

THE EVOLUTION OF BANKS AND FINANCIAL INTERMEDIATION: FRAMING THE ANALYSIS

1. INTRODUCTION

While the term “the Great Recession” has been loosely applied to almost every economic downturn in the past twenty years, the crisis of 2007-09 has—more than most recessions—lived up to that name.¹ The crisis has been felt across virtually all economic sectors and in all parts of the world. Still, if its effects have been widespread, its origins were narrower: the crisis had its roots in the financial sector and manifested itself first through disruptions in the system of financial intermediation.

This story is in itself not new. Many economic crises in history have been the result of financial crises, and many financial crises in turn originated as failures of financial intermediaries. And in every instance the reference has been to *banks*, in their essential role as deposit-taking entities involved primarily in the business of lending. Thus, Reinhart and Rogoff (2008) identify some thirty separate instances of banking crises across many countries and at different points in time during the last 100 years.

Indeed, the terms *bank* and *financial intermediary* have normally been used interchangeably. However, what was new in this last crisis is that we witnessed many instances of financial

intermediation failure that did not necessarily, or at least not directly, result from bank failures. To be sure, many banks did indeed fail during the crisis and many more were left with impaired operations—outcomes that certainly exacerbated the scale and scope of the crisis. Nevertheless, major disruptions occurred among segments of financial intermediation activity that had in recent years been growing rapidly and that did not seem to revolve around the activity and operations of banks.

For instance, we have learned that the crisis originated as a run on the liabilities of issuers of asset-backed commercial paper (ABCP), a short-term funding instrument used to finance asset portfolios of long-term maturities (see, for example, Gorton [2008]; Covitz, Liang, and Suarez [2009]; Acharya, Schnabl, and Suarez [forthcoming]; and Kacperczyk and Schnabl [2010]). In this sense, ABCP issuers (conduits) perform typical financial intermediation functions, but they are not banks. Certainly, in many instances banks were the driving force behind ABCP funding growth, sponsoring conduit activity and providing the needed liquidity and credit enhancements. But the main point is that ABCP financing shifts a component of financial intermediation away from the traditional location—the bank’s own balance sheet. Similarly, and concurrently with the ABCP disruptions, financial markets also witnessed a bank-like run on investors that funded their balance sheet through repurchase agreement (repo) transactions, another form of financial intermediation that grew rapidly but did not take place on bank balance sheets (Gorton 2008; Gorton and Metrick 2010). Additionally, in the

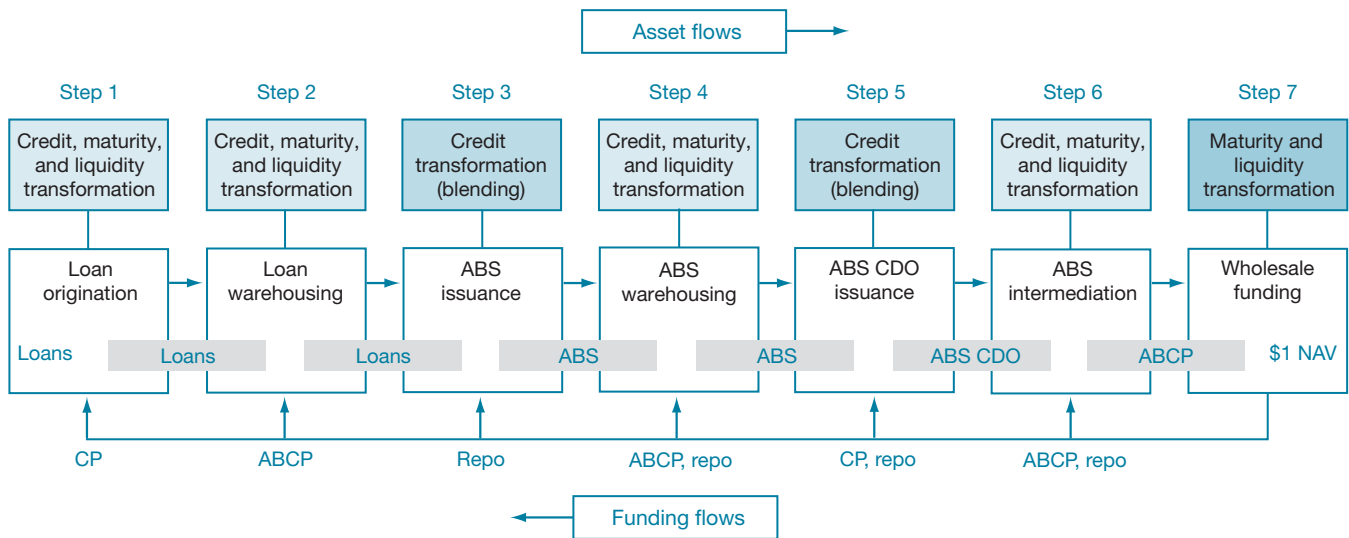
¹ The description of the 2007-09 crisis as “the Great Recession” is commonly attributed to Paul Volcker, who used the term in a speech in April 2009 (<http://sitemason.vanderbilt.edu/myvu/news/2009/04/21/paul-volcker-and-donald-kohn-discuss-the-economic-crisis-at-ogsm-forum.78224>). For the application of this term to earlier recessions, see <http://economix.blogs.nytimes.com/2009/03/11/great-recession-a-brief-etymology/>.

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The views expressed are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.

The Credit Intermediation Chain



Source: Pozsar et al. (2010).

Note: ABS is asset-backed security; CDO is collateralized debt obligation; CP is commercial paper; ABCP is asset-backed commercial paper; NAV is net asset value.

aftermath of Lehman Brothers' default, money market mutual funds, yet another class of nonbank entities that serve as financial intermediaries, experienced a run on their liabilities, an event that triggered in turn an even bigger run on ABCP issuers (Acharya, Schnabl, and Suarez, forthcoming).

The crisis has therefore exposed significant instances of financial intermediation failure but also an apparent disconnect between financial intermediation activity and banks. A new narrative has emerged, describing intermediation as a decentralized rather than a bank-centered system, one in which the matching of the supply of and demand for funds occurs along an extended *credit intermediation chain*, with specialized markets and nonbank institutions playing a part along the way.

This is the so-called shadow banking model of financial intermediation, as described, for instance, in Pozsar et al. (2010).² The authors characterize the transition from a bank-centered to a decentralized model in this way: "In essence, the shadow banking system decomposes the simple process of deposit-funded, hold-to-maturity lending conducted by banks into a more complex, wholesale-funded, securitization-based lending process that involves a range of shadow banks" (p. 13).

² The term *shadow banking* was apparently coined by McCulley (2007).

As the authors explain, the "backbone" of the new system is the credit intermediation chain. The exhibit above, from the Pozsar et al. paper, depicts the multiple steps in the chain. Loans are originated, but with a funding approach that involves a precise sequence of steps, during which they are removed from the balance sheet of the originator (warehousing), and then packaged into securities (asset-backed-security [ABS] issuance). This last step could expand into additional steps that may involve warehousing of the asset-backed securities themselves and further repackaging into more complex securities (for instance, collateralized debt obligations, or ABS CDO issuances).

This decentralization of activities opens up significant opportunities for economies of specialization, in which nonbank firms emerge as organizations that have a narrower scope than banks but perform an important function in finalizing securitization activity. In this alternative model, traditional banks may have a diminished role. Understanding the extent to which this is the case is important in and of itself, but it also raises key normative questions. Namely, what are the consequences of the new reality for the monitoring and regulation of financial intermediation? The system of controls that has been in place over time, certainly until the crisis

erupted, assumes that risks, especially in their systemic component, are mainly concentrated on the balance sheet of banks. If financial intermediation now occurs somewhere else, should we rethink the “boundaries” of regulatory control? To what extent will the new model of financial intermediation and its associated risks be subject to review and intervention with a bank-based regulatory approach?

These questions motivate the articles in this special issue of the *Economic Policy Review*. The thesis that unites all of the contributions in the volume is that banks—regulated banking institutions—have in fact *not* been bypassed in the modern process of financial intermediation. Indeed, we argue that banks have shown a remarkable capacity to adapt to the evolving system of intermediation, continuing to provide, albeit in new ways, those services needed to facilitate the matching of fund supply and demand. Moreover, we contend that when nonbank intermediation has come into play, banks have actually supported its growth.

Our thesis unfolds through two complementary approaches. First, we provide an in-depth analysis of the credit intermediation chain, focusing on the roles needed for a dollar of funding to be successfully intermediated through the new model, centered on asset securitization. Because each role is performed by a specific entity, this *role-based* approach allows us to assess the scale and scope of participation by banks—and nonbanks—in the process. The approach confirms that banks have indeed adapted naturally to the changing model of intermediation, redefining their “production function” while continuing to provide the type of services needed for intermediation to occur.

Second, we look at the same issues from the perspective of the organizational form of the banking firm itself. In particular, we posit that banks have adapted through a significant transformation of their organizational structure. If financial intermediation entails increasing participation by nonbank entities, then banks can adapt by integrating those nonbank entities in the same bank holding company (BHC) structure. This second approach, focusing on *entity type*, confirms that BHCs have allotted nonbank subsidiaries an increasingly important role in their activities, consistent with the view of adaptation through organizational changes.

Significantly, the structural changes initiated by banks have clear normative implications, since BHCs and financial holding companies are regulated by the Federal Reserve. If entities active in the credit intermediation chain have in fact been incorporated in BHCs, then we may need to reassess how much of modern financial intermediation has been overtaken by “shadow banking” and how much remains open to regulatory scrutiny.

2. FROM BANK-BASED TO SECURITIZATION-BASED INTERMEDIATION

As any textbook on money and banking would explain, the standard problem of external financing—that is, the matching of agents in possession of funds with those in need of funds—is resolved in one of two ways: 1) with *direct finance*, where fund suppliers support demand through ownership participation (acquisition of equity positions) and/or the acquisition of debt instruments (for example, bonds) directly issued by the agents demanding the funds; or 2) with *indirect finance*, where fund supply is funneled to “in-between” agents, the financial intermediaries, which are then responsible for the allocation to demand.

Direct finance grants agents an immediate participation in, and control over, investment activities, but it also entails dealing with a number of well-known informational and liquidity frictions. For instance, unless the agent seeking funds has an established track record of performance, *selection* requires learning about the agent and its intended use of funds. But even when a record of satisfactory performance exists, a supplier still needs to follow the investment project, *monitoring* activities throughout its life cycle. Moreover, before the supplier selects a specific investment opportunity, it must employ resources to *screen* available alternatives, evaluating the many dimensions of risk, return, business, scale, scope, and geography before making an informed decision. And because of these informational costs, funding constraints may still limit the ability of the supplier to *diversify* risks across a suitably large portfolio of alternative investment opportunities. Finally, even if the informational issues are successfully resolved, the fund supplier needs to factor in its own *liquidity* preferences, that is, the need to have funds available before the investment matures.

The wide range of costs associated with direct finance justifies the existence of financial intermediaries, traditionally understood to be *centralized agents* performing under one roof the roles of screening, selection, monitoring, and diversification of risk while simultaneously providing credit and liquidity services to fund suppliers. These services—the *credit, maturity, and liquidity transformations* of financial claims—presuppose all of the roles just described and show the intrinsic fragility of the intermediary’s activity: Given the nature of its operations, the financial intermediary never holds sufficient balances to guarantee full withdrawals, a condition that exposes it to potential “runs.” And because the investments of intermediaries are naturally opaque, it is difficult to distinguish the problems specific to one intermediary from problems affecting the industry as a whole, with the result that the observation of distress at one entity could lead to runs on

others as well. Hence, financial intermediation activity carries a significant social risk—the potential for systemic disruptions.³

The existence of this risk is one rationale, and perhaps the major one, for the fact that financial intermediation activity in modern history has been closely governed by laws and regulations and, more specifically, restricted to entities that are able to obtain explicit authorization in the form of a charter. In the United States, a charter permitting the taking of deposits is granted exclusively to entities organized as *commercial banks* (and similarly to thrifts and credit unions as well).⁴ Moreover, because of the potential for systemic risk, the restricted bank charter also comes with exclusive access to liquidity and credit support by the taxpayer—made available, in the United States, through access to the Federal Reserve’s discount window and the insurance of deposit accounts by the Federal Deposit Insurance Corporation (FDIC), respectively. The existence of these official backstops is a significant factor strengthening investors’ confidence in banks.⁵

Hence, both the chartering restrictions and the official liquidity and credit guarantees have been key in making the traditional system of financial intermediation a *bank-centered* system. In this framework, risks reside on banks’ balance sheets, which is the main justification for a system of regulation and supervision that is likewise focused on banks.

3. A ROLE-BASED APPROACH TO UNDERSTANDING BANK EVOLUTION

As suggested earlier, however, the advent of asset securitization has broken down the traditional system of intermediation. The origination of loans is now just the first step in a longer sequence (recall the exhibit presented above), and in every subsequent step, specialized entities now perform specific roles. For instance, warehousing in step 2 is done through dedicated entities (for instance, the ABCP conduits mentioned earlier) that finance the acquisition of the long-term assets through the issuance of shorter-term liabilities. Because of the implied maturity transformation that this role involves, this stage would typically require the provision of some form of liquidity and credit enhancement—for the same reason that banks’ traditional

activity requires both liquidity and credit guarantees. Following warehousing, the assembly of the loans into securities and the related sale to investors require the services of several parties: an *issuer*, that is, a company that acquires the assets to be transformed into securities; an *underwriter*, the entity in charge of the packaging and sale of the securities; a *trustee*, an agent that acts on behalf of and looks after the interests of the securities buyers; and a *servicer*, a party that manages the income streams from the underlying assets and the related payments to the investors. Finally, along the whole chain, the process may also require further liquidity and credit enhancement to boost the quality of the issuances.⁶

Although these roles are now typically played by separate specialized entities, they are the same roles performed simultaneously, albeit in implicit form, by a bank in the traditional centralized model of intermediation: The bank is the loan originator, but it is also the implicit issuer and underwriter of the loan portfolio to its own investors, depositors, and equity holders. Likewise, the bank performs the role of trustee, as the delegated agent for its investors, and that of servicer, as it collects the revenue stream from the loan contracts. Finally, it provides credit enhancement to debt holders, represented by the existence of equity held on the balance sheet, and liquidity services, in fact on both sides of the balance sheet, to firms and depositors.

This continuity in roles is an important qualification, showing clearly that while the system has become decentralized and complex, it is still plainly financial intermediation at its core. Consequently, we can more clearly assess whether banks have in fact been eclipsed by other players by analyzing who performs each role along the credit intermediation chain.

We begin with loan origination. Traditionally the amount of loans found on bank balance sheets would be a reasonable measure of aggregate lending activity. Yet, the evolution to a securitized-based model has actually made it more difficult to quantify precisely how much lending is originated and by whom. For instance, if loans are increasingly originated to be sold quickly to feed the asset securitization machine—the so-called *originate-to-distribute model* of intermediation—then the balance sheet (given its static nature) could not capture the richer dynamics of origination and sales taking place in the background. Hence, the levels and trends in lending amounts observed in intermittent snapshots—that is, at every point in time banks are required to file—become increasingly uninformative about the extent to which banks actively engage in the new intermediation model.

Regulatory reporting data, such as banks’ quarterly *Consolidated Reports of Condition and Income* (“call reports”), provide a small window into the originate-to-distribute practice from the observation of banks’ *held-for-sale accounts*,

⁶ Steps 4 through 6 in the exhibit represent more complex instances of securitization, but still require essentially the same roles.

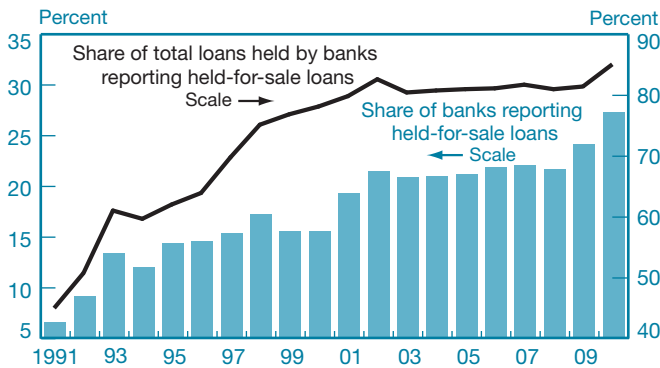
³ See, for example, Ennis and Keister (2010) for a survey of the theoretical arguments on financial intermediation fragility.

⁴ The first bank charter in U.S. history is probably that granted by the Continental Congress to the Bank of North America in 1781 (Knox 1900), although some earlier contenders for this distinction exist (for example, the Massachusetts Land Bank in 1739).

⁵ “FDIC insurance is backed by the full faith and credit of the United States government. Since the FDIC was established in 1933, no depositor has ever lost a single penny of FDIC-insured funds.” See <http://www.fdic.gov/deposit/deposits/dis/index.html>.

CHART 1

Commercial Banks Reporting Loans Held for Sale



Source: Federal Financial Institutions Examination Council, *Consolidated Reports of Condition and Income*.

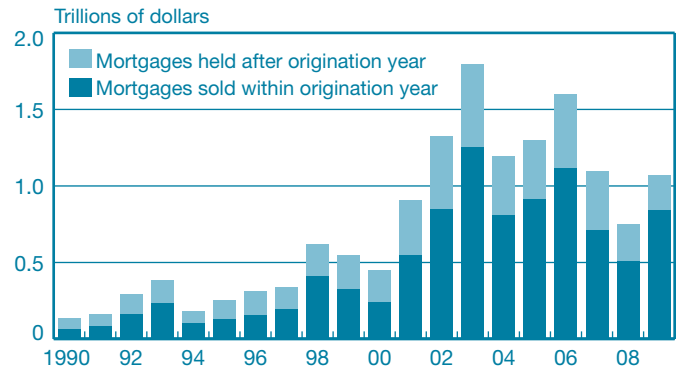
in which banks place loans that they intend to sell.⁷ As Chart 1 shows, the fraction of banks reporting held-for-sale loans (represented by the bars) increased substantially from the early 1990s, even though at the peak of the crisis, still only about one in four banks did so. However, those banks accounted for roughly 80 percent of total commercial bank loans (the solid line) over the same period. This information seems to suggest that banks increasingly shifted to an originate-to-securitize model of lending and that they may have done more origination than the balance sheet would suggest.

Still, the amount of loans held for sale at a given point in time can only offer an indirect view of the underlying dynamics of origination and sale. Ideally, one would like to see data on actual origination trends, actual sales, and the purpose of the sale—information that is not collected in current regulatory data. Information reported under the Home Mortgage Disclosure Act (HMDA) provides some detail for at least the residential mortgage subset of these assets, revealing that actual loan origination by commercial banks has grown over time (Chart 2). Moreover, a majority of these loans are sold within the same calendar year. So, for instance, in the most recent years, for every one dollar of mortgages originated and held by banks, nearly four dollars of additional mortgages were originated and sold.

⁷ The call reports (officially designated FFIEC 031/FFIEC 041) provide basic data on banks' financial condition; the forms originate with the Federal Financial Institutions Examination Council and are collected by the Federal Reserve. Note that the "held-for-sale" designation indicates only the *intent* to sell, so the size of this book is likely to depart from actual sales levels. Also, the held-for-sale books would not capture origination and sale dynamics occurring at a higher frequency than data reporting (for example, mortgage loans originated and sold all within two consecutive quarters of customary regulatory reporting). Nevertheless, the comparison of the trend in the size of these books with that of aggregate growth in securitization activity should give an indication of the participation of banks—as loan originators—in the process.

CHART 2

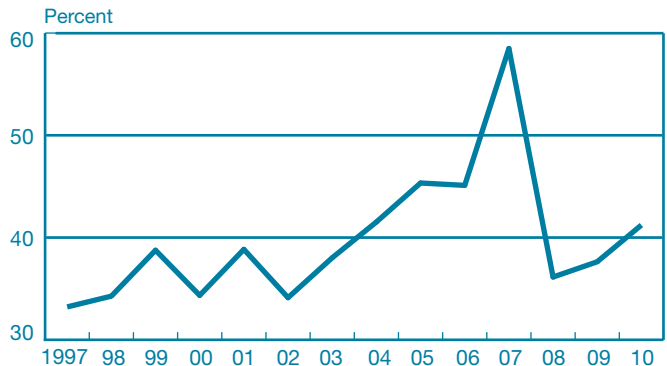
Mortgage Originations by Commercial Banks



Source: Home Mortgage Disclosure Act.

CHART 3

Mortgages Sold within Origination Year by Commercial Banks, as a Share of Total Residential Mortgage-Backed-Securities Issuance



Sources: Home Mortgage Disclosure Act; Securities Industry and Financial Markets Association.

This "churning" activity confirms quite effectively the increasing inadequacy of balance sheet data to gauge the actual importance of banks in the role of originator. Indeed, we reach the same conclusion when we compare the magnitude of residential mortgages sold in every origination year to the total new issuance of residential mortgage-backed securities (RMBS), as reported by the Securities Industry and Financial Markets Association (SIFMA).⁸ Residential mortgages originated and subsequently sold by commercial banks account for between 30 and 50 percent of RMBS issuance in most years, though this figure was closer to 60 percent in 2006 (Chart 3).

⁸ SIFMA figures for total RMBS issuance combine agency MBS issuance with nonagency RMBS issuance.

TABLE 1

Banks' Provision of Support in Structured Finance

	Top Fifty ABS Deals		Top Fifty ABCP Conduits	
	Number of Deals	Amount (Billions of Dollars)	Number of Deals	Amount (Billions of Dollars)
Banks	27	229.15	47	168.52
Nonbank affiliates	16	166.57	11	43.01
Other	30	60.59	6	11.47
Total		272.09		180.12

Source: Moody's.

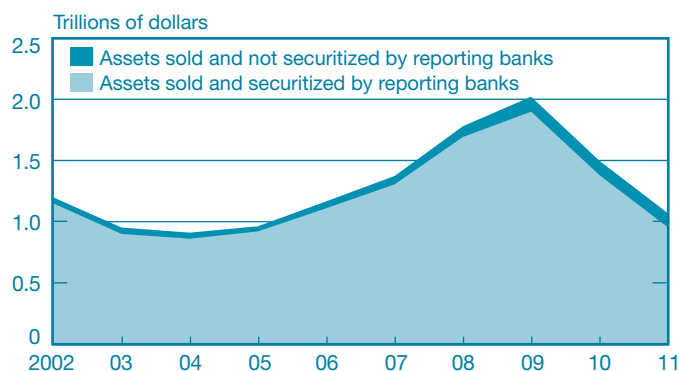
Note: ABS is asset-backed security; ABCP is asset-backed commercial paper.

Moving on to liquidity and credit enhancement, we consider the extent to which banks have ceded these roles to other entities. As noted earlier, bank-based intermediation is made relatively stable, despite its intrinsic fragility, by the existence of explicit official support from central authorities. This support takes the form of both liquidity guarantees (for example, central bank discount window access) and credit guarantees, that is, the protection of intermediaries' liabilities in the event of their default (for example, deposit insurance). By extension, the new securitized-based system, while shifting maturity transformation outside of bank balance sheets, could not thrive without receiving adequate similar support. Lacking access to official guarantees, the system requires the provision of such services from within the market itself. While various types of entities can provide, and have provided, such services, absorbing liquidity and credit risk for clients is again one of the defining characteristics of banks' business model. Moreover, banks are also natural providers of such services exactly because their sponsoring services are credible, owing to the official support they receive in turn.

The evidence seems to support the continuing importance of banks in these roles. Focusing on the ABCP market, we note that prior to the crisis, when conduits had expanded to reach a peak of about \$1.2 trillion, banks were the providers of support in almost 75 percent of the value outstanding (Acharya, Schnabl, and Suarez, forthcoming). And even after the crisis, although the volumes in this market have shrunk considerably (to less than \$400 billion in 2010), banks have maintained a dominant role. For instance, data from Moody's concerning the top fifty ABCP issuances in the United States at year-end 2010—amounting to approximately \$180 billion—

CHART 4

Outstanding Principal Balance of Assets Sold by Commercial Banks with Servicing Retained or with Recourse or Other Seller-Provided Credit Enhancements



Sources: Federal Financial Institutions Examination Council, *Consolidated Reports of Condition and Income*; Board of Governors of the Federal Reserve System, *Consolidated Financial Statements of Bank Holding Companies* (FR Y-9C data).

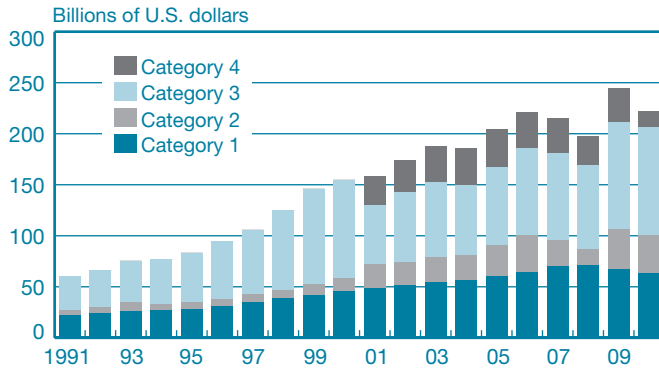
suggest that banks were the providers of support in forty-seven of such deals, for a total of \$168 billion (Table 1). As the table shows, banks were also significant providers of support in ABS issuance, and if we consider the entire holding company organization (including nonbank subsidiaries), banks figure even more importantly in the provision of this service.

Hence, banks seem to have been “private central bankers” to important components of shadow banking activity throughout the years of its growth. This is another way in which banks have asserted their renewed importance in the transformed mode of intermediation: If intermediation has migrated away from bank balance sheets, its growth still seems largely dependent on banks' support.

Further along the credit intermediation chain, to what extent have banks been engaged in the securitization process as issuers, underwriters, servicers, and trustees? This question is difficult to answer, because available regulatory data at best provide only some indirect evidence and only for the most recent period. For instance, through additions to the call reports introduced in 2001, we can derive at least a partial measure of banks' participation in asset securitization from the aggregate amount of assets sold in which banks retained a servicing role or provided some form of enhancement. As Chart 4 shows, this amount about doubles from the early 2000s to a peak in 2009 of about \$2 trillion. However, this figure does not explicitly take into account any of the other roles needed in asset securitization, and it misses the extent to which banks

CHART 5

Composition of Noninterest Income
Commercial Banks, 1991-2010



Sources: Federal Financial Institutions Examination Council, *Consolidated Reports of Condition and Income*; Board of Governors of the Federal Reserve System, *Consolidated Financial Statements of Bank Holding Companies* (FR Y-9C data).

Note: The categories are defined as follows:

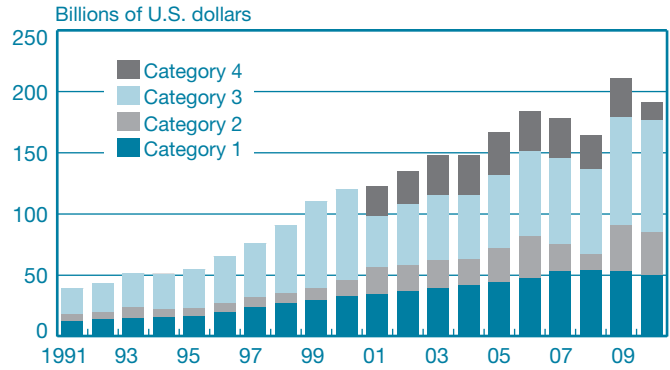
- Category 1 = income from fiduciary activities + servicing fees on deposit accounts
- Category 2 = trading revenue + other foreign transaction gains + venture capital revenue + insurance commissions and fees + investment banking fees
- Category 3 = other noninterest income + net gains on asset sales
- Category 4 = net servicing fees + net securitization income.

may have performed these roles in securitization activity that they did not originate. Some additional information can be gathered from observation of the sources of income reported by banks. The income statement, also part of the call report and also revised in 2001, now requires richer detail on the types of activities performed by banks and the relative contribution of these activities to bank income flows. In particular, banks have to report “fees from servicing securitized assets” and income from “securitizations, securitization conduits, and structured finance vehicles, including fees for administrative support, liquidity support, interest rate risk management, credit enhancement support, and any additional support functions as an administrative agent, liquidity agent, hedging agent, or credit enhancement agent.”⁹ We report these figures in aggregate (Chart 5) and separately for banks in the top 1 percent and bottom 90 percent of assets (Charts 6 and 7, respectively). The charts do seem to suggest that banks were indeed highly involved in the many roles needed to complete the process of intermediation through asset securitization. This finding is confirmed by the Moody’s data on securitization services (other than credit enhancement) provided by banks in top ABS and ABCP issuances (Table 2).

⁹ Federal Financial Institutions Examination Council, *Consolidated Reports of Condition and Income*, Reporting Form 031 Instructions, p. 35.

CHART 6

Composition of Noninterest Income
Top 1 Percent of Commercial Banks by Assets, 1991-2010



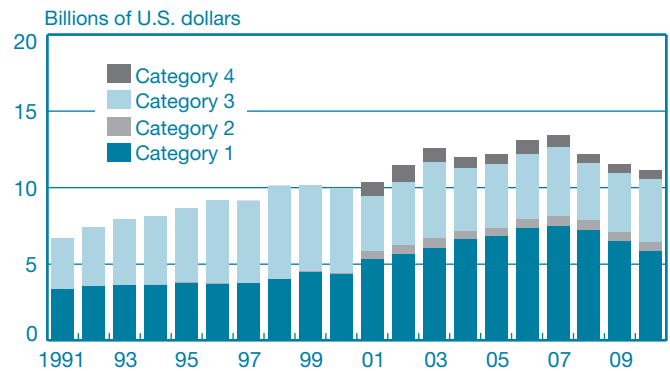
Sources: Federal Financial Institutions Examination Council, *Consolidated Reports of Condition and Income*; Board of Governors of the Federal Reserve System, *Consolidated Financial Statements of Bank Holding Companies* (FR Y-9C data).

Note: The categories are defined as follows:

- Category 1 = income from fiduciary activities + servicing fees on deposit accounts
- Category 2 = trading revenue + other foreign transaction gains + venture capital revenue + insurance commissions and fees + investment banking fees
- Category 3 = other noninterest income + net gains on asset sales
- Category 4 = net servicing fees + net securitization income.

CHART 7

Composition of Noninterest Income
Lowest 90 Percent of Commercial Banks by Assets, 1991-2010



Sources: Federal Financial Institutions Examination Council, *Consolidated Reports of Condition and Income*; Board of Governors of the Federal Reserve System, *Consolidated Financial Statements of Bank Holding Companies* (FR Y-9C data).

Note: The categories are defined as follows:

- Category 1 = income from fiduciary activities + servicing fees on deposit accounts
- Category 2 = trading revenue + other foreign transaction gains + venture capital revenue + insurance commissions and fees + investment banking fees
- Category 3 = other noninterest income + net gains on asset sales
- Category 4 = net servicing fees + net securitization income.

TABLE 2

Banks' Other Roles in Structured Finance

	Top Fifty ABS Deals		Top Fifty ABCP Conduits	
	Number of Deals	Amount (Billions of Dollars)	Number of Deals	Amount (Billions of Dollars)
Banks	40	250.60	29	111.44
Nonbank affiliates	44	261.95	26	92.29
Other	42	78.61	4	12.41
Total		272.09		180.12

Source: Moody's.

Note: ABS is asset-backed security; ABCP is asset-backed commercial paper.

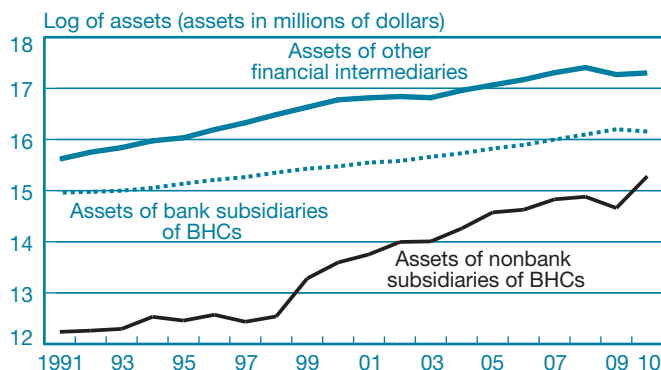
4. ORGANIZATIONAL ADAPTATION: AN ENTITY-BASED VIEW

We have suggested that banks have adapted to the modern decentralized system of intermediation by engaging, to varying degrees, in the roles that have emerged along the new credit intermediation chain. This adaptation is also evident in the changes made by banks to their organizational structure. With intermediation services provided in a decentralized fashion and increasingly by nonbank entities, banking firms have responded by integrating such entities under common ownership and control. This potential expansion of the *boundaries of the banking firm*, in the sense articulated by Coase (1937), thus suggests shifting the focus of observation from commercial banks to bank holding companies. Banks' organizational adaptation occurred somewhat organically over time, even in the presence of the strict regulatory restrictions imposed by the Banking Act of 1933 (Glass-Steagall) on the type of activities allowed by chartered banking institutions, but it was then officially sanctioned with the passage of the Financial Modernization Act of 1999 (Gramm-Leach-Bliley) and the constitution of the financial holding company as the legal entity allowed to own and control both bank and nonbank financial entities.

What does financial intermediation look like once we broaden our scope to consider bank and financial holding companies as the unit of observation (for brevity, we refer to both types of holding companies as BHCs)? Chart 8 compares the asset growth rates of regulated bank entities with those of "other" financial intermediaries (OFIs), an aggregate aimed at capturing the evolution outside the world of banks. The OFI

CHART 8

Growth in Assets of Bank and Nonbank Subsidiaries of Bank Holding Companies and of Other Financial Intermediaries



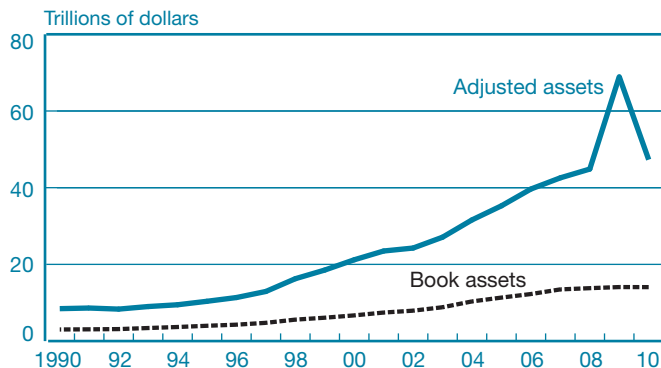
Sources: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts* and *Consolidated Financial Statements of Bank Holding Companies* (FR Y-9C data).

aggregate is constructed from the Federal Reserve's Flow of Funds data as the sum of total assets of funding corporations, insurance companies, finance companies, closed-end funds, exchange traded funds, pension funds, mutual funds, real estate investment trusts, money market mutual funds, brokers and dealers, and issuers of asset-backed securities. The total for commercial banks is from call report data. The aggregate numbers are expressed in natural logarithms, so that the line trend visualizes the growth rate of each series.

As the chart clearly shows, nonbank entities have grown substantially over the last thirty years and, most importantly, at a faster pace than commercial banks. It is also clear, however, that a significant chunk of the growth in the BHCs actually came from the nonbank subsidiaries that are consolidated on the balance sheet of the holding companies. Not surprisingly, the growth of these subsidiaries picked up in the late 1990s, with the process of deregulation mentioned earlier. The growth comparison across categories is also quite remarkable: OFI assets grew about 1.7 times from 1990 to 2010. Over the same period, commercial bank assets grew 1.2 times, while assets of nonbank subsidiaries grew more than 3.0 times.

Another way to assess the expansion in the scope of BHC activities is to consider the income data discussed earlier. Commentators have already suggested that the relative decline in banks' asset size was probably more a sign that bank assets were becoming increasingly uninformative about banks' business, rather than an indication of a true decline. In other words, banks have simply moved into alternative business lines, relying less on traditional interest-based revenues (which are reflected directly in asset holdings) and more on fee-based

CHART 9
Book Assets versus Adjusted Assets, 1990-2010
 Bank Holding Companies



Sources: Federal Financial Institutions Examination Council, *Consolidated Reports of Condition and Income*; Board of Governors of the Federal Reserve System, *Consolidated Financial Statements of Bank Holding Companies* (FR Y-9C data).

activities (which are not immediately related to asset size). In doing so, banks have preserved overall profitability and prevented their obsolescence. Boyd and Gertler (1994) made this point quite clear when they introduced the concept of “adjusted assets” as a way to quantify the importance of these non-asset-based banking business lines. From the rate of return on these activities, obtained from banks’ income statements, they performed the thought experiment of calculating how many extra units of book assets a bank would need in order to generate, through traditional interest-based activities, the same amount of fee-based income. We adapted their approach to compare the total book assets of BHCs with their computed adjusted assets. As BHCs expand and increasingly incorporate nonbank subsidiaries, whose activity is predominantly fee based, we would expect to see adjusted assets grow faster than total book assets. This is indeed the case: the gap between aggregate adjusted assets and aggregate book assets of BHCs has grown distinctly larger over time (Chart 9). While fee-based income contributed very little throughout the early part of the 1990s (hence the adjusted assets aggregate is about the same size as the book asset aggregate), the gap explodes after that. Even if we exclude the years after Lehman’s collapse, when some of the largest investment banks acquired BHC status, adjusted assets grew to be more than twice as large as total book assets.

This section’s focus on changes in entity type suggests that as the financial intermediation sector was evolving over the last three decades, “banks”—under the redefined organizational concept—did adapt, significantly expanding the boundaries of the traditional banking firm.

5. OVERVIEW OF THE VOLUME

Although this volume is motivated by the notion that financial intermediation has changed, we do not really investigate the drivers of innovation. Such an analysis would be a separate undertaking, and is beyond our scope. However, we would be remiss if we did not describe the major innovations in banking operations and in financial intermediation more broadly over the last thirty years or so. Hence, before presenting the volume’s main articles, we begin with a survey of the regulatory and policy decisions that have altered the institutions and instruments of credit intermediation and helped transform the role of banks in the process. “Regulation’s Role in Bank Changes,” by Peter Olson, suggests that government action—sometimes unintentionally—has spurred the evolution of financial intermediation.

The five articles that follow explore the idea of bank adaptation in more depth, presenting arguments and findings related to the volume’s dual emphasis on intermediation roles and changes in bank structure. In “The Rise of the Originate-to-Distribute Model and the Role of Banks in Financial Intermediation,” Vitaly Bord and João Santos focus on the role of loan origination and provide direct evidence of asset churning by banks. Using supervisory data on corporate loans, the authors are able to track the life of a loan from origination to subsequent sales. Equipped with information on the identity of the originator and the entities that acquire the loan at later stages, Bord and Santos nail down the actual role of banks in origination at the start of the modern credit intermediation chain. Their results confirm that banks play a much more important part in lending than what the balance sheet suggests. In addition, the results indicate that bank actions have actually fed the growth of the shadow bank entities involved in the subsequent steps of the credit intermediation chain.

The importance of banks in providing credit enhancements is the topic of analysis in “The Role of Bank Credit Enhancements in Securitization,” by Benjamin Mandel, Donald Morgan, and Chenyang Wei. The authors focus on the economics of credit enhancement: Why is it provided and what functions does it play? One argument, probably the most natural, is that the extension of such guarantees is a way to buffer investors—the buyers of loans repackaged as securities—to reduce their credit risk exposure. At the same time, enhancement may resolve some of the informational frictions discussed earlier by providing a signal of the quality of the underlying security. The two hypotheses imply a specific relationship between the amount of enhancement afforded and the ex post performance of the security. Namely, buffering would lead one to expect higher enhancements among more

poorly performing securities, while the signaling hypothesis would imply instead that high enhancements are associated with high performance. The authors' econometric analysis suggests that buffering investors is in fact the main motivation behind the provision of enhancement in asset securitization, thus corroborating the underlying argument that banks have played a fundamental role in supporting the modern intermediation process.

The article by Nicola Cetorelli and Stavros Peristiani, "The Role of Banks in Asset Securitization," completes the analysis of the roles implicit in the credit intermediation chain. Parsing a Bloomberg database that includes virtually the universe of asset-backed securities issued over time, and drawing on supplementary information from Moody's, the authors are able to identify the entities that play the roles of issuer, underwriter, trustee, and servicer. This "bean-counting" approach is necessary to establish the extent to which financial intermediation is now occurring "in the shadow"—that is, outside the realm of banks and beyond the scrutiny of regulators. Significantly, the evidence suggests that very little securitization-based intermediation is actually in the shadow, with much of it remaining within the scope of regulated bank entities.

The last two articles in the volume focus on our second approach to the thesis of bank adaptation, centered on the organizational transformation of banks and the expanding role of BHCs. In "A Structural View of U.S. Bank Holding Companies," Dafna Avraham, Patricia Selvaggi, and James Vickery describe the organizational structure and history of U.S. bank holding companies. While the literature on this subject draws heavily on aggregate data on bank holding companies (obtained from the Federal Reserve's publicly available FR Y-9C regulatory reports), the authors of this article merge information from a number of more obscure regulatory sources to obtain a very detailed set of stylized facts that document changes in the size and complexity of BHCs over time. In particular, the authors demonstrate that while the number of nonbank subsidiaries is an order of magnitude larger than in the 1990s, most of the structural expansion beyond the traditional boundaries of commercial banking has been limited to the largest organizations—a development that signifies the existence of important economies of scale with this form of adaptation. In the final article in the volume, "Evolution and Heterogeneity among Larger Bank Holding Companies: 1994 to 2010," Adam Copeland tracks the changing activities of bank holding companies by analyzing data on BHC income streams. Adam shows the rising importance of fee-based income across the largest BHCs,

and—consistent with our thesis—the increasing importance of nonbank subsidiaries as a source of income for the larger organization.

6. SUMMARY AND NORMATIVE SUGGESTIONS

Financial intermediation has become very complex, and banks' balance sheets are now less reflective of actual intermediation activity. However, when intermediation is distilled down to its basic components, it is still the same system, with the same roles needed so that funding can be successfully matched with demand. The crucial difference is that these roles are performed in a new way, such that it becomes economically viable, and perhaps more efficient, for different entities to specialize in providing different services.¹⁰

This observation is important, since it has provided a key to analyze the evolution of banks. We have shown, through both a role-based and an entity-based approach, that regulated banking institutions have remained crucially involved in every step of the credit intermediation chain. This ability to adapt has occurred in large part through a significant expansion of the boundaries of the banking firm, with bank holding companies becoming increasingly broad in the number of their subsidiaries and the type of activities they have been engaged in.

Our findings take us back to the policy questions we raised earlier: With so many nonbanks involved in modern intermediation, and with systemic risk now spread along the chain, regulatory agencies around the globe are currently considering reforms to the principles governing the regulation and monitoring of financial intermediation.¹¹ These efforts are likely to lead to an expansion of the boundaries of prudential-based regulation and supervision to include entities and activities that contributed heavily to systemic events during the crisis.

However, the biggest challenge facing regulators is not redesigning current regulatory boundaries but delineating principles and guidelines for monitoring and identifying *future*

¹⁰ We are aware, however, that this decentralization of roles brings with it new layers of agency/informational friction (see, for example, Ashcraft and Schuermann [2008]).

¹¹ For example, in response to an explicit mandate by the Group of Twenty, the Financial Stability Board (2011) is conducting a cross-jurisdiction exercise (still in process at the time of this article's publication) aimed at providing both monitoring and regulatory recommendations to pursue better governance of financial intermediation activities (see http://www.financialstabilityboard.org/publications/r_120420c.pdf).

mutations in the system of intermediation—mutations that, if history has taught us anything, will at least in part be the result of the battery of regulatory fixes on the table now.

We believe that the results of our analysis can offer insights on this issue. The demonstrated ability of regulated banking institutions to adapt to the changing environment suggests that there may be much to learn about the future evolution of intermediation directly from the observation of banks. Risks are still likely to be concentrated in other parts of the system—

that is, outside of banks' balance sheets—but there is a good chance a bank will be involved in new mutations of the intermediation system, either directly or indirectly. This observation thus suggests a new role for bank supervisors: In addition to carrying out their main mandate of monitoring the health of banking firms, supervisors could contribute to dynamic and forward-looking oversight of the whole system of financial intermediation as it continues to evolve.

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