studies generally focused on cross-section data at one point. Our research aims to extend the literature on the corporate complexity of large complex financial institutions by showing how one measure of complexity has evolved.

⁸³ In our Bankscope data analysis in this work and in Herring and Carmassi (2010, 2015) we have included indirectly controlled subsidiaries as well.

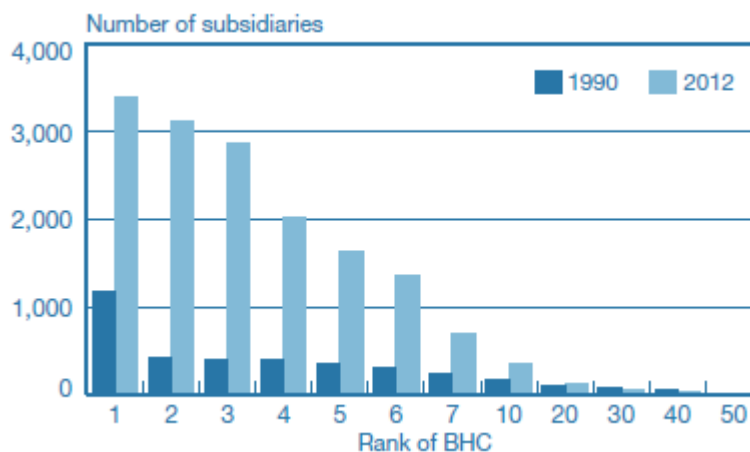
Chapter 4

Orderly resolution and the corporate structure of G-SIBs

4.1 Introduction

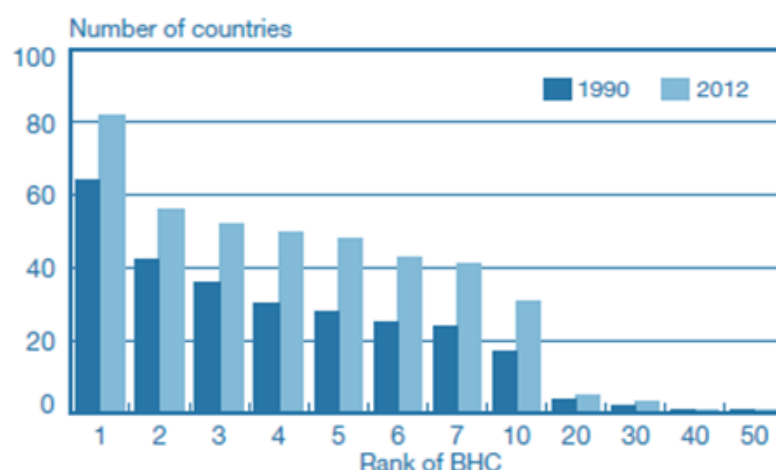
Over the last three decades the structure of banking and financial markets has undergone a profound transformation: deregulation, conglomeration and globalization have produced a dramatic change in the financial industry, leading to a huge increase in size, internationalization⁸⁴ and complexity of international banks. Figures 4.1.a and 4.1.b illustrate these trends for the largest US bank holding companies from 1990 to 2012. The banking industry has also become more concentrated. Using data from the US the market share of the ten largest bank holding companies increased from less than 30% in 1990 to more than 60% in 2012 (US GAO, 2013).

Figure 4.1.a: Organizational complexity of large US bank holding companies



⁸⁴ On the rise of international banking see, for example, CGFS (2010a) and Claessens et al. (2010); on the behavior of foreign banks see, among others, Claessens and van Horen (2012).

Figure 4.1.b: International diversification of large US bank holding companies



Source: Avraham et al. (2012) on National Information Center data and FR Y-10. Data as of February 20, 2012 and December 31, 1990.

In the wake of the recent financial crisis the authorities recognized that the growth of the G-SIBs had surpassed the capacity of regulatory agencies to ensure an orderly resolution. In the absence of reliable resolution tools, governments in Europe and the United States had committed amounts equivalent to 25% of world GDP (Haldane, 2009) to prop up several of the G-SIBs.⁸⁵ The hope was that massive financial guarantees would prevent a series of disorderly resolutions that would damage other financial institutions and the real economy. But rolling out the safety net for some of the largest financial institutions may have inadvertently encouraged them to grow still larger.⁸⁶ If creditors expect to be bailed out whenever a G-SIB approaches insolvency, these institutions will be able to fund themselves at lower cost and take on greater leverage than other smaller institutions, even those smaller

⁸⁵ The costs of bailouts exceed the costs of these subsidies and guarantees to taxpayers and the strain on public finances and central bank balance sheets. More important, but also more difficult to measure, were the resources wasted in sustaining huge, Zombie-like institutions that warehoused large amounts of non-performing assets rather than serving as useful intermediaries. In effect the banks were funding non-performing assets rather than making new loans to small and medium-sized enterprises that would generate growth. This delayed economic recovery and the creative destruction that is the heart of dynamic capitalism. It also intensified incentives for risk-taking by G-SIBs.

⁸⁶ More fundamentally, in several cases the authorities directly contributed to the growth of G-SIBs by subsidizing the merger of faltering firms with larger firms. The result was firms that were already considered too big to fail became emphatically too big to fail.

banks that are demonstrably more efficient. Thus the authorities may have purchased short-term stability at the cost of increasing longer-term vulnerability to an even more serious crisis.⁸⁷

Prodded by widespread public anger over the massive bailouts and the resulting legislative response,⁸⁸ the authorities made a concerted effort to develop more effective resolution tools to dispel the belief that some institutions are too big to fail⁸⁹ and eliminate any implicit subsidy that may arise from the perceived special status of such institutions. National regulatory authorities, working through the Financial Stability Board, have agreed to best practices in resolution policy and identified characteristics that may interfere with the orderly resolution of G-SIBs. In addition, they have established procedures to identify (and, optimistically) eliminate obstacles to the resolvability of each of the financial institutions that appears on a list of G-SIBs, which is updated by the FSB every November.⁹⁰

4.2 What are the key attributes of an effective resolution regime?

Despite the heterogeneity of bankruptcy procedures, countries broadly agree on what the fundamental objectives of the procedures should be.⁹¹ Oliver Hart (2002, pp. 3-5) has identified three goals that all good⁹² resolution procedures should meet:

1. A good procedure should deliver an *ex post* efficient outcome that maximizes the value of the bankrupt business to be distributed to stakeholders.

⁸⁷ The insulation of these institutions from market discipline will distort competition and make future crises more frequent, larger and more difficult to manage. Mervyn King (2009a) has stated that, “The massive support extended to the banking sector around the world...has created possibly the biggest moral hazard in history.”

⁸⁸ The Dodd Frank Act in the United States provides a good example of this emphasis.

⁸⁹ This phrase is commonly applied to G-SIBs, but as will be evident in the discussion below the problem extends far beyond a bank’s size to encompass organizational complexity, interconnectedness with other financial institutions and the core international infrastructure, cross-jurisdictional activity, they systemic importance and lack of ready substitutes for the services it provides. Although imprecise, this is a convenient catch all phrase that we will continue to use with this broader meaning.

⁹⁰ See, for example, FSB (2013g).

⁹¹ For a recent analysis of efficient bankruptcy procedures see Jackson and Skeel (2013).

⁹² Given that economists do not have a satisfactory theory of why parties cannot design their own bankruptcy procedures, Hart is careful not to describe these procedures as 'optimal'.

2. It should promote *ex ante* efficient outcomes by penalizing managers and shareholders adequately in bankruptcy states so that the bonding role of debt is preserved. In that context debt can serve as a disciplinary device to mitigate agency problems within the firm. The increased probability of financial distress puts managers' jobs at risk and may encourage greater effort and efficiency.
3. A good resolution procedure should maintain the absolute priority of claims to protect incentives for senior creditors to lend and to avoid the perverse incentives that may arise if some creditors have a lower priority in bankruptcy than they would if the firm were a going concern.

These three objectives apply equally to financial and non-financial firms, but in the case of G-SIBs, three additional objectives should be taken into consideration:

4. A good resolution procedure should also be mindful of the costs of systemic risk. It should be cognizant of, and attempt to limit, the spillover effects that may not only damage other institutions but also markets, the financial infrastructure, and the real economy.
5. A good resolution procedure should protect taxpayers and other potential sources of bailout funds from loss, since imposing losses on parties that do not share in the *ex-ante* gains creates perverse incentives that encourage excessive risk taking by G-SIBs.
6. A good resolution procedure should lead to quick, predictable results. Markets abhor negative surprises, particularly if they result from unanticipated behavior by regulators that results in *unexpected* losses. Traders may simply withdraw from risky markets until they are confident they understand the new playing field.

The rationale for treating G-SIBs differently from other kinds of firms can be found in these latter three objectives. The key goal is to assure continuity of systemically important services for customers and markets. This is the usual outcome under the successful application of corporate reorganization bankruptcy procedures to a non-bank firm – the firm can continue in operation, while its capital is being restructured. This often avoids liquidation, preserves going concern value and assures that investors bear losses in line with strict seniority of their claims. But the stays imposed in normal bankruptcy proceedings do not work for banks. As Huertas (2011) notes, “The very essence of banking is the ability to make commitments to pay – depositors at maturity, sellers of securities due to settle, borrowers who wish to draw on lending commitments, derivative counterparties who contracted with the bank for protection from interest rate, exchange rate or credit risks. Putting a stay on payments to creditors is equivalent to stopping the bank’s operating business.” Unlike airlines, retailers or automobile companies, banks cannot readily operate in bankruptcy. So bankruptcy for a bank has been tantamount to liquidation.⁹³

Piecemeal liquidation is generally the least desirable outcome for both creditors and society because it results in the loss of going-concern value for creditors. And, to the extent that systemically important services are abruptly discontinued, it threatens financial stability. Liquidation imposes very significant incremental losses relative to the losses that would be realized if the viable parts of the entity could continue to operate while it is being recapitalized.

The FSB, in a paper on the “Key Attributes of Effective Resolution Regimes for Financial Institutions” (FSB 2011a), set out 9 criteria that an effective resolution regime should meet in order to provide a credible framework for the resolution of financial institutions. A regime that meets the key attributes should:

⁹³ For a recent proposal to improve bankruptcy procedures in order to accommodate the special challenges posed by G-SIBs, see Jackson (2014).

1. ensure continuity of systemically important financial services and payment, clearing and settlement functions;
2. protect ... insured depositors ... and ensure the rapid return of segregated client assets;
3. allocate losses to ... shareholders, unsecured and uninsured creditors in a way that respects the hierarchy of claims;
4. [avoid reliance] on public solvency support and [creation of any] expectation that public support will be available;
5. [preserve going-concern value while minimizing] the overall costs of resolution in home and host jurisdictions and losses to creditors (when consistent with other objectives);
6. provide for speed and transparency and as much predictability as possible through legal and procedural clarity and advanced planning for orderly resolution;
7. ensure that non-viable firms can exit the market in an orderly way;
8. [enhance] market discipline and provide incentives for a market-based solutions; and
9. provide [a legal framework] for cooperation, information exchange and coordination with relevant authorities both domestically and abroad before and during a resolution.

None of the FSB member countries has met all of the Key Attributes, but substantial efforts to meet them are underway in each of the major financial centers.⁹⁴ In order to maintain momentum, the Group of Twenty has required that the FSB report on progress in meeting these goals at each of its annual meetings. In addition to fundamental legislative changes to enable each country to adopt the key attributes, the FSB has identified a number of remaining challenges for regulators to enable the resolution of a G-SIB to proceed in an orderly manner. First, the authorities must be assured that each G-SIB has enough loss

⁹⁴ The FSB (2013f, p. 11) notes that in addition to the adoption and implementation of the Dodd-Frank Act in the United States, important amendments to resolution regimes have occurred in other jurisdictions including Australia, France, Germany, Japan, Netherlands, Spain, Switzerland and the UK as well as the EU.

absorbing capacity to ensure that the critical operations of a G-SIB can continue while some other part of the group is taken through bankruptcy or an administrative resolution. Second, the authorities must develop an accelerated process for providing regulatory approvals so that a G-SIB that enters resolution on a Friday will have the necessary licenses and permissions to open critical operations within a new organizational structure (or bridge institution) on the following Monday.

Third, the authorities must find a way to override “ipso facto” clauses that permit contracts to be terminated based on a change of control, the initiation of bankruptcy proceedings or a change in agency credit ratings. This is particularly a problem with regard to qualified financial contracts. Currently counterparties may liquidate, terminate, or accelerate qualified financial contracts of the debtor and offset or net them out under a variety of circumstances. This can result in a sudden loss of liquidity and, potentially, the forced sale of illiquid assets in illiquid markets that might drive down prices and transmit the shock to other institutions holding the same assets. The FSB has urged that qualified financial contracts should be transferred in their original form to the bridge company so long as the debtor and its subsidiaries continue to perform payment and delivery obligations, but this will require a rewriting of private contracts and/or a change in contract laws in many jurisdictions.⁹⁵

Fourth, the authorities must devise a way of providing liquidity (without risk to taxpayers) to the bridge institution in the restructuring of a G-SIB. Most G-SIBs rely on their ability to rollover borrowings in wholesale markets daily to fund their operations. A bankruptcy proceeding or administrative intervention by the resolution authorities is likely to undermine market confidence and cause creditors and counterparties to flee to the sidelines and wait until they are certain the new institution is viable. Liquidity needs require immediate

⁹⁵ The FSB has committed to deal with this issue by the end of 2014.

attention because they will arise as soon as markets open. Too little liquidity or liquidity that is provided too late will wreck even the most carefully designed resolution plan.

Finally, the principal regulatory and supervisory authorities in each country in which the G-SIB has significant operations must cooperate. All G-SIBs have substantial cross-border operations and so an orderly resolution depends on cooperation in the transfer of assets and contracts to the bridge institution. The FSB has placed considerable emphasis on the harmonization of resolution principles and procedures across countries and has established crisis management groups for each G-SIB that are intended to plan how the relevant authorities would implement a resolution. Nonetheless, agreements and understandings tend to unravel in a crisis and countries may try to ring-fence the assets they control. The recent crisis provides scant evidence of cross-border cooperation during the crisis and resolutions that followed.

4.3 What are the key obstacles to an effective resolution?

Assuming that the authorities have designed a resolution regime that conforms to the Key Attributes, what characteristics of a G-SIB present obstacles to an orderly resolution? Although we will focus on the issue of organizational complexity, it is important to recognize that several other factors matter as well.⁹⁶ To highlight these factors, we will first assume that G-SIBs operate solely through branches, thus temporarily putting aside the issue of organizational structure.⁹⁷

⁹⁶ The Basel Committee on Banking Supervision addressed these issues in “Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement,” July 2013, available at <http://www.bis.org/publ/bcbs255.pdf>; see especially the discussion of the methodology for assessing the systemic importance of G-SIBs.

⁹⁷ Although no G-SIB operates solely through branches (for a variety of reasons discussed below), Cumming and Eisenbeis (2010) have proposed that very large banks be required to adopt a single bank charter that has no parent holding company nor affiliates or subsidiaries that would be subject to prompt corrective action based on market values. In the event that a deterioration in an institution’s condition would trigger intervention by the resolution authority, all creditors – foreign and domestic – would be treated equally in terms of the priority of their claims.

4.3.1 Obstacles to an orderly resolution regardless of the G-SIB's corporate structure

The FSB has turned its attention to the resolvability of specific G-SIBs within a Resolvability Assessment Process launched in 2014.⁹⁸ Each home country resolution authority has promised to identify changes that G-SIBs need to make to their structure and operations to ensure that the preferred resolution strategy is feasible. The FSB has highlighted the following characteristics for evaluation.

First, a G-SIB's size may present a challenge to an orderly resolution. The larger the bank, the "more difficult it is for its activities to be quickly transferred to or replaced by other banks" (BCBS, 2013, p. 7). Moreover, the larger the bank's share of global activities, the greater the likelihood that it will damage financial markets and the global economy and undermine confidence in the financial system as a whole.

Second, the likelihood that one G-SIB's financial distress will be transmitted to other institutions depends on the network of contractual obligations it has established. The greater a G-SIB's interconnectedness, the more likely its problems will be contagiously transmitted to other institutions. The FSB measures interconnectedness by intra-financial system assets, intra-financial system liabilities and securities outstanding. Measuring interconnectedness, however, presents inherent difficulties because it may change rapidly and measurements of the G-SIB's direct exposures cannot capture indirect exposures that occur because of the vulnerability of their counterparties. These can be very important because of the dense, but opaque network of connections among banks, especially among G-SIBs.⁹⁹ Complex over-the-

⁹⁸ See FSB (2013f, p. 4).

⁹⁹ Humphrey (1986) presented a particularly striking example of this problem in a simulation of how the unwind rule would have worked in the Clearing House Interbank Payments System (CHIPS) during a randomly selected day in January 1983. He conducted a simulation in which a clearing house participant was unable to settle its position at the end of the clearing day and so that the unwind rule was invoked. This unanticipated failure ultimately caused almost half the other participants in CHIPS to incur net debit positions greater than their total capital and would have caused one third of the dollar value of settlements to be reversed. Many of these spillover effects occurred during second and successive attempts to solve the payments matrix. Humphrey (1986) also simulated the same shock for a different day in January. The overall devastation to the system was broadly the same, but the impact fell on a different set of banks. These indirect exposures are insidious because they are opaque not only to outsiders monitoring the banks, but also to the banks themselves.

counter derivatives transactions are especially difficult to evaluate and so sometimes a G-SIB's involvement in such markets is used as an indication of interconnectedness.

Third, closely related to an institution's size and interconnectedness, is the ease with which customers can find ready substitutes for the services provided by the G-SIB. The greater a bank's market share in a particular line of business, the larger the disruption that is likely to follow its failure.¹⁰⁰ This is particularly worrisome when a G-SIB provides essential financial infrastructure to other institutions. The interruption of such services is likely to have negative spillover effects on other market participants and to reduce liquidity in secondary markets. The FSB uses three proxies to measure this challenge to an orderly resolution: (1) assets under custody; (2) payments activity; and (3) underwritten transactions in debt and equity markets.

Fourth, the complexity of a bank's balance sheet can be an obstacle to an orderly resolution. If the bank specializes in originating, trading or holding opaque assets that are difficult to value, resolution will require more time and incur greater costs. As Kane (2009) has observed, the increasing complexity of financial instruments has transformed traditional risks into "...hard-to-understand and hard-to-monitor counterparty and funding risks." Cumming and Eisenbeis (2010) note "This complexity means that when a troubled institution approaches failure, the full capital and funding needs of the troubled institution and the full ramification of its failure are difficult to assess with confidence." The FSB relies on three indicators to measure this aspect: (1) the notional amount of over-the-counter derivatives; (2) the amount of Level 3 assets (that are marked to model); and (3) the amount of trading and available-for-sale securities that may suffer a fire sale discount if sold during a period of severe market stress.

¹⁰⁰ Although this aspect is closely related to size and interconnectedness, it is conceptually distinct. For example, Bank of New York Mellon is regarded as systemically important because of the crucial role it plays in third party repo transactions, not because of its size or the composition of its assets.

Fifth, the extent of cross-jurisdictional activity can impede an orderly resolution. The more numerous the functional and/or national regulators that must be consulted during the resolution process, the greater the difficulty in implementing an orderly resolution. Even under the optimistic assumption that the agreements and protocols established by the FSB hold up under the pressure of a crisis, the larger the number of authorities that must be consulted, the greater the coordination costs and the more difficult the challenge of opening the bridge institution for business on Monday morning following a weekend resolution.

This can be a problem even if the bank operates only through branches. If a G-SIB performs functions within a country that are supervised by different functional regulators, they will need to be consulted in any decision to resolve the bank¹⁰¹ and the host country may choose to treat the branch as a separate entity for purposes of resolution. This possibility means that foreign branches should be considered apart from domestic branches when assessing the resolvability of the G-SIB.

In addition to size and interconnectedness, an institution's role in providing essential financial infrastructure, the complexity of a bank's balance-sheet and off-balance-sheet positions and the extent of its cross-jurisdictional activity, organizational complexity can also impede an orderly resolution.

4.3.2 Why complexity of legal structures may impede an orderly resolution

The fundamental analytical issue is whether a G-SIB that adopts a complicated legal structure would be more costly to resolve than a G-SIB with the same portfolio of assets and activities that operates solely through branches.¹⁰² To clarify the issue, assume that a G-SIB operates in more than 30 different countries with more than 1,000 subsidiaries including

¹⁰¹ For example, in the US the SEC is the primary supervisor for any part of a bank that performs broker/dealer functions and state insurance supervisors have primary responsibility for insurance activities.

¹⁰² Leaving aside, for the moment, the possibility that host authorities might ring-fence the branches that reside in their jurisdiction.

numerous intermediate holding companies. In addition, assume that the legal structure does not reflect the G-SIB's lines of business or the way in which it is managed.¹⁰³ (We consider why such a structure might evolve in the following section. This section examines the consequences for an orderly resolution policy.)

If this G-SIB should need to be resolved, what obstacles would its legal complexity present? The disorderly bankruptcy of Lehman Brothers demonstrated most of the problems. First, in order to resolve an institution, its lines of business must be mapped into the legal entities that will need to be taken through the resolution process.¹⁰⁴ To the extent that the business and organizational structures do not align with the legal structure this will be time-consuming and cause costly delays.¹⁰⁵ Moreover, if managerial control and the lines of business are misaligned with legal entities, it may be impossible to preserve going-concern value in the resolution process. Although planning for bankruptcy can reduce some of the delays, it cannot eliminate them.

Second, and closely related, to the extent a legal entity depends on financing or services provided from some other part of the group, it may not be possible to resolve that legal entity separately without some sort of guarantee of continuing access to those services. Examples might include financial flows and guarantees, data processing and record keeping services, information technology, risk management systems, and liquidity management. This is analogous to the concern over interconnectedness between the G-SIB and the rest of the financial system discussed above. While legal separateness might facilitate the sale or spin-off of an individual unit or line of business during resolution, this will not be possible if the

¹⁰³ This example is by no means an exaggeration. The average G-SIB has roughly 1,000 subsidiaries that are not well-aligned with lines of business or the way in which the businesses are managed and is active in more than 40 countries.

¹⁰⁴ As Mervyn King quipped (2010), “[M]ost large complex financial institutions are global – at least in life if not in death”.

¹⁰⁵ On the misalignment between legal form and economic functions see Hüpkes (2009).

legal entity is so interconnected with the rest of the group that it cannot be taken through an orderly resolution process on its own and remain a going concern.

Third, the more numerous the legal entities, the greater the number of regulatory entities that must be consulted in planning and implementing a resolution. Because G-SIBs conduct a wide variety of businesses beyond banking and securities activities, this may involve a broad range of specialized, functional regulatory authorities including insurance commissioners and, in the case of energy trading units, possibly even the Environmental Protection Agency.¹⁰⁶ Assuming that all of these parties have the legal ability and willingness to cooperate – and that their rules and procedures do not conflict – coordination costs will be high and will increase with the number of regulatory authorities that need to be consulted. Of equal importance, the greater the number of regulatory authorities that need to be consulted to start an orderly resolution process the greater the number that need to be convinced to provide licenses and permissions in order for a new bridge institution to continue to provide essential services to customers without interruption. The bridge institution will also need to be authorized to continue using critical elements of the financial infrastructure such as payments systems, clearing and custody services and to continue trading on exchanges. The number of material clearing, payment and settlement systems of which the banking groups of the “first wave filers” group for US resolution plans are members ranged between 10 and 19 according to the 2012 public sections of their resolution plans.

Fourth, opacity of organizational structures impedes regulatory oversight. If regulators do not have a clear understanding of how lines of business map into legal entities and how the legal entities interact with each other, they cannot perform effective prudential supervision, nor can they implement an orderly resolution. Legal complexity tends to fragment regulatory oversight, which is often limited to a particular legal entity or activity.

¹⁰⁶ For additional details regarding the activities of US G-SIBs in physical commodity and energy markets, see Omarova (2013).

This problem is exacerbated by the fact that flows of information among regulators remain imperfect and uncertain – particularly when information may cast an unfavorable light on a financial institution.¹⁰⁷ Information tends to flow more freely within a regulatory organization than between organizations and more freely among regulatory institutions within a country than across national borders. Thus a complex legal structure can make it difficult for an umbrella supervisor to understand and monitor the risk exposures of a G-SIB.

Fifth, if market participants are unable to understand the corporate structure and how risks are distributed across legal entities, they cannot discipline the institution's risk taking effectively. While it may be argued that the consequence will be that the G-SIB will suffer an opacity discount in the market (Morgan 2002), this may be more than offset by the implicit subsidies from the safety net. Thus the net impact on corporate decisions regarding legal structures is unclear.

The difficulties of explaining a complex legal structure to the public are apparent in the public sections of living wills submitted by G-SIBs in the US. A typical G-SIB may disclose twenty or fewer “material entities” (see Chapter 2), but generally without any detailed reference to the several hundred (or thousand) subsidiaries omitted, much less any explanation of why the missing subsidiaries would not present an obstacle to an orderly resolution or pose a concern to creditors.

G-SIBs are obliged to report more details regarding their organizational structure to the authorities and so creditors might take some comfort in the knowledge that the responsible authorities do understand the structure and interrelationships within a G-SIB, but comments by the FED and the FDIC (August 2014) on the plans submitted by 11 banking groups in October 2013 (the “first wave filers” group) indicate that the confidential

¹⁰⁷ Regulators fear that sharing unfavorable information about an institution will constrain their options for dealing with the institution and, if leaked to the public, may precipitate a run.

information was inadequate as well. They concluded that bank corporate structures remain too complex and must be simplified (see Appendix 2.D in Chapter 2).

If creditors cannot understand how their claims would fare in an insolvency scenario, they will be unable to price risk appropriately and are likely to run at the first sign of financial distress. A liquidity crisis will not only make a resolution more urgent, but will also increase the difficulty of achieving an orderly resolution since G-SIBs often draw a large proportion of their funds from wholesale markets. An institution with a thousand or more subsidiaries is virtually impossible for investors or regulators to comprehend, much less monitor.

The authorities have recognized that complexities in the legal, financial and operational structures of G-SIBs can impede even well-designed resolution regimes. The FSB (2013f, p. 13) has concluded that “Home authorities should enter into a dialogue with firms about changes needed to their structures and operations to ensure that their preferred (single- or multiple-point-of-entry) resolution strategy is a realistic strategy for the firm.” While ‘enter into a dialogue’ appears to be an exceedingly modest initiative, some authorities are taking much more decisive measures to simplify legal structures and reduce intra-firm interdependencies.

4.4 Why do G-SIBs adopt such complex legal structures?

4.4.1 External restrictions and incentives

First we will examine regulatory requirements and incentives for G-SIBs to operate through subsidiaries, then we will consider why corporations might prefer to operate through subsidiaries regardless of the external incentives or restrictions. This starting point is important because much of the complexity of legal structures of G-SIBs is a result of complicated regulations, tax laws and accounting rules. Although G-SIBs are under pressure to reduce the complexity of their legal structures, we see scant evidence that the authorities

are making efforts to amend the laws, rules and regulations that have encouraged and sometimes required the creations of such structures.

4.4.1.1 The role of regulations

In numerous instances a G-SIB has no choice but to create a separate entity if it wants to undertake a particular activity or operate in another jurisdiction. This phenomenon is embedded in history of US bank regulation from the adoption of the Edge Act in 1919 through the Glass-Steagall Act in 1933 to the Gramm-Leach-Bliley Act of 1999 to the Intermediate Holding Company Rule of 2014. The US authorities have long relied on corporate separateness as a way to permit banks to extend their activities geographically or to undertake new activities, while insulating the depository institution from problems that may arise in an affiliate. Indeed, the reason that virtually every major US bank resides in a bank holding company springs from the Bank Holding Company Act of 1956, which provided banks with means of expanding their geographic domains without violating state laws on intra-state branching or the interstate branching restrictions that existed until the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 or the activity restriction under its bank charter. In addition, the authorities have imposed corporate separateness on G-SIBs for the convenience of specialized regulators. Broker-dealer operations are housed in separate subsidiaries at least in part to facilitate supervision by the SEC and insurance activities must be chartered in individual states partly to facilitate oversight by state insurance commissioners.

In addition some countries will not permit foreign banks to enter without establishing a local subsidiary.¹⁰⁸ These countries want to ensure that the operations of the foreign bank will be subject to local regulation and oversight.¹⁰⁹

These are but a few examples of corporate separateness that is required (or at least incentivized) by the regulatory authorities. This web of regulatory restrictions and incentives in both home and host countries is so complex that it is difficult to estimate the extent to which it has had an influence on the complexity of the legal structure of G-SIBs.

4.4.1.2 The role of taxation

Tax policy is not generally considered to be part of the regulatory framework, but its impact on corporate structure is profound and ubiquitous. The deductibility of interest payments, but not dividends has led to a preference for debt finance relative to equity, as with most corporations. But in banking, this incentive has led to a proliferation of vehicles for issuing Trust Preferred Securities (TruPS) to the public. These were exchanged for junior debt claims on the bank holding company (BHC), thus reducing the BHC's taxable income. The establishment of a separate entity may also enable a bank to obtain tax benefits targeted at special activities such as real estate investment.

The ability to establish subsidiaries in foreign tax havens may facilitate the use of excess foreign tax credits and defer taxes on certain kinds of income more or less indefinitely. In addition, particular locations may be preferred so that a G-SIB can take advantage of special tax-sparing treaties with specific countries in which it conducts business. Moreover,

¹⁰⁸ Countries do differ with regard to this requirement even though they all aim to safeguard local financial stability. Some countries believe this is best accomplished by requiring that foreign G-SIBs enter through branches that will have the full capital and liquidity resources of the parent to back them up and oversight by the home country supervisor. Moreover, in practice the line between a branch and a subsidiary is often quite blurry. The BCBS (2010, p. 29) noted that "in some jurisdictions branches...may have to meet many of the requirements normally imposed on locally-incorporated subsidiaries, while in other jurisdictions subsidiaries may function much more like branches integrated into the parent institutions' business and management."

¹⁰⁹ New Zealand is perhaps the most enthusiastic advocate of this approach requiring not only that foreign-owned institutions must establish a local subsidiary, but also that the subsidiary be insulated from the parent by a number of operational firewalls.

the establishment of an intermediate-level holding company in such jurisdictions may reduce the cost of transferring funds from one foreign entity to another by avoiding withholding or transfer taxes. And, G-SIBs may also establish subsidiaries in tax havens for the benefit of foreign customers who would otherwise be subject to withholding taxes. (These customers may also value the secrecy that tax havens also tend to provide.)

In some cases, subsidiaries appear to have been established to take advantage of the special tax treatment for particular lines of the business. The multiple leasing subsidiaries disclosed by the Unicredit group may also be related to tax factors.

This web of tax incentives is even more complex than the morass of regulatory constraints and so it is virtually impossible to know the extent to which the complexity of G-SIB corporate structures reflects tax incentives. One minimal indication is the number of subsidiaries that G-SIBs have located in tax havens. As of May 2013, nine of the G-SIBs each had more than 100 subsidiaries located in off-shore booking centers and six of them had 20% or more of their subsidiaries in off-shore tax havens (see Table 2.1 in Chapter 2). But the importance of taxes in decisions regarding corporate structure is clearly much broader than the location of subsidiaries in tax havens.¹¹⁰

4.4.1.3 Accounting policies

Despite years of effort to harmonize accounting principles and practices across countries, substantial differences remain. A G-SIB may sometimes be able to exploit those differences by locating a subsidiary strategically or by creating a separate entity to escape accounting consolidation requirements. Regulators rely on accounting measures to set capital and liquidity requirements and so often the underlying motive for the creation of a more elaborate legal structure is not only to achieve a more favorable accounting treatment for a

¹¹⁰ For additional discussion of the role of taxation see Herring and Carmassi (2015).

particular activity or portfolio of assets, but also to lighten the burden of complying with the costs of regulatory capital.

The growth in special purpose vehicles (SPVs) before the crisis illustrates the distortions that can occur. Sponsors of SPVs wanted to be able to characterize these vehicles as off-balance sheet for regulatory and financial reporting purposes. U.S. Financial Accounting Standard No. 140 stated clearly the conditions under which an SPV need not be consolidated in a sponsor's balance sheet.¹¹¹ These included the requirement that the sponsor refrain from making any commitment to control or support the SPV. In order to ensure the off-balance sheet nature of the transaction, sponsors often adopted a two-tiered SPV structure to insulate the SPV through at least two subsidiaries and emphasize that the sponsor had no legal responsibility to support the securitization.¹¹²

TruPS (mentioned above) provide an example of the exploitation of an accounting rule not only to reduce taxes but also to increase regulatory capital.¹¹³ A bank holding company (BHC) would establish a trust, retaining all of the equity in the trust. The trust would issue preferred stock to investors and transfer the proceeds to the BHC owner in return for junior subordinated debt claims on the BHC. The junior subordinated debt usually had the same terms as the preferred shares and was often guaranteed by the BHC. The establishment of a separate legal entity, the trust, enabled the BHC to reduce its taxable income (as discussed above), but the consolidation of the trust for purposes of computing regulatory capital increased the amount of the BHC's Tier 1 capital by the amount of the issue of TruPS.¹¹⁴

¹¹¹ See Herring and Carmassi (2010) for an overview of the accounting rule.

¹¹² In the wake of the crisis both accountants and regulators revised their rules to close this loophole, but similar opportunities and incentives remain.

¹¹³ The Dodd Frank Act excludes TruPS from the computation of regulatory capital, although the change is subject to a lengthy transition period.

¹¹⁴ The TruPS were required to meet certain minimum specifications to qualify as Tier 1 capital.

Similarly, a G-SIB has been described (Hume, 2011) as establishing an entity in the Cayman Islands to off-load billion of troubled mortgage-backed securities. This new entity qualified as a separate company because the equity, equal to 3.5%¹¹⁵ of the assets, was placed with external investors. Nonetheless, the G-SIB provided a loan to finance the remaining 96.5% of the assets and guaranteed the external shareholders against loss. The creation of this separate legal entity (which, by design, would not be counted as a controlled subsidiary of the parent) allowed the parent to avoid establishing a reserve against the portfolio of assets and an increase in regulatory capital requirements. Moreover, it enabled the parent to crystalize a substantial tax loss which could be used to offset profits in the rest of the group.

4.4.2 Why do G-SIBs adopt such complex legal structures? Internal objectives

Even if regulatory restrictions and incentives, tax distortions and accounting loopholes were eliminated, G-SIBs are likely to prefer to establish a number of subsidiaries rather than do business through one entity. The formation of subsidiaries involves the start-up costs of obtaining a license or charter and creating a governance structure as well as ongoing costs for accounting, financial reporting and tax filings. Given these costs, presumably BHCs perceive offsetting benefits.¹¹⁶ There is a theoretical presumption that many of these subsidiaries are established to reduce frictions in markets (both external and internal). Herring and Carmassi (2015) identify a number of such frictions. They include: reducing asymmetric information costs between shareholders and creditors; reducing asymmetric information costs and agency problems between external shareholders and managers; mitigating customer concerns regarding potential conflicts of interest; reducing the costs of financial distress by protecting the group from a risky subsidiary and/or protecting a subsidiary from risks in the rest of the group; and the legacy of mergers and acquisitions.

¹¹⁵ This qualified the new entity for off-balance sheet treatment under accounting regulations.

¹¹⁶ Even in countries where there are no regulatory incentives or constraints to do so, G-SIBs have established a number of separate entities.

The impact of mergers and acquisitions deserves special comment because most of the G-SIBs have grown through a series of substantial mergers and acquisitions (Herring and Carmassi, 2010, 2015). JPMorgan Chase has one of the most remarkable histories in this regard. The current organization is the result of a series of mergers of very large banks that began in 1991 with the merger of Chemical Bank Corporation and Manufacturers Hanover Corporation. This merger resulted in a near doubling of the size of the surviving institution, Chemical Bank, and was followed in 1996 by the merger of Chemical Bank with The Chase Manhattan Corporation. The resulting institution merged with JP Morgan & Co. and incorporated as JPMorgan Chase & Co. (JPMC). In July 2004, JPMC merged with Bank One Corporation, the sixth largest bank in the United States at the time. Then during the crisis, JPMC acquired two large distressed institutions: Bear Stearns, the fourth largest investment bank, in the spring of 2008, and the banking operations of Washington Mutual, at the time the sixth largest U.S. bank, in the fall of 2008.

In the short term, the total number of subsidiaries of JPMC rose by roughly the number of subsidiaries of the target institution. Although JPMC succeeded in consolidating or closing a number of subsidiaries over time, the remaining number of subsidiaries was greater than before the merger or acquisition (see Chapter 2 for the numbers of subsidiaries of the firm before and after the various mergers, according to NIC/FED data). The delay in consolidation undoubtedly reflected the time required to evaluate how best to integrate the new business and the costs in consolidating or merging subsidiaries. But, in addition, the growing number of subsidiaries may have reflected other factors such as the desire to retain the brand and reputational capital of the predecessor firm, local regulatory requirements or a commitment to keep in place the staff and board of directors of the acquired entity. In some instances legal proceedings may have constrained efforts to rationalize the new corporate structure if the subsidiary was in process of litigation – either as a defendant or plaintiff.

More broadly, this illustrates the fact that the current structures of G-SIBs are path dependent. They reflect a broad range of external and internal incentives that may have changed over time (and across countries), and especially past mergers and acquisitions. These increases in corporate complexity tend to accrue over time and a number of frictions may impede corporate simplification – especially in the absence of regulatory pressures to do so.

Although the impact of external restrictions and incentives and of internal objectives on the number of subsidiaries cannot be quantified, numerous examples can be produced illustrating each of these motives.¹¹⁷

4.5 Concluding comment

This chapter has reviewed the internationally agreed attributes of effective resolution policies, which remain aspirational goals for most countries. Necessary improvements in the international infrastructure to facilitate resolution have also been considered. These too remain works in process.

Assuming (optimistically) that the attributes of effective resolution policies can be adopted, what are the key obstacles to implementing such policies? Obstacles include the size of G-SIBs, the degree of interconnectedness among G-SIBs, the difficulty customers would experience in finding substitutes for the services provided by the G-SIB, the complexity of a G-SIB's assets on and off-balance-sheet, and the extent of cross-jurisdictional activity. Special attention was paid to the obstacles presented by the complexity of legal structures adopted by G-SIBs. These included misalignments of the legal structure with lines of business, interdependencies among subsidiaries within the G-SIB, the number of jurisdictions

¹¹⁷ See Herring and Carmassi (2015) for additional examples illustrating each motive for increasing the number of subsidiaries.

in which the various entities reside, the opacity of the organizational structure to regulators and the market.

Next, the question of why G-SIBs have adopted such complex legal structures was posed. External incentives and restrictions, especially those created by regulations and taxes, are implicated. So too are accounting practices, especially when they can open regulatory or tax advantages. In addition, internal incentives to adopt complex legal structures were reviewed. These included attempts to reduce asymmetric information costs between shareholders and creditors and between external shareholders and managers, the mitigation of customer concerns regarding conflicts of interest, the reduction of costs of financial distress, the protection of the group from risky activities in a particular subsidiary and a legacy of mergers and acquisitions. The upshot is that G-SIBs have powerful external and internal incentives to adopt multiple subsidiaries – without regard, of course, for the obstacles such structures may pose for orderly resolution.

Chapter 5

Tools for simplifying bank corporate structures: capital requirements, living wills and subsidiarization

5.1 Introduction

In the preceding chapters we have documented the secular growth in the number of subsidiaries and the increase in complexity of the corporate structure of G-SIBs. In addition, the bankruptcy of Lehman Brothers highlighted the challenges that a complex corporate organizational structure can pose for an orderly resolution process. The regulatory authorities have recognized that if they do not develop credible resolution tools for G-SIBs they may once again find themselves in a situation where they have no good options. Without the ability to resolve a G-SIB in an orderly manner, the authorities may find themselves trying to devise another bailout – although many of the direct bailout tools used during the crisis of 2008-2009 have been constrained by subsequent legislation.¹¹⁸ The FSB has flagged the issue and agreed on standards to evaluate the resolvability of G-SIBs. Moreover, the FSB has urged that national authorities “enter into a dialogue” with each G-SIB they supervise to identify changes in its structure and operations that will make the G-SIB easier to resolve. Even though this seems to be a relatively mild exhortation, it has been accompanied by a number of initiatives to simplify corporate structures.¹¹⁹

It should not be surprising that regulatory pressure will be necessary to achieve simplification of the corporate structure of G-SIBs. As we have seen, banks have designed their corporate structures in response to powerful regulatory, tax and accounting incentives as well as compelling internal objectives. Moreover, the size and number of mergers and

¹¹⁸ See, for example, the Dodd-Frank constraints on the behavior of the Fed, FDIC and Treasury in a crisis.

¹¹⁹ Substantive measures have been adopted in the European Union, Switzerland, the UK and the U.S.

acquisitions that most G-SIBs have implemented have increased the number of subsidiaries and complexity of organizations. Because transactions costs of reorganization can be substantial, the current corporate structures of G-SIBs should be viewed as heavily path dependent. In addition, bailouts during the recent crisis conveyed the impression that institutions with structures so complex that they defied an orderly resolution would be likely treated more generously.

Since G-SIBs perceived benefits from many of the decisions that have led to development of complex corporate structures, it is naïve to expect that they would undertake substantial simplification efforts without prodding from the regulators.¹²⁰ And the regulatory authorities have developed several tools. First, we will discuss tools that are already in use or are in the process of implementation, then we will consider additional options that may be introduced if these measures prove inadequate, including the use of subsidiarization as a tool for simplifying corporate structures and making a G-SIB easier to resolve.

5.2 Current policy initiatives

5.2.1 Capital requirements

In the wake of the crisis the regulatory authorities corrected two substantial errors in their earlier approach to regulation. First, they have demanded more and higher quality capital from banks. The emphasis on improving the quality and quantity of higher quality capital was crucial. During the crisis, markets paid no attention to the regulatory definition of capital. Rather the focus was on going-concern capital (fundamentally, shareholders' equity). But regulators had permitted the proportion of going-concern capital to decrease to half the amount that was targeted in the original Basel Accord on Capital Adequacy. In 1998 the

¹²⁰ Of course, G-SIBs have some incentives to simplify corporate structures for reasons of their own. A rationalized structure should enhance managerial control and it might mitigate the opacity discount that many G-SIBs face in capital markets. See Herring and Carmassi (2015) and the sources cited there for additional discussion of the opacity discount.

Basel Committee had agreed to reduce the minimum required amount of equity to be held against risk-weighted assets from roughly four percent to two percent.¹²¹ In effect the bank regulators authorized banks to leverage themselves 50:1. Even this understates the magnitude of the policy blunder. Because risk-weighted assets tend to average about 50 percent of total assets, effective permissible leverage increased implicitly to 100:1. Maintaining solvency in an institution that was this highly leveraged would require an unimaginable degree of precision in risk management. Certainly, many financial institutions did not take full advantage of this opportunity to increase leverage, but this restraint was not due to capital regulations (apart from those G-SIBs headquartered in the United States, where a regulatory constraint on leverage remained in place).

In principle, G-SIBs might choose to meet the leverage requirement by raising additional equity capital, but it is clear that many are also meeting the ratio by reducing the size of their balance sheets. Numerous G-SIBs have announced the sale of various lines of business, which can be interpreted as part of an effort to meet the leverage constraint when it is implemented. This change in capital requirements is therefore likely to reduce the number of subsidiaries.

Second, the regulatory authorities (particularly outside the U.S.) relied primarily on monitoring a minimum risk-adjusted capital ratio that employed officially-determined risk weights. In addition to the flaw in the specification of the numerator of this ratio (mentioned above), the risk-weighted denominator proved to be entirely inadequate to capture the risks to which banks were exposed. Perhaps the most obvious indication that the ratio was not sufficiently risk sensitive is that the ratio reported by most G-SIBs did not vary during the worst financial crisis since the Great Depression. Indeed for some of the most seriously distressed G-SIBs, the ratio improved, giving the false impression that these institutions had

¹²¹ This point was made eloquently by Paul Tucker, former Deputy Governor of the Bank of England, in a speech at Yale University on August 1, 2014.

become stronger. In the aftermath of the crisis the regulatory authorities have strengthened the ratio, by making upward adjustments in the risk-weights that determine the denominator, by increasing the required regulatory minimum, and by adding on additional requirements for a capital conservation buffer and, potentially, a counter-cyclical buffer. The new framework also includes a requirement for additional capital buffers for G-SIBs.

The new capital ratios also corrected a major error in the structure of the Basel II ratios which they replaced. The Basel II ratios had been designed to provide an incentive for large banks to adopt more sophisticated risk management systems, by implicitly reducing their regulatory capital requirement. The rationale was that this would offset the costs of investing in more sophisticated risk management systems and encourage banks to manage their risk exposures more effectively. Of course, this rationale completely ignored the problem that the insolvency of a large bank would be much more difficult to resolve and would be likely to have much more serious spillovers for the rest of the financial system than the insolvency of a smaller bank. Thus, from the perspective of systemic stability the design was perverse. The regulators implicitly lowered capital requirements on institutions that should have been held to a higher standard of safety.

Higher risk-adjusted capital requirements, like requirements for higher capital to asset (leverage) ratios, could be met by issuance of capital, but most institutions also appear to be restructuring and down-sizing their risk exposures as well to meet the new standards. This may also motivate the sales of lines of business to refocus on core activities. Generally, this too would involve a simplification in the corporate structure.

Basel III requires a capital surcharge for G-SIBs. As indicated earlier, the list of G-SIBs is prepared by the FSB and updated each November. The designation is based on a set of indicators discussed in Section 4.3.1. The indicators, with the addition of some judgmental factors, produce a ranking of the systemic risk posed by each G-SIB. On this basis, the G-

SIBs are allocated across five risk buckets. Those deemed to pose the greatest potential threat to the system have their minimum capital ratio increased by 250 basis points. The add-on risk requirements decline by 50 basis point decrements, with institutions in the lowest risk bucket subject to a 100 basis point increase in their minimum capital ratios. The fifth bucket, which would require a 350 basis point increment, is currently empty. It is held out as an implicit threat to any G-SIB that grows in such a way as to increase the difficulties it poses for an orderly resolution. These factors include an increase in structural and operational complexity.

The list of G-SIBs is notable because it demonstrates that the authorities are taking account of more than just size in designating G-SIBs and evaluating each institution's threat to systemic stability. Moreover, examination of changes in the list over time indicates that some institutions have been able to improve their resolvability and move to risk buckets with lower associated risk weights.¹²² This tool is aimed explicitly at the factors that make a G-SIB easier to resolve and may be effective over time.

5.2.2 Enhanced supervision

G-SIBs are now subject to closer supervisory scrutiny than other banks and in the United States to a new supervisory tool, the Comprehensive Capital Analysis and Review (CCAR). Banks subject to CCAR must demonstrate their ability to meet minimum capital requirements and liquidity standards under three scenarios specified by the regulators. This is an effort to make the supervisory process more forward looking, but the important point for the current discussion is that imposes a burden that varies to some extent with the complexity of the institution. G-SIBs are obliged to show how the scenarios would affect the capital and liquidity of each of their major subsidiaries. Thus compliance costs rise with the complexity

¹²² But it is also true that some banks have fallen off the list because they are in process of resolution.

of the G-SIB and provide some incentive for the G-SIB to reduce its corporate complexity – or, at least, hesitate to increase it.

5.2.3 Structural restrictions

More or less simultaneously regulators in the European Union, the UK and the U.S. produced plans to insulate depository institutions within G-SIBs from possible damage from “speculative trading” and other activities deemed risky.¹²³ The U.S. proposal was included in the Dodd-Frank Act as the Volcker Rule. After lengthy consultations, implementing regulations have been issued and a phase-in period established. Although it was not the main objective, implementation of the Volcker Rule is likely to lead to some simplification of corporate structures. G-SIBs are prohibited from conducting certain kinds of activities within the group and so the entities that conduct these activities will need to be either sold to others or closed down.

5.2.4 Living wills

We discussed the design and structure of living wills and, particularly, the publicly disclosed portion in Chapter 2. Here we focus on the implications for corporate complexity. This is the primary tool for structuring the dialogue between G-SIBs and their regulatory authorities and emphasizes consideration of the potential obstacles to resolution identified by the FSB. G-SIBs are required to describe their organizational structure and map their core lines of business into legal entities. In addition they must describe interconnections and interdependencies within the group, including management information systems, and illustrate how service levels would be maintained during a resolution. Finally, they must

¹²³ The UK proposal may be found in the report of the Vickers Commission that aims to ring-fence the depository institution by requiring that such activities be conducted in a separate, but affiliated legal entity. The EU proposal is contained in the Liikanen Report which aims to provide insulation for the depository institution by requiring that trading activities be moved to a separate subsidiary. The European Commission has presented a legislative proposal on bank structural separation in January 2014.

identify memberships in material payment, clearing and settlement systems as well as all of the supervisory authorities and regulators that oversee any of its operations.

These documents are costly to prepare and, to some extent, the cost varies directly with the complexity of the underlying organizational structure.¹²⁴ Many of the documents submitted are reported to exceed ten thousand pages in length, which raises the question of whether some of the G-SIBs have simply become too complex to describe and evaluate.

For the reasons stated in Chapter 2, the publicly-disclosed sections of living wills do not contain sufficient information for an external observer to evaluate whether progress has been made in simplifying the structure of G-SIBs. This lack of transparency is a serious problem for both G-SIBs and their regulators because neither group has emerged from the financial crisis with much credibility. What might have been accepted before the crisis as a trust-us-we-know-what-we're-doing attitude, is no longer persuasive. Nonetheless, an external observer must hope that the confidential submissions would reveal that G-SIBs are making substantial progress in simplifying their organizational structures.

This optimistic conclusion is less persuasive, however, after the public rejection of the living wills submitted by the eleven “first wave filers,” broadly the most complex of the G-SIBs that conduct significant operations in the US. Although the Fed and the FDIC appear to have disagreed to some extent on how to react to the shortcomings identified in their joint press release, they agreed that the G-SIBs failed “to make, or even identify, the kinds of changes in firm structure and practices that would be necessary to enhance the prospects for an orderly resolution.” In addition, the Fed and FDIC (2014) required that the next round of submissions of living wills, due on or before July 1, 2015, establish “a rational and less

¹²⁴ It has been suggested that it might be effective to simply tax complexity directly. For example, Andrew Kuritzkes (2010) has suggested that a periodic tax of \$1 million be levied on each subsidiary of a SIFI. The tax would be deferred for five years, with the first collection in 2016 to incentivize firms to simplify their legal structures. The tax would be collected at five-year intervals thereafter. Based on current legal structures, the costs to international financial conglomerates would be significant, ranging from \$134 million to \$2.6 billion for the top thirty financial conglomerates. The tax could be justified by the negative externalities associated with cross-border activity, legal complexity, and regulatory forum shopping.

complex legal structure that would take into account the best alignment of legal entities and business lines to improve the firm’s resolvability.”

The independent statements by the two agencies split over the decision about next steps. The Fed decided to warn these G-SIBs that if they did not take “immediate action to improve their resolvability and reflect those improvements in their 2015 plans,” the Fed would join the FDIC in finding that the living wills do not meet the requirements of the Dodd-Frank Act. The FDIC Board voted to make that finding immediately, deeming the submissions “not credible”. This matters because the “not credible” finding would set the clock ticking for the possibility of regulatory interventions under the Dodd-Frank Act to reduce the complexity of corporate structures. But the finding of “not credible” must be a joint decision of both the Fed and the FDIC.

5.3 If these measures are not sufficient, what next?

Under the Dodd-Frank Act, if a bank’s living will is found to be not credible, the regulators are authorized (but not required) to undertake an escalating series of actions including higher (risk-weighted and/or leverage) capital requirements, forced divestitures or subsidiarization. Higher capital requirements would be a continuation of recent policies and should be expected to have more or less the same impact depending, of course, on the magnitude of the increase. They would be quite similar to the current G-SIB surcharge. But divestitures would be a much more extreme remedy.

5.3.1 Divestitures

Imposing constraints on the size or structure of firms has traditionally been justified solely on grounds of competition policy, not as a way of reducing corporate complexity to enhance financial stability. But what was once unthinkable is now being widely discussed.

Governor of the Bank of England, Mervyn King (2009b), former Governor of the Federal Reserve Board, Alan Greenspan (McKee and Lanman, 2009) and former Secretary of State and Treasury, George Shultz (2008) have all said, in effect, “Any bank that is too big to fail is simply too big.”

This approach raises concerns about eliminating valuable economies of scale and scope, although the empirical literature provides very little evidence of the existence of these gains at the size many G-SIBs have attained. Moreover, it is inherently difficult to tease out these benefits from the implicit subsidies that may also accrue to G-SIBs.

Others express concern that large non-financial corporations require comparably large banks to serve them, yet some of the G-SIBs have grown much more rapidly than their corporate customers. Moreover, financial innovations and improvements in the flexibility of capital markets mean that most of the credit needs of large, non-financial corporations can be met in capital markets and need not be supplied from the balance sheets of G-SIBs.

Perhaps more troubling is the question of how G-SIBs should be restructured. It seems unlikely that either courts or regulators have the expertise to do it well. It would be much wiser to permit markets to decide how such institutions should be restructured.¹²⁵ On several occasions security analysts have suggested that some G-SIB would be worth more to its shareholders broken into smaller units. Indeed, the corporate finance literature has documented the “conglomerate discount” for many industries and it remains puzzling why banks chose to form larger and more complex groups at precisely the same time that other non-bank corporations were trying to reduce the conglomerate discount by selling or closing down non-core lines of business, often due to threats of a hostile takeover.

¹²⁵ One can imagine a way of enlisting the expertise of management, although it is unlikely to be seriously considered. Regulators might approach a G-SIB they want to break-up and tell the managers that they want the G-SIB restructured as, say, two institutions. In order to ensure that managers were diligent in structuring two strong institutions, the regulators might insist that they would then choose which institution the incumbent managers would continue to operate. This strategy, familiar to any parent, might produce an efficient restructuring. The important difference, however, is that children are unlikely to exit the game, while talented managers may simply choose to go elsewhere.

Such pressures are less likely to succeed with regard to G-SIBs because the market for corporate control has substantial barriers to entry, many of them created by the regulatory permissions that would be necessary to achieve a change in control.¹²⁶ Although hostile takeovers are unlikely, given the heavily regulated position of G-SIBs, stock market valuations may have an impact in the longer term. Habitually unprofitable G-SIBs will experience strong market pressures to restructure and downsize. This has clearly happened at a number of G-SIBs although it is difficult to determine whether market pressures or the recent intensification of regulatory pressures have had a stronger impact.

5.3.2 Bank corporate structures, orderly resolution and the subsidiarization option

What kind of corporate structure best facilitates an orderly resolution? To a considerable extent, the answer to this question depends on the resolution regime. If the home country resolution authority has the legal power and resources to resolve an entire G-SIB, it may prefer that the G-SIB operate through a single legal entity if only to minimize the costs of coordinating actions with scores of other resolution authorities. Of course, this approach will succeed only if all host country regulatory authorities expect that their national interests will be treated equitably vis-à-vis residents of the home country and residents of other countries. If not, they have the right (and possibly the legal obligation) to intervene to protect local interests. The possibility of ring-fencing by the host country is an important constraint on the resolution regime and the corporate structure that resolution authorities would prefer.

G-SIBs, particularly those that specialize in wholesale activities, might prefer the flexibility of a more centralized organizational structure even though they will want to establish a number of subsidiaries to take advantage of particular regulatory and tax incentives and to achieve internal goals. Nonetheless the advantages of conducting all

¹²⁶ Note that these regulatory hurdles may also present a barrier to an orderly resolution.

banking business through a single entity are compelling. Unconstrained by the legal lending limits in individual countries, the G-SIB would have a larger capacity to serve the needs of its customers. Moreover, the ability to exercise central control over capital and liquidity will enable the G-SIB to respond more flexibly to the changing environment. It will reduce the resources that need to be allocated to liquidity so long as the needs of particular offices are not perfectly correlated. Moreover, to the extent that it achieves diversification benefits across its branch offices, the G-SIB may be able to operate safely with a smaller capital base than if it were required to allocate capital separately to each entity to achieve the same degree of safety. The latter approach limits the ability of the group to take advantage of the gains from diversification.

The possibility of ring-fencing by the host country, however, means that this flexibility may disappear in a crisis, when it is most needed. Since neither the home country nor host countries can guarantee that ring-fencing will not occur, the single entity model is not prudent. Certainly most G-SIBs and some regulatory authorities would prefer that ring-fencing could be ruled out. But notwithstanding the best efforts of the FSB it seems unlikely that sovereigns can make a credible commitment to abstain from ring-fencing when national interests are in jeopardy.

Although operation through a single legal entity is neither feasible nor prudent, one model of corporate structure attempts to capture many of the benefits despite operating through several separately incorporated subsidiaries. The “centralized” model emphasizes management of liquidity, capital, and risk exposures as well as information technology and processing from the top tier entity. So far as regulations will permit, subsidiaries would be managed as if they were branches and lines of business will be managed to maximize profits without regard for the legal entities in which the activities are conducted. The anticipated benefit is not only the achievement of enhanced flexibility, but also the belief that the top tier

can manage an internal capital market that will fund the activities of G-SIBs at lower cost than if each operating entity were obliged to raise funds locally in each market.¹²⁷ In addition, centralized management of technology and operational resources should enable the group to achieve greater economies of scale than if these resources were dispersed to the various operating units in which the services are needed. This approach will, of course, result in a mismatch between legal structures and operational structures, which as we have seen can cause serious difficulties if the G-SIFI needs to be resolved.

If ring-fencing is the rule, not the exception, then each national resolution authority would be responsible for resolving banks that reside in its jurisdiction. Under this assumption foreign branches would be treated as if they were subsidiaries (which in fact is the case in some jurisdictions). Conducting international operations through a single legal entity would not be permissible. This has shifted attention to an alternative organizational model – a decentralized or subsidiarized model. In this approach, the top tier institution manages a network of local subsidiaries that operate under a common brand, but each subsidiary is funded locally and governed (within constraints) by local directors.¹²⁸ Minority shares in the subsidiary are often listed on the local stock exchange.

Santander (along with BBVA and HSBC)¹²⁹ is one of the most articulate proponents of this approach (Santander, 2013). Each of its foreign subsidiaries meets local capital requirements and maintains excess capital to meet local growth objectives and provide a

¹²⁷ This is belief, not an established fact. Too often internal capital markets become a way to disguise cross-subsidies that insulate decision makers from an appreciation of the opportunity cost of funds. For additional discussion of internal funding see Cetorelli and Goldberg (2012a, 2012b).

¹²⁸ As noted above, some host countries have rejected this model because the fact that the top tier organization has limited liability for the local subsidiary implies that parent may choose to abandon the local subsidiary if it incurs too great a loss. Of course, concern for its broader reputation may constrain the parent from exercising this option. Indeed, parents of banking institutions have seldom abandoned an operating subsidiary unless it is confronted with creeping expropriation by the host government. Nonetheless, some host countries would prefer the stronger implicit guarantee of a branch office since, in the event the parent seems unable or unwilling to honor the implicit guarantee, the host country can still ring fence it.

¹²⁹ BBVA, HSBC and Santander (2014) have published a working paper on “Developing Credible & Effective Multiple Point of Entry Resolution Strategies,” that discusses the pre-requisites for subsidiarization that can make MPE a credible and effective resolution strategy.

buffer against most losses.¹³⁰ In addition, each subsidiary manages its liquidity needs without relying on funds or guarantees from the parent. Consistent with the emphasis on local funding, exposure to credit risk is focused on local borrowers and is usually denominated in local currency so that cross-border credit risk exposures are relatively small. Many of the subsidiaries are listed on local stock exchanges, although the parent maintains an equity stake of about 70 percent to ensure it retains control.

Santander describes several advantages to this approach. The fact that subsidiaries are subject to supervision by both the host and home country and by local and global internal audits and oversight may offer greater assurance to creditors and customers that the banks are being managed prudently. In times of crisis, the funding autonomy of subsidiaries limits contagion among the group's different units. Moreover, listing subsidiaries in local markets facilitates quick access to local sources of capital for local acquisitions and, in some circumstances, for funding the group. Santander weathered two major crises during the last decade with notable agility. Its Latin American subsidiaries proved a source of strength during the global financial crisis in 2007-2008 and during the European debt crisis Santander was able to raise capital in local markets to strengthen the group. Indeed, during the crisis Santander's credit was rated more highly than the country of its headquarters, Spain.¹³¹

HSBC, one of the largest G-SIBs, has also embraced the subsidiarization model with a much broader global network. HSBC is headquartered in London and operates in over 70 countries in Europe, Hong Kong and the rest of Asia-Pacific region, the Middle East, North Africa, North America and Latin America. It has listings on the London, Hong Kong, New York, Paris and Bermuda stock exchanges. HSBC Holdings plc, the holding company of the

¹³⁰ Figure 5.1 in Appendix 5.A depicts a simplified corporate structure of Santander as of yearend 2013: we have included in the chart only large subsidiaries (above a threshold of \$45 billion in assets), and we have reported for each subsidiary the jurisdiction, the business sector, the key financials and the ownership relationships.

¹³¹ Although consistent with the logic of the model, this latter result must have been a surprise. It seems likely that when Santander launched its expansion in Latin America Spanish regulators were more concerned about insulating the Spanish parent from problems in the foreign subsidiaries than the reverse scenario.

group, is the primary provider of equity capital to its subsidiaries and provides non-equity capital to them where necessary; but it does not provide core funding to any subsidiary, it is not a lender of last resort and does not conduct any banking business in its own right. HSBC operating subsidiaries have an independent balance sheet management and meet local capital, liquidity and funding requirements, with independent resources available to respond to financial stress (see the public section of the 2014 US resolution plan of HSBC). HSBC regards its geographical subsidiarization structure as a source of strength and stability, which can also enhance resolvability.

On the surface it may seem incongruous to suggest subsidiarization as a remedy to the problem of an excessive number of subsidiaries that have complex interrelationships, but the kinds of subsidiaries that proponents recommend involve far more than a limited liability legal structure. Both home and host country supervisors who express a preference for subsidiarization intend for the subsidiary to be autonomous and able to stand alone in the event the rest of the group experiences financial distress.¹³²

This kind of subsidiary should be able to meet its ongoing funding needs from its own resources. Although the parent will have an ownership position and may provide bail-in-able debt, the subsidiary should not rely on the parent or on access to the parent country central bank for its liquidity needs. But even this degree of financial autonomy may not be sufficient to accomplish the main objective of a policy of subsidiarization: to ensure that a legal entity can continue to operate even though its parent may be insolvent. Or, if the legal entity itself should become non-viable, to insure that it may be resolved at relatively low cost and its systemically important services continued.

This certainly implies limits on inter-affiliate interdependencies of all sorts – or a clear and reliable plan for maintaining the access of the subsidiary to such services even if the

¹³² One appeal for G-SIBs that want to provide retail banking services in the jurisdiction is that a subsidiary may gain access to local deposit insurance, which is generally not available to branches.

parent institution is in financial distress. Of course, the insulation of the subsidiary from the rest of its group can be taken to extremes. If the parent's relationship to a subsidiary is constrained to be solely one of ownership, then the parent will be akin to a closed-end mutual fund and closed end mutual funds generally trade at a discount with regard to underlying market values.

Moreover there is controversy over whether constraints put on interactions between the parent and affiliates provide a useful firewall or, in times of crisis, ignite walls of fire. Certainly control over an autonomous subsidiary gives the host country the ability to preserve the assets of the local subsidiary for the benefit of local creditors and to implement an orderly resolution if necessary. But it may reduce the likelihood that the subsidiary will receive support from the parent, if it should encounter difficulties.

This issue involves striking a balance between the benefits of capital market mobility in normal times, versus insulation from external shocks in a crisis. In general, a subsidiary that is free to engage in transactions with affiliates can fund itself more cheaply in normal times if only because the parent treasury function will be able to draw its funding from a broader array of markets.¹³³ But in times of crisis, the ability of the subsidiary to fund itself may be the key to its survival. Unfortunately, it is not possible for a subsidiary to make a rapid transition from one mode of funding to another as circumstances dictate. Access to local funding usually requires the cultivation of local relationships and access to local market infrastructure.

The issue of shared services is a bit different because it appears that institutions can avoid making a trade-off between autonomy and efficiency. A subsidiary that is constrained to develop its own back-office, information technology, risk management systems and other

¹³³ As noted in the preceding chapter, this applies to the parent's ability to manage capital and liquidity resources. Normally, it is a more efficient approach, but it is vulnerable to collapse in the event of crisis.

operational infrastructure is likely to face unnecessarily high costs.¹³⁴ Since the host country's interest should be in ensuring that the subsidiary has uninterrupted access to such services, not who owns the infrastructure, it is possible to address this issue in other ways. If the parent houses technology-intensive services in bankruptcy remote entities then the host country can have some degree of comfort that the subsidiary will be able to continue its access to essential services even if the parent experiences financial distress. The credibility of this arrangement is greater if the service subsidiary adopts a business model that will enable it to reduce costs rapidly whenever its revenues fall. Santander, one of the most enthusiastic advocates of subsidiarization, is also one of the most efficient banks in the world. It has managed to achieve the economies of scale inherent in technology intensive services and share them with its subsidiaries by establishing these units in the “factories” that do not depend on the parent for financial support and sell services to the subsidiaries at competitive prices. These relations are formalized in service level agreements (SLAs).¹³⁵

To this point we have made the tacit assumption that subsidiarization will take place with regard to different jurisdictions. This is a plausible adaptation to the prospect of ring-fencing by the host country and to a host country's distrust in the home country's ability and willingness to resolve the G-SIB in an equitable manner that adequately protects the interests of the host country. But subsidiarization can also be organized on the basis of lines of business.

¹³⁴ This problem may be ameliorated by outsourcing, but it would still be necessary to ensure that the subsidiary has suitable service level agreements.

¹³⁵ A Service Level Agreement (SLA) details the services to be provided, the level of quality, economic terms and applicable instruments and control tools, as well as termination terms. The factories own the tangible assets (e.g. machinery, infrastructure, etc.) and hold the copyright or right of use over the intangible assets they require. A market price is established for the provision of services, which is reviewed on an annual basis. The financing of corporate factories is based on the principle of balanced budgets with revenues coming from the billing of local units for services rendered. – and not on resources lent by the parent company. Therefore, the financial viability of factories depends on maintaining the relationship with users and not on corporate contributions from the parent company. Factories offer a number of benefits: services provided to the group are clearly identified, and they can be rapidly and easily insulated and protected in case of resolution; IT & operational services do not reside in material entities and so the resolution of such an entity is unlikely to hamper other affiliates; the ultimate responsibility for the functions carried out by the factories is maintained with the bank, thus permitting a reversal of the service if necessary; “market” contracts with specific clauses for resolution scenarios guarantee the continuity of the service for an agreed period.

This approach to subsidiarization does improve the alignment between legal entities and the way in which the business is conducted. It also is better suited to oversight by specialized regulatory authorities. And, provided that the subsidiary is largely autonomous from the rest of the group, it could be readily spun off to facilitate an orderly resolution. The problem arises when lines of business cross national borders as they inevitably will in a G-SIB. If the subsidiary is nonviable, which authority will control the resolution? The specialized regulatory authority? Or the host country authority? This, of course, presents a temptation to ring-fence unless the home and host country have considerable mutual trust. But if the home and host countries have made binding commitments to cooperate, the issue of corporate structure is less important unless it inhibits the ability of supervisors *ex ante*, before an entity becomes nonviable, to monitor and constrain the risk exposures of the G-SIB or impedes the effectiveness of the resolution authorities *ex post*.

Subsidiarization can enhance the clarity of the corporate structures of G-SIBs and facilitate an orderly resolution. Although such subsidiaries are likely to be easier to resolve in crisis, they may be more vulnerable to a crisis if their access to funding from the parent is constrained and, in normal times, the cost of funds to local clients is likely to be higher than if the subsidiary's financial interdependencies with the rest of the group were not limited. Moreover, subsidiarization does not provide a complete solution to the problem of corporate complexity, because subsidiaries can be organized on the basis of their location or on the basis of the kind of business conducted, but these approaches often conflict.

Is the difference between the centralized and decentralized model apparent in the publicly disclosed data on subsidiaries? Other things equal, one might expect G-SIBs that follow a decentralized model to differ in some respects from G-SIBs that follow a more centralized approach. The decentralized groups might be expected to have a higher proportion of operating subsidiaries reporting large volumes of assets and substantial

operating income. Table 5.1 displays data for two banks that are regarded as following a decentralized model, Santander and HSBC, and two groups that are generally not thought to emphasize decentralization, Citigroup and Deutsche Bank. Considered across a variety of different measures, it would be difficult to infer from this table that these four banks have adopted different organizational models. Of course these data are, at best, a very indirect indicator of differences in managerial strategy, but they do raise a question about how difference between the two models can be measured with publicly available data.

Table 5.1: Selected data on the corporate structures of four G-SIBs (June 2014)

	Citigroup	Deutsche Bank	HSBC	Santander
Number of majority-owned subsidiaries	1,945	1,985	2,076	710
Bank	5%	3%	4%	9%
Insurance	2%	0.5%	2%	2%
Vehicles/trusts	23%	23%	19%	29%
Other financial subsidiaries	31%	28%	20%	26%
Non-financial subsidiaries	39%	45%	55%	33%
No. of subs with asset data available (>=0.5 USD mln)	165	644	330	272
No. of subs with assets> \$ 10 bn	31	24	42	28
No. of subs with operating income available (>=0.5USD mln)	214	423	294	206
No. of subs with operating income >= 1 USD bn	21	18	34	21
No. of subs with no. of employees available	194	406	358	165
No. of subs with employees>= 100	74	81	135	62
No. of subs with employees< 10	62	243	71	46

Source: elaborations on Bankscope data.

One obvious difference between the centralized and decentralized models might be the extent to which subsidiaries are funded in local markets. Presumably G-SIBs that follow a decentralized model would fund their subsidiaries mainly through local markets, while G-SIBs that rely on a more centralized model would rely to a greater extent on funding from the

parent. This distinction seems plausible and, in principle, is objectively verifiable. On closer inspection, however, it may not be a meaningful difference. So long as a G-SIB meets all local capital and liquidity requirements and the parent assumes that its claims on the subsidiary cannot be liquidated until they mature, the difference may not matter in the operation of the subsidiary.¹³⁶

The decentralized model appears to better facilitate an orderly resolution, if only because it should be relatively easy to recapitalize and privatize an autonomous subsidiary. But in addition to financial autonomy, it is crucial to ensure that the subsidiary continues to have access to services that may be supplied by other entities in the group or outsourced. These services may include processing, management information systems or risk management models which are unlikely to reside in the subsidiary because it cannot achieve sufficient economies of scale to be efficient. But a G-SIB that emphasizes subsidiarization can reap advantages from economies of scale by placing technology-intensive services in bankruptcy remote entities, which in turn provide services to operating subsidiaries governed by tightly drawn service level agreements.¹³⁷

In a survey of the implications of the choice of foreign expansion through branches (a centralized approach) vs. foreign expansion through subsidiaries (a decentralized approach), Fiechter et al. (2011) find there is no conclusive evidence that one option is preferable to the other. Indeed, most G-SIBs have both foreign branches and subsidiaries. The choice seems to depend on the particular circumstances in the host country and the strategic objectives of the parent. Dell’Ariccia and Marquez (2010) found that banking groups tend to prefer to go abroad through subsidiaries where political risk is perceived to be lower than economic risk, and through branches where political risk is considered higher than economic risk. In the first case, the group tries to insulate the parent company from losses potentially coming from

¹³⁶ It may, however, expose the G-SIB to a greater risk of intra-group contagion since all subsidiaries will depend on the parent for financial strength.

¹³⁷ As noted above, this appears to be what Santander has accomplished through its “factories.”

foreign markets, while in the second case branches would shield the bank from the risk of expropriation by the foreign government because the bank would not have an ownership share that could be seized.¹³⁸

We have not been able to find conclusive evidence that the subsidiarization approach has better financial stability properties than a more centralized approach. The answer appears to depend on the kind of shocks to financial stability being contemplated and assumptions about capital mobility and the resolution regime (see below). Probably, most importantly, it depends on the skill of top managers, the most difficult aspect to evaluate – although inadequate management information systems create a presumption that top management cannot be effective. In practice, G-SIBs operate through both branches and subsidiaries, so the differences between the centralized and subsidiarized model are less sharp than they are in theory.

5.4 Single Point of Entry vs. Multiple Points of Entry

A system that relies on resolution by the home country authority is unlikely to work if host countries can ring-fence the entities within their jurisdictions. On the other hand reliance on ring-fencing to resolve G-SIBs will lead to disorderly resolutions and loss of going-concern value. Thus, the authorities have tried to devise workable alternatives. Two dominant models have emerged, which are variations on these two polar cases.

The Single Point of Entry (SPE) model has been endorsed by the Bank of England and the Federal Deposit Insurance Corporation.¹³⁹ It tries to finesse the complexities of dealing with a welter of intermediate holding companies and subsidiaries by focusing the resolution process on the top level holding company. The home country resolution authority

¹³⁸ This is, of course, subject to the caution above that the distinction between branches and subsidiaries can become very fuzzy if the host country wants additional assurances and demands that the parent “pre-position” capital.

¹³⁹ The Swiss regulator, FINMA, has also endorsed the SPE for the resolution of G-SIBs (FINMA, 2013).

will intervene whenever a subsidiary of the G-SIB fails to meet its regulatory capital requirements. It will seize control of the top level holding company, take it into a bankruptcy process and place the rest of the group in one or more bridge institutions. The entity that failed to meet its capital requirements will be recapitalized by converting the BHC's debt into additional equity to restore the capital adequacy of the subsidiary. Temporary liquidity support can be provided if necessary, but taxpayers must be insulated from any potential loss. In principle this will permit the G-SIB's operating subsidiaries to continue without interruption and provide time for the resolution authorities to restructure the bridge bank and spin it off to the public.¹⁴⁰

The SPE depends on two critical assumptions that: (1) the BHC will have sufficient debt at the top tier holding company to be able to recapitalize a faltering subsidiary;¹⁴¹ and (2) host country authorities will permit the home country resolution authority to control the process. Even countries that support the SPE seem to be taking precautions against the possibility that it might not succeed. For example, the U.S. has required that large foreign banks establish mid-level holding companies for their U.S. subsidiaries. These holding companies would be required to meet prudential requirements in the U.S. and would be subject to resolution in the U.S. if they fail to meet such requirements. Other countries are requiring the foreign branches "pre-position" capital.

While this strategy is appealing to G-SIBs that have adopted a holding company structure, it requires substantial changes for G-SIBs that do not have a holding company structure. For this reason an alternative Multiple Point of Entry (MPE) strategy has been proposed. In this approach the resolution process is focused on each subsidiary that fails to

¹⁴⁰ This is the point at which the complexity of a G-SIB's corporate structure becomes costly. The more complex the corporate structure the more difficult will be the task of restructuring the group and privatizing viable segments.

¹⁴¹ If losses at a subsidiary exceed the capacity of the BHC to recapitalize it, then losses will have to be imposed on creditors of the subsidiary. Unfortunately, this is likely to undermine confidence in the viability of the bridge institution.

meet its capital requirements. The resolution will be conducted by the country in which the faltering subsidiary is chartered. In effect, the parent will not be expected to bail-out a nonviable subsidiary and the rest of the group is expected to continue operation.

The MPE relies on three critical assumptions: (1) that the failing subsidiary will have sufficient bail-in-able capital to recapitalize the viable part of the institution without relying on taxpayer assistance;¹⁴² (2) that the remaining subsidiaries of the group will not suffer a loss of market confidence because of the resolution of an affiliate institution; and (3) that other countries will not use the initiation of the resolution process in one country as a rationale for intervening in other entities of the group residing in their jurisdictions. Although this approach has obvious appeal for G-SIBs that are not organized within a holding company structure, it is difficult to find much evidence in the past behavior of market participants to support the second assumption. And if markets do not have confidence that it will succeed, the authorities may find themselves in a situation where they believe they have no good alternative and feel obliged to provide a bailout to preserve financial stability.

Neither strategy is certain to succeed, but maintaining the possibility that either might be employed does not help the market price and monitor the risk of default. In fact, if the market is surprised by the resolution strategy the authorities employ, confidence in the system may be undermined.¹⁴³ If creditors and investors cannot anticipate the endgame, they cannot price risk efficiently. Ultimately, this uncertainty is likely to be destructive to markets and to the banks themselves, and to exacerbate the risk of disorderly resolution.

¹⁴² See Huertas (2014) for a lucid description of how a subsidiarized bank should be resolved in an orderly manner.

¹⁴³ Gracie (2014) emphasizes the point that transparency regarding the resolution process is essential to creditors and investors.

5.5 Concluding comment

The authorities have recognized that complex and opaque corporate structures are an impediment to an orderly resolution and have pledged to improve transparency and reduce the complexity of the corporate structure of G-SIBs. The FSB has instituted Resolvability Assessment Reviews and the authorities have taken or planned several measures to simplify the corporate structures of G-SIBs.

Enhanced capital requirements may lead G-SIBs to simplify their corporate structures (and perhaps reduce the size of their balance sheets). Regulators have demanded improvements in both the quality and quantity of regulatory capital. They have tightened the definition of regulatory capital and focused on going-concern capital. This corrects a serious error made at the turn of the century when the Basel committee tacitly permitted banks to ramp up their leverage by astonishing amounts.

In addition to enhancing the numerator in regulatory capital ratios, they have increased the risk weights used to determine the size of risk-adjusted assets in the denominator. More importantly for non-U.S. banks, they are phasing in a leverage ratio that will constrain the ability of G-SIBs to attain the degree of leverage that many banks adopted before the crisis.

To the extent that these measures require that G-SIBs issue more equity capital relative to (some measure of) assets, they are likely to lead in part to a reduction in the size of G-SIB balance sheets and perhaps a sale of lines of business. This may reduce the complexity of their corporate structures. The tool that is most likely to be effective, however, is the G-SIB regulatory capital surcharge that will be levied on institutions according to regulatory evaluation of the impediments they pose to an orderly resolution. One of the key inputs to this evaluation is the complexity of the G-SIB's corporate structure. Some banks appear to have responded to this incentive and have down-sized and simplified their

corporate structures to the extent that the FSB has assigned them to a bucket with a lower regulatory capital surcharge.

Enhanced supervision, particularly the CCAR requirement in the U.S., is forcing G-SIBs to take account of the complexity of their corporate structures and may add to incentives for simplification. The Volcker rule may force some divestitures, but overall its impact on corporate complexity will not be dramatic.

The living will requirement sets the structure for direct conversations regarding the complexity of corporate structure and other impediments to an orderly resolution between G-SIBs and their regulators. The public sections of living wills in the U.S. do not enable an external observer to monitor signs of progress. Moreover, the recent rejection of the living wills of some of the largest G-SIBs by the Fed and the FDIC raises questions about how effective they have been. The joint statement by the agencies highlighted the lack of progress in changes in the structure of these groups that would enhance the prospects for an orderly resolution. The agencies ramped up the pressure on G-SIBs to accelerate progress indicating that in the absence of improvements they will invoke the process to undertake a series of escalating regulatory measures.

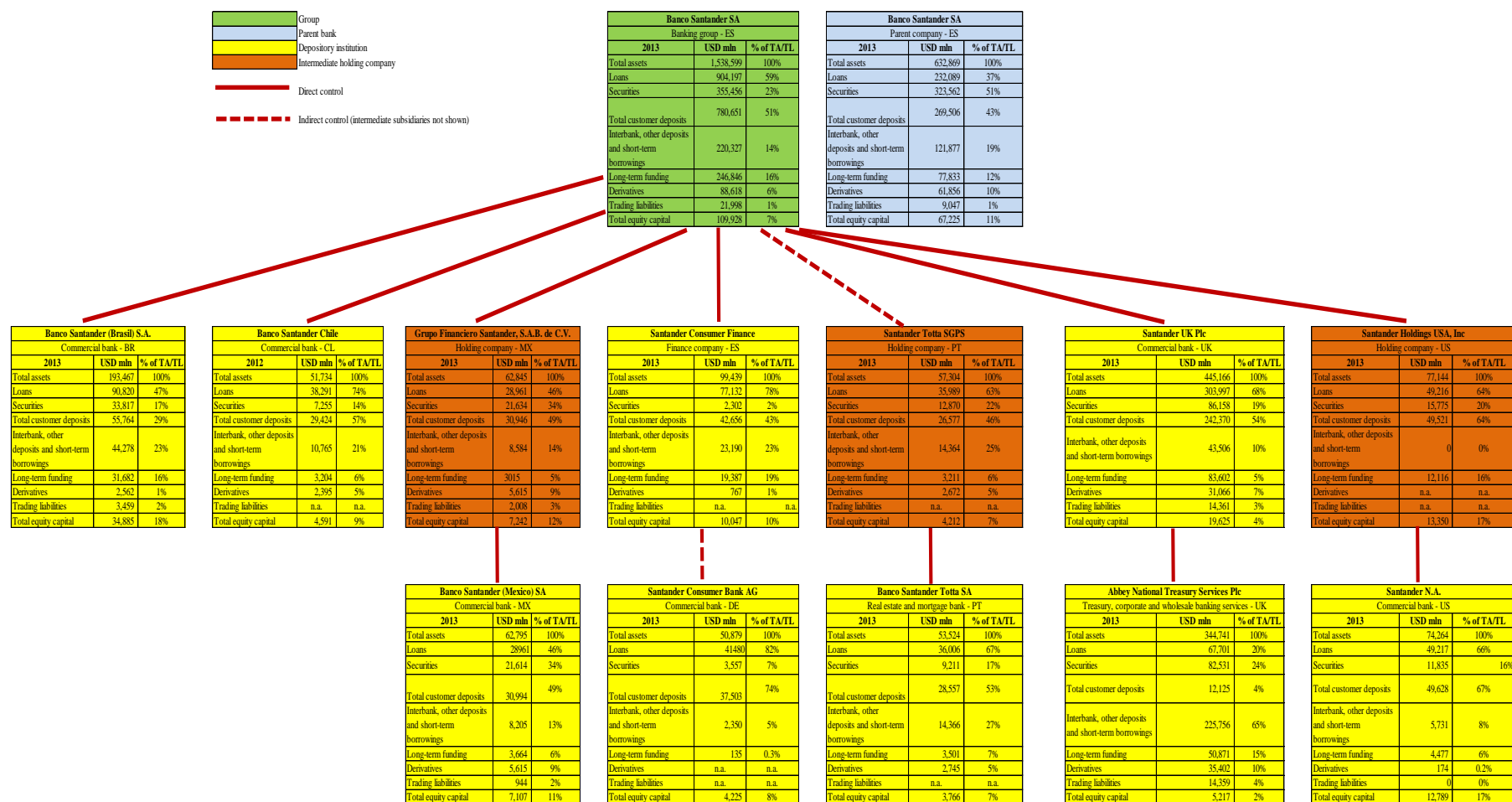
In principle, these could include forced divestitures, although precisely how this might be done is unclear. It seems more likely that G-SIBs will experience greater pressures to subsidiarize. This would improve the clarity of corporate structures and facilitate the orderly resolution of subsidiarized entities, but it might make such entities more vulnerable to some shocks and it would likely increase the costs for such entities in normal times. Unfortunately it provides only a partial answer to the problem of complexity, because subsidiarization on the basis of lines of business has an equally strong rationale as subsidiarization on the basis of country of residence and the two principles may conflict.

Given that G-SIBs will prefer to have a degree of corporate complexity, are some approaches to managing the group more amenable to an orderly resolution? Two models were examined: the centralized approach and the subsidiarized (decentralized) approach. Although the centralized approach promises some efficiency gains relative to the decentralized approach, it poses a serious challenge to orderly resolution. And, although some G-SIBs are proponents of the decentralized approach, it is difficult to infer this emphasis from the publicly available data on subsidiaries.

Since most G-SIBs exhibit elements of both the centralized and subsidiarized approach, which resolution strategy is most likely to succeed? The Single Point of Entry is typically contrasted with the Multiple Point of Entry approach. Both depend on some heroic assumptions. The SPE is more likely to preserve financial stability – if it works. But even proponents of the SPE have taken measures to resolve resident foreign institutions and protect domestic financial stability if necessary. Subsidiarization, however, may facilitate both the SPE and MPE. Either approach is likely to work more effectively to the extent that subsidiaries are largely operationally independent. But, lack of clarity about which strategy resolution authorities will adopt creates uncertainty that impedes market discipline and increases the likelihood that markets will react perversely when a resolution is implemented.

Appendix 5.A

Figure 5.1: The corporate structure of Santander (yearend 2013; only subsidiaries with more than \$ 45 billion in total assets are included)



Source: analysis of Bankscope data.

Chapter 6

Brief summary of policy recommendations

6.1. Introduction

Despite the notable collapse of several major institutions during the crisis, the overall trend toward bigger and more complex financial institutions has continued (often encouraged by publicly subsidized mergers). Although some G-SIBs have made progress in rationalizing and simplifying their corporate structures, other G-SIBs have greatly increased their complexity (at least as measured by their number of controlled subsidiaries) so that, on average, the overall degree of complexity has not significantly decreased since the crisis and, until very recently, has slightly increased.

With the increased official scrutiny of G-SIBs, one might assume that more public data would be available to analyze their corporate structures. Alas, this is not the case: despite the emphasis in official documents on greater transparency and market discipline as well as the introduction of the living wills requirement, publicly available information remains fragmented and difficult to compare across institutions and sources because of differing definitions, reporting criteria, and reporting dates. The reforms adopted to reduce complexity have yet to prove their effectiveness.

6.2 Data and disclosure issues

Virtually any proposal to enhance transparency meets with two objections from the industry¹⁴⁴. First, is the claim that such data are proprietary and that disclosure would cause a loss of competitive advantage. Too often this assertion appears to have gone unchallenged by policy-makers. Although many of the details of recovery and resolution plans should remain confidential,¹⁴⁵ we are not aware that any G-SIB has made a plausible case for withholding the details of corporate organizational and ownership structure. Alternatively, it might be argued that one G-SIB had discovered a tax structure that would permit it to conduct a particular activity more profitably than its peers, but this does not constitute a rationale for public protection of such data. Moreover, in today's highly integrated marketplace it seems highly unlikely that one institution could identify and exploit a loophole that is not quickly apparent to its competitors. For that reason, we welcome the joint statement of the Fed and the FDIC (2014) that they will be “working with ... firms to explore ways to enhance public transparency of future plan submissions.”

The second objection to greater transparency is that most legal entities, including multiple tiers of holding companies, have been created for tax or regulatory purposes and do not present obstacles to an orderly resolution. This may be true. But G-SIBs should have the burden to categorize such entities in terms of the function they serve and to explain why each category would not interfere with an orderly resolution. Simply asserting that the corporate clutter has

¹⁴⁴ A third standard objection does not seem plausible in this case. Institutions argue that disclosure is costly. Although we have some sympathy with this concern in other instances, it has no relevance in this case. The data that we argue should be disclosed are already collected and disclosed to the authorities. The additional costs of making such data available on the web are trivial.

¹⁴⁵ For example, it would not be reasonable to require that the G-SIB disclose which units might be sold to specific buyers, if the G-SIB is under financial distress.

negligible implications for the resolution process should not go unexplained.¹⁴⁶ We have sympathy with the notion that “material entities” should be subject to more stringent disclosure standards, but the criteria on which this classification is made should be publicly verifiable and consistent across firms.

More specifically, our attempts to analyze the existing data suggest that all G-SIBs should be required to employ the same clear, consistent data definitions in their public reports, which should be in a format that can be easily analyzed using standard software. At a minimum such disclosures should include a clear definition of material entities based on consolidating statements¹⁴⁷ or the importance of the services an entity provides to the rest of the group and an organizational chart showing the hierarchy of material entities. Information about each material entity should include its principal business, total assets, income data, location, intra-group financial transactions and guarantees, intra-group operational dependencies, memberships in payment, clearing and settlement systems, Tier-1 Common Equity Ratio and Liquid Short-Term Funding Ratio. This information will be of relevance to creditors, counterparties and the host country regulatory authorities. Moreover, it will allow the public to evaluate progress made toward rationalizing and simplifying the structure of G-SIBs.

In addition, disclosure should extend to the (presumably large number of) entities deemed to be non-material. These non-material entities should be sorted into standardized categories

¹⁴⁶ We discovered several interesting examples of such entities during our interviews. One of the most interesting was the practice of creating multiple special entities to take possession of real estate gained through foreclosure. It is apparently common practice to divide, say a hotel, into multiple separate entities so that a lawsuit regarding a problem in the parking lot would not jeopardize the viability of other parts of the hotel complex or create a financial burden for the parent. These kinds of subsidiaries are unlikely to obstruct an orderly resolution. The same is true for most trusts and shell holding companies. The problem is that current disclosures do not permit the public to draw such distinctions or understand why they would not cause problems in a resolution.

¹⁴⁷ This definition should be objectively verifiable. For example, an entity would be presumed material if it constituted more than some specified proportion, say 3%, of consolidated assets or consolidated revenues. An additional category of subsidiary needs to be taken into account because it may provide crucial services to the rest of the group, but may not have significant assets on its balance sheet or generate significant revenue. An example would be a risk management entity that monitors and controls the broad risk exposures of the group.

accompanied by an explanation of why entities within the category would present no obstacle to an orderly resolution. Within each of these standardized categories, each entity should be identified by name, location, primary function and rationale.

Foreign branches should also be identified because past experience has shown that in time of crisis the host country authority may ring-fence a branch and treat it as if it were a subsidiary.¹⁴⁸ G-SIBs should include the full list of foreign branches located outside the jurisdiction in which the entity is chartered, and the location and total assets of such branches as well as their principal lines of business. These disclosures should be made in the public sections of living wills. Greater transparency with regard to these details will enable external observers to evaluate whether progress is being made in the announced goal of rationalizing and simplifying the structure of G-SIBs. Both G-SIBs and bank regulators would benefit from greater clarity that might help persuade a skeptical public that progress is being made.¹⁴⁹

Since the FSB has been assigned the responsibility of designating G-SIBs, it should already be maintaining a data bank that includes these data (and much more). Because of this responsibility the FSB is also the logical entity to set standards for reporting. Moreover, since the FSB has endorsed the principle of transparency, providing public access to these data would be entirely consistent with its mission. Although the FSB does not have the power to compel such disclosures, it could institute reviews of the compliance of member countries with the agreed standards and post data for all G-SIBs indicating “not available” for entries where a member

¹⁴⁸ Variable Interest Entities (VIEs) also deserve attention. By design, VIEs made it possible for a firm to control an entity without holding a majority of voting rights. This enabled the firm to avoid consolidating the VIE because the rules on consolidation were based on voting control. Since the crisis the Financial Accounting Standards Board has extended the rules for consolidation to encompass such entities. New disclosure rules require that a firm disclose its maximum exposure to loss in VIEs. This requirement is a substantial advance over previous practice and should be continued.

¹⁴⁹ Although, as we noted in Chapter 2, the public section of living wills should be substantially improved, the United States remains the only country that requires public disclosure of any portion of living wills.

country is not in compliance. Improved disclosure of these basic data regarding the corporate complexity of G-SIBs would help bolster public confidence in the resolution process and reinforce regulatory pressures for simplification with market discipline. Better disclosure would be in the interests of both G-SIBs and the regulatory authorities. Lack of public confidence in resolution procedures can be a substantial obstacle to implementing even a well-designed resolution plan.

Disclosures about the resolution regime that the authorities intend to use are also important, but often overlooked. To make effective use of the data disclosed by G-SIBs in evaluating credit risk, market participants must understand how a G-SIB would be resolved. If market participants do not understand the endgame, they will have uncertainties about how losses will be allocated. Such uncertainties blunt whatever disciplinary incentives the market might provide. Worse still these uncertainties may contribute to panicky reactions when a resolution is initiated, especially if the resolution scenario differs from what markets expect.

In this regard, the fact that officials are continuing to support two very different approaches to resolution – the Single Point of Entry and Multiple Points of Entry – only intensifies the uncertainty.¹⁵⁰ Under these circumstances, regulators in some of the most important financial centers are likely to continue taking precautions that would enable them to ring-fence the local operations of foreign institutions if their preferred resolution plan proves unworkable.

Certainly an orderly resolution would be more likely if the G-SIBs were less complex and more transparent. But it is also important for the authorities to articulate a plausible, consistent framework for resolution that will eliminate as much uncertainty as possible about which creditors and counterparties will experience a loss and in what order of priority should a

¹⁵⁰ The new European framework perpetuates this uncertainty about which resolution approach will be taken. Banks are permitted to designate their preferred approach, but the authorities may proceed however they wish.

resolution become necessary.¹⁵¹ Only then will capital markets work effectively to help prevent the necessity of a resolution and to help stabilize the process if it should become necessary.

6.3 Reforming public policies that encourage corporate complexity

Although we do have evidence that policy initiatives are underway to encourage corporations to simplify their corporate structures, we lack any evidence that the authorities have given any attention to the numerous public policies that encourage and sometimes require that G-SIBs create a substantial number of separate entities (these are discussed in Chapters 1 and 4). Regulatory and tax incentives for G-SIBs to establish separate entities are numerous and pervasive. While each of these policies may have had a logic when introduced, the cumulative impact is remarkably complex and undoubtedly exacerbates the problems that corporate complexity poses for implementing an orderly resolution of a G-SIB. Moreover, virtually all of these policies were adopted without any consideration of their impact on the resolvability of G-SIBs at least in part because the authorities have only recently recognized the importance of the problem despite numerous forewarnings (see Herring, 2002, 2003).

Although we certainly do not discourage the authorities from adopting measures to simplify the corporate structures of G-SIBs to facilitate an orderly resolution, it may be equally important and even more effective to reform some of the policies that have given rise to such byzantine complexity. Tax and regulatory simplifications are long overdue for many reasons. But their role in creating institutions that seem too complex to fail should add to the urgency of such reforms.

¹⁵¹ Huertas (2014) has summed the issue nicely in his phrase “constructive certainty, not constructive ambiguity”.

6.4 Subsidiarization

Because the incentives for corporations to adopt complex structures are strong and persistent and because regulatory authorities appear to harbor doubts about the extent of international cooperation in the event a G-SIB must be resolved, some G-SIBs and regulators have placed emphasis on a strategy of subsidiarization. This is not simply another example of the authorities encouraging a proliferation of subsidiaries. Rather it is an attempt to make operating subsidiaries more autonomous. New Zealand has been the most articulate advocate of this approach and has carefully detailed all of the aspects of corporate separateness that would enable a locally chartered entity to continue to provide essential services even if the parent should collapse. The challenge is in creating just the right amount of autonomy to enable the subsidiary to continue operations during a resolution (of either the parent or the entity itself) without losing most of the benefits of an affiliation with a strong powerful international group. Some G-SIBs have developed innovative new structures to be able to enjoy the advantages of economies of scale in the production of shared services while assuring host country regulatory authorities that their locally chartered entities will continue to have access to these vital services during a resolution.

Subsidiarization can enhance the clarity of the corporate structures of G-SIBs and facilitate an orderly resolution under SPE, MPE or bankruptcy. Although such subsidiaries are likely to be easier to resolve in a crisis, they may be more vulnerable to a crisis if their access to funding from the parent is constrained. In normal times, the cost of funds to local clients is likely to be higher than if the local subsidiary's financial interdependencies with the rest of the group were not limited. Moreover, subsidiarization does not provide a complete solution to the problem

of corporate complexity because subsidiaries can be organized on the basis of their location or on the basis of the kind of business conducted, but these approaches often conflict.

We lack strong empirical evidence that a subsidiarization approach has been more resilient. But in the absence of a plausible, reliable global system for the resolution of G-SIBs, it may be a more realistic choice than relying on international understandings that cannot be enforced.

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