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Banks, Banking, and Crises

Gary Gorton*

The subprime mortgage credit crisis demonstrates that while financial intermediaries have changed in many ways, at root their problems remain the same. Indeed, the old problem of banking panics can reappear in new guises.

In the subprime mortgage crisis, investors without information about exactly which bonds have declined in value have refused to reinvest in the short-term obligations of structured vehicles, including Structured Investment Vehicles (SIVs) and Asset-Backed Commercial Paper Conduits. And, without financing from capital markets, these intermediary vehicles either must sell assets, causing the prices of a range of assets to fall and resulting in widespread losses, or must receive financing from their sponsor banks, reabsorbing the vehicles onto the balance sheet and resulting in decreased capital for the sponsoring banks. In this report I review my research on banks and banking, and look at bank crises in particular.

Implicit Contracting in Banking

In a 2006 paper, Nicholas Souleles and I studied the role of off-balance-sheet vehicles, like those mentioned above.¹ Such “special purpose vehicles” (SPVs) are legal entities with narrowly circumscribed roles; they are essentially thinly capitalized robot asset management firms, with no employees and no physical location. The assets of SPVs are financial obligations, typically commercial or consumer loans or mortgages, or

securities linked to such loans and mortgages. These assets may be originated by a single sponsoring financial institution, or may come from multiple originators. While the SPV owns the assets, the servicing of the assets (collecting the loan payments, repossessing the car, foreclosing on the house, and so on) is contracted out, commonly to the sponsor.

SPVs are a form of bank; they hold loans financed by short-term liabilities. The informationally opaque loans are originated by financial intermediaries and then sold to robot firms (SPVs) and financed in capital markets. Why don't banks just hold the loans, instead of selling them to SPVs? And, how can it be incentive-compatible for investors to buy SPV liabilities in capital markets, that is, why should investors in SPVs' liabilities believe that the loans held by SPVs are not lemons?

Souleles and I investigate these questions, arguing that the motivation for using SPVs is that they reduce bankruptcy costs because their assets avoid these costs. Off-balance-sheet financing is most advantageous for sponsoring firms that are risky or face large bankruptcy costs. Avoiding the potential “lemons problem” is more difficult because legal and accounting constraints require the SPV to be separate from the sponsor. SPVs are incentive-compatible because the sponsors can implicitly commit to subsidize or bail out their SPVs. In a repeated game context, this implicit contract can be supported by investors' threat not to invest in SPVs where the sponsor does not honor the implicit contract.

We test these predictions using a unique dataset on credit card securitizations and find that riskier firms securitize more and that the pricing on the

SPV debt includes a premium related to the sponsor's risk of default, in addition to the risk of the SPV's assets. Thus, it is not a surprise in the current credit crisis that sponsors are tending to their SPVs, reabsorbing them on-balance sheet in some cases and buying their liabilities in other cases.

Implicit contracts also arise in the area of loan sales, a phenomenon that should not happen according to the standard theory. A central idea in the theory of financial intermediation is that intermediaries produce information about potential borrowers that does not become known to outsiders; that is, it is private information.² From this point of view, loans should not be saleable in the capital markets because of lemons problems. Yet, starting in the 1980s, a market for loans opened in the United States that is now quite well developed. In two papers, George Pennacchi and I investigate these issues and also find support for the implicit contracting hypothesis.³

What Do Banks Do?

Because the loans in SPVs and those sold in loan markets are still originated by banks, the role of intermediaries is still important. What do banks do that is so important? On the asset side of their balance sheet, intermediaries produce information about potential borrowers and allocate credit. They also monitor borrowers and importantly, can restructure loans to try to control borrower behavior, as discussed in my paper with James Kahn.⁴ The role of banks in monitoring can be very significant, especially in economies that are more bank-oriented, for example Germany. Frank Schmid and I⁵ show that such bank-oriented economies, ones where the stock

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market plays a much smaller role than in the United States, are a challenge to the notion that “efficient” financial markets are central to economic efficiency. James Dow and I link these two concepts of “efficiency” and also show how banks can allocate resources as efficiently as stock markets.⁶

On the liability side of bank balance sheets, banks create securities that are nearly riskless. Banks hold diversified portfolios (and historically could issue clearinghouse loan certificates when needed) so their liabilities, mainly demand deposits, can circulate as a means of exchange. Other liabilities, like certificates of deposit, are also important as near-money securities.⁷ This role of banks has evolved over many years. Before the U.S. Civil War there was no national currency and demand deposits were not widely used. Instead, banks printed their own money that circulated as a hand-to-hand currency. That period traditionally has been viewed as chaotic, with “wild cat” banks taking advantage of an unsuspecting public. However, this is not an accurate characterization of the period. In two studies on the pricing of free notes, I found a quite efficient market at that time.⁸ When notes circulated, they did so at a discount from par. The discount increased with the distance from the issuing bank. If a bank’s discount widened, there was an incentive to go to that bank and redeem the note. Monitoring banks in this period was based on market prices being efficient. It seems that bank panics started when demand deposits replaced bank notes. Being a claim jointly on a person’s account and the bank, demand deposits did not circulate, and the clearinghouse was born.

Banking Panics

Implicit contracts do not necessarily contemplate systemic problems, which may characterize the subprime crisis. There have been at least ten banking panics in U.S. history, but the last one, during the Great Depression, is a dim memory for most people. A banking panic

occurred when depositors at banks had reason to believe that their bank held assets of possibly lower value than they had previously believed. Banking panics tended to be a peculiarly American phenomenon because the United States had many banks (because of branching restrictions), resulting in less diversified portfolios than might otherwise have been the case.

Banking panics are not irrational, as Charles Calomiris and I show.⁹ Rather, they are rooted in a lack of information. Panics have tended to happen near business cycle peaks; with a recession coming on, there would indeed be some loans that would not be repaid.¹⁰ Depositors would go to their banks and demand their cash back, because the value of cash is easily determined, unlike the value of bank deposits. But the banking system could not honor these demands, since their loans are illiquid, so redemption was suspended. In fact, suspension was usually illegal, but was tolerated during panics.¹¹ The illiquidity of assets, and resulting plummeting prices should these assets be sold, meant that another solution needed to be found.

The Origins of Central Banking

The historical solution to panics evolved over the nineteenth century and the logic of the solution is at the root of much of central banking. The solution was the private organization of banks, called the clearinghouse. During normal times, bank clearinghouses did what the name suggests, clear checks. But during panics, when depositors were concerned about the failure of individual banks, the member banks transformed themselves into a single institution, one large diversified portfolio. The single institution would then issue claims—clearinghouse loan certificates—to replace demand deposits from individual banks. The loan certificates were claims on the joint portfolio of the member banks. Banks monitored each other’s loan portfolios to ensure that each was willing to share the liability of the group’s portfo-

lio. Essentially, banks created one giant portfolio of all member bank assets to diversity away the information asymmetry. Loan certificates that were backed by the banking system as a whole thus replaced depositors’ claims on individual banks. In 1984 and 1985 papers on my own, and in a 1987 paper with Donald Mullineaux and a recent paper with Lixin Huang, I have discussed the history and theory of bank clearinghouses.¹² These studies also show how central banking emerged from this institution.¹³

With the advent of the Federal Reserve System, the role of clearinghouses was diminished, with bank regulators taking over many of the clearinghouse regulatory functions. In the modern era, bank regulators face new challenges. For example, interest rate derivatives allow market participants to transfer the systematic risk of interest rate movements from one party to another. But, this does not diversify the risk. Where this risk ultimately resides is a question that I investigate with Richard Rosen.¹⁴

Also, the corporate governance of banks may give them an incentive to take risk, which Richard Rosen and I argue was the case in the 1980s and early 1990s.¹⁵ With disintermediation of chartered commercial banks by unregulated intermediaries, it has become harder for regulators to monitor risk in the broader banking system.¹⁶ Regulators cannot simply force banks to hold more capital because banks can simply exit the regulated industry by shrinking.¹⁷ One way to do that is by moving assets off-balance-sheet. The subprime crisis shows the affects of this: namely, in an important sense, risk in the banking system has been moved via credit derivatives and structured vehicles, out of the banking system. But, this has simply moved the “banking panic” to these vehicles. This, in part, is a by-product of bank regulation.

The problems of banking crises remain elsewhere in the modern world. Such problems can be large, as with the savings and loan crisis during 1988–92, or any of the forty or so crises in recent

history in other economies. These problems resulted in costs of 15-50 percent of GNP to clean up.¹⁸ So, Lixin Huang and I have studied the role of governments in bank bailouts.¹⁹ Basically, when the assets of the banking system need to be sold, it is not possible for private agents to purchase them for the simple reason that private agents don't have enough "liquidity." A private bank clearinghouse can create liquidity by creating money. But in the modern era, only the government or central bank can play this role. In the current crisis, the government has been less successful in playing this role, as of this writing.

Banks, Credit Crunches, and the Business Cycle

Historically, banking panics anticipated recessions. But, banks' credit allocation behavior also may be an autonomous part of the business cycle more generally. Large changes in bank credit allocation, sometimes called "credit crunches," appear to be an important part of macroeconomic dynamics. Bank lending is procyclical. Rather than change the price of loans—the interest rate—banks sometimes appear to ration credit. A dramatic example in the United States is the period shortly after the Basel Accord was agreed to in 1988, during which time the share of U.S. total bank assets composed of commercial and industrial loans fell from about 22.5 percent in 1989 to less than 16 percent in 1994. At the same time, the share of assets invested in government securities increased from just over 15 percent to almost 25 percent. More generally, it has been noted that banks vary their lending standards or credit standards.

Ping He and I study how banks compete in lending and how they set their lending standards.²⁰ Banks produce information about potential borrowers, but at the time they do not know how much information competitor banks are producing about the same borrowers. In a Green and Porter-style model of bank competition, we show that banking must involve credit crunches, periods when

banks cut back on credit, and increase the costly information production.

We test the model's predictions in a variety of loan markets by parameterizing the information that is at the root of bank beliefs about the behavior of other banks. It has been difficult to test models of repeated games, but we take a new approach in this work. The empirical tests are constructed based on parameterizing public information about relative bank performance that is at the root of banks' beliefs about rival banks' lending standards. In other words, proxies for banks' beliefs are directly constructed and their behavior is shown to be a function of changes in these variables. The relative performance of rival banks has predictive power for subsequent lending in the credit card market, where we can identify the main competitors. At the macroeconomic level, the relative bank performance of commercial and industrial loans is an autonomous source of macroeconomic fluctuations. In an asset-pricing context, the relative bank performance is a priced risk factor for both banks and nonfinancial firms. The factor-coefficients for nonfinancial firms are decreasing with size, consistent with smaller firms being more bank-dependent.

Summary

Banks and financial intermediation, generally, are at the core of the savings-investment process. The process of taking in consumers' savings and using these resources to finance investment happens in an opaque way, leading to information asymmetries that can cause panics and runs. This can take many different forms, as new financial innovations, such as credit derivatives and special purpose vehicles, can move risk off bank balance sheets. The subprime crisis is the latest lesson.

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M. Carey, eds. Chicago: University of Chicago Press, 2006.

² See G. Gorton and A. Winton, "Financial Intermediation," in *The Handbook of the Economics of Finance: Corporate Finance*, G. Constantinides, M. Harris, and R. Stulz, eds., Elsevier Science, 2003.

³ G. Gorton and G. Pennacchi, "Are Loan Sales Really Off-Balance-Sheet?" in *Journal of Accounting, Auditing and Finance*, 4(2) (Spring 1989), pp. 125-45, and "Banks and Loan Sales: Marketing Non-Marketable Assets," NBER Working Paper No. 3551, December 1990, and *Journal of Monetary Economics*, 35 (3) (June 1995), pp. 389-411.

⁴ G. Gorton and J. Kahn, "The Design of Bank Loan Contracts," NBER Working Paper No. 4273, February 1993, and *Review of Financial Studies*, 13 (2000), pp. 331-64.

⁵ G. Gorton and F. Schmid, "Universal Banking and the Performance of German Firms," NBER Working Paper No. 5453, February 1996, and *Journal of Financial Economics*, 58 (2000), pp. 3-28.

⁶ J. Dow and G. Gorton, "Stock Market Efficiency and Economic Efficiency: Is There a Connection?" NBER Working Paper No. 5233, August 1995, and *Journal of Finance*, 52 (3) (July 1997), pp. 1087-1130.

⁷ G. Gorton and G. Pennacchi, "Financial Intermediaries and Liquidity Creation," *Journal of Finance* 45(1) (March 1990), pp. 49-72.

⁸ G. Gorton, "Reputation Formation in Early Bank Note Markets," *Journal of Political Economy*, 104(2) (1996), pp. 346-97; and G. Gorton, "Pricing Free Bank Notes," *Journal of Monetary Economics* 44 (1999), pp. 33-64. Also, see G. Gorton, "Banking Theory and Free Banking History: A Review Essay," *Journal of Monetary Economics* 16(2) (September 1985), pp. 267-76.

⁹ C. Calomiris and G. Gorton, "The Origins of Banking Panics: Models, Facts, and Bank Regulation," in *Financial Markets and Financial Crises*, R.G. Hubbard, ed. Chicago: University of Chicago Press, 1991.

¹⁰ G. Gorton, "Banking Panics and Business Cycles," *Oxford Economic Papers*, 40 (1988), pp. 751–81.

¹¹ G. Gorton, "Bank Suspension of Convertibility," *Journal of Monetary Economics*, 15 (2) (1985), pp. 177–93.

¹² G. Gorton, "Private Bank Clearinghouses and the Origins of Central Banking," *Business Review, Federal Reserve Bank of Philadelphia (January-February 1984)*, pp. 3–12; G. Gorton, "Clearinghouses and the Origin of Central Banking in the U.S.," *Journal of Economic History*, 45(2) (June 1985), pp. 277–83; G. Gorton and D. Mullineaux, "The Joint Production of Confidence: Endogenous Regulation and Nineteenth Century Commercial Bank Clearinghouses," *Journal of Money, Credit and Banking*, 19(4) (1987), pp. 458–68; G. Gorton and L. Huang, "Banking Panics and Endogenous Coalition Formation," *Journal of*

Monetary Economics, 53 (7) (October 2006), pp.1613–29.

¹³ G. Gorton and L. Huang, "Banking Panics and the Origin of Central Banking," in *Evolution and Procedures in Central Banking*, D. Altig and B. Smith, eds. Cambridge: Cambridge University Press, 2003.

¹⁴ G. Gorton and R. Rosen, "Banks and Derivatives," in *National Bureau of Economic Research Macroeconomics Annual*, B. Bernanke and J. Rotemberg, eds. Cambridge: MIT Press, 1995.

¹⁵ G. Gorton and R. Rosen, "Corporate Control, Portfolio Choice, and the Decline of Banking," *NBER Working Paper No. 4247*, December 1992, and *Journal of Finance*, 50(5) (December 1995), pp. 1377–420.

¹⁶ G. Gorton, "Bank Regulation When 'Banks' and 'Banking' Are Not the Same," *Oxford Review of Economic Policy*, 10(4) (Winter 1994), pp.106–

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¹⁷ G. Gorton and A. Winton, "Liquidity Provision, Bank Capital, and the Macroeconomy," 2000, working paper http://papers.ssrn.com/sol3/papers.cfm?abstract_id=253849.

¹⁸ S. Claessens, S. Djankov, and D. Klingebiel, "Financial Restructuring in East Asia: Halfway There?" *World Bank Financial Sector Discussion Paper No. 3*, 1999.

¹⁹ G. Gorton and L. Huang, "Liquidity, Efficiency, and Bank Bailouts" *American Economic Review* 94(3), (June 2004).

²⁰ G. Gorton and P. He, "Bank Credit Cycles," *Review of Economic Studies*, 2007, forthcoming.

