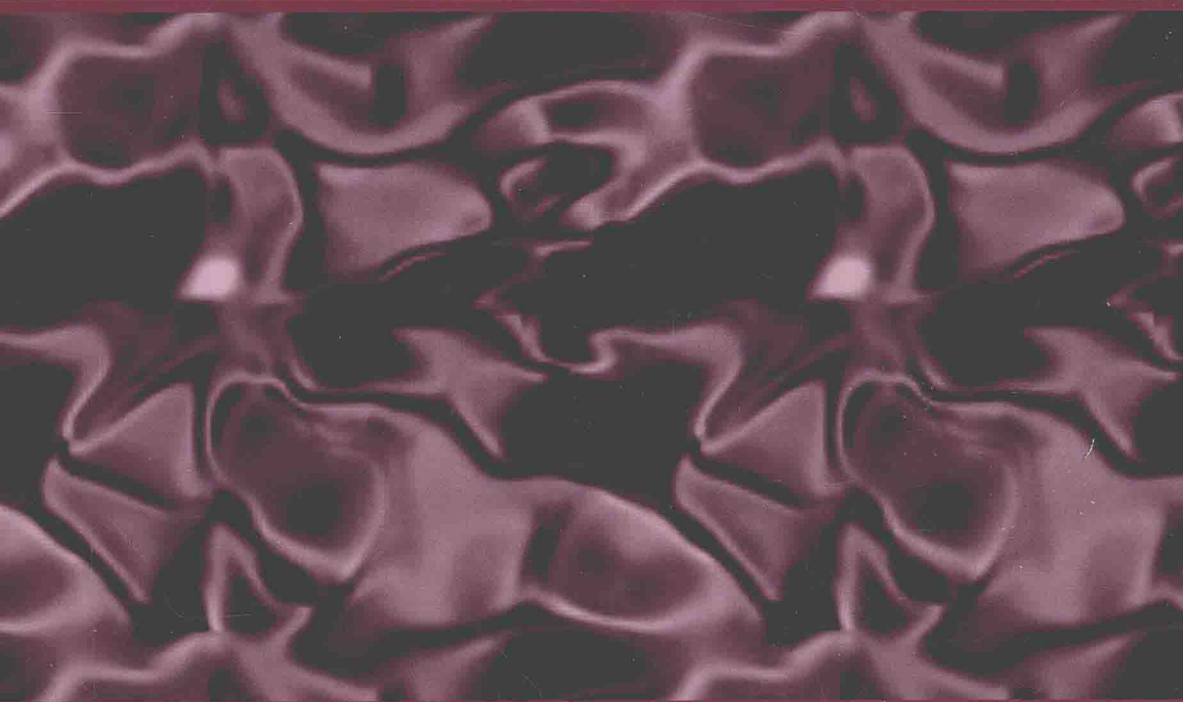


# Economics of Financial Law

VOLUME I

Edited by Geoffrey P. Miller



# Economics of Financial Law

## Volume I

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ECONOMIC APPROACHES TO LAW

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Economics of Financial Law  
Volume I

# Economic Approaches to Law

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# Introduction

*Geoffrey P. Miller*

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The topic of financial law is so vast, covers such a wide array of subjects, and implicates so many important public policies, that it may be optimistic to suggest that the subject has a central core or that the idea of an ‘economics of financial law’ has intellectual coherence. Nevertheless, the readings compiled in these volumes, when considered from a sufficiently abstract point of view, do reflect common themes.

One such theme is the safety and soundness of institutions and markets. Bankers have incentives to serve the public interest by operating in a prudent manner; but they also face temptations to harm the public interest by investing in inappropriate and risky ventures. The history of financial systems is punctuated by crises and panics that destroy vast accumulations of capital, undermine public confidence, and suppress economic activity. The world’s financial markets experienced such a panic in 2007–2009, a topic that receives substantial coverage in the pages that follow.

Another common theme is the protection of consumers. Inherent in the banking function is the potential for abusive or sharp practices. Transactions in financial instruments are inherently non-transparent, a fact which creates opportunities for manipulation. The sophistication and complexity of modern finance, moreover, affords professionals a built-in advantage over ordinary investors and borrowers. In the wake of the financial crisis of 2007–2009, which unmasked many questionable practices, the subject of consumer protection in financial markets has emerged as a front-burner issue in many countries. In the United States these concerns led to the creation of a powerful new administrative agency, the Consumer Financial Protection Bureau.

The rules, regulations, and practices affecting financial institutions are principally justified as enhancing safety and soundness or protecting consumers against exploitation. This is not to say, of course, that financial regulations, even if justified on sound public policy grounds, are always sensible or well-crafted. Critics have long claimed that many bank regulations are poorly designed, ineffective, or counterproductive, and that too often rules ostensibly justified as serving broad public policies are little more than thinly-disguised favors for organized special interests. Whether bank regulations are sensible or misguided is often a matter of debate. An adequate assessment of their justifications requires an understanding of the underlying economic factors to which they respond and with which they will interact. The readings in this compendium are intended to assist in that enterprise by compiling in convenient form the essential literature on the economics of financial law.

Scholarship in this field is both broad and deep, and extends back far into the history of economic science. It has, accordingly, been impossible to include all important contributions. The selection of some materials for inclusion, and the decision to omit others, are inevitably subjective tasks. An added problem is presented by the financial crisis of 2007–2009, an event that challenged longstanding assumptions about the safety and soundness of banks, the



sufficiency of bank capital, the efficiency of financial markets, the vulnerability of consumers, and the ability of central banks to prevent liquidity crises. Any analysis of financial markets undertaken prior to these events is subject to revision and rethinking in light of the lessons of experience.

Given these difficulties of selection, no compilation can hope to achieve complete and comprehensive coverage. I have attempted, however, to identify leading contributions in the field and to organize them in a logical fashion that reflects the underlying economic structure. On occasion, I have included in this introduction a description and discussion of contributions which were excluded from the compilation for reasons of space. I hope the compilation in these volumes will be useful to researchers, policymakers, and others who are concerned with the topic of financial institution regulation.<sup>1</sup>

## **Volume I**

### *Part I. The Nature of the Banking Firm*

It is perhaps discomfoting that economists have never reached consensus on the most basic question of all: what is a bank? The difficulty of the matter stems from the multifaceted nature of contemporary financial markets. Banks and related institutions make loans, take deposits, issue debt, act as brokers, dealers and underwriters of securities, act as brokers and underwriters of insurance products, provide safe deposit services, manage mutual funds and individual portfolios, provide investment advice, supply trust services, participate in swaps and derivatives markets, offer credit enhancement products, provide business introductions, and much else besides.

Beneath this welter of activities, economists, lawyers, and policymakers seek to identify what is fundamental. One common perception is that the distinctive feature of banks is that they invest money contributed by public investors. The notion of banks as custodians of customer wealth has been a persistent theme in the literature and politics of banking for more than 200 years. The idea traces back at least to the English economist David Ricardo (1772–1823), who is reported to have remarked that ‘the distinctive function of the banker begins as soon as he uses the money of others’. In the twentieth century, the idea was taken up by populists who complained that bankers, having been entrusted with money from public investors, too often abused that trust by wasting the money so conferred or by enriching themselves at the expense of others. Louis D. Brandeis (1856–1941) captured this sentiment in his tract ‘Other People’s Money and How the Bankers Use It’ (1914). Brandeis there set out a theme that has been frequently revived, most recently in critiques of the fecklessness and greed of bankers associated with the financial crisis of 2007–2009. The idea that banks are distinctive because they invest other people’s money can be criticized on the ground that all public firms – whether or not chartered as banks – invest other people’s money. This objection aside, the perception that banks are subject to unique obligations arising from their custodianship of funds contributed by others is deeply entrenched in popular culture.

Lawmakers have sought to define the nature of a banking firm. Doing so is essential because many laws, regulations, and authorizations apply to banks and not to other firms. These legal definitions, at least under U.S. law, focus on two activities: taking deposits and making loans.

The verbs in this definition indicate the functions involved: the bank ‘takes’ deposits – it obtains liquidity from depositors – and ‘makes’ loans – it distributes liquidity to borrowers. The legal definition comes close to describing the economic function of a bank, but it has the shortcoming, from the standpoint of economic analysis, that it addresses the bank’s business lines without exploring what underlying function is being served by these activities.

Central bankers have attempted to define what is distinctive about banks. E. Gerald Corrigan, a former president of two Federal Reserve banks, proposed a definition in his essay, ‘Are Banks Special?’<sup>2</sup> Corrigan suggested that banks perform three essential functions: they issue transaction accounts; offer backup liquidity to other institutions; and are transmission belts for monetary policy. Corrigan’s attempt at classification has been widely cited, in part because of the distinction of the author and in part because bankers were naturally intrigued by the idea that they might be special. An analysis of the essay reveals, however, that what Corrigan views as distinctive happens to coincide with the interests and regulatory portfolio of his former employer, the Federal Reserve. The central bank is charged with managing the money supply (transaction accounts), is the backup source of liquidity to banks (in its role as lender of last resort), and is responsible for formulating and implementing the nation’s monetary policy (it is the wheel that drives the bank ‘transmission belt’). The claim that banks are ‘special’, moreover, is in Corrigan’s account also a reason for more intensively regulating them – an honor some bankers might have preferred to avoid. Notwithstanding that Corrigan’s essay can be seen as a thinly disguised brief for enhancing the Federal Reserve’s power and influence, the publication did focus attention on fundamental issues and sparked a debate that continues to the present day.

Academic economists have taken up the challenge of defining what is essential about banks. These efforts fall into two categories. Some economists consider the definition of a bank from the standpoint of a particular public policy issue. An example is George J. Benston’s paper, ‘What’s Special About Banks?’ (Chapter 1, Volume I). Responding in part to Corrigan’s essay, Benston identifies six aspects of how banks have been special (although not in his view unique): efficiently produced products, importance for the development and growth of economies, international scope, role in economic instability and the conduct of monetary policy, early regulation by governments, and source of data for academic researchers and institutions. Although agreeing with Corrigan that banks are special (although disagreeing on the features that make them special), Benston sees decidedly less justification for regulating them: in his view, protecting the deposit insurance fund is the only valid ‘public interest’ reason for bank regulation. Benston would repeal all laws specifically dealing with banks and bank companies except those dealing with chartering and deposit insurance.

The second approach to defining a banking firm seeks to ground analysis in fundamental principles. Here, economists focus on two functions. First, banks function as intermediaries. In that capacity, they transmit liquidity from economic agents who value it less to agents who value it more. Intermediated finance is distinguished from direct finance in that the intermediary breaks the connection between the supplier and the user of the liquidity: the supplier has a claim only on the intermediary and not on the ultimate user. Intermediated finance offers advantages over direct finance, including portfolio diversification, economies of scale and scope, bonded expertise, and on-going monitoring of the activities and financial position of borrowers.

Martin Hellwig’s 1998 study, ‘Banks, Markets, and the Allocation of Risks in an Economy’ (Chapter 2, Volume I), provides a deep-level analysis of intermediation. In the absence of

transaction costs, contracts would be written between economic agents that distributed each risk to the party most able to take it on. The allocation of resources through financial markets would be efficient and complete; financial intermediaries would not be needed. In the real world, such arrangements are not feasible due to high transaction costs. Hellwig's paper insightfully demonstrates that financial intermediaries provide efficient responses to this problem by centralizing risk distribution and thus avoiding a massive proliferation of individual contracts.

In addition to acting as intermediaries, banks serve as providers of payment services. The deposit account is a form of private money created by the bank and used by economic agents to transfer liquidity in exchange for goods or services. While banks dominate payments in developed economies, they are not the only providers of these services. Government-issued currency is also used, as are – although in much smaller amounts – esoteric instruments such as local currencies, LETS systems, private electronic payment instruments (merchant-issued or online game currencies), and crypto-currencies such as Bitcoin.

Why are these functions – acting as financial intermediaries and providing payments services – so closely linked in banking firms? Several economists have offered explanations. Fischer Black, in a paper not reproduced here, observed that bank loan customers often also keep a deposit account at the institution. Black explained the connection as benefitting both bank and borrower by providing the bank with an inexpensive means for monitoring the borrower's financial condition during the life of the loan.<sup>3</sup>

Anil K. Kashyap, Raghuram Rajan, and Jeremy C. Stein's 2002 article, 'Banks as Liquidity Providers: An Explanation for the Coexistence of Lending and Deposit-Taking' (Chapter 3, Volume I), observes that banks often lend via commitments – for example, they extend a line of credit that the borrower can elect to take down at any time at the borrower's option. In this respect the lending and deposit functions are similar: both the borrower (in the line of credit) and the depositor (in the deposit account) have the right to withdraw funds from the bank on demand. Accordingly, the bank must hold reserves against both contingencies. Because reserves are expensive, the bank can conserve on expenses if it combines the lending and loan commitment functions and if the risks of those two functions are not too highly correlated. Hence deposit taking and lending are often seen together.

Douglas W. Diamond and Raghuram G. Rajan's 2001 paper, 'Liquidity Risk, Liquidity Creation, and Financial Fragility: A Theory of Banking' (Chapter 4, Volume I), offers a complementary but different explanation for the linkage between deposit-taking and lending. Banks implicitly promise funders that they will deploy resources and expertise to monitor loans they have extended. Once funds have been extended, however, banks may threaten to cease monitoring unless funders provide additional compensation. Bankers and funders would both be better off if banks could credibly commit *ex ante* not to engage in such opportunistic behavior. Diamond and Rajan suggest that the deposit contract provides such a credible commitment: if bankers threaten to reduce monitoring, depositors will fear that assets will be disposed of in a fire sale creating a threat to solvency. Rather than incur this risk, they will run the bank. The threat of a run lends credibility to the bank's commitment to continue monitoring its loan portfolio, and thus reassures its funding sources *ex ante*.

The foregoing theories are plausible, but none of them appear sufficiently robust to explain the strength of the linkage between the deposit-taking and lending functions. A simpler, complementary explanation might be that bank payment services are effectuated by customer

accounts held at the bank. Given that the bank holds customer accounts to support the payment function, it has funds on hand that can be used to support loans to customers. In other words, the payment function is the truly distinctive feature of banks; intermediation is an important but collateral activity that arises due to the presences of balances in banks' transaction accounts.

### *Part II. Shadow Banks*

No analysis of the banking firm would be complete without a discussion of shadow banks. Shadow banks can be defined in various ways, but are commonly understood to consist of short-term or on-demand non-deposit liabilities together with financial institutions that obtain funding from these sources. Because shadow banks do not offer demand deposits, they are not regulated as banks (although they may be subject to some other regulatory scheme, such as that pertaining to securities firms). Concern about shadow banks emerged on the front-burner of regulatory policy as a result of the spectacular failures of Lehman Brothers and Bear Stearns during the 2007–2009 financial crisis.

Gary Gorton and Andrew Metrick's 2010 article, 'Regulating the Shadow Banking System' (Chapter 5, Volume I) was an important contribution to crystalizing public policy concerns. These authors identify money market funds, repurchase agreements, and asset-backed securities as principal components of the shadow banking system. They call for reforms, including imposing bank-like regulation on money market funds that offer traditional banking services and requiring that asset-backed securities be purchased and held only by regulated bank-like institutions.

Morgan Ricks' 2012 paper, 'A Regulatory Design for Monetary Stability' (Chapter 6, Volume I) focuses on what the author terms 'money claims'—fixed-rate, short-term borrowings other than trade credit. Ricks argues that short-term credit markets are subject to dangerous instability. Ricks recommends comprehensive reforms, including a licensing requirement for issuers of money claims; a requirement that money claims issuers abide by portfolio restrictions and capital requirements; a government guarantee of all money claims; and a requirement that licensed entities pay risk-based fees to the government in exchange for its guarantee. Effectively, Ricks would put the sovereign's credit behind all money claims and would impose bank-like regulation on any institution that issues such claims.

American regulators have responded to concerns about shadow banking. They brought systematically important nonbank financial institutions within the ambit of bank supervision and imposed a floating net asset value requirement for institutional prime money market funds. Overall, however, the regulatory response might be seen as anemic in light of the severity of the problems identified by Gorton–Metrick, Ricks, and others. The reason for the limited regulatory response may have to do with the nature of the changes that would be entailed: both the Gorton–Metrick and the Ricks proposals would fundamentally transform markets for short-term debt.

### *Part III. Liquidity*

After considering the nature of the banking firm (and its cousin, the shadow bank), the readings turn to one of the most important features of banking firms, namely their role in supplying

liquidity to the economy. The role of banks in liquidity provision has always been a central focus of bank economists, but it gained additional importance when the world's financial markets suffered a terrifying loss of liquidity during the darkest days of the crisis of 2007–2009. Regulators responded vigorously, although too late to prevent the harm. The Basel III liquidity rules dramatically upgrade what had been a rather primitive regulation requiring banks to hold minimum reserves against deposits.

A key issue, pertinent to the role of banks in supplying liquidity, is the maturity mismatch between assets and liabilities. Banks supply liquidity to investors by taking deposits payable on demand; but they invest deposited funds in long-term investments that cannot be sold without substantial costs. The durational mismatch creates fragility: banks face the potential for destabilizing runs and are exposed to interest rate risk. Why do banks take on this problematic structure? Several economists have offered explanations.

Charles W. Calomiris and Charles M. Kahn's 1991 paper, 'The Role of Demandable Debt in Structuring Optimal Banking Arrangements' (Chapter 7, Volume I), presents the deposit contract as providing an economically valuable mechanism for imposing market discipline on bankers who otherwise would take on too much risk. Depositors have an incentive to monitor the banker because, in the event of trouble, they can 'vote with their feet' by withdrawing their funds. Knowing of this risk, bankers are incentivized to avoid excessive risk. Depositors, in other words, impose a powerful form of market discipline through their implicit threat to run the bank.

Gary Gorton and George Pennacchi's 1990 article, 'Financial Intermediaries and Liquidity Creation' (Chapter 8, Volume I), explains the deposit contract as a response to the risk uninformed liquidity traders face when they buy or sell assets in a market that also contains informed traders. In Gorton and Pennacchi's model, the bank solves this problem by offering liquidity traders deposit contracts backed by capital provided by informed traders. An interesting implication of this work is that the solution to the liquidity trading problem does not necessarily require a bank: similar benefits could be offered by a money market fund (or even single firm) if the issuer of the demand instrument can offer sufficient assurances to liquidity investors that they will not be exploited by informed traders.

#### *Part IV. Lending*

In addition to providing liquidity to deposit customers, banks loan money to borrowers. The lending function is often cited as a crown jewel of banking and a principal justification for its existence: banks enhance social wealth by allocating liquidity to the highest-valuing users. As Walter Bagehot put the idea in the late nineteenth century, the files of English banks

are full of the bills drawn in the most profitable trades, and . . . empty of those drawn in the less profitable. If the iron trade ceases to be as profitable as usual, less iron is sold; the fewer the sales the fewer the bills; and in consequences the number of iron bills in Lombard Street is diminished. On the other hand, if in consequences of a bad harvest the corn trade becomes on a sudden profitable, immediately 'corn bills' are created in great numbers, and if good are discounted in Lombard Street. Thus English capital runs as surely and instantly where it is most wanted, and where there is most to be made of it, as water runs to find its level.<sup>4</sup>

What is it about bank loans that make them a desirable mechanism for distributing liquidity within an economy? The key here is that financial intermediaries, unlike investors in public

debt, are able to monitor their borrowers on an ongoing basis during the life of the loan. The ability of an intermediary to engage in on-going monitoring of borrowers has implications for the structure of loan agreements. Gary Gorton and James Kahn's 2000 article, 'The Design of Bank Loan Contracts' (Chapter 9, Volume I), models intermediated loans subject to ongoing monitoring and renegotiation. The Gorton–Kahn model predicts that bank loans will have seniority over other unsecured debt; that the bank will retain an option to liquidate the borrower, and that the initial interest rate on the loan will be set to minimize costs of moral hazard and renegotiation rather than to reflect the default risk on the loan.

What advantages flow from the fact that bank loans are subject to monitoring and renegotiation? One benefit is that they function as a signal of borrower quality. In a paper not reproduced here, Eugene Fama observes that loans to business customers typically have short maturities and are rolled over when they mature.<sup>5</sup> In consequence, banks frequently re-evaluate the creditworthiness of borrowers. The decision by a bank to lend to a customer thus acts as an ongoing quality signal to other creditors and to capital markets. In support of this theory, Fama observes that firms often take out a line of credit with their bank even if they do not actually intend to use it: the line is itself valuable as a signal to others that the firm is likely to meet its obligations.

The monitoring capacities of intermediated finance also polices against opportunistic risk-taking by borrowers. One problem of lending – indeed, a problem of debt in general – is that it creates a conflict between creditors and shareholders. The equity holder captures the upside of risky projects and shares with creditors the downside of investments that go south and result in the borrower's insolvency. In the presence of debt, equity becomes more risk-preferring than either debt-holders or society would prefer.<sup>6</sup> Clifford W. Smith, Jr. and Jerold B. Warner's 1979 article, 'On Financial Contracting: An Analysis of Bond Covenants' (Chapter 10, Volume I), demonstrates that bondholders deal with this problem through covenants in the governing legal documents. The approach to borrower opportunism found in bond covenants, however, is less flexible and less effective than the monitoring and renegotiations that are possible when credit is provided through an intermediary.

Douglas W. Diamond's 1984 paper, 'Financial Intermediation and Delegated Monitoring' (Chapter 11, Volume I), also draws on the monitoring advantages of financial intermediaries. In Diamond's model, investors delegate the task of monitoring loan contracts to outside parties. Delegated monitoring conserves on costs because the alternative is either duplication of effort if each lender monitors directly, or a free-rider problem in which lenders rely on others to perform the task. But, given the advantages of delegated monitoring, why should that task be given to a financial intermediary rather than some other firm? Diamond suggests that intermediaries are efficient providers of delegated monitoring due to diversification. Within the intermediary, a diversified asset portfolio reduces the cost to the intermediary of risk-bearing and also reduces the risk that the intermediary will default on its own debt.

'The Theory of Financial Intermediation', by Franklin Allen and Anthony M. Santomero (1998, Chapter 12, Volume I), offers a related theory for why lending occurs through intermediaries rather than through direct investment. Unlike Diamond, who focuses on diversification as the key to understanding why intermediaries are efficient monitors, Allen and Santomero emphasize participation costs. Agents who invest directly in financial assets incur costs of research prior to purchase and monitoring and analysis thereafter. These participation costs limit investment in financial assets. Intermediaries respond to this problem

by offering securities with stable cash flows achieved by hedging and other risk-management strategies. Investors can place their funds with the intermediary without incurring the research and monitoring expenses associated with direct investment. Allen and Santomero argue that the role of intermediaries in reducing participation costs is important and different than other benefits of intermediation such as reducing asymmetric information or conserving on transaction costs.

A puzzle in this area is why financial intermediaries, who are experts at analyzing and monitoring investments, sometimes display spectacular errors of judgment. Bagehot was aware of this problem: even though he lauded the efficiency of bank lending in general, he also marveled about the occasional acts of ‘amazing indiscretion’ on the part of great firms.<sup>7</sup> Bagehot’s characterization could just as well describe Bear Stearns, Lehman Brothers, AIG, and many other firms in recent times. Part of the explanation for the frequency of huge lending miscalculations may have to do with the pressures placed on banks by public investors (consider Citigroup’s Charles Prince, who famously remarked in 2007 that ‘as long as the music is playing, you’ve got to get up and dance’). Compensation policies and intellectual shortcomings of bankers may also play a role. With limited time horizons and compensation for current performance, bankers may commit to investments that offer good returns in the short run but that also pose high levels of risk. These theories may be part of the explanation for bankers’ mistakes, but probably are not the full story. As yet, the problem of gross mistakes in judgment by large financial intermediaries is incompletely theorized.

### *Part V. Capital*

The financial crisis of 2007–2009 led many to conclude that banks and shadow banks operated with inadequate capital in the years prior to the financial turmoil. Regulators responded by upgrading capital requirements; the Basel III capital rule imposes a ‘capital conservation buffer’ which is in effect a hike in required capital, and even more capital is required of systemically important institutions. Meanwhile regulators pressured banks to hold capital above the regulatory minima. Even these measures were insufficient in the view of some observers who called for capital dramatically above the levels currently required.

What does economic research tell us about the proper level of bank capital? The Modigliani–Miller theorem implies that under idealized conditions the capital structure of a bank has no effect on its value. In the real world, a bank’s capital structure does matter. But how? And how can capital be efficiently managed so as to reduce the risk of bank failure without unduly impairing the profitability of banking firms? The readings in this section address those questions.

Douglas W. Diamond and Raghuram G. Rajan’s 2000 paper, ‘A Theory of Bank Capital’ (Chapter 13, Volume I), explains capital as reflecting a tradeoff of benefits and costs. Unlike depositors, who can liquidate immediately, capital providers have no fast remedy if the banker mismanages the assets (although if sufficiently organized they can replace the bank’s management in the long run). Thus as capital increases, managers become better able to appropriate rents for themselves – thus increasing financing costs *ex ante*. This negative feature of capital is countered by positive aspects: capital provides a valuable cushion against shocks to asset values, and changes in capital can impact a bank’s ability to hold up liquidity-constrained borrowers by credibly threatening to withdraw funding. In Diamond and Rajan’s



view, the amount of capital in the bank is a function of all three effects. This paper provides insight into the dynamics underlying a bank's capital structure in the absence of regulatory requirements.

Other accounts consider the incentive effects of capital on a banker's propensity to take risks. Other things equal, a banker who responds to the interests of shareholders will seek to minimize capital, for several reasons: capital is seen as an expensive form of financing; increases in capital reduce the bank's ability to offer deposit accounts, which are not only a source of financing but also a business line and source of customer relationships; and as capital decreases, shareholders capture more of the profits from risky investments and experience less of the losses.

This last effect – the increasing risk-preference of equity as leverage increases – is problematic from a social policy point of view because it reduces investments in banks and also incentivizes banks to take on excessive risks. The problem can be addressed, although not eliminated, through modifications to a bank's financing instruments. One strategy, employed by many banks in the Anglophone world prior to the 1930s, was the use of assessable stock. Assessable stock functioned like ordinary stock with one exception: if the bank failed and depositors incurred losses, the holder of the stock would be required to recapitalize the bank *ex post*. Assessable stock was not an unlimited liability instrument because the amount of allowed payments was capped, typically at some multiple of par value (a common pattern was twice par).

Assessable stock had desirable features as compared with conventional equity. It provided a built-in mechanism for recapitalizing the bank in the event of shocks to asset values, and the holders arguably became risk-averse when the bank was in financial distress – the point where common shareholders became highly risk-preferring. On the downside, assessable stock increased transaction costs because of the need to identify the holders and collect the assessment; and the prospects for collection was reduced given that the failure of the bank adversely affected the personal financial positions of many shareholders.

Two readings in this collection examine the role of assessable stock. Berry K. Wilson and Edward J. Kane's 1996 paper, 'The Demise of Double Liability as an Optimal Contract for Large-Bank Stockholders' (Chapter 14, Volume I), examines the performance of assessable stock before and after the onset of the Great Depression. They find that assessable stock benefited shareholders of large national and state chartered banks during the 1920s, but that this benefit disappeared in the early 1930s – a result that could help explain the political decision, made in 1933, to abandon assessable stock for national banks and replace it with a program of federal deposit insurance. The authors also find that the collection rate on assessments for national bank shareholders did not decline during the turbulent years 1930–1934.

Benjamin C. Esty's 1998 article, 'The Impact of Contingent Liability on Commercial Bank Risk Taking' (Chapter 15, Volume I), examines the performance of assessable stock from 1900 to 1915. Esty found that banks with assessable stock held a lower proportion of risky assets and more capital. Moreover, as net worth declined, these banks were less likely to increase their investment in risky assets. Overall, Esty's research supports the proposition that assessable stock provided a desirable cushion against insolvency and discouraged bankers from taking on undesirably high levels of risk when capital became thin.

Assessable stock is no longer used, but a variant on the idea, contingent convertible bonds ('cocos') came to the front burner of policy in the aftermath of the financial crisis of 2007–



2009. These securities convert from debt to equity upon the occurrence of some event or condition defined in the contract. Because these securities recapitalize banks without requiring bail-outs, they are often referred to colloquially as ‘bail-in’ instruments. Cocos have much to recommend them: they recapitalize banks automatically without the need for litigation, government intervention, or taxpayer funds. On the other hand, these securities are subject to potential shortcomings and uncertainties. In particular, they have been critiqued on the ground that automatic conversion triggers can be manipulated and may result in multiple conversion equilibria which increase volatility and reduce the certainty of valuations.

This collection includes several papers on contingent convertible debt. John C. Coffee, Jr.’s 2011 paper, ‘Systemic Risk after Dodd-Frank: Contingent Capital and the Need for Regulatory Strategies beyond Oversight’ (Chapter 16, Volume I), proposes a bail-in security with the following features. The conversion would occur on a gradual basis, and the debt would convert to senior nonconvertible preferred stock with cumulative dividends and voting rights. The intent is to dilute the equity in a manner that deters excessive risk taking, to create a class of voting preferred shareholders who would be rationally risk averse, and to effect changes incrementally in order to counteract obstacles of political resistance and bureaucratic indecision.

Patrick Bolton and Frédéric Samama’s 2012 article, ‘Capital Access Bonds: Contingent Capital with an Option to Convert’ (Chapter 17, Volume I), offers a different version of contingent capital. Instead of automatic conversion upon a predefined external event, their proposal contemplates that banks would purchase an option to issue new equity at a predetermined strike price. Effectively, they propose a form of insurance for banks who expect to need to raise equity capital in a crisis. They argue that the option approach would benefit banks, which would purchase costly new capital only when they need it; and also benefit investors who could implement counter-cyclical equity investment strategies. A challenge for their thesis is to identify private parties who might credibly sell this sort of protection, given that financial markets are likely to be in crisis when a call for a capital injection is made; they suggest that sovereign wealth funds would be appropriate candidates.

Charles W. Calomiris and Richard J. Herring’s 2013 paper, ‘How to Design a Contingent Convertible Debt Requirement That Helps Solve Our Too-Big-to-Fail Problem’ (Chapter 18, Volume I), offers a sophisticated version of a contingent convertible bond designed to provide a contingent cushion of common equity, create a credible signal of default risk, and establish incentives for the voluntary issuance of equity as a means of avoiding a dilutive conversion. The authors argue that their proposed design would incentivize systemically important financial institutions to implement sound and effective systems of risk governance.

#### *Part VI. Bank Runs and Systemic Risk*

As illustrated during the financial crisis of 2008–2009, liquidity problems are not fossils. Far from it: the world’s financial markets came perilously close to catastrophe when credit markets froze in September 2008. The turbulence of those years focused attention of scholars and policymakers as never before on the topic of bank runs and panics.

A leading model of bank runs is Douglas W. Diamond and Philip H. Dybvig’s 1983 paper, ‘Bank Runs, Deposit Insurance, and Liquidity’ (Chapter 19, Volume I). Banks insure depositors against unforeseen liquidity demands because the bank can diversify against random