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Editorial

Post-crisis evolution of banking and financial markets: Introduction

The *Wells Fargo Advisor's Center for Accounting and Finance Research* sponsored a conference at Washington University's Olin Business School on October 6th and 7th of 2017, celebrating Emeritus Professor Stuart I. Greenbaum's 80th birthday. The conference, entitled "Post-Crisis Evolution of Banking and Financial Markets", attracted researchers from all over the world, and included two Federal Reserve Bank presidents, two former Olin School of Business deans as well as the incumbent, and numerous policymakers. A subset of those papers appear in this issue of the *Journal of Financial Intermediation*, a co-sponsor of the conference.

The goal of the conference was to have research presented on the issue of developments in financial markets since the financial crisis of 2007–09. A major factor in the crisis was the increasing integration of banks and financial markets via developments like securitization and the burgeoning markets for asset-backed securities and credit default swaps, developments that created linkages between depository institutions and shadow banks, and had significant systemic risk consequences. These issues have raised questions about the desired degree of competition, complementarity and co-evolution between banks and markets (e.g. Song and Thakor, 2010), and its risk-spillover implications for financial stability and the prudential regulation of banks and markets (see Boot and Thakor, 2018 for a detailed discussion). So a natural question is: what have been the post-crisis developments insofar as they pertain to the integration of banks and markets, and the emergence of financing alternatives to both banks and markets? A related question is: what issues have emerged as new concerns and new prudential regulation tools regulators should consider as they look ahead? The papers in this issue shed important new light on these and related questions.

The first paper, *"Customer and Investors: A Framework for Understanding the Evolution of Financial Institutions"*, by Merton and (Richard) Thakor, develops a theory of financial intermediaries that distinguishes between two groups of financiers of the intermediary: (1) customers who provide funds in exchange for services as a well as an expectation of a financial return, but do not wish to bear the intermediary's credit risk, and (2) investors willing to accept credit risk in return for an appropriate risk-adjusted return. Examples of customers are depositors in banks and policyholders in insurance companies, and examples of investors are shareholders, subordinated debtholders and so on. The research question they focus on is: in a setting in which the intermediary's customers receive valuable services via financing contracts that cannot be effectively traded or replicated in incomplete markets, how should the intermediary structure contracts with its customers and investors, and what are the implications of this for regulation, government safety nets, the design of institutions and exchanges and the evolving integration of banks and markets?

Modeling this dyadic customer-investor financing structure of the intermediary, the authors show that in the first best, the intermediary's customers are never exposed to any of the intermediary's own credit risk, even though they may be exposed to the risk inherent in the contract terms themselves. So, for example, customers in a mutual fund are willing to accept randomness in the return on an index fund, but not the risk that they may lose money because the fund incurs losses for other idiosyncratic, fund-related reasons (like fraud or risky investment positions inconsistent with the stated goals of the fund). In other words, the insulation of customers from the credit risk of the intermediary is not driven by the risk aversion of the customers, but rather by the efficiency of structuring contracts that shield customers from all such risk and have it borne by the intermediary's investors. In the second best, when the intermediary faces costs in providing customers this insulation, the equilibrium may expose customers to credit risk that generates "customer contract fulfillment costs." These costs may justify government guarantees and safety nets, even in the absence of bank runs. The authors further examine issues related to how contracts between banks and their financiers are structured and how risks are shared. These include deposit contracts, repos, and insurance contacts. Related issues addressed include efficient bank design, regulatory practices, the microfoundations of exchanges, the role of market discipline, and the functional boundaries between banking and financial markets. This paper illuminates not only how financial intermediaries should structure contracts with their customers and investors, but also how they should be regulated and how the interplay between banks and financial markets is likely to evolve.

On the issue of the possible future integration of banks and markets, the paper shows that the extent of this integration is constrained by the bank's desire to shield its customers from its own credit risk, which implies that the greater the value of liquidity services provided by the bank to its depositors—and hence the greater the value of the insulation from credit risk the bank provides—the more limited will be the efficiency-enhancing integration of banks and markets. The result that *all customers in financial intermediaries* should be shielded from the intermediary's credit risk in the efficient contract has important ramifications and links this paper to the literature on why bank deposits should be riskless (e.g. Dang et al., 2017). There are two significant marginal contributions with respect to that literature. First, this paper shows that depositor risk aversion is unnecessary for this result. Second, the result is *not* limited to bank deposits, but applies more generally to all contracts between financial intermediaries and their customers; bank deposits are but a special case of these contracts.

While the Merton and Thakor paper focuses on formal financial intermediaries and markets, financing is provided to borrowers also through informal financing channels. Microfinance is perhaps the most well-known example of this, but it is not the only form of informal finance. In fact, even in well-developed financial systems like the US,

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informal financing plays a significant role; for example, think of angel financing in the funding of entrepreneurs. Thus, it is important to understand how informal finance works, and what it implies for welfare. In *"Understanding Informal Financing"*, Allen et al. use Chinese data, as well as data on twelve other emerging market countries, to empirically test the predictions of an earlier theoretical framework developed by the authors. They define informal financing as "…operating within social or business networks in the absence of a formal financial intermediary." The research question they examine is: in an economy with formal financing, what role does informal financing play in supporting the growth of firms in the economy?

Theoretically, it is reasonable to posit that informal financing can play a valuable role because it can potentially use "soft" information much more effectively than formal intermediaries can. Thus, in situations in which some borrowers may find themselves credit rationed due to informational frictions, informal financing can step in and fill the vacuum. But it is important to distinguish between different types of informal financing. For example, angel financing and trade credit are both informal financing, but so is financing provided by drug dealers! The authors thus distinguish between "constructive informal financing" and "underground financing". Examples of the former are trade credit, interpersonal borrowing (money from family and friends), registered pawn shops, and financing companies. An example of the latter is financing from a loan shark. The paper finds that constructive informal financing, which serves smaller, younger firms, is associated with positive growth of firms and the economy and appears to be welfare enhancing, whereas underground financing is not. Informal financing coexists with bank lending, but diminishes as bank lending becomes more pervasive. The paper points out the welfare-enhancing role that informal financing can play, even in more developed economies.

Apart from making an important contribution to the literature on informal financing, the paper also has implications for regulation. Specifically, the paper argues that formal and constructive informal financing can be substitutes but also complements. As informal financing can help reduce incompleteness of the credit market, regulation needs to be cognizant of the potential value enhancing role of having a diversity of funding sources.

Whether it is formal or informal lending, default risk is often controlled by asking the borrower to pledge collateral. As the previous theoretical literature has shown, collateral can help to attenuate informational frictions of various sorts—moral hazard and pre-contract private information, in particular—thereby reducing default risk and expanding the borrower's borrowing capacity. During times of financial stress, as concerns about insolvency risk are elevated (as they were during the 2007–09 crisis), the spread between the costs of unsecured and secured lending tends to go up. Thus, collateral becomes even more valuable during financial crises. To the extent that collateral is in scarce supply, it creates incentives for those who have it to use it to the fullest extent possible. In their paper, *"Collateral, Rehypothecation, and Efficiency"*, Kahn and Park theoretically examine the economics of collateral rehypothecation, which refers to the practice whereby lenders use the collateral pledged by their clients for their own borrowing. The main research question the paper poses is: under what circumstances does rehypothecation arise and what are its costs and benefits? Specifically, is there always alignment between the objectives of the borrower and the lending intermediary or are there cases in which the intermediary underuses or overuses the borrower's collateral?

The paper uncovers both benefits and costs—rehypothecation improves funding liquidity by augmenting funds flowing into the system, but it also generates deadweight costs by misallocating assets among agents when counterparties fail. It creates a collateral chain that elevates the risk that the collateral may not be returned to the pledger that values it most highly. The analysis then focuses on the possibility of a conflict between the intermediary and its borrower on rehypothecation arrangements, and shows that the direction of the conflict depends on the haircut of the contract between them. Rehypothecation is used excessively by the intermediary when there is overcollateralization (with the borrower in favor of underutilization), and not enough when there is undercollateralization.

This paper represents a significant contribution not only to the theoretical literature on collateral, but also to the broader literature on post-crisis measures to improve financial stability. Ceasing rehypothecation can exacerbate a financial downturn, but it can also lead to a faster recovery. This suggests a role not only for possible private innovations in contracts between lenders and borrowers who get secured loans, but also regulation that seeks to reduce hard-to-observe systemic risk.

In keeping with the importance of collateral-related issues, *"CLO Trading and Collateral Manager Bank Affiliation"* by Santos and Peristiani, empirically tackles a different set of issues. These issues are related to the trading of asset-backed securities that result from the securitization of loan portfolios. The paper focuses on collateralized loan obligations (CLOs)—resulting from the securitization of bank loans. This market has a somewhat more benign history than the related collateralized debt obligations (CDOs) that involve the repackaging of bonds and includes mortgage backed securities (MBS). This market evolved in *synthetic* collateralized debt obligations (CDOs) – synthetically constructed securities backed by (unsold) tranches of previous securitizations—and collapsed with the financial crisis. Collateralized loan obligations (CLOs)—resulting from the securitization of bank loans—have been growing steadily since 2012 after a hiccup following the crisis. They provide banks with the benefits of securitizing otherwise-illiquid loans. They also represent a significant way in which the boundaries between banks and markets get blurred. Yet, despite the considerable volume of corporate loans outstanding in CLOs, our knowledge of the way CLO managers administer their loan portfolios is very limited. This paper seeks to fill this void. It asks the research question: does the institutional affiliation of the CLO manager affect the manager's access to information and decisions about when to sell distressed loans? Or, alternatively, do concerns about the institution's (bank's) survival (franchise value) affect the manager's behavior? The idea is that a CLO manager who is affiliated with a bank might have access to proprietary information about the portfolio that a non-bank affiliated manager might not. This means there is a theoretical reason to expect the behaviors of the two kinds of managers to be different.

With an interesting dataset, the paper examines the behavior of banks and non-banks regarding the sale of distressed loans during 2007–11. The paper finds that CLO managers affiliated with banks sell off their positions in loans arranged by their banks well before these loans default, but CLO managers affiliated with non-banks do not sell off their distressed loans in a similar fashion. The findings are consistent with bank-affiliated CLO managers being more conservative than non-bank-affiliated CLO managers, but they could also be because these managers have access to valuable private information. Further, the analysis shows that although bank-affiliated CLO managers are averse to holding any distressed loans, they are also more aggressive in divesting distressed loans arranged by their parent bank, suggesting that they benefit from a relative information advantage.

An important marginal contribution of this paper is that it enhances our understanding of the trading activities of CLO managers. This is valuable not only for future research, but also for regulators. Moreover, the empirical results highlight a potential limit to banks' ability to originate loans and distribute them via their affiliated CLOs, given the proclivity of the managers of these CLOs to divest distressed loans early.

While all of these papers presented analyses of issues that are of central relevance in the blurring of boundaries between banks and markets and its consequences for systemic risk, a new factor that has emerged after the crisis in regulatory discussions as a driver of bank risk taking is the culture of banks. Yet, we have very little by way of research on this issue. This is a glaring void and it hampers our ability to understand *how* the internal functioning of banks at the individual employee level affects their behavior as organizations, which limits our

comprehension of the potential impact of any regulatory initiative on bank behavior. *"Bank Culture"* by Song and Thakor takes a stab at addressing this issue theoretically. Culture, by virtue of its elusive intangibility, is difficult to model and this paper is the first theoretical effort in the academic banking literature. The model has the bank designing an employment contract to induce the desired allocation of managerial effort between bank "growth" and "safety." Multitasking by the bank manager results in the distortion in the second-best case always being in the direction of the manager devoting excessive effort to growth and not enough to safety, highlighting the limits of explicit compensation contracts. Competition among banks exacerbates a bias toward growth owing to endogenously-arising competition-induced herding behavior among banks.

Culture is modeled as a way for the bank to use non-contractible soft information to reward employees for behaving in manner consistent with the culture. It thus enables the bank to exercise influence that goes beyond what can be achieved with explicit compensation contracts. The model shows that culture has an assortative matching role—it facilitates matching of banks with managers who have similar beliefs about the quality of the borrower pool. In addition to this, it may also independently offset the bank's bias toward growth (away from safety). The analysis also shows that a safety-focused culture may be contagious among banks (given endogenous) herding behavior, and this contagion tends to become more pronounced with more bank capital and weaker governmental safety nets.

The paper not only provides an economic framework to think about bank culture, but it is also rich in regulatory policy implications for central banks that see bank culture as an aspect of prudential regulation. Specifically, it tells regulators that increasing bank capital can reduce systemic risk not only because of the well-known effect it has on the ex ante risk taking incentives of banks through the usual channels, but also because it can fundamentally alter a bank's culture choice, thereby affecting individual employee behavior in ways that more direct prudential regulation mechanisms may never be able to do. The paper also points out that *the inability of regulators to "measure" culture should not be an impediment to using culture* for regulation, since culture can be influenced through more familiar tools like capital requirements and reduced safety nets.

Overall, the papers in the conference, with the major themes represented by the papers in this issue, have significantly advanced our understanding of the post-crisis blurring of boundaries between banks and markets and the risk implications of this phenomenon. They have highlighted the fact that to better grasp how risks in the financial system are evolving, we need to understand the unique aspects of banks' funding model which relies heavily on customers who do not wish to be exposed to the bank's credit risk, trends in both formal and informal financing and how they impact economic growth, the role of collateral and the systemic risk implications of how it is deployed in the economy (especially through mechanisms like rehypothecation), the trading of asset-backed securities emerging from the securitization of bank loans, and bank culture. But these papers do not provide the final answers on these important issues. Rather, we see them as grains of sand in the oyster that will inspire much further research and produce pearls of additional insights in the future.

References

Allen, F., Qian, M., Xie, J., "Understanding informal financing", *J. Financ. Intermed.* (this issue).

Boot, A., Thakor, A.V., 2018. "Commercial Banking and shadow banking: the accelerating integration of banks and markets and its implications for regulation. In: Berger, Allen, Mullineaux, Phil, Wilson, John (Eds.), chapter in Oxford Handbook of Banking, third ed. forthcoming.

Dang, T.V., Gorton, G., Holmström, B., Ordonez, G., 2017. Banks as secret keepers. Am. Econ. Rev. 107 (4), 1005–1029.

Kahn, C., Park, H. J., "Collateral, rehypothecation, and efficiency", *J. Financ. Intermed.* (this issue).

Merton, R.C., Thakor, R., "Customers and investors: a framework for understanding the evolution of financial institutions", *J. Financ. Intermed.* (this issue).

Santos, J., Peristiani, S., " CLO trading and collateral manager bank affiliation", *J. Financ. Intermed.* (this issue).

Song, F., Thakor, A.V., 2010. Financial system architecture and the co-evolution of banks and markets. *Econ. J.* 120 (547), 1021–1255 September.

Song, F., Thakor, A.V., "Bank culture", *J. Financ. Intermed.* (this issue).

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