ECONOMICS WORKING PAPERS

Federal Reserve Structure, Economic Ideas, and Banking Policy During the "Quiet Period" in Banking

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Economics Working Paper 24120

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November 18, 2024

We evaluate the decentralized structure of the Federal Reserve System as a mechanism for generating and processing new ideas on banking policy in the 1950s and 1960s. We document that demand for research and analysis was driven by banking industry developments and legal changes that required the Federal Reserve and other banking regulatory agencies to develop guidelines for bank mergers. In response to these developments, the Board and the Reserve Banks hired industrial organization economists and young economists out of graduate school who brought in the leading theory of industrial organization at the time, which was the structure, conduct, and performance (SCP) paradigm. This flow of ideas into the Federal Reserve from academia paralleled the flow that was going on in monetary policy and macroeconomics at the time and contributed to the increased professionalization of research at the Federal Reserve. We document how several Reserve Banks, particularly Boston and Chicago, innovated by creating dissertation support programs, collecting specialized data, and creating the Bank Structure Conference, which became the clearinghouse for academic work on bank structure and later for bank risk and financial stability. We interpret these examples as illustrating an advantage that a decentralized central bank has in the production of knowledge.

Keywords: Federal Reserve System, banking, industrial organization, financial regulation, governance
JEL Codes: B2, E58, G2, H1, L1

[1] We would like to thank Bob Eisenbeis, Doug Evanoff, Stuart Greenbaum, Neil B. Murphy, Sam Peltzman, and Jim Schmitz for helpful discussions. We would also like to thank several Federal Reserve archivists, particularly Joanne O'Dell, for their assistance and Alan Chernoff and Keith Hazen for excellent research assistance. The views expressed in this essay are those of the authors and not necessarily those of the Federal Reserve Bank of Cleveland or the Federal Reserve System.

1. Introduction

In this paper, we evaluate the role of the Reserve Banks in producing knowledge on banking policy during the 1950s and 1960s. We show that demand for research and analysis into banking policy was driven by growing concerns about monopoly power and legal changes that required federal banking regulators to more extensively consider competitive factors when evaluating bank mergers. We also show that the several Reserve Banks, in particular, Boston and Chicago, innovated by increasing data collection and expanding ties with academics who brought the latest ideas from industrial organization economics.

Our paper is a companion piece to the Bordo and Prescott (2023) study of the role of Reserve Banks in developing and propagating ideas in monetary policy over the 1960–2000 period. In that paper, we documented that starting with the St. Louis Fed in the 1960s, influential ideas in monetary policy were developed, cultivated, and propagated by several Reserve Banks. We argued that internal reforms to the Federal Open Market Committee in the 1950s created a demand from Reserve Banks for monetary policy ideas. This contributed to increased ties with academia in the 1960s that made it easier for new ideas to enter the Federal Reserve System. Furthermore, we argued that these new ideas, sometimes contrary to the prevailing view in Washington, were able to be supported and nurtured by a Reserve Bank due to the decentralized structure of the Federal Reserve. We also argued that the success of some of these ideas illustrates a benefit of a decentralized organization that allows for experimentation in the production of knowledge.

We find some similarities but a significant difference in the development of banking policy ideas in the 1950s and 1960s. This period is known as the "quiet period" in US banking because

there were few bank failures and the financial system was stable. The main policy and research questions then were tied to bank structure and monopoly power and their impact on bank performance and the provision of banking services to customers.

As with monetary policy, we find that increased ties with academia starting at the end of the 1950s were an important venue for the flow of new ideas and analytical methods into the Federal Reserve. Unlike in the case of monetary policy, we find that the Reserve Banks did not necessarily develop independent views distinct from those of the Board. Instead, banking research and policy analysis were a joint effort between the Board, the Reserve Banks, other banking regulatory agencies, and academics. It was motivated by a common interest in these issues due to developments in the banking industry and legal changes that required the banking regulatory agencies to make more decisions about bank mergers.

Our conjecture is that banking policy developed in this way because there was a consensus, among economists at least, that the major legal constraints of the era, such as unit banking laws — laws that prohibited or severely limited bank branching — and the prohibition of paying interest on demand deposits, were inefficient. Furthermore, while the Federal Reserve Board did make decisions that affected bank structure, e.g., approving mergers, writing regulations for bank holding companies, or deciding to adjust the interest rate cap on time and savings deposits, the core factors determining bank structure were set by law.

Nevertheless, as with monetary policy, there was competition among the Reserve Banks in developing ideas about banking policy. Here the competition was motivated by a desire to improve one's reputation and, in some cases, to provide useful information to the banking community and member banks. Our view is that this competition improved the quality and

quantity of research and policy analysis on bank structure questions and the result illustrates one benefit of a decentralized central bank.

We find that the Federal Reserve Banks of Boston and Chicago were particularly innovative on research into bank structure issues in this period. Starting in the late 1950s, both began sponsoring dissertations in order to get young, technically trained economists to work on questions the central bank cared about and, in the case of the Chicago Fed at least, to hire recent graduates. Several of these dissertations were among the earliest works applying the structure, conduct, and performance paradigm (SCP) from industrial organization to the banking industry. We also find that the Federal Reserve Bank of Boston innovated by starting to collect bank cost data that ultimately evolved into the System's Functional Cost Analysis Program. This program collected, on a voluntary basis, detailed cost data from banks. In return for participating, the banks received data useful for benchmarking their performance. However, these data were also used for many studies of bank cost structure, the results of which mattered for evaluating bank mergers and bank branching laws and regulation.

The Chicago Fed also created the Conference on Bank Structure and Competition, better known as the Bank Structure Conference (BSC), in 1963. This annual conference, which was held most years until 2014, became a focal point and clearinghouse for research into structure, conduct, and performance in banking during the 1960s and then, as we will discuss in a subsequent paper, research into bank regulation and financial stability starting in the 1970s. This role became increasingly important as movements to reform the banking system in the 1970s, 1980s, and 1990s developed. In Evanoff, et al.'s (2008) history of this conference, they showed that many ideas for banking reform that were implemented in the 1980s and 1990s were

previously discussed at this conference. We build upon their work to illustrate the role that a Reserve Bank can play in the development and dissemination of ideas.

The dissertation fellowship programs and the conference played a second role, albeit an indirect one. Several of the recipients of these fellowships, and in particular George Kaufman of the Chicago Fed, formed or became members of the Shadow Financial Regulatory Committee.[2] This committee was created in 1986 and was designed to comment on and advocate for banking regulatory reform and generally took a pro market view. As we will argue, because financial regulation is so complicated that it creates large barriers to entry, former regulatory economists were well positioned to opine on banking reform. This committee was influential on the banking reforms of the 1990s, in particular parts of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) in 1991, which was aimed at reforming the deposit insurance system in response to the savings and loan and commercial bank crises of the 1980s. The committee was also strongly supportive of the Riegle-Neal Act in 1994 and the Gramm-Leach-Bliley Act in 1998, which removed many of the branching and legal restrictions on banking that were the focus of the bank structure research of the 1960s.

As in our paper on monetary policy developments in this period, we find that research into banking policy was catalyzed in this period by increasing ties between Federal Reserve researchers and academia. As discussed below, the structure, conduct and performance (SCP) paradigm was developed by industrial organization economists in academia. These ideas came into the Federal Reserve through the hiring of academics and new Ph.Ds., but the production of

[2] The initial members of this committee were George Benston, Robert Eisenbeis, Paul Horvitz, Ed Kane, and George Kaufman. As we will see, Benston, Horvitz, and Kaufman received dissertation fellowships from Federal Reserve Banks.

new knowledge wasn't just from academics. The Federal Reserve financed research, sponsored dissertations, encouraged academics to apply and expand the SCP paradigm to the banking industry, provided questions, and supplied data and computing capabilities, both of which were hard to obtain at the time.

The range of banking issues that the Federal Reserve touches on is broad and includes more than bank structure questions. It includes financial stability, lender of last resort, bank regulation, financial markets, and payments. These topics interact; for example, bank structure matters for financial stability and payment policy as well as for monetary policy. Nevertheless, there is a pattern in US financial regulation that will impact the focus of banking research at a particular time. In the United States the financial regulatory system fluctuates between one that is focused on safety and financial stability and one that is focused on efficiency.

We focus this paper on bank structure and its implications for efficiency because that was the primary focus of banking analysis during the quiet period. As will be discussed later, the financial regulatory system that came out of the banking crises of the early 1930s was heavily focused on safety at the expense of efficiency. Bank competition was limited and controlled. Furthermore, macroeconomic conditions were stable, and there was a long period of price stability. The result was few bank failures and little financial instability.

Research on banking problems and financial stability re-emerged in the 1970s when changes in bank behavior and macroeconomic conditions increased risk to banks and higher inflation increased the costs of regulations such as interest rate restrictions, which in turn increased the incentives to arbitrage regulations. Some of these arbitrages increased financial instability. In a subsequent paper, we plan to document how Federal Reserve research into

banking problems and financial stability began to develop in this period. We will also show that on financial stability topics, e.g., the moral hazard costs of deposit insurance and the appropriate use of the lender of last resort, some Reserve Banks did develop views that differed from those in Washington. However, one constant in both periods will be the increased ties to academia and how the Chicago Fed's Bank Structure Conference continued to be a premier venue and clearinghouse for the discussion and dissemination of ideas and research on banking issues.

2. United States Banking History

Before discussing intellectual currents in the 1960s, it is necessary to provide some history of the banking and regulatory systems and, particularly, what came out of the 1930s. A substantial fraction of the policy questions and research on bank structure in the 1960s was in response to laws and regulations put into place in the 1930s.

Since the beginning of the Republic, legislators have placed numerous restrictions on bank formation, bank organizational form, and bank activities. These restrictions were often motivated by concerns about the concentration of financial power, but they were also often imposed in reaction to financial and banking panics. Prior to the Civil War, the United States had made two aborted attempts at forming a central bank: the First Bank of the United States and the Second Bank of the United States. Congress allowed the charters of both banks to expire; so, other than these two banks, all banks chartered in this period were chartered by states.

Nationally chartered banks did not reappear until the National Bank Acts of the 1860s, which created federally chartered national banks. One goal of the National Bank Acts was to drive out state-chartered banks by taxing their issuing of bank notes, which was the primary type of

money at the time and a major type of bank lending. While this worked at first, state-chartered banks eventually learned that they could basically do what bank notes did by issuing demand deposits and transferring balances (White (1982)).

Furthermore, in some states, state-chartered banks had more powers and fewer restrictions than national banks. For example, a national bank had to operate out of one building and had strict limitations on the types of loans it could make and on its activities. In some states, state-chartered banks could establish branches and could hold less capital and make broader types of loans. The result was that state-chartered banks began to grow in size in the 1880s, and by the beginning of the 20th century, the US had a robust dual banking system in which the Comptroller of the Currency (OCC) regulated national banks and state regulators regulated state banks (Federal Reserve Committee on Branch, Group, and Chain Banking (1932); White (1982)).

The Federal Reserve Act, which was passed in 1913, created a new classification for banks, that is, whether they were members of the Federal Reserve. By law, national banks had to be member banks, but state-chartered banks could choose. While membership did come with several benefits, such as access to the Fed's discount window, the ability to hold a reserve account, and check clearing through the Federal Reserve, the Federal Reserve Act also imposed costs on member banks such as more restrictive rules and reserve requirements.

In 1927, Congress passed the McFadden Act, which liberalized national banks' powers. In this period, the economy was booming and safety in banking was not a priority. The McFadden Act gave national banks the ability to branch to the same extent as state-chartered banks could. Furthermore, it relaxed some restrictions on member banks to allow them to better compete

with state-chartered banks by relaxing lending standards and allowing certain activities that had been prohibited before.

A Move to Safety in the 1930s

In response to the collapse of the banking system at the beginning of the Great Depression, major changes were made to bank regulation. The first major changes were in the Banking Act of 1933, also known as the Glass-Steagall Act. The framers of the Banking Acts of the 1930s believed that the boom of the 1920s, which preceded the crash of 1929, was caused by excessive competition (Meltzer (2002)). To prevent a reoccurrence, the act forbade commercial banks from paying interest on demand deposits. It also gave regulators the power to cap interest rates on time and savings deposits. To protect small banks, the act created the Federal Deposit Insurance Corporation to insure deposits. Based on the belief that banks' ties to Wall Street amplified the stock market boom of the 1920s, the act also separated commercial and investment banking. In a related provision, the act attempted to restrict the use of "speculative" credit, which included features such as limits on margin loans.

A second set of changes was to greatly increase the powers of regulators to approve and deny branch and bank applications (Peltzman (1965)). The new laws instituted a "convenience and needs" test for approvals. Furthermore, the FDIC had to approve new banks that received deposit insurance. In practice, the process developed into a system that limited entry, restricted branching, and protected banks from competition.

The third set of changes during the 1930s was to greatly increase the federal government's involvement in housing finance. The National Housing Act of 1934 created the Federal Savings and Loan Insurance Corporation (FSLIC), which insured depositors of federally

chartered savings and loans; the Federal Housing Administration, which guaranteed residential mortgages; and the Federal Home Loan Banks (FHLB), which provided liquidity to savings and loans. This heavy government involvement ultimately created moral hazard and other problems that contributed to the savings and loan crisis of the 1970s and 1980s and we will discuss this in a subsequent paper.

Bank Regulatory Structure

The reforms of the 1930s created a third federal regulator for commercial banks, which was the Federal Deposit Insurance Corporation (FDIC). Regulation and supervision of commercial banks was allocated in the following way. National banks were regulated by the OCC. State-chartered banks that were members of the Federal Reserve were regulated by the Federal Reserve in cooperation with state regulators, while state-chartered banks that were not members of the Federal Reserve were regulated by the FDIC in cooperation with state regulators. For thrifts, a dual system was established in which a federal charter was created for savings and loans, and these thrifts were supervised by the Federal Home Loan Bank Board (FHLBB) and received deposit insurance from the FSLIC, which was overseen by the FHLBB. State-chartered thrifts continued to exist and were regulated by their own states. Thrifts had no direct connection with the Federal Reserve.

The restrictions on size and branching, both across states and within some states, created an arbitrage opportunity for banks that wanted to circumvent the restrictions. One development was the use of a bank holding company, which was a corporation or trust that would own banks as subsidiaries. Another development was chain banking, which is the ownership or control of a network of banks by an individual or a group of individuals. According to Lamb (1962), these types

of organizational forms were first used around 1900 and grew extensively during the 1920s. The idea behind these structures was to duplicate the benefits of a bank with branches. For reasons discussed in the next section, Congress passed the Bank Holding Company Act of 1956, which not only legally defined a bank holding company, but gave the Federal Reserve powers to supervise holding companies and the power to veto expansion by a holding company. The law also required bank holding companies to divest themselves of non-bank firms that they owned (Fischer (1968)).

To summarize, by the 1950s the United States had developed a banking system that was characterized by the following features. First, unlike just about any other country in the world, the US had a large number of small banks, many of which were unit banks. Second, in reaction to the financial crisis of the late 1920s and early 1930s, strict restrictions on bank activities and pricing, such as limitations on the payment of interest on deposits, were imposed. Third, the financial system had strong incentives to innovate to get around the restrictions. Fourth, some restrictions were inefficient but were supported by coalitions of stakeholders who benefited from them. Fifth, the costs and benefits of a regulation – and thus arbitrages to that regulation – depended on the contemporary bundle of bank regulations, structure, and macroeconomic conditions. Finally, there was ongoing interest from academics, bankers, legislators, and the public in the structure of the banking system.

3. The "Quiet Period" in Banking and the Structure, Conduct, Performance Paradigm

The result of the legal and regulatory changes in the 1930s was a stable, but much less competitive banking system than previously existed. Entry was controlled and branching restrictions limited competition. Starting in 1935, a new bank required not just a charter from a

federal or state chartering agency, but also approval by the newly created FDIC if the bank wanted deposit insurance.[3] Furthermore, in evaluating an application the federal agencies were required to consider the convenience and needs of the local community. In states where branching was allowed, banks also needed approval to establish a new branch.[4] Price controls on interest rates further limited competition, and there were opportunities for collusion, particularly through clearinghouses. Clearinghouses were developed in the 19th century to reduce the costs of clearing checks and other payments, but prior to the creation of the Federal Reserve, some of them also evolved to take on central bank-type roles such as liquidity provision during panics and monitoring of members (Timberlake (1984) and Gorton (1985)). The collective nature of these institutions made it easier to collude on prices, and indeed in the 19th century, some of them explicitly did so by controlling the interest rates paid by its members as a device to prevent competition and make the members safer. In the 20th century, some of these practices continued, and Fischer (1968) reports that clearinghouses facilitated collusion throughout the 1950s.

However, decreased competition was not the only reason for the stability of banks during the 1950s and 1960s. To finance World War II, the United States issued a large amount of debt, and the Federal Reserve encouraged commercial banks to hold these securities by pegging long-term rates at a rate that made them desirable to hold (Garbade (2020)). As a result, at the end of 1945, commercial banks held 64 percent of their assets in the form of US government obligations. This concentration declined over time, but by 1960, commercial banks still held 28 percent of

[3] In this period, a state-chartered bank could operate without FDIC insurance, but few did.

[4] For an analysis of bank entry following the legal changes of the 1930s, see Peltzman (1965), who found that the regulatory changes of the 1930s significantly lowered entry. For some insight into the process of how approval for a new bank worked in practice during this period and which points out that competitors to the potential entrant could oppose approval, see Schweiger and McGee (1961).

their assets as Treasuries or other federal obligations (Flow of Funds (1973)).[5] These assets had no credit risk. The only risk to banks from holding them was changes in interest rates. But under Fed Chairman William McChesney Martin's policies during the 1950s and 1960s, macroeconomic conditions were relatively stable and interest rates and inflation stayed low until the latter half of the 1960s. The result of the restrictions on competition and stable macroeconomic conditions was a banking system in which few banks failed during the 1940s, 1950s, and 1960s, and most of the failures that did occur were of small banks.

While the banking system was safe, the constraints on competition created fears that banking markets were oligopolistic and were hurting consumers and businesses. These fears were amplified by the sizable number of bank mergers in the 1950s and the growth of holding companies and chain banking groups to avoid bank branching restrictions. These concerns led Congress to pass the Bank Holding Company Act of 1956 and the Bank Merger Act of 1960. Furthermore, in an important legal decision about the applicability of the Clayton Antitrust Act to bank mergers, in 1963 the Supreme Court decided in *United States v. Philadelphia National Bank* that antitrust laws did apply to banking and that the relevant market was the local market (Evanoff, et al (2008)).

The change in the general view about competition is illustrated by a quote from Professor Clifton H. Kreps, Jr., in the introduction to a 1964 study on banking competition, which was commissioned by the Federal Reserve Bank of Richmond:

> "Within the span of the last thirty years – from the mid-1930's to the present – public concern over the banking competitive situation has shifted its focus completely. Whereas formerly the concern was over the <u>prevention</u> <u>of</u> <u>excessive</u>

[5] The Flow of Funds (1973) defined the commercial banking sector as consisting of "chartered commercial banks, their domestic affiliates, Edge Act corporations, agencies of foreign banks, and banks in U.S. territories."

> competition in the banking business, today, the concern is instead over the preservation of adequate competition in banking." Kreps (1964).

The increased interest in competition raised conflicts with the policies that restricted bank entry and the interest rate controls in the Banking Act of 1933.

The change in view about competition and the resulting legal changes created a need for the bank regulatory agencies to study and measure the effects of bank structure on competition and bank performance. The natural tool to use for analysis and research was the then ascendant structure, conduct, performance (SCP) paradigm that came out of work on imperfect competition by Joe Bain, Edward Chamberlin, Edward Mason, and Joan Robinson. Much of this work originated at Harvard, where Chamberlain and Mason were professors and where Bain earned his Ph.D.[6]

The main hypothesis of SCP is that market structure influences the conduct of firms and that in turn affects prices, products, and firm profits. Conceptually, the model has at its extremes perfect competition and monopoly, with imperfect competition for intermediate cases. In practice, much of this literature measures concentration ratios and, using cross-sectional, industry-specific analysis, examines how they influence prices, products, and profits.

As interest in these issues developed among the public, banking regulators, and academics, the SCP paradigm was a natural tool to apply to bank structure questions. Banking had entry restrictions that limited competition, legal constraints that fixed some prices, and institutions such as clearinghouses that made it easier to collude. Furthermore, in many states banking had legal restrictions on organizational forms such as unit banking or restrictions on

[6] For an overview of the SCP paradigm in industrial organization, see Schmalensee (1986).

interstate banking that affected competition. These legal restrictions motivated research into the extent to which branching and organizational form affected the organizational efficiency of banks. While this latter question can be narrowly focused on the optimal size and organizational form of a firm, the answer to it did matter for SCP analysis. For example, even if branch banking leads to increases in concentration, those monopoly costs might be offset by the efficiency gains from branch banking. In general, research into these two questions was intertwined and the same researchers often worked on both questions.

The concerns about monopoly and the absence of bank failures meant that virtually all of the research and interest in banking in the 1960s was related to the SCP paradigm. Research into bank failures and financial instability developed later, starting in the 1970s, as the quiet period ended.

4. SCP Comes to the Federal Reserve

The foundational economic work on banks in the SCP paradigm was David A. Alhadeff's 1954 book *Monopoly and Competition in Banking*. Alhadeff compared unit banks with branch banks in California, which was a state that allowed branch banking at the time. He attempted to measure bank output and to compare cost patterns, pricing, and profitability of different bank organizational forms.

About the same time that Alhadeff's book was published, Federal Reserve interest in bank structure was growing. The Federal Reserve as well as other bank regulators always had an interest in bank structure, but the banking developments in the 1950s generated additional

interest even before passage of the Bank Holding Company Act of 1956.[7] In 1955 the Reserve Bank Presidents' Conference created a Special Committee on Studies of the Banking Structure. Minutes of a meeting of the Board of Governors with the Reserve Bank presidents reports that the committee was created because of the results of some studies of bank supervision and "… a feeling on the part of the Presidents that the significance of changes in the banking structure deserved special study." (Board of Governors of the Federal Reserve System (1955))

The main activity of this committee was to commission about 30 papers written by academics, bankers, and insurance executives on economic changes and the changing structure of commercial banking. These papers were presented at a conference hosted by the Federal Reserve Bank of Philadelphia early in 1957 and compiled into a conference volume (Special Committee on Studies of the Banking Structure (1957)). However, despite the high profile of some of the academics, e.g., David Alhadeff and Lester Chandler, the papers were primarily descriptive with little quantitative analysis.

After the special committee was created in 1955, interest in the topic only continued to grow due to legal changes. The Banking Holding Company Act of 1956 gave the Board of Governors oversight over bank holding companies. The Bank Merger Act of 1960 required the bank regulatory agencies to consider "competitive factors" in addition to "banking factors" in evaluating bank mergers (Kaufman, Mote, and Rosenblum (1989)). The Supreme Court decision in 1963 (*United States v. Philadelphia National Bank*) held that the Clayton Act's provisions for evaluating mergers applied to banks as well (Evanoff et al. (2008)). These developments created a need by the Federal Reserve and the other bank regulatory agencies to develop procedures for

[7] For an example of early interest, see Federal Reserve Committee on Branch, Group, and Chain Banking (1932).

evaluating bank merger applications, to collect data, and to support research into the connection between market structure and performance.

In response to these changes, in 1961 the Board of Governors created the Banking Markets Unit and a program for the analysis of bank structure and competition (Kaufman, Mote, and Rosenblum (1989) (KMR)). Both operated under the direction of Robert Holland, who was then a senior Board staffer.[8] The activities of the unit and the program are described in a November 1964 article in the *Federal Reserve Bulletin*. In that article, Hall, et al. (1964) (HHSS) describe several open bank structure questions, explain why the Federal Reserve and other regulatory agencies care about the answers to these questions, argue that research is valuable in answering these questions, survey the SCP banking literature, and describe work underway at the Federal Reserve on these issues. Furthermore, HHSS state that

> "… the Board of Governors launched a formal research program related to banking markets about 3 years ago. A major aim of that program has been to stimulate research by a wide range of professional analysts in academic institutions, public agencies, and private research and trade organizations. To this end the Board and the various Federal Reserve Banks have actively provided data, have sometimes provided financial aid, and have often provided technical counsel to outside researchers. More than 30 doctoral dissertations and similar research projects are now in progress or have recently been finished with such Federal Reserve assistance. " (HHSS (1964), p. 1385)

The first point to note about the statement is that the Board and the Reserve Banks jointly responded to the need to understand bank structure issues. As we will see, the activities were only loosely coordinated by the Board. This allowed for competition between the Reserve Banks. Unlike in the case of monetary policy, this competition was not motivated by a Reserve Bank president's role on the FOMC. Instead, it was motivated by a desire to establish a reputation for

[8] Later, one of the authors of the article, Robert Holland, became a Federal Reserve governor.

doing work on bank structure issues in which the Fed and the public were deeply interested; to better understand banking structure, which affected Reserve Bank operations such as check clearing and supervision; and in at least one case, to provide a service to member banks.

A second point to note about the statement is its reference to the commissioning of dissertations. This hints at a theme that we identified with monetary policy methods and the Federal Reserve in Bordo and Prescott (2019, 2023): namely, that the communication of specialized technical information requires large investments in specialized expertise as suggested by Arrow (1974) and that the 1960s are the period in which the Federal Reserve begins to greatly increase its investment in economic expertise by hiring more economists out of graduate school and interacting more with academics. That pattern fits bank structure research too, with the creation of the Banking Markets Unit at the Board and the gradual increase of research on the topic at the Reserve Banks, which began mostly in the early 1960s.

In the case of these supported dissertations, several were written by economists who later became well known in banking and finance, such as George Benston, Franklin Edwards, Stuart Greenbaum, Paul Horvitz, George Kaufman, Neil Murphy, and Sam Peltzman. Furthermore, several of these dissertation writers started their career at the Federal Reserve. Greenbaum started at the Federal Reserve Bank of Kansas City, Kaufman started at the Federal Reserve Bank of Chicago, and Horvitz and Murphy started at the Federal Reserve Bank of Boston. These young economists brought with them the latest techniques in industrial organization economics and econometric methods, while, in return, the System provided not only economic questions for them to address, but also data and access to computers, which were only just

starting to be used in that era.[9] Bank data were difficult to obtain at the time – for example, the Call Report was not publicly distributed until the 1970s — and computation of even a simple regression was time consuming; so having access to computing power was valuable.

Finally, after arguing that banking markets are not described by the perfect competition model due to the laws designed to safeguard against excessive competition, HHSS make this case for why the Federal Reserve should be studying bank structure, and it is very much in the tradition of SCP and even mentions implications for monetary policy:

> "A prerequisite for ideal bank regulation is a reasonable understanding of the connections between (1) different market structure and organizational characteristics and (2) their various behavioral consequences. This requires study of the connections between various changes in structural characteristics and the degree of competitiveness injected into a market. At the same time, the effects of different structural characteristics on long-run average costs of banks need to be considered. And finally, attention must be given to the relationships of banking structure and organization to other aspects of banking behavior deemed to make significant contributions to the nation's welfare. These latter include such factors as the procyclical or counter-cyclical impact of bank behavior, bank responsiveness to countercyclical public policies, and the continuing availability of banking services in each market." HHSS (1964, p. 1384)

5. Reserve Banks Innovate

While HHSS (1964) pointed out the joint aspect to the System's response, the Federal Reserve's decentralized structure also allows for competition in the production of knowledge by multiple semi-independent organizations. The two features do not conflict; indeed, they complement each other. The dynamic was for the Board to do its own work but to also encourage research into SCP and let the Reserve Banks experiment as to how they did it. One advantage a

[9] We would like to thank Stuart Greenbaum for pointing out the importance of computing resources. Greenbaum earned his Ph.D. at Johns Hopkins and finished his dissertation on bank cost structure in 1964 while employed at the Kansas City Fed.

Reserve Bank had was that its role in providing banking services and supervising banks gave its researchers access to qualitative information on how banks operate and into banking markets, particularly when they are local and regional, as many were at the time. Another advantage was that in having 12 Reserve Banks, the System had 12 entities that had incentives to compete in the production of knowledge, with the reward being an improved reputation and enhanced standing of the Bank, as well as providing expertise that mattered for their operations. Just as the SCP paradigm took the view that a concentrated banking market would charge higher prices and provide fewer services, we take the view that a more concentrated market in the production of ideas about banking structure would have produced less knowledge.

We document three ways in which Reserve Banks innovated in the late 1950s and the 1960s. The first was to create dissertation fellowship programs. The second was to create and provide banking data. The third was the Chicago Fed's creation of the Bank Structure Conference in 1963. All three of these developments were part of a trend in which the Federal Reserve interacted more with academia, which was a theme we identified with monetary policy in the 1960s.

Dissertation Fellowship Programs

As we noted in Bordo and Prescott (2023), the Schultz (1943) review of research departments at the non-New York Reserve Banks found that in the early 1940s, little useful activity was going on other than regional data collection. The Schultz (1943) assessment was that the research departments at the Reserve Banks were understaffed with sufficient competent personnel, often had the wrong personnel for analytical work, gave competent personnel the wrong incentives, and did not always know how to use what research talent they did have

(Schultz (1943)). To fix this, Schultz recommended that the Reserve Banks support researchers by having them get graduate training, interact with academics, and publish in academic journals. Schultz's argument was that professional rewards would motivate research department staff, encourage them to develop more human capital, and help Reserve Banks attract qualified staff. Schultz says this about incentives for researchers:

> "The chief stumbling block in motivation is not inadequate salary, insufficient promotion, or insecure tenure, but the lack of professional recognition – the inability of the research worker to establish himself among his professional colleagues.
>
> To join the research staff of the Federal Reserve System is like entering a monastery. The individual leaves all claims and all chance to advance in his professional world behind. He no longer has at hand ways and means for bringing his own professional talents to the attention of his peers. This might appear as an overstatement, but it is not. Everything that a research worker in the bank does usually fails to get beyond the next man in the hierarchy and when it goes further, in any case, it ends up in the files of the bank. The failure to have developed an adequate publication policy means that the banks are dissipating the strongest incentive there is to motivate research workers to do their best. A very drastic reformulation of the rights and privileges of a research worker to publish is overdue. This incentive must be harnassed [sic] if the bank wants efficient, effective and competent professional personnel." Schultz (1943), pp. 10-11

In the 1940s and 1950s, by far the best economists and thinkers in the Federal Reserve were concentrated at the Board and the New York Fed.[10] For example, Table 1 reports academic publications by Federal Reserve entity. Not surprisingly, the Board and the New York Fed published much more than everyone else. However, whether motivated by the Schultz (1943)

[10] The connections between the New York Fed and academia go back to at least to the 1930s. In 1933, Professor John Henry Williams of Harvard University joined the New York Fed as assistant Federal Reserve agent. He stayed connected to that Bank until the early 1960s and served in various roles, including vice president in charge of the research department. While serving in these roles, he was simultaneously a professor at Harvard for most of this period. Furthermore, he was a very prominent economist, serving as president of the American Economic Association in 1951. He also attracted numerous economists to the New York Fed. (Federal Reserve Bank of New York (1980-81))

memo or not, the research departments at the non-New York Reserve Banks slowly started moving in that direction in the 1960s, and the creation of dissertation fellowship programs were an example of this move. These programs helped with recruitment of young economists. They are also an example of one way in which the flow of information increased between academia and the Federal Reserve starting in the 1960s.

We are aware of three Reserve Banks that began fellowship programs in this period. The Chicago Fed started one in 1957, the Boston Fed in 1958, and the Cleveland Fed in 1961 (Federal Reserve Bank of Cleveland (1960)).[11] Our conjecture is that Boston and Chicago set up programs because both Districts had large numbers of higher-quality colleges and universities with faculty who did research. The Boston Fed District contains Harvard, MIT, and the many other colleges and universities of New England, while the Chicago Fed District covers the large state universities of Illinois, Indiana, Iowa, Michigan, and Wisconsin as well as the University of Chicago and Northwestern University.

We will concentrate our discussion on Chicago's program because it seems to have been the most extensive.[12] However, we want to make one point about Boston's program because it is tied to the second innovation we will discuss, namely, innovative data collection. One of the earliest dissertations Boston supported was Paul M. Horvitz's MIT dissertation in 1958 on concentration and competition in New England banking. Horvitz used data collected by the

[11] We do know that some individual dissertations were supported by other Reserve Banks as well.

[12] Also, the Boston Fed's program was less formal. Dissertations that were supported tended to arise due to individual connections between an academic and the Bank. Source: Conversation with Neil B. Murphy, whose dissertation on wholesale banking was supported by the Boston Fed and whose first job was with the Boston Fed. Murphy wrote his dissertation under the direction of banking economist Donald Hodgson at the University of Illinois; so the Boston Fed did not restrict itself to its own District. Nevertheless, the large number of research universities in its District probably made these personal connections easier.

Boston Fed in a specialized survey of member banks in its District, which included some cost allocation data for branch banks and interest rate data from the Commercial Loan Survey periodically run by the Boston Fed (Horvitz (1958, p. 151)).

Returning to the Chicago Fed, this Bank seems to have had more of a connection to academia than other non-NY Reserve Banks in the 1950s. As Table 1 shows, the Chicago Fed was publishing in academic journals in the 1950s. Furthermore, Chicago published more than any other non-NY Reserve Bank throughout the 1950s and 1960s. Consistent with this somewhat academic focus, the Chicago Fed started a dissertation fellowship program in 1957 that would provide financial support to several Ph.D. candidates each year. According to the Chicago Fed's employee newsletter, "This new program has a dual purpose -- that of encouraging outstanding talent to study the problems of the nation's central banking system and of stimulating interest in their choosing this field for their future careers." (Rymarowicz (1957))

Another purpose of the program was to attract young economists to work for the Chicago Fed after they finished their Ph.D.s.[13] On this dimension, the program led to several prominent hires for Chicago. For example, Karl A. Scheld, who received a fellowship in 1957, later became research director at the Chicago Fed, and George G. Kaufman, who received one in 1959, started his career at the Chicago Fed and then later returned as a visiting scholar.[14] Kaufman would be a particularly important hire because he ran the Bank Structure Conference through the 1960s until

[13] Source: Conversation with Sam Peltzman, who received one of these fellowships in 1963 and received an offer from the Chicago Fed when he finished his Ph.D.

[14] In addition to the names mentioned above, several well-known economists who received these fellowships included John McCall, Jr. in 1957, George J. Benston in 1960, William Poole in 1962, Sam Peltzman in 1963, and Susan Bies in 1969. A review of dissertation topics through 1971 indicates that most of the supported dissertations were on banking or monetary economics (Federal Reserve Bank of Chicago (1971)). The program ended sometime in the mid-1970s.

he left for academia. He became associated with the Chicago Fed again in 1981 as a visiting scholar, and then started the Shadow Financial Regulatory Committee that was influential in the banking reforms of the late 1980s and 1990s.

Data Creation

It is easy to forget today just how hard it was to collect and analyze data in the 1960s. The Call Report was not widely available, and by modern standards, it did not collect much information. In the 1960s, it was only four pages long.

For questions about bank structure, even if access was available, the data provided in the Call Report were inadequate. While the Call Report provides basic information about a bank's balance sheet and income statement, it contains only limited information about a bank's activities. It reports broad classes of loans, but non-interest expenses are lumped together, income by type of loan is not reported, and payment services are not broken out. Only limited information about costs and revenue by bank product can be deduced. Without that information, comparisons of costs relative to earnings can be subject to biases. For example, two banks of the same asset size, but one mainly lends to small businesses and the other mainly lends to large borrowers, would have different cost structures, but that would be because they were offering different products, not because one was necessarily more productive than the other. Similarly, comparing a $50 million unit bank with a $50 million branch bank could easily be misleading because each bank would likely offer a different bundle of products. A better comparison might be to compare a $50 million branch bank with five branches to a $10 million dollar unit bank.

To properly make the comparisons described above requires specialized data. On this dimension, the Boston Fed was an innovator, although credit here should be shared with the

New York Fed. As we discussed earlier, Paul Horvitz's MIT dissertation, which was supported by the Boston Fed, used data that Boston collected from a sample of member banks in its District. While we don't know the exact date that Boston started its data collection efforts, the Boston Fed was doing cost surveys of member banks in its District at least as early as 1958 (Boston Fed (1961)), and Behr (1969) reports that both the Boston Fed and the New York Fed initiated collection of cost data in 1956 and these efforts were independent. In remarks given to an ABA Automation Conference in 1965, a New York Fed employee said that the New York Fed had been offering analysis of cost-type data to small commercial banks for 10 years (Blanchette (1965)). While both banks may have offered this program, Benston (1965) reports that it was the Boston Fed that first made the data available for economic analysis.

Regardless of the exact origin, this effort eventually grew into what became known as the functional cost analysis (FCA) program. The FCA program collected data from banks in which the banks would allocate costs to bank functions such as classes of deposit accounts, types of loans, safe deposit boxes, customer service, etc. It also collected data on the number of deposit accounts and transactions, the number of loan accounts, employee and officer compensation as well as advertising expenses.[15] Participation was voluntary, and in return, banks received summary information useful for benchmarking and evaluating their own performance.[16] Initially, the service was only offered to member banks. It's likely that part of the motivation was to provide services to member banks to make Federal Reserve membership more appealing.[17]

[15] Later, the Call Report started collecting some of these data.

[16] For an example of the kind of benchmarking information the program provided to banks as of 1975, see Federal Reserve Bank of Chicago (1976).

[17] When the Federal Reserve System was set up, membership by state banks was voluntary. (National banks had to be members.) In return for joining, member banks received benefits such as payment services and access to the discount window, but there were also costs, such as Federal Reserve regulations and reserve requirements. Until

Throughout the 1960s, additional Reserve Banks joined the program, so that by 1970 all the Reserve Banks were participating.[18] In 1982, the program was offered to non-member banks, and thrifts began participating that year on a pilot basis (Dallas Fed (1982)). Throughout the program's history, mainly smaller banks participated. The program ended in 1999. For a history of this program, see Ors (2004).

While the main purpose of the FCA program was to provide a service to banks, the value of this program to the SCP banking literature and, in particular, the part of that literature that attempted to measure economies of scale and the impacts of organizational form should be apparent. As we discussed above, banks are multi-product firms, and simple performance comparisons of banks in different size classes, as in Alhadeff (1954), can only provide so much information.

Benston (1965), which is based on his University of Chicago dissertation and for which he received dissertation support from the Chicago Fed, was the first paper to extensively use the FCA data. Benston used the data to break up each bank into sub-banks that each produced a different product, e.g., one sub-bank that produced demand deposits, another that produced consumer loans, etc. The advantage of this approach is that it adjusted performance for

2008, by law reserves paid zero interest, so membership was particularly costly when inflation was high. In this period, the Federal Reserve would try to offset membership costs by subsidizing payment services and providing other services, of which the functional cost analysis program was likely one. During the inflation of the 1970s, the costs of membership increased, and many banks left the Federal Reserve (Varvel (1977)). While declines in membership affected the Federal Reserve's ability to offer payment services and reduced Reserve Bank activities, it also made it harder for the Federal Reserve to act as lender of last resort because it couldn't directly lend to non-member banks without invoking the "unusual and exigent" circumstances of Section 13(3) of the Federal Reserve Act. Among other things, the Monetary Control Act of 1980 solved the "membership problem" by allowing non-member banks to hold reserve accounts, get payment services from the Fed, and borrow from the discount window. It also required the Federal Reserve to recover costs on payment services it provided.

[18] Regan (1972) reports that 951 member banks in the 12 Federal Reserve Districts were participating in 1970. Regan (1972) also describes some of the procedures used to allocate costs.

differences in product mix across banks. Of course, there were limits to these data. Cost allocation decisions can vary by bank, and bank participation in the FCA was voluntary, so the sample of banks was not representative. Furthermore, the participants were mainly small banks, so the analysis was less useful for analyzing the efficiency of larger banks (Ors (2004)). Nevertheless, these data contributed to research on important questions about bank structure that the Federal Reserve, the other banking regulatory agencies, and the public cared about. For a short discussion of the methodological approach taken by the literature on SCP and economies of scale in banking, see the Appendix.

The Chicago Fed Bank Structure Conference

The second and most important way that the Chicago Fed innovated in terms of banking research was through the creation and support of the Bank Structure Conference. The origin of this conference was a 1963 meeting that the Chicago Fed arranged with a group of 20 academics to discuss research into the microeconomics of financial markets and to encourage research into evaluating the structure, conduct, and performance of banking markets.[19] The result of that meeting was an agreement to have a follow-up meeting. The conference then continued annually, except for 1966 and 1973, until it ended in 2014.

As discussed earlier, the creation of the conference was motivated by developments in the banking industry and changes in the law. Kaufman, Mote, and Rosenblum (1989) (KMR) report that the initial 1963 meeting was set up because the Chicago Fed wanted to know what micro banking research 7th District academics were doing and to encourage additional research. The first meeting was valuable enough that the Chicago Fed decided to continue it.

[19] Much of the history of the BSC conference is from KMR (1989) and Evanoff, et al. (2008).

Of course, the initial topics of the conference all involved bank structure. However, this stayed the case through the entire 1960s. More specifically, during the 1960s, KMR (1989) say that "… six topics dominated the program:

1. Measures of competition
2. Delineation of banking markets, including surveys of how customers choose their banks
3. Evidence on structure and performance, including market surveys and theoretical design of optimal banking structure
4. Cost studies, primarily economies of scale
5. Review of legislation and court decisions
6. Review of ongoing research and encouragement of further research" (KMR (1989), p. iv.)

All of these topics are firmly part of the SCP paradigm.

To connect this individual effort back to the joint efforts of the Board, the Reserve Banks, and even the other banking regulatory agencies, these topics fit the goals and program of the Bank Markets Unit set up by the Board under Robert Holland. These goals were:

1. "To narrow the areas of doubt and conjecture regarding the relationship between banking structure and market performance:
2. To lay the basis for developing a better catalog of pertinent economic information to be analyzed as background in specific cases; and
3. To contribute, over the longer run, some evolution of standards for decisions on holding company and merger applications." (Holland quoted in KMR (1989), p. ii)[20]

Finally, KMR (1989) also state that the Board encouraged the Reserve Banks to carry out research on bank structure, and the creation of the BSC was Chicago's response to this encouragement.

[20] KMR (1989) are quoting Robert Holland from a memo titled "Status of Program for Analysis of Banking Structure and Competition," from Robert C. Holland to Watrous H. Iron, who was chairman of the Committee on Research and Statistics of the Conference of Presidents. Board of Governors of the Federal System, November 30, 1962.

The contribution of this conference was to gather almost every active researcher on bank structure in one place to present their work and exchange ideas. Furthermore, by linking with industrial organizational economists, the conference helped bring into the Federal Reserve SCP and other ideas from industrial organization. KMR (1989) state that much of the initial research presented at the conference took ideas and methods from industrial organization and then modified them for banking and financial markets.

6. Diffusion of Knowledge in the 1960s

The main mechanism for the diffusion of knowledge and ideas into the Federal Reserve that we have identified is the increased interaction between the Federal Reserve and academia that really starts to develop in the 1960s. In Bordo and Prescott (2023), we tied this development to internal reforms that Chairman Martin made to the FOMC in the mid-1950s that increased the demand for monetary policy analysis by the non-New York Reserve Banks. For banking research, the demand comes from a need to better understand banking structure developments due to legal changes that affect bank merger analysis as well as a general sense that the regulatory move to bank safety in the 1930s gave banks monopoly power and created inefficiencies.

Despite the different reasons for the demand for monetary and banking policy ideas, the solution was similar. In both cases, the Federal Reserve increasingly hired economists out of graduate school and increased the rigor of its analysis. While our papers emphasize this change to the Reserve Banks, it is important to realize that a similar change was underway at the Board. As we discussed earlier, Robert Holland set up the Banking Markets Unit in 1961 by hiring

economists out of academia.[21] Something similar was going on with respect to monetary policy at the time. Edward C. Ettin, who started at the Board in 1964, describes a culture in which the professional staff was not well trained when he arrived (Kwast and Small (2006)) and then describes how work on monetary policy by the Board staff started to become more academic over time.

The importance of the ties to academia can be seen in one of the patterns we observe with respect to bank structure research in the 1960s: the methodological sophistication of the analysis and statistical methods increased. Much of this increased sophistication entered the Federal Reserve and the other regulatory agencies from academia, although, of course, with the change in professional incentives that Schultz (1943) recommended, Federal Reserve economists also contributed to the improvements in methods.

The other pattern we observe with respect to bank structure research in the 1960s is a contribution of the bank regulatory agencies, which identified questions, provided financial support, gathered data, and provided the data to researchers. This illustrates that the production of knowledge is not at all one directional and that organizations, in this case government agencies, can offer valuable input into the production of knowledge. Finally, tied to both patterns, however, are the improvements in computational power that allows for ever more sophisticated statistical analyses to be run on ever larger data sets.

One way to see why the 1960s were so significant is to go back to the 1950s. In that period, Federal Reserve personnel published almost no work in academic journals on SCP topics. We

[21] Almarin Phillips, who was a professor at the University of Virginia at the time, consulted with the unit. The unit also hired George R. Hall, who had been a professor at the University of Virginia.

reviewed all the papers published by Federal Reserve researchers counted in Table 1 during the 1950s. While there are several articles describing bank activities, e.g., Guttentag (1957) of the New York Fed on mortgage warehouse lending, there is only one paper on competition and one paper on economies of scale. Furthermore, neither of these papers was about banking. Robertson (1954) of the St. Louis Fed was about competition and anti-trust in general, and Knudtson (1958) of the Minneapolis Fed is about economies of scale in agricultural production. Most Federal Reserve work on banking was descriptive and published in the various Reserve Bank monthly reviews or the *Federal Reserve Bulletin*.

The first significant research paper on SCP that we find associated with the Federal Reserve is the Horvitz (1958) study of competition and concentration in New England banks. As we discussed earlier, this paper was an MIT dissertation supported by the Boston Fed. Compared with Alhadeff (1954), Horvitz (1958) uses similar methods to compare cost structures for unit and branch banks in New England, though he had better data, including expense and deposit data gathered by the Federal Reserve Bank of Boston from bank surveys.[22]

After Horvitz (1958), however, there are rapid changes in the 1960s. More data become available, there are improvements in quantitative methods and there are improvements in computation that allow for larger data sets to be analyzed using the newer quantitative methods. In the portion of the SCP literature on economies of scale and cost structure of banking, the first papers we are aware of that ran regressions are Schweiger and McGee (1961) and Gramley

[22] By modern standards, Alhadeff's (1954) quantitative methods were simple, basically comparing performance of branch and unit banks for different size ranges and geographic location. Nevertheless, his work was an improvement on previous analyses that were mostly qualitative (Horvitz (1958) and Guttentag and Herman (1967)).

(1962), the latter who worked for the Kansas City Fed at the time and later become a Federal Reserve Governor. While Schweiger and McGee ran some of their regressions on all 6,233 member banks in 1959 (using data provided by the Board and the Chicago Fed), most studies during the early 1960s used smaller sample sizes. For example, Gramley (1962) used Call Report data from a survey of 270 commercial banks in the Federal Reserve 10th District. It included a survey of a subsample of these banks that gathered data on officer and employee compensation. Following these two papers, regression methods become standard, but what we do see is increases in the size of samples. In the early 1960s, there were over 14,000 banks, but gathering and tabulating that much data was costly, and the statistical analysis of the data was typically done on small samples, likely because the ability to run a regression on a large number of banks depended on the availability of computers. Computers were just starting to be used in that period, and access to computing was limited; even in large organizations that had computers, they had to be shared with other users. Over time, we gradually see larger samples being used. Greenbaum (1965) was able to do his analysis on a larger sample of 1,158 banks.

A similar pattern is seen for SCP papers, namely those that analyze concentration and performance. The Rhoades (1977) survey lists 39 studies from 1977 or before and lists the unit of observation and the number of observations. According to his analysis, the first banking SCP study that used regression methods is the Edwards (1964) Harvard dissertation that was supported by the Boston Fed. As discussed earlier, the SCP literature typically regressed a performance measure on concentration measures and control variables; so, in this literature, the number of observations will be smaller than that in the bank cost studies; for example, a study might compare bank performance in different counties within a state or in a metropolitan

statistical area. Still, here we see changes in what can be computed. For example, Edwards (1964) compares interest rates on business loans across 49 metropolitan statistical areas. Kaufman (1966) compares interest rates and earnings across 99 counties in Iowa. Later in the decade, Taylor (1968) regresses loan revenue on various independent variables on a sample of 1,315 banks.

7. Conclusion

In this paper, we documented the introduction of the SCP paradigm into the Federal Reserve. The SCP ideas came into the Federal Reserve via contact with academics and the hiring of young economists out of graduate school with modern training. The Federal Reserve's interest developed due to bank structure changes, an increased concern about bank monopoly power, and legal changes that required the Federal Reserve and the other banking regulatory agencies to make decisions on bank mergers and acquisitions tied to their effects on competition. The Federal Reserve's role in the production of knowledge was to provide financial support for research into SCP in banking, both by funding academics and by hiring them, and by providing public policy questions to study providing data.

Consistent with Bordo and Prescott (2019, 2023), we found that several of the Reserve Banks innovated in the production of bank structure research. We argued that the Federal Reserve's decentralized structure allowed for different Reserve Banks to experiment and compete in the production of knowledge. Both Chicago and Boston innovated by sponsoring dissertations. Boston, along with New York, innovated by creating bank cost data, and Chicago

played a particularly important role through the creation of the Bank Structure Conference, which became the clearinghouse for research and policy analysis of bank structure questions.

In assessing the role of the Reserve Banks, there are two counterfactual questions to consider. First, why can't a central bank rely on academia to produce the knowledge it needs? Second, would the knowledge still have been produced with fewer entities, e.g., if the research function was solely located in Washington?

For the first question, certainly academia's role is paramount, particularly in the development of methods and techniques. However, there is no guarantee that academia will devote the amount of resources to investigating bank structure questions that the regulatory agencies would like. After all, there are plenty of other sectors in the economy that can be studied. Indeed, an explicit motivation for the Chicago Fed's support of dissertations was to get young economists to work on questions of interest to the Federal Reserve. Furthermore, the interaction with the banking sector that the Federal Reserve and the other banking regulatory agencies have provides insights into questions and access to data that outsiders typically do not have. In this period, data could really only be provided by a banking regulatory agency.[23]

The second question is: what specifically do the Reserve Banks produce that wouldn't have been produced if the research function were only in Washington? Here, as we discussed earlier, we believe that more competition tends to produce better outcomes. However, in the case of the Federal Reserve, one strength of its decentralized structure is the ties that Reserve Banks build with their respective regions due to outreach, the provision of banking services, and

[23] This is still the case today. While Call Report and other bank financial data is now widely available, there is still supervisory data that is not publicly available such as a bank's regulatory rating. The latter data is confidential, but some of it can be used by bank regulatory economists under strict conditions to protect confidentiality.

the supervision of banks. Reserve Bank economists have used these ties to gather qualitative information.

A second feature to focus on is that continuity of research efforts can dissipate in a single organization if its interest and focus change. With more entities researching a topic, if one entity loses interest, another entity may continue. The result is that it is more likely that knowledge on that topic will be preserved and studied over time.[24] An illuminating example of how an institution's interest can change over time is the research focus of the OCC during the 1960s. The OCC developed a strong interest in research analysis on banking under the tenure of James Saxon, who was Comptroller of the Currency from 1961 to 1966. Saxon was a reformer who aggressively expanded the powers of national banks and approved *de novo* banks and branches. One of his initiatives was to build up the agency's research capabilities. Along those lines, he hired banking economists such as Paul Horvitz and started the *National Banking Review* in 1963. This journal published numerous papers on bank structure and monetary economics by prominent economists such as Milton Friedman, Allan Meltzer, and Paul Samuelson, and by many OCC, Federal Reserve, and FDIC economists. Soon after Saxon left the office of comptroller, the OCC ended the journal in 1967, and the number of publications by OCC economists quickly declined.[25] Our point here is that interest in producing publicly available research analysis can change over

[24] Another dimension that we found relevant for monetary policy is that a centralized organization has a stronger incentive to keep discussions internal. For a formal model of that dynamic, and why committing to allow differences of opinion to air in public can be beneficial to an organization, see our paper on monetary policy and the Reserve Banks in the 1960-2000 era (Bordo and Prescott (2023)). We think this dynamic is less important for bank structure research.

[25] In the data set of publications summarized in Table 1, publications by OCC staff by year starting near the end of Saxon's tenure are 1965: 9.5, 1966: 2, 1967: 5, 1968: 0, and 1969: 1. Searching the same set of journals for the 1970-1974 period, we found only two publications by OCC staff.

time; so having multiple entities in this line of business increases the chance that productive research will continue over time.

The impact of the SCP work on reform is less clear. While certainly the analysis had some impact on bank merger analysis, the significant reforms occurred over a considerable span of time. There were branch banking reforms in some states during the 1960s and 1970s, but the most significant reforms did not occur until the early 1980s, when many of the interest rate restrictions on deposit accounts were removed, or the 1990s when restrictions on interstate banking, many of which date back to the 19th century, were essentially ended by the Riegle-Neal Act in 1994, and the 1930s separation of commercial and investment banking was ended by the Gramm-Leach-Bliley Act in 1999.

Theories of regulatory reform invariably raise considerations about political economy and the distribution of rents among producers and consumers. For a discussion along these lines, see Peltzman (1989). Since major bank reform requires legal changes, reform was not going to happen until Congress wanted to make such a change. The role of research in this context is to provide information and analysis that Congress might use when the interests and economic conditions change to the point where reform is politically feasible. Along these lines, many of the early SCP economists, such as George Kaufman, were involved with the Shadow Financial Regulatory Committee, and that group was influential in pushing for banking reforms in the late 1980s and the 1990s, as we will discuss in future work.

Returning to the bank structure research, the main focus of banking research during the "quiet period" was structure, conduct, and performance, and the Federal Reserve brought state-of-the-art ideas and methods into the System by increasing its ties with academia. As we will

discuss in future work, banking research begins to change focus in the 1970s as financial instability begins to increase with the failures of significant banks such as Franklin National in 1974. It then increases dramatically with the S&L crisis and commercial banking crises of the 1980s.

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Table 1: Number of academic journal publications by Federal Reserve and banking regulatory agency affiliation over the 1950-1969 period.

	1950-1954	1955-1959	1960-1964	1965-1969	Total
Federal Reserve Board	26	25	36	41.5	128.5
New York Fed	17	23	20	24	84
Chicago Fed	7	12	6	16	41
Other Reserve Banks	13	21	15.5	43.83	92.32
FDIC	13	3	1.33	7.5	24.83
OCC	0	0	19	18.5	37.5
Total	76	84	97.83	151.33	409.15

Notes: For coauthored articles, an author receives a proportional share. Counts include articles, commentaries, discussions, and book reviews.
Source: Author's calculations from journals listed below. All accessed via jstor.org except for the *National Banking Review*.

List of journals: *Accounting Review, American Economic Review, American Journal of Agricultural Economics*, *Bulletin of the Business Historical Society*, *Business Economics*, *Business History Review*, *Econometrica*, *Economic Development and Cultural Change*, *Economic History Review*, *Economic Journal*, *Economica*, *Financial Analysts Journal*, *International Economic Review*, *Journal of Accounting Research*, *Journal of Business*, *Journal of Economic History*, *Journal of Farm Economics*, *Journal of Finance*, *Journal of Financial and Quantitative Analysis*, *Journal of Human Resources*, *Journal of Industrial Economics*, *Journal of Law & Economics*, *Journal of Money, Credit & Banking*, *Journal of Political Economy*, *Management Science*, *Monthly Labor Review*, *National Tax Journal*, *National Banking Review*, *Nebraska Journal of Economics and Business*, *Oxford Economics Papers*, *Quarterly Journal of Economics*, *Review of Economics & Statistics*, *Southern Economic Journal*, *The American Economic Review*, *The Journal of Business of the University of Chicago*, *The Review of Economic Studies*

Appendix: SCP in Banking

Broadly, research into bank structure in this period fell into two broad categories in which there was substantial overlap. Below, we describe each part separately.

Economies of Scale

This part of the literature compared the performance of individual banks to try to identify if there were economies of scale or if organizational form mattered for efficiency. Typically, these studies tried to estimate a long-run average cost curve for the industry using cross-sectional estimates of the costs of different-sized banks. The slope of the long-run cost curve would indicate the size of any economies of scale. If the average cost curve was u-shaped, then economies of scale would be positive at low quantities of output and negative at higher quantities of output.

Broadly, studies would estimate a function of the form:

$$cost = f(output, size, organizational\ form, input\ prices, other\ controls),$$

Variables such as input prices and other controls were included to separate shifts in cost curves from economies of scale.

Early work estimated a Cobb-Douglas cost function, but later, more flexible functional forms such as the translog cost function were adopted. Various questions were debated in the literature. For example, is a better measure of output the number of deposit accounts or their dollar value? Is it better to use total costs or operating costs? Later, the literature also considered X-efficiency among banks, that is, the idea that some financial institutions operated on the interior of the efficient cost frontier. It also expanded to analyze economies of scope, that is, complementarities across products.

This paper is not the place to provide an overview of this literature, but broadly the economies of scale literature in banking tended to find that scale economies disappeared at modest sizes (Benston, Hanweck, and Humphrey (1982); Berger, Hunter, and Timme (1993); Berger and Humphrey (1994); Greenspan (2010)).[26] Nevertheless, there was considerable debate over this finding, and some papers, such as Hughes and Mester (2013), found substantial economies of scale. Regardless, with the elimination of many of the branching restrictions and interstate banking restrictions under the Riegle-Neal Act of 1994, the debate about this topic seemed to dissipate and banking economists mainly turned their attention to other questions. Nevertheless, the answers to questions about economies of scale are still relevant today. For example, as Stern and Feldman (2009) have documented, regulatory policy has led to an implicit too-big-to-fail policy. What are the costs from the resulting distortion in the size distribution? Another example is the collapse in bank entry following the financial crisis that was documented by McCord and Prescott (2014). One theory of this drop is that it was due to the large increases in regulatory and supervisory costs in response to the financial crisis (Peirce, Robinson, and Stratmann (2014)). If that is indeed the case, then the impact of these policies on bank size distribution is a cost of the policies that needs to be taken into account.

Concentration and Competition

This part of the literature is directly in line with the structure, conduct, and performance methodology developed by Chamberlain, Mason, and Bain in industrial organization. These papers, using cross-sectional data, estimated the impact of concentration measures on bank

[26] For an accessible early survey, see Humphrey (1990).

performance or the provision of services. The papers in this literature would typically estimate an equation of the form

$$performance\ measure = f(concentration\ measure, controls)$$

The unit of observation would be a market. For example, in Kaufman's (1966) study of bank structure and performance in Iowa, his markets were Iowa counties and he regressed several performance measures such as loan rates, deposit rates, and bank pre-tax earnings on a concentration measure (his was the number of banks in the county) and controls for demand using county characteristics such as population, income, and employment.

Rhoades's (1977) survey of SCP papers in banking reported that of the 39 studies he surveyed, 30 found a statistically significant relationship between market structure and the variable of interest and 9 did not. A later survey from this era is Gilbert (1984), who emphasizes problems with the literature.

While studies of structure, conduct, and performance are still being done today, the methods have changed dramatically since the 1960s. In particular, the static SCP approach characteristic of work in the 1960s and 1970s declined as the industrial organization field moved to game theoretic methods in the 1980s (Berry, Gaynor, and Morton (2019)).