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Jeremy Atack and Larry Neal
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1 Financial innovations and crises: The view backwards from Northern Rock

Jeremy Atack

On September 17, 2007, the UK experienced its first bank run in over 140 years.[1] Early that morning, nervous depositors all over the UK began queuing outside their local branches of Northern Rock bank to redeem their deposits (often their life savings) while the bank still had the cash to meet their demands. They had heard the reassuring words over the preceding weekend from Bank of England Governor Mervyn King, including the announcement that the Bank had extended a $4.4 billion line of credit, and they were worried.[2] British deposit insurance rules limited full coverage to just the first £2,000 of a deposit and only 90 percent of the balance up to the insurance cap of £35,000.[3] As a result, many depositors had substantial sums at risk. The run ended only when the Chancellor of the Exchequer, Alistair Darling, overruled the British regulator of banks, the Financial Services Authority, by suspending deposit insurance rules and promising unlimited 100 percent coverage to all existing depositors in the bank as of midnight, Wednesday, September 19, 2007 for the duration of the crisis.[4] Nevertheless, as 2008 began, the crisis was still on-going with no end in sight. As of mid-December 2007, the Bank of England and the British taxpayers had extended at least £25 billion in credit to the bank (about $50 billion) but Northern Rock depositors have continued to withdraw their funds. There were even ministerial discussions about whether or not to nationalize the bank to protect the taxpayers' investment.[5] These discussions became reality when Britain's Parliament passed the Banking (Special Provisions) Act on February 21, 2008, transferring all shares in Northern Rock to the government.[6]

No other recent event better illustrates the themes of this book – the evolutionary nature of financial intermediaries and financial markets, the

[1] Collins, "Overend"; Patterson, "Home Monetary Drains."
[2] *BBC*, "Northern Rock Besieged"; *International Herald Tribune*, "Crisis Deepens."
[3] *New York Law Journal*, "International Banking"; Demirguc-Kunt *et al.*, "Deposit Insurance."
[4] *Financial Times*, "Darling Steps in." [5] *The Guardian*, "Ministers Prepare Plan."
[6] *Reuters*, "Britain Passes."

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critical role played by institutional arrangements in organizing and regulating these activities, and the risks that people bear as these work their way through the system. Getting the rules and organizations "right" brings economic growth and riches. Getting them "wrong" spells economic turmoil and decline.

In the past three decades, the world has witnessed dramatic changes in the organization and operations of financial intermediaries and markets both within and between countries as globalization has spurred global competition. Beginning in the late 1920s and early 1930s and lasting until successive waves of financial deregulation spread around the world beginning around 1980 – a process often referred to in each country as the "big bang" – most financial intermediaries and markets enjoyed a high degree of domestic protection. Now, they are once again subject to common pressures and we are seeing what Justice Brandeis once called "a race to the bottom" as these institutions scramble to remake themselves and compete more effectively.[7]

For example, once upon a time, banks derived their loanable funds from depositors, which they used to make loans to credit-worthy customers. These were then held to maturity thereby building up a "relationship" with customers on both the asset and liabilities side of the balance sheet. Nowadays, however, many banks – including Northern Rock – depend upon impersonal capital markets and other financial institutions for their funds, and they increasingly repackage and resell their loans to third parties. In the process, they pocket one-time loan origination, debt servicing and securitization fees in place of the stream of interest income they once received. They also pass risk along to the investors downstream. This behavior changes their incentives from concern about the long-term outcome to immediate cash income. Indeed, it was Northern Rock's inability to borrow on the capital and credit markets to refinance maturing short-term borrowing that precipitated the crisis.[8] The bank no longer had the funds with which to buy new mortgages, a situation which suddenly and dramatically decreased the liquidity of their asset portfolio as well as threatening their income stream.

To understand why the recent turmoil in the global financial markets resonates so strongly with financial historians, it is useful to review the tensions created by financial innovations. Many of these stem from the different roles which financial intermediaries (mainly banks but also insurance companies, pension funds, and the like) and capital markets (mainly thought of as stock markets dealing in bonds and equity shares, but including secondary markets in short-term debt ranging down to the

[7] *Liggett* v. *Lee*. [8] *Financial Times*, "Confidence."

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overnight market in interbank debt) play in finance. Traditionally, financial intermediaries have provided five valuable services to the economy: (1) liquidity; (2) resolving denomination mismatches; (3) reducing credit risk; (4) mediating maturity differences; and (5) bearing interest rate and exchange rate risk.

Some of these same services have also been provided by financial markets, albeit typically in somewhat different forms. The distinctions, however, are rapidly disappearing, putting direct and indirect finance into head-to-head competition with one another. Both financial intermediaries and financial markets, for example, increase liquidity – the ease (speed and price) with which a debt can be converted to cash, and ownership transferred to another party – but they do this in different ways. Financial intermediaries increase liquidity by exchanging the more risky claim against the debtor for a less risky claim against the intermediary, taking advantage of their specialist knowledge and their ability to monitor the debtor. Financial markets, on the other hand, increase liquidity by bringing together buyers and sellers and establishing trading rules which are clear to all parties. In these markets, specialists also emerge to ensure that the market is complete so that a buyer exists for every seller.

Both financial intermediaries and markets also resolve a matching problem between the sums that lenders wish to lend and those that borrowers wish to borrow – often referred to as denomination divisibility. Banks do this by mobilizing and pooling the savings of many small depositors on the liabilities side of the balance sheet to grant fewer and larger loans to debtors on the asset side of their balance sheet. Financial markets accomplish the same task by securitization – dividing the debt into many small, homogeneous and tradable parts either as equity or debt instruments.

Banks seek to defray credit risk – the risk that the borrower might default on the obligation – through the screening and monitoring of their customers. Sometimes this is accomplished through the structure of the loan – for example, an amortized loan. Other times it might be accomplished through a demand for collateral. It is also achieved through long-term banker–customer relationships and repeat trading. Financial markets seek to achieve some of these same benefits through signaling via bond ratings, the issuance of revenue bonds, the use of mortgage bonds, credit-default swaps, or through the reputation of the underwriter. In the case of the sub-prime crisis, there is growing evidence that these controls failed. Rating agencies failed to appreciate the extent and magnitude of the risk of default, and reputable agents all too willingly lent their names in the marketing of these securities.

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Figure 1.1 "Passing on the Risks."
Source: The Economist, "Passing on the Risks," (November 2, 1996) Vol. 341, Issue 7990, p. 73. Courtesy of the artist, David Simonds.

Only two areas have really distinguished financial intermediaries from financial markets. First, banks performed the vital service of maturity mediation which arises from the desire of depositors to lend short-term and to have ready access to their funds, and the wishes of borrowers to borrow long-term so as to not jeopardize their investment. Second, by virtue of this maturity mediation, banks also bear the risk that rises in interest rates will depress asset prices, especially for longer term investments. However, even these last two bastions of financial intermediation services have become blurred by debt securitization. Banks increasingly initiate loans, supposedly taking advantage of their specialist knowledge, but do not hold the loans for very long. Instead, these are bundled, repackaged and resold as standardized financial instruments in tranches with the bank simply acting as servicing agent (Figure 1.1).[9]

Each of these activities, whether supplied by banks and other financial intermediaries or through financial markets, are now generally regarded as growth-promoting and serve as causal factors in economic growth rather than simply by-products of an expanding economy.[10] Few today – and certainly not the contributors to this volume – believe Joan Robinson's assertion that "where enterprise leads, finance follows."[11] Instead, a preponderance of empirical evidence as well as theoretical

[9] *The Economist*, "Passing."
[10] Levine, "Financial Development" and "Finance and Growth."
[11] Robinson, "Generalisation."

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argument support the case that greater financial depth measured, for example, by the ratio of some broad definition of money (say, M3) to GDP, is associated with faster economic growth. Moreover, this relationship holds true even after correcting for prices and population across countries and over time.[12]

As these essays show, some institutional designs have worked better than others. As financial innovations work their way through the existing financial institutions and structures, crises have occurred. Each time, critics have railed against the innovations that appear to have played a role in the crisis, arguing that the unseemly profits for the early innovators could not be justified by the real contribution to the economy. Furthermore, they claim that these returns distracted capable people from continuing to do honest and productive work in their traditional métiers. Examples of such complaints would include Jay Cooke's profits from Union bond sales during the American Civil War and the construction of the Union Pacific,[13] and Michael Milken's earnings from high yield – a.k.a. "junk" – bond sales in the 1980s.[14] Each time, however, provided that the rest of the financial system adjusted to the crisis with the help of both private and public initiative and incentives to "get it right," the benefits of faster economic growth increased the material benefits to society and led it to new heights.

When the financial system did not adjust but rather stifled the financial innovations that seemed to be at the root of the crisis, stagnation and long-term decay (at least in relative terms) typically followed. One such case – the restrictions on French finance following the collapse of John Law's system – is touched upon in two of the essays that follow.[15] This is why it is crucial for governments to respond in a constructive manner to the credit crunch that struck in the summer of 2007 and "get it right" so that the gains being achieved by financial globalization will be sustained.

Why, then, did the initial response to Northern Rock's problems by the British financial authorities not work? After all, central bank transparency and co-insurance of bank deposits, both in evidence as the British authorities reacted to the Northern Rock crisis, had long been touted by academics as desirable changes, precisely to prevent such crises.[16] However, the Bank of England's transparency in the public

[12] See Rousseau and Sylla, "Financial Systems."
[13] Oberholtzer, *Jay Cooke*; Josephson, *Robber Barons*.
[14] Bruck, *Predators'*; Stone, *April Fools*; Stewart, *Den*.
[15] de Pinto, *Essay;* Soboul, *La France*.
[16] Geraats, "Central Bank"; Athey *et al.*, "Optimality"; Poole, "Transparent." For an argument contra, see Mishkin, "Central Bank."

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announcement of a line of credit to Northern Rock worked no better than earlier public acknowledgments of bank troubles. For example, the Congressional "naming of names" of banks receiving aid from the Reconstruction Finance Corporation simply increased pressure on those banks.[17] During the Savings and Loan crisis of the 1980s in the US, criticism and scorn were heaped upon the American deposit insurance system for its 100 percent insurance coverage.[18] Indeed, while the insurance cap ($100,000) under the FDIC was already generous by world standards, some large institutions such as Continental Illinois enjoyed unlimited protection as they were deemed "too big to fail" and, absent other solutions to their balance sheet problems, the FDIC would sponsor and underwrite the purchase of their assets and assumption of their obligations.[19] Co-insurance was, instead, touted as the solution for deposit insurance's moral hazard because it forced bank depositors to consider the credit practices and financial health of their depository institutions. But, as we have seen in the Northern Rock episode, it was precisely these same incentives which precipitated the bank run.

Northern Rock's problems are a small part of a much larger, global problem – the sub-prime lending crisis. This segment of the market began to gain market share in the late 1990s, making up about 13 percent of all mortgages in 2000–2001, but when delinquency and foreclosure rates rose during the recession and following 9/11, their share declined to under 10 percent until 2003–2004. By 2006, such mortgages accounted for about one-quarter of all mortgages issued in the US. The crisis began in late 2006 as higher interest rates in the US began to filter through to borrowers with adjustable rate home mortgages. Many of these individuals had been given mortgages for which their past credit history or current financial status should have disqualified them. Predictably, as borrowing costs rose and asset price rises stalled or reversed, foreclosure rates began to rise sharply in that segment of the market with less than perfect credit, and especially for those with adjustable rate sub-prime mortgages (Figure 1.2).[20] High rates of delinquency and foreclosure

[17] Mason, "Political Economy" and "Reconstruction Finance."
[18] See, for example, Calomiris, "Deposit Insurance." For a follow up on the issue, see Dreyfus *et al.*, "Deposit Insurance."
[19] See, FDIC, *History*, especially Ch. 7.
[20] According to Federal Reserve Board Chairman Bernanke ("The Subprime Mortgage Market") 14.4 percent of sub-prime mortgages were in default by May 2007 while Schloemer *et al.*, "Losing Ground," estimate that one in five of the sub-prime loans made in 2005–2006 will end in foreclosure. More recent data from the Congressional Budget Office and the Mortgage Bankers Association (CBO, *Budget*, Figure 2–1) indicate that sub-prime fixed and adjustable rate mortgages had approximately equal delinquency rates of about 10 percent at the start of 2005 but, by the third quarter of

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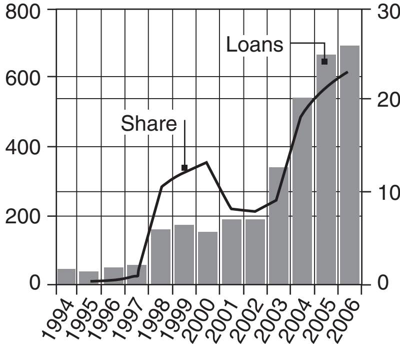

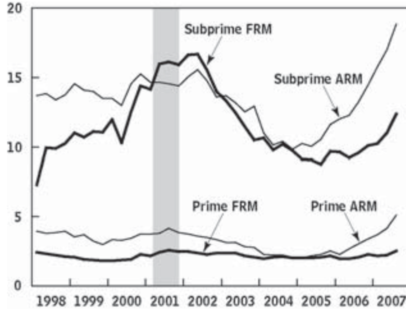

Figure 1.2 Crisis in the US mortgage market: sub-prime loan volume, sub-prime mortgages as share of all mortgages and mortgage delinquency rates by mortgage type.
Source: Center for Responsible Lending/Inside Mortgage Finance; Congressional Budget Office.

have also made it painfully clear that risk might have been under-priced in the global search for interest premiums in excess of the historic low rates prevailing in the economy at that time. These mortgage market problems have been further complicated by mortgage securitization which has sliced, diced and repackaged the underlying mortgages in ways that makes untangling the true risk exposure of each difficult, if not impossible. Consequently, current and future pricing has become highly uncertain and price volatility has increased.[21]

The $150+ billion Savings and Loan crisis of the 1980s transformed the mortgage market in the US. In 1985, there were 3,274 S&Ls nationwide. By 1992, their number had shrunk almost 50 percent to just 1,645 and their numbers have continued to decline.[22] As of 2006, there were just 1,279 federally regulated thrift institutions, down from a peak of 4,842 in 1966.[23] These specialized financial institutions favored by public policy since the Federal Home Loan Bank Act of 1932 had

2007, while fixed rate sub-prime delinquencies had only climbed to about 12 percent those for adjustable sub-prime mortgages had almost doubled.

[21] The absence of a reliable market has led to the abandonment of "marking to market" to "marking to model."

[22] Curry and Shibut, "Cost," Table 4.

[23] Office of Thrift Supervision, *2006*, Table 2.1, p. 5.

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amassed considerable expertise in the granting and management of home mortgages. As they have disappeared, they have been replaced by mortgage brokers who have little or no interest in holding mortgages. Rather, their earnings came from loan origination, securitization and debt servicing fees instead of from the interest on the amortized mortgage loan. Volume replaced quality and the latter could always be disguised through diversification and subdivision as a part of securitization.

By late summer 2007, sub-prime lending problems in securitized assets were endangering financial institutions on the European continent even before their presence was widely recognized in the US (let alone officially acknowledged). In Germany, in early August, for example, some $4.8 billion in emergency credit was extended to IKB Deutsche Industriebank and a number of asset-backed security funds were closed in order to halt large withdrawals by investors which were forcing asset sales on a deteriorating market. Similar closures affected funds in France, notably those associated with BNP Paribas, a large French bank.[24] Later that same month, SachsenLB, a Leipzig savings bank, was forced into a merger with Landesbank Baden-Württemberg (LBBW) in an effort to resolve the former's growing liquidity crisis.[25]

These widening problems, among others, doubtless played a role in the European Central Bank's initial decision to offer $130 billion in low-interest credit to the European financial markets,[26] and then a stunning $500 billion in mid-December[27] – a far more aggressive action than the Federal Reserve's more belated and conservative actions to lower interest rates and provide liquidity. Rather than intervene directly, the American monetary authorities tried a variety of other responses. Citicorp, the largest commercial and investment bank in the world, for example, tried to create a joint guarantee fund with a consortium of other international commercial and investment banks.[28] In the past, similar efforts had worked quite well. In 1890, for example, the Bank of England had coordinated a bailout of Baring Brothers merchant bank[29] and in 1997, the New York Federal Reserve had coordinated a bailout of Long Term Capital Management.[30] This time, however, no credible coordinating agent of the scale required appeared, and the effort failed.[31] In January, 2008, Citicorp took an $18+ billion write down in its assets, yet speculation remains of more write-offs to come.[32] Meantime, the US Treasury tried to provide the needed coordination but, because of moral

[24] *New York Times*, "Shaky Markets." [25] *Spiegel On-line International*, "Bail-Out."
[26] *International Herald Tribune*, "ECB." [27] *BBC News* "EBC." [28] CNN "Banks."
[29] Ford, "Argentina"; della Paolera and Taylor, *Straining*, Chs. 3 and 4.
[30] *New York Federal Reserve*, "William J. Mcdonough"; *New York Times*, "Fallen Star."
[31] *Washington Post*, "Banks." [32] *Wall Street Journal*, "Citigroup."

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hazard concerns, it has only succeeded in getting the major mortgage lenders to agree to extend their efforts to work out alternatives to foreclosure for their most recent and weakest customers who are not yet delinquent in their payments.[33] The continued uncertainties about how to "get it right," not just in terms of meeting the immediate crisis, but also in terms of the long-run evolution of the global financial system, is simply prolonging the crisis as this book goes to press.

Northern Rock itself had also participated in these sub-prime lending activities and securitization schemes by entering into a partnership with Lehman Brothers. As the company's press release put it, the goal was "to offer near-prime, sub-prime and self certified loans to customers. The credit risk on these loans will not be borne by Northern Rock, but we will earn fee income for the loan introduction."[34]

Nor was this the only way in which Northern Rock serves as a metaphor for changes in the global financial system during the past thirty years or so. The Northern Rock Building Society was formed by the merger of two venerable building societies – both mutual savings companies – in 1965.[35] In the late 1990s, amid an on-going controversy about the dissipation of past and future company worth for the benefit of current depositors, it demutualized and re-formed as a joint-stock bank listed on the London Stock Exchange.[36] British financial institutions were slower in making the switch from mutual organizations to joint stock companies. By the time that Abbey National demutualized in 1989 – the first building society to take advantage of the opportunity under the Building Societies Act of 1986 – almost 900 American mutual savings associations had filed petitions to demutualize, and 769 changes had been approved. By 2006, 1,451 mutual savings associations regulated by the Office of Thrift Supervision in the US had become joint stock entities.[37]

Similarly, the structure of Northern Rock's balance sheet mirrored changes that had long been on-going in American banking circles. According to a mid-year statement in 2006:

> Funding through securitization remains an integral part of Northern Rock's funding strategy. During the first half of 2006 two residential mortgage issues were completed raising £9.0 billion through our Granite vehicles. The January deal at £6.0 billion was our largest to date. Diversification of our investor base continued with 75% of the securitized bonds being issued in US dollars or euros.[38]

[33] *New York Times*, "Mortgage Plan."
[34] Northern Rock, "Stock Exchange." [35] Northern Rock, "Corporate Profile."
[36] Northern Rock Foundation, "History."
[37] Martin and Turner, "Demutualization"; Office of Thrift Supervision, *2006*, Table 2.8, p. 12.
[38] Northern Rock "Highlights."

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Such borrowings had long been of increasing importance to American banks. In the mid-1990s, borrowings had accounted for a little more than 16 percent of the liabilities of US commercial banks while deposits (transaction and non-transaction) made up over 60 percent.[39] By 2005, however, borrowings had grown to 23 percent, largely at the expense of deposits.[40] Moreover, by participating in the global market far beyond their home bases, financial institutions have also found themselves facing exchange rate risk in addition to credit risk and interest rate risk.

The essays that follow represent original research, and take up the difficulties in making innovations in banking and financial markets work as complements for the long-run benefit of the economy, especially when their services are increasingly substitutes for one another. The papers begin with the efforts of the Dutch Republic in the seventeenth and eighteenth centuries to innovate first in the field of banking and subsequently in the marketing of government debt. These are followed by discussions of how France and Britain tried to imitate and improve upon the Dutch successes. The growing volume of long-distance trade throughout the eighteenth century forced merchants to develop the means to mediate interest rate and exchange rate risk and facilitate trade through international bills, an instrument that was familiar to the first Secretary of the Treasury of the US: Alexander Hamilton. Hamilton tried to integrate the various intermediation and market innovations from western Europe into a coherent financial system for the new nation and largely accomplished that goal. The system that Hamilton put in place initially flourished until populist politics in the 1830s forced a regress that was to last until the Civil War. The breathing space provided by this hiatus enabled Britain to recover the lead in finance, albeit it only temporarily, as nations jockeyed to capitalize on the most successful new innovations. The case studies presented here highlight the complexity of getting banking and capital markets to work effectively as complements in the long-run.

The twentieth century has witnessed a number of financial experiments, many of them (such as the gold exchange standard and foreign control of domestic finances) failures. A few, such as central bank open market purchases of assets other than government debt, seem to have succeeded but were not institutionalized and have yet to be repeated. Others, such as growing central bank intervention, have met with mixed success. This returns us to the question of what lessons we have learned from these diverse national experiences with financial intermediation

[39] Federal Reserve, *Bulletin*, August 1995, Table 1.26.
[40] Federal Reserve, *Bulletin*, December 2007, Table 1.26.

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