



Two Drivers of Financial Innovation

Notes from the Vault

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In many ways, financial innovation has taken a backseat to financial stability concerns since the start of the financial crisis, as firms focused first on survival and then on complying with a blizzard of postcrisis regulations. However, banks have largely restored their financial condition and many of the major changes in regulations have moved into the implementation phase. Absent another shock to financial stability, the importance of financial innovation is likely to grow over the next several years. I look at two of the biggest drivers of past innovation in banking services, technology and regulation, to better understand likely trends in future innovation.

Regulation as a driver of innovation

Complying with regulation raises the cost of financial transactions by consumers and other users of financial services. As financial services are highly regulated along many dimensions, these restrictions create numerous opportunities for innovations that reduce or lower regulation cost.

Innovation driven by regulatory avoidance developed an especially bad reputation during and after the financial crisis that started in 2007. In many cases innovations were used to avoid prudential regulation and allow banks to become more risky. For example, financial innovations have long been used by financial firms to engage in what is sometimes called capital arbitrage, for example, by creating the appearance but not the reality of transferring risk from the bank to investors. An example is mortgage loan conduits, such as structured investment vehicles, where again the loans were also treated as being sold and, hence, did not need to be backed by more capital. In reality, these conduits relied on "liquidity" guarantees that served as de facto credit guarantees when the default rate on the underlying mortgages increased beyond expectations, according to [Viral V. Acharya, Philipp Schnabl, and Gustavo Suarez](#) (2013).

Although many recent forms of regulatory-driven innovation have justifiably earned a bad name, in the past many economists viewed some forms of regulatory innovation as beneficial. A large part of this favorable view came from innovations that weakened and ultimately forced the repeal of a variety of laws that sought to restrict competition. Innovative firms developed ways of avoiding these limits on competition that both boosted their profits and benefited the users of financial services.

An outstanding example of how limits on competition were overcome is that of money market mutual funds overcoming regulatory limits on interest paid to small investors. The Banking Acts of 1933 and 1935 gave the Federal Reserve the power to set interest rate ceilings on time and savings deposits, in part to raise bank profits and reduce their incentive to invest in riskier assets (see [R. Alton Gilbert](#) for a discussion of the Fed's regulation, referred to as Regulation Q). These regulations were generally nonbinding for their first 30 years, but starting in the late 1960s there were prolonged periods where market rates were above Regulation Q ceilings. The Federal Reserve eliminated rate ceilings on large certificates of deposit (CDs over \$100,000) and on some longer maturity certificates. Congress and the regulatory agencies took further actions in 1978 and 1979 (see [Paul Calem](#)). However, small depositors continued to face limits on the rates that banks could pay.

An alternative existed in the form of money market mutual funds, which first offered shares to the public in 1972 (see [Timothy Q. Cook and Jeremy G. Duffield](#)). Money market funds invested in low-risk obligations that paid market rates, such as commercial paper and large CDs from banks. The higher rates paid on these investments were then passed on to the money funds' investors. As Regulation Q ceilings fell further behind market rates in the late 1970s, investor assets in money funds grew rapidly. The funds soon became too large and politically popular to eliminate. Congress instead passed the Depository Institutions Deregulation and Monetary Control Act in 1980, which phased out Regulation Q and allowed banks to pay market rates on deposits.

The regulatory limits on the location of bank offices and on competition between commercial and investment banks are other examples where regulatory innovation broke down old rules and increased competition. At one time banks were not allowed to open or acquire new offices across state lines and even faced severe limits on intrastate branching in many states. These barriers fell as more aggressive banks used new technology in the 1970s to offer selected banking services outside their branching area, thereby partially overcoming the geographic restriction on the location of bank offices. Their success played an important role in changes to state and federal laws (see [Randall S. Kroszner](#)). A small literature documents the effect of reductions in geographic barriers, including its effect on economic growth and volatility (see [Viral V. Acharya, Jean Imbs, and Jason Sturgess](#)) and on reduced racial discrimination (see [Ross Levine, Alexey Levkov, and Yona Rubinstein](#)).

The barrier between commercial and investment banking established by the 1930s Glass-Steagall Act came under attack from the commercial banks and investment banks in the 1970s, both seeking to invade the other's business (see [Lawrence J. White](#)). As the lines between commercial and investment banking became increasingly blurred, the limits on commercial banks were first relaxed by regulatory reinterpretation of Glass-Steagall and later the barriers were largely removed by the Gramm-Leach-Bliley Act of 1999.¹

Technology as a driver of innovation

Advances in technology have long been an important driver of financial innovation. An early example of new information technology (IT) that has significantly changed retail banking is the automated teller machine (ATM), which was first introduced in the 1960s and, after some refinement, experienced rapid growth in the late 1970s and 1980s (see [Ellen Florian](#)). The continuing evolution of technology has helped dramatically change the overall consumer banking experience since the early 1970s, when almost all individual receipts and expenditures were paper (currency or paper checks). As of 2010, [Loretta J. Mester](#) reports that almost 94 percent of all households used electronic forms of payments, including ATMs, debit cards, automatic bill paying, and smart cards. (See [Scott Frame and Lawrence J. White](#), 2012, for more discussion of changes in retail payments technology.)

Another major driver in financial innovation is the development of financial technology broadly defined, especially when combined with developments in information technology. Advances in IT have been critical both to obtain and manipulate the enormous amounts of data required to estimate some statistical models and for timely calculations of some complex valuation and risk measurement formulas.

Statistical models of credit risk have been essential to the development of modern markets for consumer lending. Prior to their development, the lending officer's personal knowledge of the borrower was a critical input into the lending decision. While this personal approach to evaluating loans has some advantages, the process is not amenable to allowing geographically distant lenders to compete in local retail lending markets. Thus, the development of models that used readily verifiable information, such as past credit history, to estimate reasonably accurate models of future behavior opened the door for nationwide competition in a variety of markets like credit cards and mortgage lending. The verifiable measures of credit quality produced by these models were also critical to the securitization of credit cards and mortgages. More recently, the credit scoring technology has been applied to small business lending (see [Allen N. Berger and W. Scott Frame](#)).

Another important development was that of new financial technologies to price cash flows whose values are contingent on future events. One especially valuable technique is the development of asset pricing based on the concept of arbitrage, the idea that identical cash flows from two different sources should have the same price. The path-breaking options pricing formula of [Fischer Black and Myron Scholes](#) (1973) and [Robert C. Merton](#) (1973) relies on arbitrage between the market for the underlying security, the cash market, and the option. The estimated prices that are obtained from many arbitrage-based formulas contain errors, as these models typically depend upon assumptions that rarely hold in practice. However, arbitrage models often deliver good-enough pricing values to allow the pricing of very complex claims that might otherwise be almost impossible to value. These techniques have proven critical to the growth of a variety of markets for exotic financial instruments, including securities backed by 30-year, fixed-rate mortgages that give borrowers the option to prepay with no penalty (for a discussion of the complexity of valuing these securities, see [Andrew Kalotay, Deane Yang, and Frank J. Fabozzi](#), 2004).

The future of financial innovation

The future prospects for innovation in banking related services are bright. Advances in our ability to obtain, store, and process information continue to be made. With some lag, these advances in hardware and software are being applied to the provision of banking services. The need to visit a bank branch during business hours will continue to diminish in favor of consumers being increasingly able to obtain whatever banking service they want, wherever and whenever they want it. Less visibly, banks will also continue applying advances in IT to better service corporate and institutional customers.

Financial technology also continues to advance with more and better data being analyzed by increasingly sophisticated empirical techniques. In doing so, financial technology also takes advantage of continuing developments in IT.

However, regulation is likely to be the biggest source of innovation over the next few years. Regulatory initiatives since the crisis have sought to reduce bank risk by forcing banks to operate differently from how they otherwise would, which has the effect of raising costs and restricting banks' ability to serve its customers profitably. A good case can be made that from a societal viewpoint, the benefits of reducing the probability of a future crisis more than offset these higher costs and restrictions on services. However, from a purely private cost/benefit perspective, banks that innovate to minimize the costs and restrictions imposed by regulation gain a competitive advantage. Given the variety and volume of new regulations (3,500-plus pages, according to [Diane Katz](#)), banks and other financial service providers are being given considerable incentives to innovate.

Banks will not be alone in innovating ways to provide traditional banking services. Unlike banks, nonbank firms can often adopt new technologies with little or no risk that the innovation will disrupt the economics of their existing business model. Of course, [Felix Salmon](#) is correct that regulation places some limits on what nonbank firms can do. However, the converse is also true. Banks face limits on what they can do and, when competing with nonbank financial firms, they often face higher regulatory costs.

Is regulatory innovation by nonbank firms good or bad? A good case can be made that such innovation is good to the extent its primary consequence is to enhance competition. But what about innovation around bank prudential regulations that increases the importance of nonbank financial firms in providing important services? On the one hand, moral hazard is reduced by a transfer of risk from insured banks to nonbank firms that can be put in bankruptcy. On the other hand, nonbank firms that are individually not systemically important could be systemically important as part of a pack of firms following similar strategies. An example of such a pack is the money market funds industry that experienced a massive run after the failure of Lehman Brothers caused Reserve Primary Fund to "break the buck." This run on money funds significantly amplified the instability in global financial markets, according to the [Bank for International Settlements](#). The transfer of risk from regulated, systemically important banks to less regulated, systemically important nonbank financial firms is unlikely to enhance financial stability and may not reduce moral hazard.

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¹ Although Gramm-Leach-Bliley has sometimes been blamed for the U.S. financial crisis that started in 2007, banks were involved in underwriting and owning mortgage-backed securities long before the passage of the act. Indeed, Bank of America issued the first private-label mortgage in 1977 (see [U.S. Treasury](#)). In three of the most important collapses of 2008 (Bear Stearns, Lehman Brothers, American International Group), the firm either did not own an insured depository or it owned a small depository that was not a material factor in the collapse.

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