

Banks and Markets: Substitutes, Complements, or Both?*

BY MITCHELL BERLIN

In traditional banking arrangements, households hold their savings in the form of deposits at the bank, which makes loans to both firms and households and holds these loans to maturity. But in the United States, and to a lesser extent in other developed countries, markets have increasingly taken over the roles traditionally played by banks. The shift of financing activity from banks to financial markets, as well as their continued coexistence, raises a number of questions. In this article, Mitchell Berlin discusses some of these questions, such as: What factors determine the relative importance of banks and markets in a financial system in which the two types of finance coexist? Why do so many borrowers continue to use a mixture of bank loans and bonds? And perhaps most important: How does the mix of banks and market finance affect the real economy? That is, how much households save, how firms invest, and how fast the economy grows.

Banks play a central role in most developed financial systems. In traditional banking arrangements, households hold their savings in the form



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of deposits at the bank, which makes loans to both firms and households and holds these loans to maturity. But in the United States, and to a lesser extent in other developed countries, markets have increasingly taken over the roles traditionally played by banks. Since the 1980s, a larger share of firms' borrowing has shifted from bank loans to bonds (Figure 1). In addition, *securitized assets* — in which loans are pack-

*The views expressed here are those of the author and do not necessarily represent the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

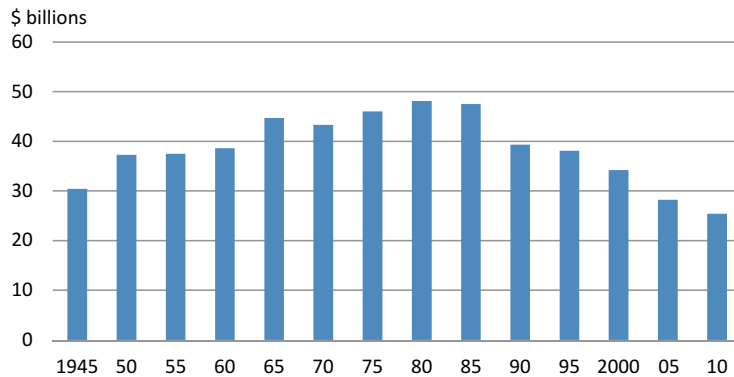
aged with other loans into marketable securities — have become an increasingly dominant channel for consumer finance in the U.S. (Figure 2) and in Europe (Figure 3).¹ While some breathless observers have predicted the ultimate decline of traditional banking altogether, most recognize that modern financial systems involve a mix of banks and markets. This is true even at the level of the individual firm. Firms with ready access to stock and bond markets continue to borrow from banks. And following the disruptions in the asset-backed securities market during the recent financial crisis, it no longer seems obvious that the consumer loan market will be so heavily dominated by securitized loans.

The shift of financing activity from banks to financial markets, as well as their continued coexistence, raises a number of questions. What factors determine the relative importance of banks and markets in a financial system in which the two types of finance coexist? Why do so many borrowers continue to use a mixture of bank loans and bonds? And perhaps most important: How does the mix of banks and market finance affect the real economy? That is, how much households save, how firms invest, and how fast the economy grows.

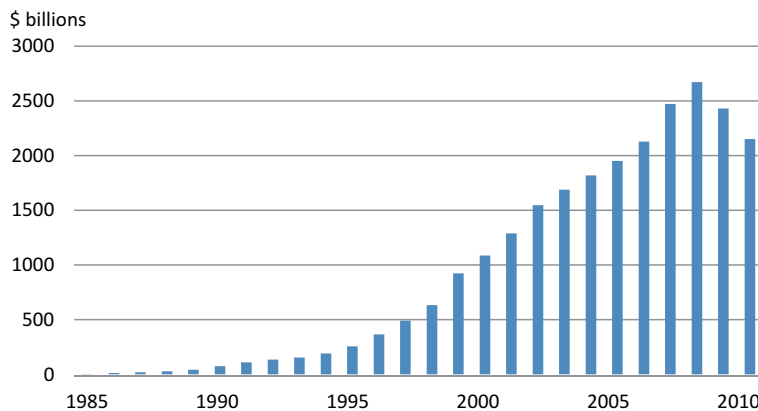
BANKS AND MARKETS BOTH PRODUCE INFORMATION, BUT DIFFERENTLY

Before going further, we need to clarify some terms. I use the polar

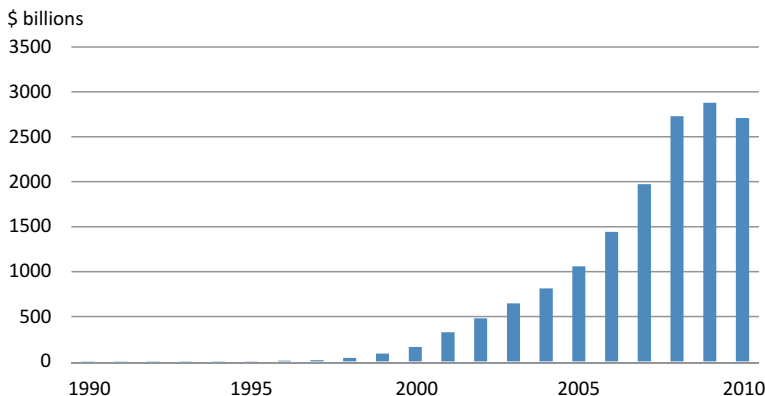
¹ In their review article, Gary Gorton and Andrew Metrick explain how securitization works and discuss the underlying economics of securitization at length.

FIGURE 1**Bank Loans as a Share of Corporate Debt**

Source: Flow of Funds, Federal Reserve Board. Total corporate debt is the sum of commercial paper, corporate bonds, and bank loans

FIGURE 2**Total U.S. Asset-Backed Securities Outstanding**

Source: Gorton and Metrick

FIGURE 3**Total European Asset-Backed Securities Outstanding**

Source: Gorton and Metrick

terms *bank loans* and *bonds*, *banks* and *markets*, in order to simplify a complicated world. Intermediaries such as finance companies, insurance companies, and even some hedge funds may act much like commercial banks if they hold a large share of a firm's debt, even though they are not funded by deposits.² However, it will sometimes be important to think about banks more narrowly as deposit-taking firms. I use the term *bonds* to refer to widely held securities — including securitized loans — that may be held in households' portfolios but may also be held (and traded) by various types of intermediaries, including commercial banks. Thus, when a commercial bank originates credit card loans that are packaged into asset-backed securities and actively traded by the bank's trading subsidiary, I will classify these as market activities, not banking activities.

Banking economists have viewed banks as specialists in producing information about borrowers before the loan is made (*screening*) and monitoring their activities closely until the loan is repaid. For example, a banker will examine a borrowing firm's books to forecast future earnings growth, visit the firm's factory to examine the quality of the firm's receivables, and even talk to the firm's customers to make judgments about the firm's ability to pay. There is substantial empirical evidence for this view of banks, but the view that banks monitor firms while markets do not is too stark. Better said, banks and markets use different technologies for screening and monitoring borrowers.

Banks Monitor Firms Using Covenants. Business loans made by banks typically include covenants, a fundamental tool in bank lending. Broadly, covenants come in two varieties. Some covenants place direct

² Debt held by a small number of lenders is often called *private debt*.

restrictions on firm's activities, for example, restrictions on large new investments by the firm without the bank's approval. The second type requires the firm to maintain various measures of financial health and the ability to pay, for example, a minimum net worth ratio (the ratio of equity to total assets) or a minimum ratio of short-term to total assets.

A key feature of bank loan covenants is that they are set tightly and renegotiated frequently.³ In their sample of bank loans, Ilia Dichev and Douglas Skinner examine two covenants frequently included in loan contracts and show that most firms maintain financial ratios just above the level that would put the firm in default; indeed, most firms are just in compliance when the contract is signed.⁴

The flip side of tight covenants is that it is easier for a single lender to renegotiate loan terms with a borrower than it is for widely dispersed bondholders. In his working paper, Michael Roberts found that loan contracts were renegotiated about once a year. For the most part, firms renegotiating contracts are not financially distressed, although Roberts and Amir Sufi found that covenant violations were most common in difficult economic environments. Over the life of the loan contract, the firm's business environment changes and contracts are adjusted to meet new realities — but only after the bank takes a close look into the firm's financial health.

Ease of renegotiation doesn't mean that every default is cured through renegotiation or that the terms on which loans are renegotiated are typically easy for the firm. Covenant violations

³ My article with Loretta Mester formalizes this view of bank lending

⁴ Dichev and Skinner focus on the current ratio (short-term debt over total assets) and net worth ratio because they are common and relatively standardized across loan contracts.

lead to real constraints on the firm's behavior; the finding that the mass of firms are just in compliance provides indirect evidence that firms would be operating at lower liquidity or net worth levels if they were not constrained by covenant restrictions. More directly, Sufi finds that, following a covenant violation, both the used and unused portions of a firm's line of credit are typically reduced by between 15 and 25 percent, while Sudheer Chava and Roberts find that real investment declines by 13 percent.⁵

You might understand why a bank

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would like to keep a tight rein on borrowers; after all, a firm with high net worth and liquid assets is more likely to pay back the loan. But why would a firm accept such restrictions, and what types of firms would choose to use bank loans with tight covenants? From the firm's point of view, tight covenants may be attractive because the bank can profitably lend at a lower loan rate when the bank is better protected against loss. Without tight restrictions, many small firms and risky firms would simply find any outside funding to be too expensive. And we will examine in some detail the reasons why many larger firms will prefer to borrow using a mixture of bank loans and bonds; broadly, the reason is that a mix of bank loans and bonds often lowers the firm's total borrowing costs. But for low-risk firms that can afford the costs of borrowing on public

⁵ These findings understate the constraints covenants impose on firms because they don't include the costs of the decisions the firm took to avoid breaching or renegotiating a contract. For example, firms may forgo a profitable investment in preference to seeking a change in its loan contract.

debt markets, some mixture of short- and long-term bonds and internally generated funds may be preferable to the tight covenants and intrusive monitoring typical of bank lending.⁶ Furthermore, much of the banking industry is regulated and regulatory costs are ultimately passed onto banks' customers, including borrowers. To avoid these costs, all firms have an incentive to limit their borrowing from banks.

Although I have focused here on covenants and renegotiation, researchers have also highlighted repeated lending between a single bank and

borrower, a *lending relationship*, as a distinctive feature of bank lending. In a lending relationship, banks build up information about the borrowing firm over time. In addition, researchers have found evidence that banks use firms' deposit accounts as a mechanism for banks to monitor borrowing firms.⁷

Markets Monitor by Aggregating Investors' Information. Nobel laureate Friedrich von Hayek first proposed the idea that market prices incorporate the information of market participants and, thus, provide guideposts to making economic decisions: buy, sell, invest. In financial markets, mutual fund managers, hedge fund managers, and other investors buy and sell stocks, bonds, and derivative securities based on their own research and the research

⁶ However, even large firms that seldom borrow from banks retain backup lines of credit with banks to call on when financial markets are tight.

⁷ Degryse and coauthors review the literature on lending relationships, and Loretta Mester and coauthors, among others, provide empirical evidence for the monitoring role of deposits.

of information specialists such as ratings agencies and industry analysts. Stated somewhat simplistically, based on their research, investors seek to buy securities that they believe will rise in price and to sell those securities that they believe will decline in price. Securities prices rise and fall accordingly.

But how does all this buying and selling affect firms' real decisions? The market for corporate control is one channel. For example, Alon Brav and coauthors have recently examined the role of hedge funds in the market for corporate control between 2001 and 2006. Some hedge funds specialize in buying up the securities (stocks or bonds) of underperforming firms and using their financial stake to put pressure on the firms' managers or to get rid of current management. The fund's investors gain if a firm's performance improves and its stock or bonds increase in value. Indeed, Brav and coauthors find that just the announcement of a hedge fund's intent to play an active role increases a firm's stock price, on average, and these gains are not reversed. Alex Edmans and coauthors provide evidence that a decline in a firm's stock price significantly increases the likelihood of a takeover attempt.

A second channel is the direct effect of market prices on management decisions. A growing body of evidence shows that managers' investment decisions are affected by the firm's stock price. Furthermore, managers' investment decisions appear to be improved when stock prices are more informative.⁸

How Does the Shift from Banks to Markets Affect Information Production? To date, researchers have only started to think about the

⁸ See Yaron Leitner's *Business Review* article for an accessible account of the theory and evidence on the effects of market prices on managerial decisions.

implications for the larger economy of changes in the information environment when activity shifts from banks to markets.⁹ For example, Christine Parlour and Guillaume Plantin demonstrate that the option to securitize assets may inefficiently reduce banks' information production about borrow-

To date, researchers have only started to think about the implications for the larger economy of changes in the information environment when activity shifts from banks to markets.

ers' financial health. This happens if the bank has large cost savings from shifting assets off its books. To see why, imagine the bank did produce information about borrowers, hoping to sell well-performing loans at a higher price by certifying when a loan is healthy. But rational buyers will be suspicious of the bank's claims and demand a large discount in the fear that the bank was selling them a *lemon*, a troubled loan being passed off as a healthy one. Thus, producing information about the firm will not be profitable for the bank. When the gains from moving loans off the bank's books are large, the loans will be sold, but only at a price so low that the bank can't profitably produce information. And since no information is produced, neither the bank nor the buyer of the loan knows whether the loan is healthy or troubled.¹⁰

From another perspective, Vincent Glode and coauthors argue that

⁹ Arnoud Boot and Anjan Thakor's and Fenghua Song and Thakor's articles are notable exceptions. Both articles contain models in which banks and markets coexist. My distinction between close monitoring and aggregating information follows theirs.

¹⁰ More formally, Parlour and Plantin show that when the gains from selling are large, the only equilibrium is a *pooling* equilibrium without information production.

markets may also provide incentives to produce too much information. They show that fund managers who make their living trading securities produce information to gain a bargaining advantage over other traders. In their model, much of the research simply affects the distribution of gains between

traders: what one trader (and his investors) gain and another trader (and his investors) lose. The information doesn't increase the total profits shared by investors, only the distribution of these profits.

Insights such as these are a starting point for developing a deeper understanding of how incentives to produce information change with an evolving mix of financial activities carried out through banks and through markets.

COMPETITION UNDERMINES INTERMEDIATION

Competition in financial markets increased dramatically in the last quarter of the 20th century, in significant part due to deregulation, with banks facing increased competition on both sides of their balance sheets.¹¹ (See *Deregulation and Competition*.) Smaller and riskier firms that could only have borrowed from banks in the past could now borrow directly on bond and stock markets. One indicator of this trend is the decline in the age of firms going public. Between 1970 and 2000, the

¹¹ I focus here on competition from financial markets rather than competition between banks. More competition between banks has much the same effect as competition from financial markets.

Deregulation and Competition



On the asset side, the deregulation of underwriting fees in 1973 and commercial bank entry into investment banking made it cheaper for firms, especially smaller firms and riskier firms, to gain access to public debt and stock markets.* The securitization of mortgages was largely the result of the collapse of the savings and loan industry in the 1980s, which was primarily driven by the deregulation of deposit rates in 1980. This technology was then adapted to a wide range of loans, providing access to securities markets to a whole new range of borrowers, mainly households. Finally, the dismantling of barriers first to intrastate and then to interstate banking increased competition between banks for borrowers' business. On the liability side, competition from money market funds — beginning in the 1970s — increased households' access to financial markets. While money market funds did not develop strictly because of deregulation, they were an innovation that was largely driven by regulatory arbitrage; money market funds could hold commercial paper without the capital requirements that were first imposed by regulators on banks in the 1980s.

* In addition to these regulatory changes, Michael Milkin's recognition that portfolios of junk bonds would yield predictable returns expanded high-risk firms' access to public debt markets. His discovery may be thought of as a "technological" advance in financial markets.

median age of a firm undertaking an *initial public offering* — selling stock to the public for the first time — declined from around 40 years to five years, with the most dramatic decline in the 1970s following the deregulation of underwriting fees.¹² Household borrowers also gained access to securities markets via securitized mortgages and credit card loans; these assets were increasingly moved off banks' balance sheets. On banks' liability side, depositors could now choose to invest their savings in securities through a wide range of intermediaries that held securities instead of loans, for example, mutual funds or hedge funds.

As a general rule, competition lowers fees and increases the variety and availability of financial services. But some of the distinctive services

provided by banks depend on cross-subsidies among bank customers. Cross-subsidization is feasible only when banks have market power over their customers.

Firms' Access to Markets Undermines Lending Relationships.

Financial economists have found convincing evidence that firms in a long-term lending relationship with a bank are less likely to be required to post collateral and less likely to be denied loans. In essence, banks make loans to young firms and risky firms that are profitable only if the firm sticks with the bank and pays higher than purely competitive loan rates in the future. So, in a bank loan portfolio, the profits from older and safer firms subsidize the loans to younger and riskier firms.

This works only as long as the bank has some market power over older and safer borrowers. If it is easy and cheap for a firm to go public and to sell securities, the bank can't charge the firm a high loan rate or maintain its accustomed level of control over the firm's

activities, and the scope for such cross-subsidies decreases. Supporting this view of the decline in banks' market power over firms with access to public markets, Carola Schenone shows that the rate a firm pays on its bank loan declines when the firm goes public.

In addition to losing older and safer borrowers to bond markets, banks' more limited ability to cross-subsidize across borrowers means that bank loans to younger and riskier borrowers become increasingly *arm's length*, in the language of the banking literature. Essentially, this term means that the bank screens the borrower when it makes the loan but does not renegotiate loan terms or provide temporarily concessionary rates if the firm is in trouble. In turn, younger and riskier firms find that borrowing exclusively from a bank becomes relatively less attractive compared to selling bonds.

Banks Provide Less Liquidity When Households Have Access to Financial Markets.

One of the traditional roles of banks is to allow households to put their money in checking or savings accounts and allow them to withdraw their money on demand. In their classic article, Douglas Diamond and Philip Dybvig demonstrate how a bank can do so even while holding a portfolio of mainly illiquid assets (e.g., loans), which have a higher yield than liquid assets such as cash. Diamond and Dybvig assume that investors have no alternative to putting their funds in the bank, a relatively accurate picture of the real world until the 1980s. But what happens when some households have the alternative of investing directly in securities markets? In his follow-up article, Diamond explicitly considers the effect of households' ac-

¹² These numbers are from the article by Jason Fink and coauthors. The median age increased to 12 years by 2006, suggesting that market participants reacted to the excesses of the Internet boom of the late 1990s by demanding more seasoning before a firm could go public.

¹³ In his model, he views households as if they were trading for themselves, but you can just as easily think of them as customers who can shift their savings from a deposit to a mutual fund or a hedge fund and have a manager trade on their behalf.

cess to financial markets.¹³

In Diamond and Dybvig's model, the feasibility of the banking arrangement depends on a cross-subsidy among depositors. Some households find that they need funds right away — they face a *liquidity shock* — while others have no immediate need for funds. As long as households have no alternative to the bank, the bank can promise households access to their funds on demand with only a small penalty. But this is only possible if households that don't need their funds will accept a lower rate than they could get in the market; that is, they are subsidizing the households that withdraw funds.

As long as households are concerned that they may need their funds at short notice — and as long as only a fraction of households need to withdraw funds at any time — this arrangement is attractive to all households. Most households would prefer to avoid being penalized whenever a pressing need for funds arises, and they would be willing to give up some return for this assurance. You can think of the bank as a type of insurance company that provides insurance against liquidity shocks.¹⁴

Things change when some households have direct access to securities markets. Since it is unrealistic to think that a bank can really tell why a depositor needs to make a withdrawal, the deposit rate has to be the same for all households. This means two things: (i) any subsidy paid to households that withdraw funds to, say, make a mortgage payment must also be paid

¹⁴ In addition to providing customers with more liquidity, the bank also changes the mix of investments in the economy. Specifically, the bank holds a portfolio with a larger fraction of illiquid (but high-yielding) investments than individuals could hold in their own portfolios. Without the bank, individuals would have to hold lots of low-yield liquid investments (cash in mattresses) to self-insure against liquidity shocks.

to those who withdraw their funds to trade in the market; and (ii) only households without access to securities markets can be the source of the subsidy. So as more customers have easy access to securities markets, the interest rate the bank can offer to households with immediate liquidity needs decreases, and the liquidity insurance offered by the bank becomes less valuable. In turn, even more activity shifts from banks to markets.

BANKS AND MARKETS ARE ALSO COMPLEMENTARY

Competition tends to make bank services less unique and to shift activities from banks to markets. But this doesn't mean that the banking sector will shrink until banks become niche providers, serving only very small firms and the most cautious and unsophisticated households. First, greater competition doesn't mean that market power disappears completely. Furthermore, not all of the services provided

Competition tends to make bank services less unique and to shift activities from banks to markets.

by banks depend on monopoly power and cross-subsidies. Perhaps most important, bank loans and bonds are *complements*.¹⁵

Firms' Optimal Financing Mix Includes Bank Debt.¹⁶ Since the 1960s, financial economists have made a huge effort to understand firms' capi-

¹⁵ Broadly, two products are complements when the cost of producing (or using) one good lowers the cost of producing (or using) the other.

¹⁶ The theoretical description in this section includes insights from articles by Eric Berglof and Ernst Ludwig von Thadden and by Cheol Park.

tal structure, that is, how much equity and how much debt were chosen by firms and why. Beginning in the 1990s, theorists began to think more carefully about the composition of firms' debt, e.g., short-term versus long-term debt, bank debt versus public debt. More recently, empirical financial economists have explored the structure of debt contracts in much more detail.

Consider a firm that is large enough to borrow in bond markets; in principle, at least, the firm could avoid borrowing from a bank altogether and thus avoid the bank's monitoring. Indeed, the firm would gain maximum flexibility by selling long-term bonds, let's say 30-year bonds. But would this be the cheapest way for the firm to borrow? Sensible bondholders will be concerned that a lot can change in 30 years. The firm's markets may dry up, or new managers with a taste for high risk or costly empire building may replace current management. The firm may have to pay quite a high rate of interest to convince bondholders to accept these types of risks, or there might not be a rate high enough to convince them.

One possible alternative for the firm is to split its borrowings into short-term debt (commercial paper) and long-term bonds. In this case, the firm will have to prove that its finances are healthy by paying off its short-term debt on a regular basis. And if bondholders are no longer convinced that the firm's prospects are good, short-term investors can pull the plug and the firm will be forced to scramble for funds. Thus, short-term debt may serve as a disciplinary device that, in turn, facilitates borrowing for a longer term. While this debt structure is feasible for low-risk firms with an impeccable reputation, it poses problems for riskier firms.¹⁷

¹⁷ For very low-risk firms, the disciplinary role of short-term debt is probably a secondary matter. For such firms, short-term borrowings are simply a convenient way to finance working capital.

Let's take a firm with a significant chance of default. In fact, let's consider a firm that is unable to pay off its short-term creditors because of financial difficulties. Crucially, a firm facing financial problems is often worth a lot more alive than dead; simply auctioning off the firm's assets inside or outside bankruptcy proceedings would fetch a lower price than the firm is worth as a going concern. With the prospect of a looming default, bondholders will have a powerful incentive to agree if the firm's managers propose the following deal: Accept new claims that pay less than the original contractual return but not much more than they would have received by auctioning off the firm's assets and sharing the proceeds. As long as all creditors have the same priority, that is, each of the firm's creditors has a pro rata claim on the firm's assets in the event of default, they would unanimously agree to this deal.

While a restructuring to avoid default is often better for both bondholders and managers, it is not hard to see that the possibility of renegotiation undermines the threat to impose default, so short-term debt doesn't have as much disciplinary power as it appeared on first sight. Most worrisome, if managers know that bondholders will renegotiate, they may take more risks or build empires, and we are back where we started: high borrowing costs.¹⁸

Short-Term Bank Debt Is a Hard Claim. The threat to impose default can be made more believable if the short-term creditor has priority over other creditors because the creditor with priority captures more than its pro rata share of the auction value of

¹⁸ Making it very hard to renegotiate would improve discipline. But the option to renegotiate is also valuable for firms in risky environments. Furthermore, if the firm can choose to enter Chapter 11 bankruptcy proceedings, the bondholders get bargaining plus bankruptcy lawyers!

the firm's assets. (For these purposes, having a collateralized claim serves much the same purpose.) Since it gets a disproportionately higher payoff in default, the creditor with priority will be a hard bargainer; economists would say that he or she holds a *hard claim*. Even if the threat to impose default is never actually carried out, discipline is improved because the firm's managers know that default will be painful. And even though the short-term creditor gains at the expense of other creditors

While holding a hard claim is valuable to discipline managers, liquidating fundamentally sound firms or mistakenly relaxing contract terms for genuinely troubled firms makes everyone worse off.

in negotiations, the firm's long-term creditors benefit from the discipline imposed by the hard claim.¹⁹ Furthermore, negotiations will be more efficient if the holder of the short-term claim has the capacity to closely examine the firm's financial condition. While holding a hard claim is valuable to discipline managers, liquidating fundamentally sound firms or mistakenly relaxing contract terms for genuinely troubled firms makes everyone worse off.²⁰

In summary, risky firms with access to bond markets will borrow through a mixture of subordinated long-term debt and higher priority short-term debt (or debt with stringent

¹⁹ Long-term creditors will also insist on receiving an interest rate that compensates them for the likelihood that the short-term creditor does too well at their expense in contract negotiations.

²⁰ Note that while my account focuses on the disciplinary role of short-term debt, longer-term debt with strict covenants and with priority over other long-term creditors has a similar disciplinary effect.

covenants) held by a creditor that can monitor the firm closely.²¹ That is, for all but the safest firms, bank debt is part of the debt mix that reduces borrowing costs. For that matter, a firm's access to bond markets may depend on the role played by the bank.

Evidence for the Value of Hard Claims. Recent research has provided support for the role of hard claims in risky firms' debt structure. Mark Carey and Michael Gordy examine a large sample of firms that entered

bankruptcy and ask which firms have a larger *recovery value*, that is, which firms ultimately paid creditors the largest amount per dollar invested when the firm's assets were liquidated. Carey and Gordy find that recovery values are higher for firms with a higher share of bank debt and that other factors are of secondary importance. In their terminology, banks are "grim reapers." Banks discover financial troubles early and their interventions prevent managers from imposing greater losses on creditors.²²

Joshua Rauh and Amir Sufi examine a sample of *fallen angels*, firms that experience a dramatic drop in their credit rating from investment grade

²¹ Subordinated bondholders receive a payoff only after other debt holders have been paid in full. Thus, subordinated debt holders have higher priority than stockholders but lower priority than other bondholders.

²² This evidence doesn't imply that bankruptcy was an efficient outcome, only that the threat to impose default was effective and that the decision to liquidate was informed, in the sense that creditors tended to gain after liquidation.

to junk status, which means that their risk of default increases substantially. They find that these firms were originally funded primarily by unsecured debt and equity, but after the collapse in their credit rating, they shifted toward a mix of secured bank debt and unsecured and subordinated long-term bonds. Similarly, comparing a sample of low-risk and high-risk public firms, Rauh and Sufi found the same pattern; low-risk firms secure funds mainly using equity and unsecured debt, while high-risk firms borrow through a mixture of short-term, secured bank loans and subordinated long-term debt.²³

Deposits and Lines of Credit Are Complements. In their article, Anil Kashyap and coauthors argue that because banks are funded by deposits, they have a cost advantage in providing lines of credit. As long as depositors' and firms' demands for funds are not perfectly correlated, that is, as long as borrowing firms don't always borrow under their line of credit at the same time that depositors withdraw their funds, banks can meet all commitments while holding a relatively small amount of (low-yield) cash balances. Furthermore, if firms' and depositors' demands for liquidity are negatively correlated — meaning that firms borrow at times when savers are holding more of their savings in deposit accounts — the cost complementarity is even stronger.

Evan Gatev and coauthors provide empirical evidence for this strong type of cost complementarity. They focus on periods in which stress in money markets restricts many firms' access to the commercial paper market. At times of stress, firms borrow on their lines of credit. In stressful times, funds on deposit with banks also increase.

²³ I am simplifying their results slightly. The higher risk firms also include some senior unsecured debt and convertible bonds in their debt structures. This slightly complicates but doesn't contradict my interpretation of their evidence.

Funds flow into the banking system, probably because firms and households view banks as safe places to put their savings in a financial storm.

Lines of Credit Are Part of a Firm's Optimal Financing Mix. Recently, a number of economists have modeled firms' financing decisions as if they were part of an *optimal long-term contract*. The approach in this research

agers without closing down the firm every time it suffers a setback.

I have argued that bank loans' mixture of tight control and renegotiation is one solution to these problems, but it is not the only one. The mix of securities the firm uses to finance operations is another solution. In DeMarzo and Fishman's model, the borrowing firm has an incentive to use cash flows

While depository institutions have a cost advantage in providing lines of credit, they have no such advantage in holding long-term debt in their portfolio.

is to figure out what the best long-term financing contract would look like — including the pattern of loan payments and the conditions under which the firm is placed in default — and then to ask whether some mix of securities could reproduce the terms of this contract. Interestingly, in Peter DeMarzo and Michael Fishman's model, the terms of the optimal long-term contract can be mimicked by a financing mix of equity, long-term debt, and a line of credit.

Broadly, the optimal long-term contract is designed to solve two types of problems. First, borrowing is rife with conflicting incentives: Borrowing firms have incentives to take too much risk, to cover up problems until it is too late, or to consume excessive perks. Uncontrolled, these conflicts would increase default risk and raise borrowing costs (or even make financing infeasible altogether), so financial contracts are designed to control incentive problems. Second, firms operate in an intrinsically risky business environment. Even when a firm's managers are making cautious and thrifty decisions, the firm's cash flows are variable and uncertain. An optimal long-term contract must impose discipline on man-

to consume perks, and the lender can't directly observe the firm's cash flows or how the firm is using its cash flows. The authors show that the optimal financing mix is a combination of equity, long-term debt, and a line of credit, a combination that looks a lot like the mix of contracts used by many real world firms. The long-term debt forces the firm to make some payments to the lender, but because principal is paid back later, the firm has more flexibility to pay workers, suppliers, etc. The line of credit provides even more flexibility in the event of temporary setbacks; the firm can draw down the line of credit to cover long-term debt payments and to meet operating costs even when the business environment is tough. In addition to the long-term debt payments, discipline is imposed on the firm in two ways. No payments can be made to the firm's stockholders unless the firm stays current on all debt payments. Furthermore, if the firm can't make payments on its credit line, the lender imposes default.

While depository institutions have a cost advantage in providing lines of credit, they have no such advantage in holding long-term debt in their portfolio. Furthermore, we have already seen

that there are benefits from having separate investors hold the firm's short- and long-term debt. Consistent with both theory and real world practice, firms with access to public debt markets borrow through a mixture of bank loans — here, loans borrowed under a line of credit — and public bonds.


CONCLUSION

Banks and markets interact in a number of ways. Firms and households view banks and markets as substitute ways to borrow funds and to hold their savings. Many of the distinctive features of banking services are based on cross-subsidies among the bank's customers, but these are only feasible if banks retain market power over borrowers and depositors. Thus, increasing competition in financial markets — driven primarily by deregulation in the last quarter of the 20th century — tends to undermine the profitability of banks and to increase the share of activities carried out through

financial markets. But there are limits to how far the banking sector can shrink because banks and markets are also complementary. Many firms, not just those too small to access bond markets, lower borrowing costs using a mix of financial contracts, including bank loans. In particular, banks retain a comparative advantage in providing lines of credit because they provide deposits.

There is a wealth of evidence that the mix of bank loans and bonds has real effects at the firm level — for example, a heavier reliance on bank loans increases the recovery rates for firms that enter bankruptcy — but the evidence that the mix of banks and securities markets matters at the macroeconomic level is much weaker. Ross Levine's comprehensive review of the evidence concludes that while financial development has a significant role in promoting economic growth, there is not much evidence that the relative scale of the activities carried out

through banks or through markets has a large effect on a country's economic growth.

That said, the recent financial crisis and the ensuing deep recession are likely to force economists to revisit and rethink the evidence about economic performance in the last few decades, a period that witnessed the rapid growth of financial markets, especially the growth of securitized assets. Some analysts view the heavy shift toward securitized markets in the U.S. as a major cause of the crisis.²⁴ At the same time, economies dominated by banks, for example, Spain and Ireland, also experienced a lending boom and an attendant bust. It will take some time for us to absorb the lessons of the financial crisis and to determine whether it provides any lessons about the mix of banks and markets going forward. 

²⁴ See Ronel Elul's *Business Review* article for a review of the evidence about securitization and mortgage default.

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