75 years
FEDERAL RESERVE BANK OF DALLAS

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# Economic Review

## *Interstate Banking and the Federal Reserve: A Historical Perspective*

Robert T. Clair and
Paula K. Tucker

## *The Texas Industrial Production Index*

Franklin D. Berger and
William T. Long, III

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# Interstate Banking and the Federal Reserve: A Historical Perspective

*I do not believe that we will ever reach a point in this country where we will have perfection in our banking legislation. We are, of course, in a changing economy and, looking over the past hundred years, we have found that no one has been able to develop a perfect system of money and banking.*

—Marriner S. Eccles, Chairman
Federal Reserve Board
in congressional hearings
on the Banking Act of 1935

For much of its history, the United States has had a banking system like no other in the industrialized world. Since the early 1800s, the U.S. banking system has been highly fragmented, consisting of numerous small banks without extensive branch systems. Banking organizations that expanded across state lines were extremely rare, and none had established nationwide networks. It is this lack of nationwide banks that distinguishes the banking system in the United States from the banking systems of other countries. Interstate geographic restrictions on banking have been lifted only recently, fostering the development of regional and, ultimately, nationwide banking.

Interstate banking raises several issues that directly affect the Federal Reserve's mandate to maintain a safe and sound banking industry. Supporters have promoted interstate banking as a method for banks to diversify their risks. Opponents have argued that interstate banking permits banks to become "too big to fail"; that is, the Federal Deposit Insurance Corporation (FDIC) will not close a large bank for fear of repercussions to other banks. Thus, permitting banks to grow through interstate banking may diminish incentives for soundness. Debates have also addressed whether interstate banking would increase bank efficiency or promote a concentration of banking power resulting in a higher cost and a misallocation of credit. The Federal Reserve has been an important player in the interstate banking debate because it has been the traditional regulator of bank holding companies, the corporate organizational form that would likely be used to establish an interstate banking network.

Over its 75-year history, the Federal Reserve's position has evolved from opposition to support of interstate banking. This article discusses interstate banking in a historical context and suggests the sources of the initial opposition to interstate banking. The authors document the softening of the Federal Reserve's opposition over the years and present evidence of the Fed's currently supportive position. This evolution results largely from disentangling the issue of interstate banking from other issues, such as monopolistic power and political influence resulting from the concentration of financial power.

The origins of interstate financial organizations in the United States date back to the late eighteenth century. Two main forms of interstate organizations developed at different times: interstate branching and interstate banking. Interstate branching developed first with the chartering of the First Bank of the United States in 1791. Interstate branching permits a bank to operate branch offices in states other than the state in which the head office is located. Interstate banking, which

began to develop in the late 1800s, allows banking organizations to operate fully chartered banks in more than one state.

In this article, interstate branching and interstate banking will be considered as a single issue; however, the differences between the two are not inconsequential. Interstate branching has the potential to be a more efficient organizational form that could provide better banking services to certain customers. Advantages would include more efficient deposit-taking services for national organizations and the reduction or complete elimination of the need for cash concentration and check collection services. Because branches are typically less costly to establish than separately chartered banks, interstate branching would offer more banking offices than interstate banking.

## Interstate banking: guilt by association

The fact that the United States did not have interstate banking for much of its history and that today it does not have full interstate banking is directly related to opposition to the first two national banks. Early in U.S. history banks were chartered by special acts of either state or federal legislatures. In the eighteenth and early nineteenth centuries, a national bank charter implied that the bank was chartered by federal authority and was empowered to operate nationwide. Following the passage of the National Banking Act of 1864, national banks were chartered by federal authority, which Congress had delegated to the Office of the Comptroller of the Currency. Bank operations, however, were restricted to a single location, the polar extreme of a nationwide operation.

Congress chartered two national banks. The First Bank of the United States — chartered from 1791 to 1811 — encountered opposition, and Congress failed to renew its charter. Congress later chartered the Second Bank of the United States in 1816, which operated for 20 years until President Andrew Jackson vetoed the congressional bill to renew its charter.

These two national banks faced opposition because of the characteristics of their charters. The banks were granted exclusive national charters; therefore, they enjoyed a monopoly in the provision of nationwide banking services. Because their charters permitted them to establish branches across state lines, they operated with a distinct advantage over state-chartered banks. Both the First and Second Banks were very large organizations, and their size was at least partially attributable to the government's role in subscribing a large part of their capital stock. The Second Bank controlled more than one-third of all banking assets at the time (Chandler 1959, 137). In both instances, some bank directors, several of whom were appointed by the federal government, neglected to dismiss political factors when making bank decisions.

The problems inherent in the structures of the First and Second Banks of the United States could have been addressed largely by eliminating their monopolistic positions. Had more national charters been granted, competition might have reduced some of the criticisms directed at these banks. For example, arguments of undue concentration of financial power would have been more difficult to substantiate if several large national banks were operating. Proponents of easier monetary conditions would have found it more difficult to focus their attacks if the supply of bank notes had been controlled by not one but by several banks.

Another problem in the chartering of the monopolistic national banks was that the banks were politically active. The chartering of the First and Second Banks was a contested political issue between the Federalists, led by Alexander Hamilton, and the anti-federalists. The Federalists supported the ratification of the Constitution and wished to see strong centralized power in the federal government. They supported the federal chartering of banks and preferred to see the United States develop a commercial and industrial economy. The anti-federalist forces, including Thomas Jefferson's Democratic-Republican party, supported greater political power vested in the states. Jefferson and his supporters wanted the states to issue bank charters and they preferred to see the United States develop an agricultural economy.

Given the political differences between the two groups, it is not surprising that charges of favoritism were lodged regarding the banking operations of the nationally chartered banks. Lester V. Chandler reported accusations that the First Bank "was dominated by Federalists and that it

discriminated against anti-Federalists in making loans" (Chandler 1959, 135). The charges against the Second Bank were more direct; it granted loans to influence votes. Furthermore, the president of the Second Bank, Nicholas Biddle, openly opposed President Andrew Jackson (Chandler 1959, 137).

The exercise of political power by these organizations was often erroneously attributed to their size. Certainly their size increased their political power, but the fact that they exercised the power at all is more likely the result of their monopolistic charters. If these banks had been in competition with other national banks, then their failure to grant loans to anti-federalists only would have created profitable opportunities for their competitors to exploit.

The primary factor affecting the exercise of political power by the First and Second Banks was the federal government's role as a stockholder. The government owned one-fifth of the capital stock of both of these banks. Five of the directors of the First Bank were appointed by the government and included members of Congress and well-known Federalists (Johnson 1988, 8, and Holdsworth and Dewey 1910, 34). With regard to the Second Bank, the President of the United States, with Senate approval, appointed five of the twenty-five directors (Hammond 1957, 244). One of the presidential appointees to the board of directors, Nicholas Biddle, was president of the Second Bank from 1823 to 1839 (Hammond 1957, 291).

Additional opposition came from state-chartered banks that saw the First and Second Banks as interlopers on their own government-granted monopolies. State-chartered banks of this era were also established by special acts of state legislatures. The requirement of legislation posed a significant barrier to entry that lessened competition. The national charters of the First and Second Banks created the right to establish interstate branches, and thus, created new competition for state banks. The state banks had every incentive to support political forces opposed to the national banks.

It might be argued that state banks both won and lost their fight against the Second Bank of the United States. Shortly after the demise of the Second Bank, many states enacted banking incorporation laws that granted bank charters to anyone meeting general requirements, thereby ending the practice of special charters through acts of legislation. These new laws eliminated an important barrier to entry in the banking industry and helped eliminate the monopolistic power of the specially chartered banks. By vigorously pointing out the evils of monopoly, state banks set the stage for their own loss of protection from competition.

The history of the First and Second Banks unfortunately left interstate branching (and interstate banking) guilty by association. The First and Second Banks were criticized because of their monopolistic power and their exertion of undue political influence. Their opponents also condemned interstate organization and size, neither of which were at the root of the problem. Interstate banking creates opportunities for large banks to develop; however, size alone is not a sufficient condition to establish monopolistic power, especially if there are no barriers to entry.

State banks argued against interstate organization, focusing primarily on the distribution of credit within the country. Opponents of interstate banking argued that interstate banks would redirect credit away from rural areas into cities. There is little empirical or theoretical evidence to support this argument. Money should flow to where it earns the highest return regardless of the banking structure (Scheld and Baer 1986, 75–76).[1]

Events surrounding the First and Second Banks dramatically influenced banking legislation and regulation. Most states passed beneficial legislation to establish bank incorporation laws that reduced barriers to entry and increased competition in banking. The fear of concentration of financial power and undue influence, however, fostered detrimental restrictions designed to limit bank growth. Government-imposed geographic restrictions against branch banking limited the size of banks. It was thought, perhaps erroneously, that these laws would also force banks to lend in their local communities. Country banks placed some of their deposits in interest-earning accounts

[1] *It should be noted, however, that to the extent the First and Second Banks used their monopolistic position to play politics with their loan decisions, there may have been cases where loans were granted to urban Federalists and denied to rural anti-federalists.*

at city banks if these deposits offered higher returns than local loans.

The restrictions against branch banking resurfaced following the passage of the National Banking Act of 1864. Although the text of the legislation contained no references to branch banks, the Comptroller of the Currency's interpretation of the act prohibited national banks from establishing branches. This prohibition resulted from fear that national banks would establish interstate banking operations and represent a concentration of financial power. In 1922, the Office of the Comptroller of the Currency reversed its position and began to approve branches. With the McFadden Act in 1927, Congress removed any ambiguity concerning the power of national banks to establish branches. The act permitted national banks to establish branches within the city of their head office operations if state banks could do the same. In 1933 amendments to the act permitted national banks to branch wherever state banks in the same state were allowed to branch. The McFadden Act, however, by its definition of permissible branching, effectively prohibited the establishment of interstate branches.

The combination of bank incorporation laws and branching restrictions in many states produced a highly fragmented banking system of small banks. Branching was relatively rare with only 87 banks operating a total of 119 branches in 1900 (Cagle 1941, 118). In 1913 there were 26,664 national and state banks holding $22,056 million in assets. There were 19,197 state banks accounting for more than 70 percent of all commercial banks. The average size of a state bank was $574,000 in assets, less than half the size of an average national bank (Board of Governors of the Federal Reserve System 1959, 35 – 44).

## Interstate banking at the time of the Federal Reserve's creation

When Congress established the Federal Reserve System in 1913, some banks were attempting to build interstate networks. The industry was fragmented, but consolidation began with the development of two new types of multibank organizations: chain banks and group banks. These new banking structures were primarily methods to circumvent intrastate branching restrictions and thereby reduce the fragmentation of the banking industry. To a lesser extent, these new structures were also used to create interstate organizations. Both of these structures were networks of separately chartered banks and, hence, these interstate networks represented the first form of interstate banking in U.S. history.

Chain banking is an informal form of multiple-office banking in which three or more banks are owned or controlled by the same individual or individuals. Organizationally, the banks are formally unrelated to one another and each has a completely independent charter. Stockholders who are common to all the banks in the chain effectively control these banks. These stockholders need not hold 100 percent of the stock of each bank, only a controlling share.

Chain banks date back to at least 1890. Their unique structure and the relative lack of regulation concerning chain banks makes it difficult to trace their development. Chain banks were primarily an alternative to branch offices in states where branching was restricted. The first chain banks began in the Northwest and South. Chain banking grew rapidly from 1900 to 1920. Growth peaked in 1925. By the end of 1931, when the first accurate data on chain banks became available, 176 chains were operating 908 banks with aggregate assets of $927 million. Over time the number of chains and the number of their associated banks declined, but their financial size grew. By the end of 1945, when the number of chains had dropped to 115 operating 522 banks, their total deposits had risen to $4,628 million.

Some early chain banks crossed state lines, establishing interstate banking organizations. For example, in 1926 the Witham-Manley chain included 175 banks operating in Georgia and Florida (Lamb 1962, 56). By the end of 1939 there were 18 interstate chains (Cagle 1941, 127). C.E. Cagle states that "... under existing legislation neither group nor chain systems are prohibited from taking in banks from the Atlantic to the Pacific. Although no chain or group system operates banks from coast to coast, many have banking offices in several States" (Cagle 1941, 140).

While it did not become totally extinct, chain banking eventually evolved into group banking, a more formal structure of multiple-office banking. In this structure a controlling

organization, usually a holding company, holds controlling stock, often 100 percent, in the affiliated banks. Each bank is a separately chartered bank with its own board of directors and its own corporate identity. The holding company provides supervision and assistance in developing loan and investment policies. The main advantage of the group bank over that of a chain bank is that the holding company can raise capital in the financial markets so that the group bank's growth is less constrained. In contrast, chain banks were limited by the financial resources of the individual or individuals who formed the chain. Furthermore, because it involves a corporation, a group bank's control over its affiliated banks is presumably perpetual, while chain banks often dissolve following the estate settlement of one of the key stockholders.

The exact date of origin of group banking is somewhat uncertain, primarily because no distinction was made between group and chain banks in banking data collected prior to the late 1920s. Cagle reports that one bank holding company was formed prior to 1900, even before the creation of the Federal Reserve System.[2] The major expansion of group banking occurred in the late 1920s, coincident with the stock market boom. The major bank holding companies found a ready market for their securities. By 1931 there were 97 group banking systems operating 978 banks with an additional 1,219 branch offices.

Early in their development, group banks were used to establish interstate banking organizations. W. Ralph Lamb reports that at least six large bank holding companies crossed state lines. When Transamerica Corporation was formed in 1928, the founders intended to establish six regional holding companies that would serve the entire nation. An article titled "Branch, Chain, and Group Banking: December 1929" (Board of Governors of the Federal Reserve System 1930, 148) reports that 10 of the 34 largest group banking organizations operated in more than one state. One of these was a Minneapolis-based group-banking system controlling banks in eight states.

## Early Federal Reserve policy toward interstate banking

Early in its history, the Federal Reserve System viewed the development of interstate banking negatively. The issue of interstate banking was often intertwined with the issue of branch banking and the fear of concentration of financial power, whether justified or not. Simultaneously, the Federal Reserve also had to handle the issue of Federal Reserve System membership. Every piece of banking legislation was considered not only for its intrinsic merits, but also for whether it would encourage or discourage Fed membership; an example is the Fed's position concerning branching for national banks.

In 1924 Congress held hearings on the branching privileges of national banks. National banks operated at a disadvantage in many states because state banks were permitted to operate branch offices while national banks were restricted to operating a single office. Eventually the law was changed by the McFadden Act in 1927, which restricted national banks to operating branch offices in the city of their head office in states that permitted branching.[3]

Nationwide branching was discussed during the 1924 hearings preceding the McFadden Act. The testimony of two members of the Federal Reserve Board, Governor D. R. Crissinger and Vice Governor Edmund Platt, indicated that extensive interstate branching or banking would not be considered a positive development. Their objections seem to be based on arguments of undue concentration of financial power. While they did not object to branching across state lines, they opposed extensive national branching networks. Despite these objections, the Fed not

[2] *W. Ralph Lamb, however, reports that, "[T]he Marine Bancorporation, formed in Seattle during the summer of 1927, was the first independently capitalized bank holding corporation organized primarily for that purpose." Sydney Hyman reported that the 1928 formation of the First Security Corporation "was the first time the [holding company device] was used in banking."*

[3] *The McFadden Act was later amended in 1933 to permit national banks the same branching privileges as existed for state banks located in the same state.*

only supported the limited easing of branching restrictions on national banks included in the McFadden Act but also supported statewide branching for national banks. Because national banks were required to be members of the Federal Reserve System, the Fed did not want any restrictions that might discourage a bank from operating under a national charter and thereby discourage membership.

When Vice Governor Platt testified to the House Committee on Banking and Currency, he was asked by Congressman W. F. Stevenson of South Carolina about the advisability of permitting national banks in New York City to establish branches in New Jersey. Platt responded, "If the State law allowed banks in the city of New York to establish branches in contiguous territory, I would see no reason why they should not go to Newark provided the people of New Jersey would agree to it" (U.S. Congress 1924, 211). While this statement indicates that Platt would support interstate branching, he limited his support only to branches that would operate in a relatively close proximity to the head office of the bank. Congressman William Williamson of South Dakota summarized Platt's position as, "You are not going so far as to advocate nation-wide branches for Federal Banks, the only suggestion being that it might be wise to permit a branch in a locality contiguous to the city, even if it were necessary to cross the State line?" Platt agreed (U.S. Congress 1924, 219).

Governor Crissinger was hostile toward interstate branching and was not particularly supportive of intrastate branching. Crissinger told the committee:

> I do not believe that this country is ready for national branch banking systems. Personally I would be opposed to them.... I further am of the opinion that the country is not ready for State-wide branch-banking systems in all the States. (U.S. Congress 1924, 231)

Crissinger's opposition to chain banking, especially involving interstate banking, was made clear by the following exchange with Chairman Louis T. McFadden:

> *The Chairman*.... So it is my understanding that at least one of those five banks out there is not confining its activities to branches, but they are attempting to control through the chain-banking method not only California but other States. They are proposing to expand that way. I do not know what you think about it, but it strikes me that is breeding a dangerous situation in banking.
>
> *Mr. Crissinger*. I agree with you.
>
> *The Chairman*. It has been clear to me for some time that this committee ought to consider some kind of a restriction on chain banking. It is a menace in this country.
>
> *Mr. Crissinger*. The board has no restrictions on it, because we have no authority to put restrictions on it. But it is notorious that we have banks in the system that not only own the stock of the member banks but they have allied institutions which own stock in various banking concerns in this country and some out of this country. (U.S. Congress 1924, 236)

Crissinger, however, believed that federal law should not abrogate state law on branching. He recommended that national banks in a given state receive the branching privileges permitted to state banks in that state, a position that would encourage, or at least not discourage, Fed membership. The Fed was opposed to extensive interstate organizations regardless of whether the vehicle was branch banking or group banking.

## Regulation of the bank holding companies

After their rapid growth in the late 1920s, group banks came under greater scrutiny. Both federal regulators and legislators sought to obtain greater control over these new organizations outside the current structure of bank regulation. The Federal Reserve System used its control over granting membership to restrict member banks from obtaining control of other banks. The Fed's limitations on member banks, however, only further discouraged membership.

The range of suggested legislation was extreme. Some proposals called for "death sentence" legislation for group banks that would break up existing holding companies. Others suggested "freeze" legislation that would have prevented any further acquisitions by holding companies. Such extreme suggestions usually came from

unit banks, the competitors of group banking systems. The legislation that was eventually passed in 1933 was intended to provide the Federal Reserve with the ability to control but not to prohibit the further expansion of the group banking systems.

The first important piece of legislation dealing with group banking systems was the Banking Act of 1933. This act is primarily remembered for requiring the separation of investment banking and commercial banking and for establishing the Federal Deposit Insurance Corporation. With regard to group banking, this act defined a "holding company affiliate" as any company "(1) which owns or controls, directly or indirectly, either a majority of the shares of capital stock of a member bank or more than 50 per centum of the number of shares voted for the election of directors of any one bank at the preceding election, or controls in any manner the election of a majority of the directors of any one bank; or (2) for the benefit of whose shareholders or members all or substantially all the capital stock of a member bank is held by trustees" (Lamb 1962, 174). Group banking systems were now referred to as holding company affiliates.

Regulatory control over the holding company affiliates was established through the granting of a "voting permit." The Banking Act of 1933 required that a holding company affiliate obtain a voting permit from the Federal Reserve Board to vote its shares of member bank stocks. To obtain a voting permit the holding company affiliate must agree to regular reporting and examination, to separation of investment from commercial banking, to maintain liquid reserves, to limit dividends to actual earnings, and to be subject to the same criminal penalties as pertained to member banks with regard to false entries.

The primary regulatory concern about the existence of holding company affiliates, or bank holding companies as they later came to be known, was that these holding companies should not financially weaken their affiliated member banks. For example, the amount of credit that could be extended by the affiliated member banks to the holding company was limited to 10 percent of capital stock. Another view was that bank holding companies should not be able to undertake any activities that would have been prohibited for banks. This restriction was a very narrow prohibition against the ownership of a majority interest in both a member bank and an entity principally engaged in investment banking (Huertas 1988, 744). There was nothing in the Banking Act of 1933, however, that would prevent further interstate banking. As Lamb reiterated the idea stated by Cagle, "nothing prohibited group systems from taking in banks from the Atlantic to the Pacific prior to the 1956 legislation" (Lamb 1962, 177).

While the Banking Act of 1933 was important as the first piece of legislation to regulate bank holding companies, it was hopelessly inadequate to achieve regulation as some members of Congress had intended. The act had several major loopholes that permitted many of the bank holding companies to avoid regulation entirely. First, the act applied to a holding company only if at least one of its affiliates was a member bank. Consequently, group banks comprised of only state-chartered nonmember banks were not affected by the legislation. In some instances members of group banking systems withdrew from the Federal Reserve System to avoid the need to obtain a voting permit. Furthermore, the definition of holding company was too restrictive because it was possible to control an affiliated bank by owning much less than 50 percent of the stock. In addition, the act applied only if the bank holding company desired to vote its shares. In some cases, the control of the affiliated banks was possible without the voting of shares. In 1952 more than 40 percent of bank holding companies were not subject to federal regulation (Lamb 1962, 177).

## A softening of Federal Reserve opposition: discord on the Board

Federal Reserve policy regarding interstate banking softened by the early 1930s. In 1926, Governor Crissinger stated quite clearly that he had little use for chain or group banks extending across state lines. By 1933, however, many of the interstate group banks had provided valuable services during the period of financial crisis. In many instances the strength of the bank holding company was used to stabilize its affiliated banks, demonstrating the potential for the bank holding

company structure to reduce bank failures.[4] In more than one instance, bank holding companies acquired failed banks and re-established banking services, which helped the effected communities recover (Lamb 1962, 94 – 97). The positive contributions made by the bank holding companies during this period helped temper the 1933 legislation from the previous suggestions of "death penalties" or "freezes."

Opinions of the members of the Federal Reserve Board were not uniform with regard to interstate banking. Furthermore, in the discussion of legislation in the 1930s, the issue of interstate banking overlapped considerably with the issue of branching. When testifying in 1930, Roy A. Young, Governor of the Federal Reserve Board, made it clear that he was representing only his opinion and not a unanimous opinion of the Board with his statement to the committee.

Young supported the position of John Pole, Comptroller of the Currency, which proposed that the national banks be permitted to branch within a trade area that might exceed state boundaries. Young stated his view of how this might work to the committee.

> So I have come to the same conclusions that the Comptroller of the Currency has, that a trade area is the proper thing at the moment. To describe a definite trade area is extremely difficult. If the Federal reserve act intended to have the Federal reserve system do it, I might say that they did it as well as they could with 12 regional banks, and we have since extended that by the establishment of 25 branches, and even that is not 100 per cent perfect. (U.S. Congress 1930, 501)

Young's statement implies a willingness to permit national banks to branch across state lines just as the Federal Reserve Districts cross state lines. He also stated a preference for interstate branching as opposed to interstate banking through chain and group banks.

Diversity of opinion on the Federal Reserve Board continued after Eugene Meyer became Governor following Young. Meyer was willing to support branching on a limited scale, although it is unclear whether he would have supported either interstate branching or banking. During his testimony in a Congressional hearing in 1923, Meyer stated, "Branch banking may be good or it may be bad. It may be good if carried on in a limited way and bad if permitted on an extensive scale" (Krooss 1969, 2679). Meyer reread this quotation into the *Congressional Record* in the early 1930s, suggesting that his position had not changed. But the Board could not reach an agreement on the issue, and this lack of unanimity was stated clearly by Meyer when testifying to the Senate Committee on Banking and Currency.

While Young's supportive opinion and the diversity of opinion on the Board indicated a softening of the resistance to interstate banking, the Fed's position reversed sharply in the early 1940s. In the 1943 Annual Report of the Board of Governors of the Federal Reserve System, the Board recommended "that immediate legislation be enacted preventing further expansion of existing bank holding companies or the creation of new bank holding companies. Such legislation should be so designed as to prevent any such company from using the corporate device to circumvent and evade sound banking principles, regulatory statutes, and declared legislative policy." Surprisingly, this recommendation occurred when Marriner S. Eccles was the Chairman of the Board of Governors. Before he joined the Board of Governors, Eccles was credited as possibly the first banker to establish an interstate multibank holding company.

## The Transamerica case

The Federal Reserve's recommendation for "freeze" legislation was driven by the desire to halt the expansion of one particular bank holding company. The Board's statement was clear that most bank holding companies are cooperative in the regulatory process. The statement then focused on the "exceptional case" where the corporate device was used to challenge the Board's ability to regulate, to expand into extraneous businesses including industrial and manufacturing concerns, to circumvent state branching laws, and to concentrate financial power and permit

[4] *Nonetheless, there were failures among the affiliated banks of bank holding companies. From 1930 to 1933, 200 affiliated banks with deposits of more than $1 million suspended operations.*

financial manipulation. While the Board did not name the "exceptional case," this proposal for legislation was aimed at Transamerica Corporation.

Transamerica Corporation was founded in 1928 and operated by Amedeo P. Giannini. Beginning with the Bank of Italy, and later the Bank of America, Giannini redefined the provision of banking services, especially in expanding access to the banking system to the average individual. He was a pioneer in the establishment of extensive branch networks and retail banking, and he supported nationwide branch banking.

Many of the charges made by the Board hardly seem like accusations. Certainly, Giannini was establishing extensive branch networks, but the Board had supported statewide branch banking in the past. Transamerica was hardly "the exceptional case" in maintaining a structure that permitted it to operate without a Federal Reserve voting permit, nor was it the only holding company that owned nonbanking businesses.

The Board's arguments regarding Transamerica appear to be based on fear of undue concentration of financial power that might be used to exploit monopolistic power in banking and in other industries. Again, as in the case of the First and Second Banks of the United States, the issues of monopoly and undue influence became intertwined with interstate operations and size. Important differences existed between these two situations. The First and Second Banks held statutory monopolies and faced limited competition. Transamerica Corporation, in contrast, built its sizable organization while in competition with other existing banks and while facing potential competition from new entrants. The Transamerica situation is complicated further by the twist of separating banking and nonbanking enterprises.

Beginning in 1945 the Board of Governors proposed specific bills to regulate bank holding companies. Hearings were held on many of these bills, but it was not until 1956 that the Bank Holding Company Act was finally passed. The delay in passing legislation may be attributed to the change in the political agenda during the transition from the Roosevelt to the Truman administrations. Roosevelt's administration had to deal with the Great Depression and World War II, while Truman's was more focused on the transition to a peace-time economy. A clash of the personalities of regulators, politicians, and bankers also may have been involved.

Henry Morgenthau, Jr., was the Secretary of the Treasury from 1934 to 1945. In the late 1930s, Morgenthau asked the federal regulators of banks, including the Federal Reserve Board, to review their position on the concentration of financial power arising in bank holding companies. Morgenthau was particularly concerned about the rapid growth of Transamerica Corporation, a bank holding company in California that owned Bank of America, other banks in several states, and a variety of nonbanking companies. While the federal regulators agreed that bank holding companies needed greater regulation, no compromise could be established as to which agency should regulate them. Meanwhile, Transamerica Corporation continued to expand its operations.

In 1943 the Federal Reserve Board, together with the Comptroller and the FDIC, notified Transamerica that they would decline permission for Transamerica to directly or indirectly acquire any more banking offices. Eccles met with Transamerica officers and obtained a "stand-still" pledge from Giannini. Despite the pledge, Transamerica resumed acquiring banks, which was legal under federal law at the time. The agencies refused to permit Transamerica to convert these banks into branches of Bank of America.

By late 1945, Transamerica's expansion spurred the Board to investigate the possibility of initiating an antitrust suit against Transamerica, and the Board contacted the Justice Department for its opinion. Attorney General Thomas C. Clark responded that the evidence would probably not support a case against Transamerica under the current legal standards. Because the judicial approach seemed blocked, the Federal Reserve Board pursued a legislative solution, proposing bills to regulate bank holding companies.

By the time the proposed legislation for bank holding company regulation was prepared, Morgenthau was no longer Secretary of the Treasury. The Secretary in 1946 was John W. Snyder. The change in the Secretary was important because Snyder was more favorably disposed toward Transamerica Corporation. Snyder personally had brought the work done by Giannini in directing credit to post-war Europe to the attention of President Truman (James and James 1954,

478–79). It is likely that Snyder's unwillingness to support the bank holding company legislation prevented its passage for several years; Snyder was a master at hindering legislation he opposed.

Snyder left the Treasury Department in 1953 following Eisenhower's presidential victory. Hearings on a banking holding company bill were held in 1955 and a bill limiting bank holding company activities was passed in 1956.

During this period of blocked legislation from 1945 to 1955, the Federal Reserve did not stand idle with regard to Transamerica. Following a new judicial interpretation of antitrust law, the Board in 1947 again requested the attorney general to evaluate the potential of an antitrust suit against Transamerica. Two significant events followed. First, Snyder had requested that the attorney general advise him of all matters concerning Transamerica. The attorney general sent the Board's request to Snyder where it was held without action. Second, the joint agreement between the Federal Reserve, the FDIC and the Comptroller refusing to grant any permits to Transamerica to convert banks into branches was breaking down. The Comptroller, under what appears to be pressure from Snyder, began to grant Transamerica's requests. The Board assessed the situation and in November 1947 investigated Transamerica Corporation for violation of the Clayton antitrust laws. This case was not fully resolved until 1953 when the United States Court of Appeals set aside the Board's ruling against Transamerica.

## Federal Reserve softens policy

Despite the Federal Reserve's reaction to Transamerica Corporation, its position on bank holding companies and particularly on interstate banking through holding companies was neutral in the late 1940s and early 1950s. The issue of the regulation of bank holding companies was clouded by the Transamerica case, which was focused on the degree of bank concentration and, to a lesser extent, the mixing of banking and commerce. In his 1947 testimony to the Senate Committee on Banking and Currency, Eccles reported that Transamerica controlled 43 percent of total deposits in California, nearly 45 percent of the deposits in Oregon, and 79 percent of the deposits in Nevada.[5] Eccles believed that such concentration "destroys the whole principle of competitive banking" (U.S. Congress 1947, 26). Eccles also listed a number of the nonbanking enterprises owned by Transamerica and stated that it is "axiomatic that the lender and the borrower or potential borrower should not be dominated or controlled by the same management" (U.S. Congress 1947, 15).[6]

The Board's harsh position against bank holding companies in 1943 moderated substantially by 1947 when hearings were held on proposed bank holding company legislation. The proposed legislation did not restrict interstate banking through bank holding companies at all. Possibly the clearest statement of Federal Reserve policy with regard to bank holding companies came from Eccles during his testimony before the Senate Committee on Banking and Currency in May 1947. In describing the proposed bill, Eccles stated:

> What this bill does is to exercise control over holding companies. ...There were certain evils and abuses which had developed in this field and there was an attempt on the part of Congress to regulate the situation, to give the Board power to regulate bank-holding companies. ...But we are not proposing here, and we think if we did propose it that we would not succeed, and see no use for proposing the death sentence or what may be known as the freeze. ...[W]e are not asking Congress to hold in this bill that the holding company is necessarily an evil. It can be abused, but in a great many, indeed in most

[5] *It is unfair to condemn Transamerica Corporation for controlling 79 percent of the banking deposits in Nevada. In 1933, the governor of Nevada approached Transamerica and requested that they take over a chain of failed banks. While the chain was beyond redemption, Giannini entered the state through the purchase of an existing bank and established a branching network (Fischer 1962, 52). Giannini's efforts are credited with greatly aiding the state's economic recovery.*

[6] *It is unclear why Eccles expanded this "axiom" to require the divestment of the nonbanking corporations. Certainly a prohibition on the lending by a banking affiliate to any other affiliate in the bank holding company would have been effective.*

of the instances, they have not abused their power. (U.S. Congress 1947, 21)

The proposed 1947 bill did not call for any restriction on interstate banking. The Fed appears to have accepted interstate banking as being permissible for a bank holding company. This is not totally surprising since Eccles had been an interstate banker prior to his joining the Federal Reserve, and the advantages of geographical diversification were presented as far back as the 1924 testimony of Vice Governor Platt.

By not requesting either a "death penalty" or a "freeze," it is clear that the Fed's position changed substantially since the call for legislation in the Annual Report of 1943. The proposed legislation in 1950 showed that Federal Reserve policy was essentially unchanged from the 1947 statement made by Eccles. In testimony for the 1950 proposed bill, Thomas B. McCabe, the new Chairman of the Board of Governors, stated that the new bill was very similar to the 1947 bill.

Another banking bill was introduced in 1952 that would have restricted interstate banking via the bank holding company. Specifically, Section 5(d) of H.R. 6504 prohibited any bank holding company from acquiring a bank located outside the state in which the bank holding company maintained its principal offices; furthermore, bank holding companies would be prohibited from acquiring any more banks in states that did not permit the operations of branches. This change was a substantial departure from the bank holding company bills proposed in 1947 and 1950.

The Federal Reserve was openly against such provisions in the 1952 bill. Twice the Fed's position was stated in the committee hearings. The first statement was in a letter submitted to the committee by William McChesney Martin, Jr., Chairman of the Board of Governors. The second was given in testimony to the Senate committee by Governor J. L. Robertson. Robertson stated:

> [T]he prohibition against expansion across State lines would mean that a State would be deprived of any right to express its policy as to the operation within its borders of a bank holding company having its principal office in another State....In our opinion, the States should be left entirely free to deal with bank holding company operations on a basis different from that on which they deal with branch banking operations and to express their policy as to the operation of out-of-State holding companies within their borders. (U.S. Congress 1952, 25)

The Federal Reserve Board's position regarding interstate banking via the holding company device shifted from uncertain to supportive following the Banking Act of 1933 until the early 1950s. The reason for supporting interstate banking appears to have shifted over the years. Platt and Young recognized the positive aspects of diversification, but by 1955 Robertson supported the position by citing states' rights.

## The Bank Holding Company Act of 1956

After more than a decade of proposed bills and hearings, the Bank Holding Company Act of 1956 was passed. The two main purposes of the act were to regulate further expansion of bank holding companies and to require the divestment of their nonbanking activities. Interstate banking was not the primary focus of the act, but an important legislative change in the act dictated the development of interstate banking in the United States until today.

The Banking Holding Company Act of 1956 evolved from a series of House and Senate bills. In 1955 the House of Representatives passed a bill, H.R. 6227, which would have prohibited any further interstate acquisitions by bank holding companies (Lamb 1962, 195). As stated above, the Federal Reserve Board opposed the restriction. Most of the debate concerning the restriction focused on the issue of states' rights and whether it was appropriate for Congress to dictate to the states whether a holding company can acquire a bank in their state. In the end, however, the restriction remained in the bill reported out by the House committee and passed by the House.

The Senate committee held hearings on several proposed bills concerning bank holding companies, including the House bill in the summer of 1955. The Senate bills included S. 880 and S. 2350. The first bill, S. 880, prohibited further interstate acquisition, similar to the House bill. The second bill, S. 2350, however, did not mention a restriction. In February 1956 the Senate committee produced a compromise bill, S. 2577, in which further interstate acquisitions were not

prohibited. This bill was reported out of committee and sent to the Senate.

The issue of interstate banking was reintroduced during Senate debate on the bill. Senator Paul A. Douglas of Illinois introduced what is now known as the Douglas amendment, which prohibits further interstate acquisition unless the state involved specifically authorizes it by law. Douglas was opposed to big banks, which he believed failed to serve the needs of small businesses and borrowers. This argument is a variation of the argument that large banks would drain deposits away from rural areas to fund financial activity in the money centers. He stated that he was "unhappy" that the current bill permitted the already existing interstate bank holding companies to continue to operate their current networks of banks. The amendment was first proposed by the American Bankers Association and was heavily supported by the Independent Bankers Association. Despite the Federal Reserve's opposition, which was cited by Senator Robertson during the Senate debate, the Douglas amendment was passed and became part of the Bank Holding Company Act of 1956.

The passage of the Douglas amendment set the tone for interstate banking for the next two decades. The bank holding companies with existing interstate networks continued to operate their networks, a distinct competitive advantage over other banks. Because no state had passed a law that specifically authorized interstate acquisition, the Douglas amendment was effectively a prohibition against further interstate banking until 1978.[7] The passage of the Bank Holding Company Act of 1956 shifted the issue of interstate banking out of Congress and into state legislatures.

## Development of state laws authorizing interstate banking

Maine was the first state to pass laws permitting interstate banking, thus ending the effective prohibition against expanded interstate banking brought about by the Bank Holding Company Act of 1956 via the Douglas amendment. Effective January 1, 1978, Maine permitted interstate banking on a national reciprocal basis; that is, out-of-state bank holding companies were permitted to acquire Maine banks if Maine bank holding companies were granted similar privileges in the acquiring bank holding company's state (Amel 1988, 24).

Maine was alone, however, in its effort to establish interstate banking until 1982 when both New York and Alaska passed interstate banking laws. The New York law, which became effective June 28, 1982, was similar to Maine's in providing for interstate banking on a national reciprocal basis. Alaska's law differed in that effective July 1, 1982, it permitted open entry for all states; that is, there was no reciprocity requirement.

Open-entry interstate banking law as was passed in Alaska was more likely in states where banks were facing financial difficulties. First, bank holding companies in these states were not in a position to make acquisitions; hence, reciprocity was less important. Second, the absence of a reciprocity requirement created a larger market for the acquisition of troubled institutions and higher acquisition prices. In addition, there were often restrictions that entry be made through the acquisition of existing banks. Third, some states with troubled financial institutions established interstate banking permitting only failed institutions to be acquired. This approach increased the ease with which regulators could deal with a troubled institution but protected the existing bank holding companies from undesired takeover attempts. Alaska, a large energy-producing state, was feeling the pain of the decline in oil prices in 1982 and its effect on the Alaskan banking industry, which influenced the decision to pass open-entry legislation.

Interstate banking activity accelerated from 1983 to 1985 with the creation of regional interstate pacts. Large banks within the region supported the law because it afforded them the potential advantages of interstate banking without competition from the money-center banks. The first pact was the New England pact encompassing Connecticut (1983), Maine (1978), Massachusetts (1983), New Hampshire (1987), Rhode Island (1984), and Vermont (1987). (The year in paren-

[7] *There were some minor exceptions permitting additional acquisitions by specified bank holding companies in certain states.*

thesis indicates when interstate banking took effect.) Because Maine was in this pact and Maine permitted interstate banking on a national reciprocal basis, Connecticut and Massachusetts put in place anti-leapfrogging clauses. Banks in these two states were worried about competing with the large money-center banks of New York. They envisioned the money-center bank holding companies acquiring a Maine bank holding company and then using the Maine bank holding company to make acquisitions throughout New England. The anti-leapfrogging clauses prevented the entry of New York banks into these two states.[8]

Other regional pacts began to develop shortly thereafter. In 1984 Kentucky passed an interstate banking law to establish a regional pact of Mid-Central states. Ohio, Tennessee, and Virginia joined this pact in 1985, and Illinois, Indiana, and Missouri joined in 1986. West Virginia finally joined the pact in 1988.

A third regional pact for Southeast states began in 1985 with interstate banking laws passed in the District of Columbia, Florida, Georgia, Maryland, North Carolina, Tennessee, and Virginia. South Carolina passed an interstate banking law the next year, and in 1987 Alabama and Louisiana joined the pact, followed by West Virginia in 1988.

Interstate banking continued to develop on a state-by-state basis. Additional regional pacts were formed and other states passed open-entry or national reciprocal legislation. The current status of interstate banking laws and their outlook for the early 1990s is presented later in this article. During this development of state laws permitting interstate banking, one federal law was passed that provided a limited liberalization of interstate banking. In October 1982 Congress passed the Garn-St Germain Depository Institutions Act of 1982. The act is primarily associated with the additional deregulation of interest rates on deposits, but one provision of the act authorized out-of-state acquisition of failed or failing banks and thrifts. The Garn-St Germain Act did not encourage interstate acquisitions but authorized them only to minimize the cost of dealing with failing institutions to the FDIC and the FSLIC.

## Federal Reserve supports the development of interstate banking

The Federal Reserve saw as favorable that states were removing barriers to interstate banking. There was concern that regional pacts would create uneven development and consequently an unequal quality of banking services across the country. In testimony to the Senate Committee on Banking, Housing, and Urban Affairs on September 13, 1983, Chairman of the Board of Governors Paul Volcker stated:

> These state actions are constructive in breaking down outmoded barriers but they also dramatically illustrate the haphazard and unequal development of interstate activity. A closely integrated economy requires and deserves more uniform rules in this important area....Similar doubts arise about the logic of proposals that a Providence, Rhode Island bank be able to purchase a bank two states and 150 miles away in southern Vermont, but that an Albany, New York bank 30 miles away be prohibited....For want of any better rule to assure gradualism and to take state preferences into account in the evolution of interstate banking, regional compacts have had an appeal to some as a transitional device. We are concerned, however, about the implications for a kind of balkanization of the process that could discriminate against banking organizations in some states and, without serving a legitimate local purpose, limit the ability of banks wishing to sell or merge to find an appropriate partner. (Volcker 1983, 30–31)

[8] *The regional nature of interstate banking and the concern over the money-center banks dates back to the very beginning of group banking and interstate acquisitions. Lamb states that the conservative banks of Minnesota had close relationships with their city correspondent banks, especially in times of emergencies. Rumors surfaced that banks from New York and Chicago were attempting to gain control of the city correspondents in Minneapolis in order to gain access to the Twin City trade area. The Minnesota bankers chose to organize their key correspondents into group banks. The first was the Northwest Bancorporation in January 1929, and First Bank Stock Corporation was formed three months later.*

Because many of the regional compacts were structured as temporary arrangements with eventual shifting to national reciprocal interstate banking, some of these concerns about regional compacts were probably overstated. The regional compacts were justified on the grounds of permitting the large regional banks to consolidate their positions prior to permitting the entrance of the much larger money-center banks.

Current Chairman of the Board of Governors Alan Greenspan also supports interstate banking. Prior to becoming Fed Chairman, Greenspan published a paper on the advantages of deregulation of product and geographic barriers. In that work he stated:

> Geographic diversification can similarly work to reduce risk. Assuming that capital remains adequate, there is no reason to expect lending in another state will be inherently more risky than lending in an institution's home state. Indeed, by diversifying to another regional and economic base, a bank has the opportunity to reduce its overall risk. (Greenspan 1987a, 16)

Chairman Greenspan has not changed his position on interstate banking since joining the Federal Reserve. In a statement before the House subcommittee on telecommunications and finance, Greenspan stated:

> Already 10 states have adopted full interstate banking, 13 states have provided for it after a transition period, and 8 additional states permit interstate acquisition of troubled banks. This constructive trend, especially when fully developed, will result in better service to customers and a strengthened banking system. (Greenspan 1987b, 4)

## Current status of interstate banking in the United States

By 1989 the vast majority of states had passed some type of legislation enabling interstate banking. The status of interstate banking laws in the United States in April 1989 is shown on Map 1. The various types of legislation have been grouped into four categories, with the darkest shading of green indicating the most liberal laws concerning interstate banking. Nine states have passed legislation permitting acquisitions by bank holding companies from any other state, which is often referred to as open-entry and is the most liberal type of legislation. Nine states permit reciprocal interstate banking on a nationwide basis. Reciprocity implies that out-of-state bank holding companies are permitted to make acquisitions in a given state only if they are located in a state that grants similar privileges to bank holding companies located in the other state. For example, for an out-of-state bank holding company to make an acquisition in New York, it must be headquartered in a state that would permit New York bank holding companies to make acquisitions.

The most common form of interstate banking legislation is the regional compact, which is labeled regional reciprocal on the map. In a regional compact interstate banking is limited only to states specified in the enabling state legislation and reciprocity is required. These compacts are usually limited to adjacent states or to states that are contiguous to adjacent states. The regional compacts overlap in some states. Twenty-five states utilize regional compacts and some are quite large, including as many as twelve states. Interstate acquisitions are not permitted in seven states as of the date of this publication.

Substantial changes in interstate banking laws will occur in the next few years. Seven states that passed legislation for regional compacts also specified the shifting to more liberal interstate banking laws at a specified "trigger" date in the future. Many of these "trigger" dates are approaching. Furthermore, two states have recently passed legislation that will become effective in the next year. By 1993 nine more states, including some of the most populous, will permit either open-entry interstate banking or reciprocal interstate banking on a nationwide basis. The status of interstate banking in 1993 based on legislation that has already been passed is presented in Map 2.

A comparison of the two maps shows some striking regional shifts in interstate banking law. By 1993 the vast majority of the West and Southwest will permit national interstate banking on either an open-entry or national reciprocal basis. Similarly, most of the Great Lakes region will permit reciprocal interstate banking on a national basis by 1993. The areas showing the least change are the Southeast regional interstate compact and the New England regional compact. Prohibitions

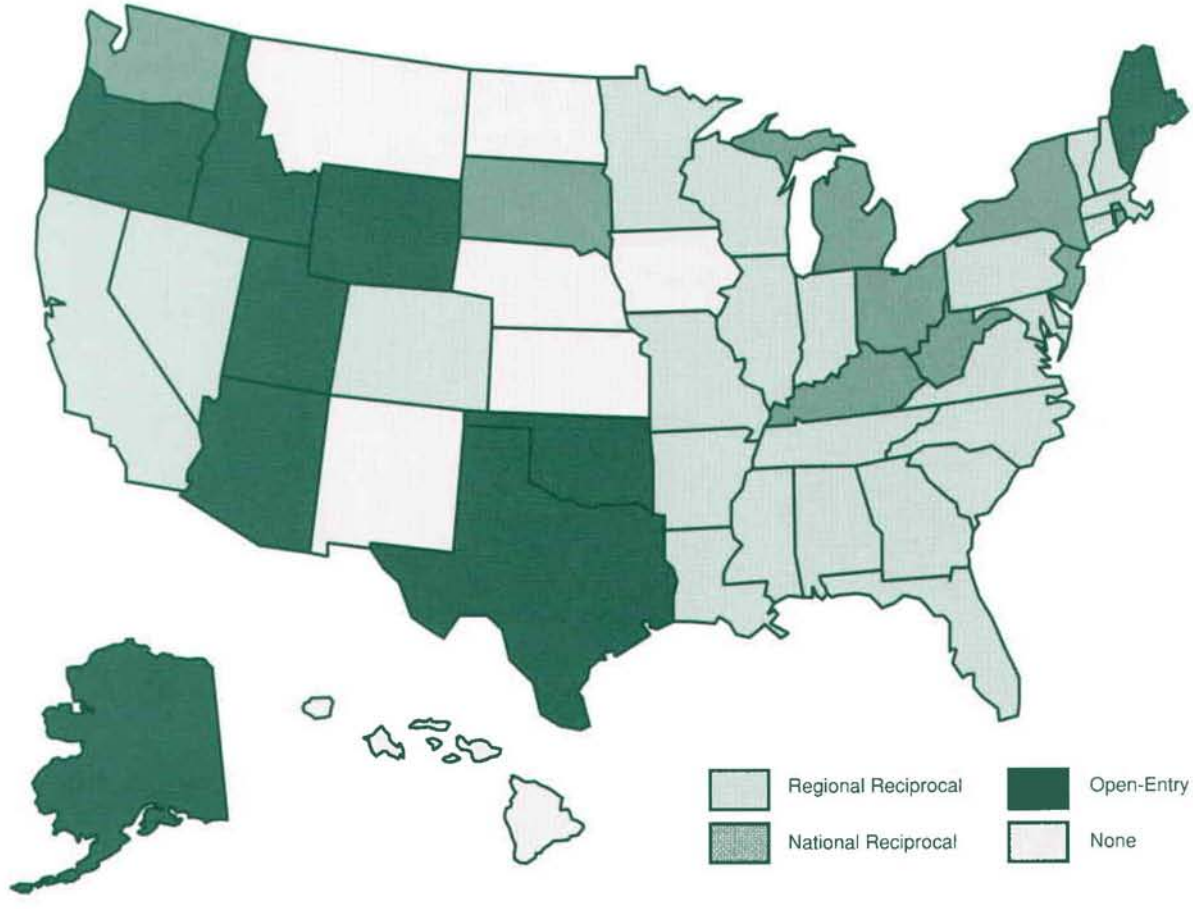
against interstate banking appear to be concentrated in the Great Plains states.

## Summary

For most of its 75-year history, the Federal Reserve has supported interstate banking. Beginning with Crissinger in 1924, interstate banking was described as "a menace." By the early 1930s, however, various members of the Board were willing to accept group banks and interstate banking. Young even described the growth of group banks as "a natural development." This shift in attitude, together with the positive contributions of group banks during the Great Depression, led to only a minor degree of regulation of these banks in the Banking Act of 1933.

Federal Reserve policy shifted sharply in the late 1930s and early 1940s in response to the rapid expansion of the Transamerica Corporation. Eccles described bank holding companies as a device "to escape the supervisory powers." Eccles' position moderated as legislation was proposed to close the loopholes that permitted some bank holding companies to escape supervision. By 1947 Eccles made it clear that he believed that bank holding companies were "not necessarily evil." The prevailing opinion of the Federal Reserve seemed to shift to one of regulated expansion with support for interstate expansion. In fact,

Map 1
Interstate Banking Regulation, April 1989



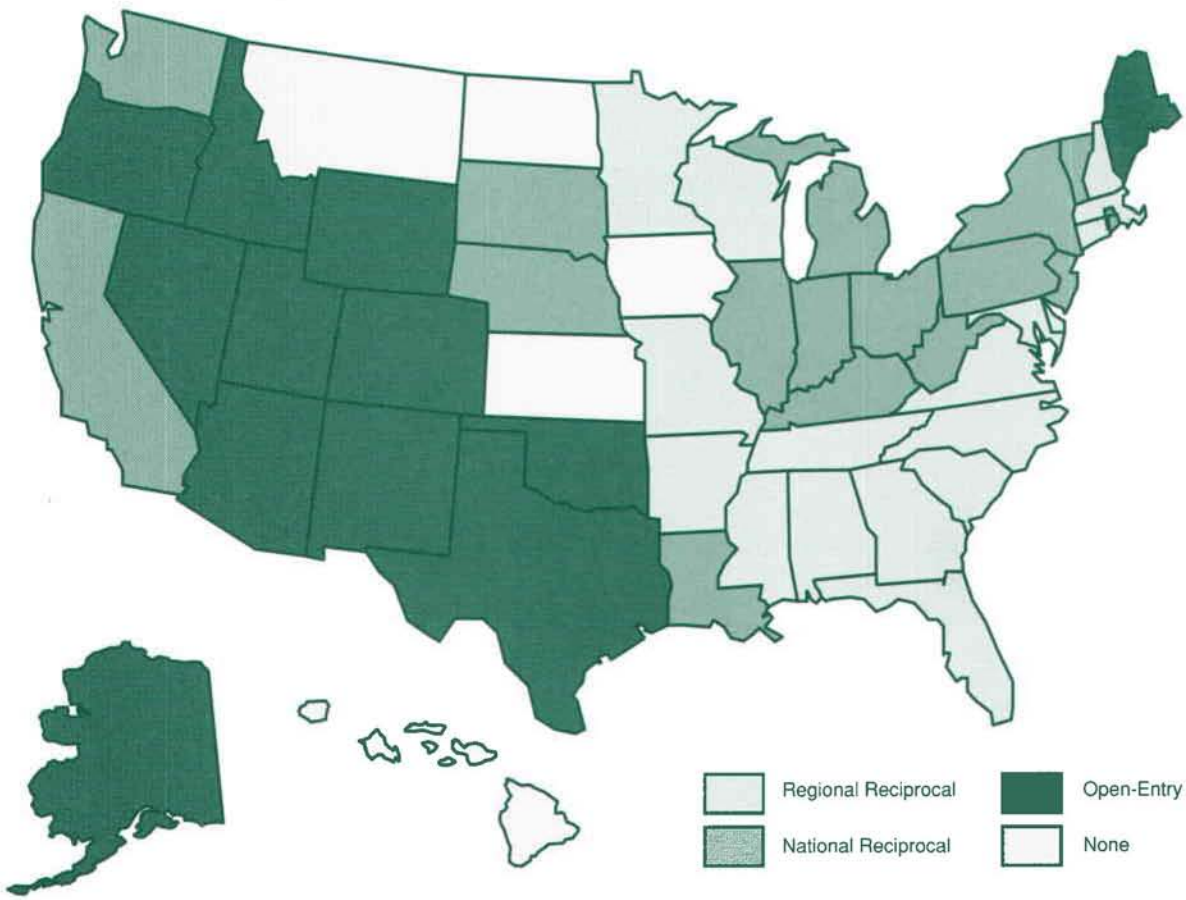

SOURCE OF PRIMARY DATA: *American Banker*, 4 April 1989, 10.

when Congress suggested the prohibition of any further interstate expansion, Governors McCabe, Martin, and Robertson all voiced their opposition. Their opposition, however, was not sufficient to defeat the Douglas amendment to the Bank Holding Company Act of 1956, which prohibited further interstate acquisition unless specifically authorized by state law.

The Douglas amendment effectively stopped further interstate banking for two decades. In the late 1970s and early 1980s, however, state laws were enacted to permit interstate acquisitions. The Federal Reserve's position fully supported interstate banking. Volcker described these laws as breaking down "outmoded barriers." Volcker was concerned, however, that many states were passing laws that permitted interstate acquisition in limited geographical areas, and he preferred instead a system of full national interstate banking. Volcker recognized the concern that interstate banking would alter the nature of the U.S. banking system, and he responded to that concern.

> I recognize the traditional and historic concern about local control of banking, the importance of healthy community banks, and the dangers from excessive concentration of resources. Fortunately, we have a good deal of experience within large states about the ability of small banks to survive and prosper alongside relative giants—and for the good

Map 2
Interstate Banking Regulation in 1993




SOURCE OF PRIMARY DATA: Amel (1988).

> reason that they can operate efficiently and establish solid relations with local consumers and businesses. . . . [P]roperly implemented and controlled I see no danger that the United States would be bereft of large numbers of smaller banks, or that, with appropriate safeguards, excessive concentration would become a problem. (Volcker 1983, 32)

Alan Greenspan, the current Chairman of the Federal Reserve, has described interstate banking as a "constructive trend" that will provide the country with "a strengthened banking system."

The change in the Federal Reserve's position over the years is likely the result of disentangling the issue of interstate banking from fears of concentration and undue influence of large banks. This disentangling occurred both inside and outside the Fed and spanned the chairmanships of several Fed leaders. Interstate banking has proven to be helpful in achieving the goals of the Federal Reserve. The safety and soundness of the banking industry will likely be enhanced since interstate banking provides additional opportunities for diversifying risks. It has also proven to be an effective mechanism for injecting needed capital into weak banks in economically depressed regions (*see the box: Interstate Banking in the Eleventh District*). The establishment of interstate networks will help banks be more efficient in providing services to their customers who also operate nationally. It is also likely to improve the efficiency of the nation's payment system by reducing the number of checks that must be cleared through the Federal Reserve (*see the box: The Effect of Interstate Banking on Federal Reserve Check Clearing*).

### Interstate Banking in the Eleventh District States

Interstate banking is well advanced in the Eleventh Federal Reserve District. After entering into the Southeast regional compact in 1987, Louisiana has since moved to nationwide interstate banking on a reciprocal basis. An out-of-state bank holding company must acquire an existing bank, as *de novo* entry is prohibited. New Mexico currently permits interstate banking only for the acquisition of failing banks, but on January 1, 1990, it will permit open entry to banks from all states. New Mexico also prohibits *de novo* entry and further requires that the acquired bank be at least five years old at the time of acquisition. Texas currently permits open entry to banks from all states and also prohibits *de novo* entry. Texas law requires that the acquired bank have been in existence as of July 15, 1986, or in operation for at least five years prior to acquisition.

The push toward national interstate banking and the prohibitions against *de novo* entry result from the problems facing banks in the Southwest in the later half of the 1980s. After the decline in energy prices and the collapse of the real estate market, many banks in this region faced loan losses sufficient to cause many of them to fail. The enactment of interstate banking laws improved the ability of regulators to deal with these failures and offered opportunities for banks that had not failed to diversify their operations and capital resources through interstate mergers.

Interstate mergers in Texas represent both the disposition of failed banks and the acquisition of healthy banking organizations. NCNB Corporation acquired First RepublicBank, the state's largest bank, through an FDIC-assisted merger. BancOne Corporation of Columbus and Equimark Corporation of Pittsburgh also entered the Texas market by acquiring failed banks. In contrast, other banking organizations entered the Texas market through the acquisition of healthy banks including Chemical Banking Corporation of New York City; First Interstate Bancorp, Inc., of Los Angeles: Northern Trust Company of Chicago and Comerica Incorpoated of Detroit.

## The Effect of Interstate Banking on Federal Reserve Check Clearing

The expansion of interstate banking in the U.S. will not only change the nation's banking system but also will cause significant changes in the Federal Reserve's payments system. The Federal Reserve currently clears about 15 billion of the estimated 40 billion checks written in the United States annually and is the only check clearing system serving the entire nation. In a study titled "Interstate Banking: Impacts on the Payments System" (September 1986), authors Allen Berger, David Humphrey, and Joanna Frodin, estimate the effects of interstate banking on the U.S. payments system.

Of the 40 billion checks written annually in the United States, about 28 billion end up in a bank other than where they originated and must be cleared. To be cleared, the average check is processed through an average of 2.4 financial institutions, one of which is usually part of the Federal Reserve. Depending upon whether the check originated inside or outside of a bank's Federal Reserve check processing zone, the check will be sent down one of seven check-clearing paths. Each path consists of a mix of private sector and Federal Reserve processing and/or transportation. Thirty-one billion checks remain inside the zone of the bank on which they are drawn; and, of these, Federal Reserve facilities perform processing, transporting, or both, on about 8 billion checks. When a check is first deposited outside its originating zone, however, its chances of being processed, transported, or both by the Fed increase substantially. In this instance, 7 billion of the 9 billion out-of-zone checks pass through a Federal Reserve facility.

Berger, Humphrey, and Frodin hypothesize that three factors are important in determining what portion of checks written are cleared or transported for clearing by the Federal Reserve: bank concentration, the average bank's size measured by its deposits, and the geographic dispersion of bank deposits. Bank concentration is the number of banks serving a particular market; the more concentrated a market, meaning the fewer banks are serving it, the less demand for Federal Reserve check-clearing services. As bank size measured by total deposits increases, there is also less demand for Federal Reserve check-clearing services. Bank geographic dispersion is measured as the extent that the deposits of banks headquartered in a particular zone are held at bank offices outside this zone. The authors hypothesized that greater dispersion reduces demand for Federal Reserve check clearing. The development of interstate banking is expected to increase bank concentration, average bank size and bank geographic dispersion. Therefore, interstate banking is expected to reduce the volume of checks cleared through the Federal Reserve.

The estimation of the effects of nationwide interstate banking indicates the Federal Reserve's market share of check processing volume would decline from 37.5 percent to between 15 percent and 21 percent. This estimate is based on the assumption that 25 percent of total deposits in the nation will be held at banks with nationwide operations. The movement to nationwide interstate banking would also shift the demands for Federal Reserve services away from check processing toward accepting checks that have been fine sorted (already processed before delivery to the Fed) and toward increased use of the Federal Reserve's transportation network.

The total impact on the Federal Reserve payments system, however, would not be as large or as rapid as the numbers might suggest. Greater acceptability of checks is estimated to result in check volume growth of 4.8 percent after complete interstate banking, in addition to the normal growth of check usage of about 4.28 percent annually. The effect on the Federal Reserve, the authors note, would be a decline in volume of about 1 percent to 3 percent annually for about ten years.

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# The Texas Industrial Production Index

The Federal Reserve Bank of Dallas has produced the Texas Industrial Production Index (TIPI) continuously since 1958. The index measures the output of Texas' mining, manufacturing, and utilities sectors and provides a regional counterpart to the national industrial production index compiled by the Board of Governors of the Federal Reserve System. Regional production indexes published by several other Federal Reserve Banks are limited to the manufacturing sector. The importance of oil and gas extraction in the Texas economy, through both direct and secondary effects on the manufacturing sector, necessitates its inclusion.

In this article, we consider what an industrial production index attempts to measure, why it is useful in conducting economic analysis, and what TIPI tells us about the performance of the Texas economy during the 1980s. In the appendix, we explain TIPI's construction in detail, including recent methodological improvements such as the incorporation of gross state product data.

The Texas Industrial Production Index clearly shows that the manufacturing sector buoyed Texas industry during the 1980s. Texas manufacturing output rose faster than overall industrial output, especially after the national recovery began in 1982. Nevertheless, until recently, drastic declines in oil prices and the resulting retrenchment in the energy industry held the growth of manufacturing output in Texas below that of the nation. TIPI clearly depicts the 1986 Texas recession caused by the oil price collapse and the weak recovery that began in early 1987.

## Why a regional production index?

The Federal Reserve Bank of Dallas is interested in monitoring the economic activity of the Eleventh Federal Reserve District, which includes Texas and parts of Louisiana and New Mexico. This interest is motivated, in part, by the special role the Bank plays in contributing to the formation of the nation's monetary policy and in gaining awareness of the varying impacts of monetary policy at the regional level. Another motivating factor is the research Bank economists conduct on such issues as the causes and consequences of regional economic growth and future trends in regional economic activity. Further, the Bank is committed to providing information of interest to the public as well as the business and academic communities.

TIPI is intended to supplement the wealth of other data that are used for regional analysis but are limited in timeliness or scope. For example, employment data are timely but not comprehensive. Employment data are available with a fairly short time lag for most states as well as the nation. But employment may not accurately reflect the income that a particular industry or region generates if technological change permits output to increase without increasing employment. Moreover, employment and output will not have a constant relationship because of the substitution of capital for labor in production processes.

Texas manufacturing illustrates how output and employment can diverge (Chart 1). Through the 1970s, manufacturing employment and output tracked one another fairly closely. In the early 1980s, however, output growth exceeded employment growth, as shown by the divergence of the

Chart 1
Texas Manufacturing
Employment and Production

(Indexes, 1982 = 100)


SOURCES : U.S. Bureau of Labor Statistics.
Federal Reserve Bank of Dallas.

two indexed series. One explanation for this divergence is that technological change during the 1970s reduced the importance of labor in many manufacturing processes. As capital assumed more importance, manufacturers were able to increase output without corresponding increases in employment.

TIPI can also provide more timely information than other measures of regional economic activity. Direct measures of income or output, such as personal income and gross state product, are available for all states, including industry detail. Yet, the time lag in reporting these data ranges from several quarters to several years. Such long lags make analyzing current conditions and forecasting future activity difficult. Economic activity in many industries can reverse course quickly. If reporting lags are long, then business and government decisionmakers will be unable to react appropriately to such changes. Furthermore, in forecasting it is necessary to predict the values of variables not only for the future but also for current or past periods for which data are not available. To the extent that historical data are not available on a timely basis, forecasts will be weakened.[1]

## What is TIPI?

The Texas Industrial Production Index provides timely monthly estimates of changes in the level of output of the manufacturing, mining, and utilities sectors of the Texas economy. TIPI includes indexes for aggregates such as durable and nondurable goods, manufacturing, mining, utilities, and total industrial production, plus all two-digit Standard Industrial Classifications (SIC)[2] that have significant representation in Texas industry. The indexes begin with January 1967.[3]

Actual monthly physical output is available for several industries, and is incorporated into the calculation of TIPI.[4] For the rest, two alternative, but related, measures of output are available at the state and two-digit SIC level of detail. Both are based on the concept of value added. *Value added* is the market value of produced goods less the cost of the materials and services purchased from others to produce those goods. Equivalently, value added is the income earned by the factors of production such as labor, capital, land, or entrepreneurship. We compare the two sources of value added data later in this article.

To ensure that changes in estimated output correspond as closely as possible to changes in real physical output and are not due to changes in price levels, we deflate nominal value added by using two-digit SIC price deflators from the U.S. Bureau of Economic Analysis (BEA).[5]

Unfortunately, data on output (value added) for most industries at the regional level are available only annually. The purpose of an industrial production index, however, is to facilitate analysis of *recent* developments. Therefore, a regional

[1] *We do not forecast Texas industrial production in this article. For an example of such a forecast, see Gruben and Long (1988).*

[2] *See* Standard Industrial Classification Manual *(1972).*

[3] *Although we have produced TIPI since 1958, methodological and data changes over time prevent calculation of the indexes before 1967.*

[4] *These industries are oil and gas extraction, petroleum and coal products, electric utilities, and gas utilities. Details on how the production indexes for these industries are created are provided in the technical appendix.*

industrial production index methodology must transform data that *are* available on a timely and monthly basis into a measure of monthly production. Texas employment and average weekly hours worked are available monthly from the U.S. Bureau of Labor Statistics.[6] Data on electric power sold to each two-digit SIC Texas industry are available from the Federal Reserve Bank of Dallas Statistics Department. These are the principal data transformed into output for industries that do not have actual monthly output data available. The appendix to this article explains in detail how the Texas Industrial Production Index is constructed.

### What does TIPI show about Texas industries?

This section covers what TIPI reveals about the performance of the Texas industrial sector during the 1980s. We begin with a discussion of the major factors affecting Texas industry in the 1980s. It is in the context of these events that movements in Texas industrial output occurred. Then for TIPI as a whole and for selected subindexes, we examine index movements from two perspectives. First, we compare the performance of the index with its national counterpart. We also examine how the performance of the major components of TIPI affected the overall index. Where possible, we offer explanations for the behavior of these industries, but we do not attempt to use a formal model to quantify what factors contributed to fluctuations in individual industries.[7] Previous research examined how growth in various industries affects the volatility of regional economies and how exogenous shocks affect different industries.[8]

**Events affecting Texas industry**. Three related events dominated the performance of Texas industry during the 1980s. The first and most obvious was the decline in oil prices, first beginning at the end of 1982 and again at the end of 1985. Even worse than the large decline in prices that *actually* occurred was the plunge in the level that people *expected* oil prices to reach. Forecasts that oil prices would exceed $100 per barrel by the year 2000 were not uncommon before 1982. Clearly, such high prices failed to materialize, but many oil producers and consumers based plans on drastically higher prices. This is significant because much economic activity is based on expectations about the future state of the economy. Thus, the reduction in economic activity that followed tumbling prices was much worse than it would have been had price expectations been more realistic.[9]

A second major influence that buffeted both the Texas and national economies was the rise, then prolonged fall, in the foreign exchange value of the U.S. dollar . The rising dollar made foreign goods less expensive relative to domestic goods, which hurt U.S. manufacturers, including those in Texas. The decline in the value of the dollar beginning in March 1985 reversed this effect, helping domestic firms sell more goods to other countries. Cox and Hill (1988) conclude that Texas was a significant beneficiary of the decline in the dollar, though the impact for the state was slightly less than for the nation.

The third factor affecting Texas industry during the 1980s was the record-length recovery of the nation's economy since 1982. As with the decline in the dollar, the recovery has benefited Texas industry, notwithstanding the problems generated in the energy and financial sectors by the oil price decline. The response to these factors clearly has not been uniform across industries.

[5] *Because regional price deflators do not exist, we must use national deflators. To the extent that the distribution of industries constituting any two-digit SIC code varies regionally, inaccuracy is introduced into the process of constructing real value added.*

[6] *Average weekly hours worked are available for production workers only. We assume that using these figures for nonproduction workers does not introduce serious error into the estimates.*

[7] *Because TIPI serves as a timely monthly indicator of economic activity in Texas, it has been used in econometric forecasting models for the state. See Gruben and Long (1988).*

[8] *See Gruben and Phillips (1989) for a discussion of which industries contribute to stability in the Texas economy. Sherwood-Call (1988) examines which states have had the most stable economies in recent years.*

[9] *For a discussion of the adjustment of the Texas economy to lower oil prices, see Fomby and Hirschberg (1989).*

**The performance of Texas industry in the 1980s**. Since 1982, Texas industrial output overall has grown more slowly than national output (Chart 2). The decline in oil prices prevented the Texas economy from rebounding from the 1981–82 recession as strongly as did the nation. Later, while national output was boosted by lower oil prices and a lower dollar, Texas output remained weak as the state economy became less energy-dependent. Nevertheless, several industries in the state have outperformed their national counterparts since 1982. These include electric power generation, oil and gas extraction, instruments, transportation equipment, and electric and electronic equipment.

Three of the five faster-growing Texas industries—instruments, transportation equipment, and electric and electronic equipment—are durable goods manufacturing industries. These three industries are relatively insensitive to fluctuations in energy prices. They are also among the industries that stood to benefit most from declines in the exchange value of the dollar.[10] While these factors explain their overall strong performance, they do not explain why these industries grew faster in Texas than in the nation as a whole. The factor that best explains the stronger-than-national performance of these industries is their relationship to the defense industry in Texas. The defense buildup during the first half of the 1980s benefited Texas defense contractors. These contractors tend to be heavily concentrated in aircraft and electronics industries. It is likely that strength in the instruments industry is also related to military spending. Although Texas no longer greatly exceeds the nation in per capita defense spending, defense outlays have likely boosted these industries more than their national counterparts.

**Oil and gas extraction**. Despite sharp increases in oil prices during 1973–74 and 1978–81, output in oil and gas extraction in both Texas and the rest of the United States remained essentially flat throughout the 1970s and early 1980s. Oil and gas extraction comprises crude oil production, natural gas production, and oil and gas field services, which are largely exploration-related. Texas

Chart 2
Total Industrial Production


SOURCES: Board of Governors, Federal Reserve System. Federal Reserve Bank of Dallas.

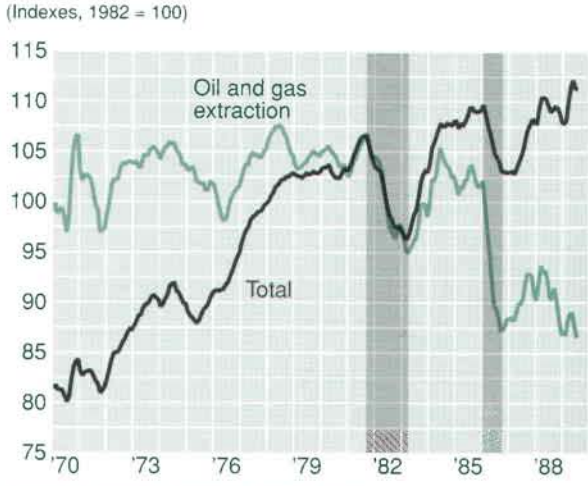
crude oil production was about 24 percent lower in 1981 than in 1970. For the rest of the United States, it was only about 4 percent lower. Increased exploration activity resulting from oil price increases prevented crude oil production from falling even further. Exploration activity contributes directly to oil and gas extraction because the drilling activity increases value added regardless of whether oil or gas is discovered. New discoveries, principally in Alaska, and increases in output from higher-cost wells account for the smaller decline in the rest of the United States. Because Texas' oil fields are relatively old and cost less to operate, Texas crude oil production is not as responsive to price increases.

The oil price declines of 1981–82 and 1985–86 tell a different story. These decreases caused precipitous declines in Texas oil and gas extraction of about 11 percent and 16 percent, respectively (Chart 3).

These declines also had indirect effects, such as lowering the demand for the goods and services of other industries and reducing the incomes of royalty owners, drillers, and producers. The lower demand for other goods and services contributed to the recession in Texas through multiplier effects.[11] During the first oil price decline in the early 1980s (see the left shaded area

[10] *See Cox and Hill (1988, 7).*

Chart 3
Texas Total Industrial Production and Oil and Gas Extraction




SOURCE: Federal Reserve Bank of Dallas.

Chart 4
Manufacturing Production


SOURCES: Board of Governors, Federal Reserve System.
Federal Reserve Bank of Dallas.

of Chart 3), the 10-percent decline in total Texas industrial output was similar to the decline in oil and gas production. During the second period (see the right shaded area of Chart 3), however, the 6-percent decline in overall output was much smaller than the 16-percent decline in oil and gas production. This difference may reveal how much the Texas industrial sector had already adjusted to lower oil prices by the mid–1980s. Of course, the national recession that occurred during the first period confounds our ability to be more conclusive on this point. Effects of the state's weakened economy also were observable in other industries.

**Total manufacturing**. Manufacturing may be the most interesting sector to analyze with a regional industrial production index such as TIPI. The economic events mentioned earlier—oil price movements, exchange-rate fluctuations, and the national economic expansion—affected this sector in various ways. Lower oil prices benefited some industries and hurt others. The falling value of the U.S. dollar benefited some industries more than others, and the national economic expansion allowed some industries to avoid a more severe downturn as a result of falling oil prices. Before examining the durable and nondurable components of the manufacturing sector, we will compare the sector's overall performance to that of the nation.

Output in Texas manufacturing industries grew faster than that of the nation until 1982 (Chart 4). Since the national recession and the 1982 decline in oil prices, Texas manufacturing output has grown more slowly, on average, than that of the nation. Texas manufacturing output fell as a result of the 1985–86 oil price decline, whereas the nation's output did not. In early 1987, Texas manufacturing output, boosted by the falling dollar and the continued national expansion, began to rebound and actually grew faster than national manufacturing output.

Manufacturing constitutes roughly 54 percent of industrial output in Texas, compared with 78 percent for the nation.[12] After the first oil price decline, which occurred at the end of a national recession, manufacturing output in Texas declined about 10 percent, roughly the same as the decline

[11] *For models that describe how these multiplier effects influence the Texas economy, see Hill (1986) and Brown and Hill (1988).*

[12] *Manufacturing is about 16 percent of total gross state product in Texas and about 19.7 percent of gross domestic product for the nation.*

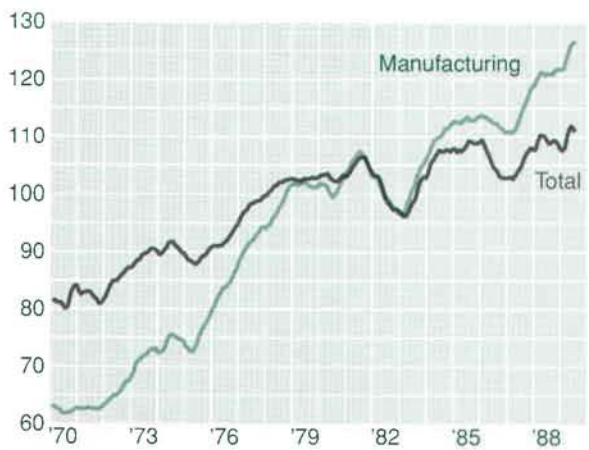
for overall state industrial output (Chart 5 and Table 1). After the retrenchment and readjustment in the early 1980s, manufacturing output declined only 2.7 percent after the severe 1985–86 oil price decline. The beneficial effect of the oil price decline on the national economy probably offset some of that event's negative effect on Texas manufacturing. Manufacturing output was further helped by the lagged effect of the decline in the dollar's value beginning in March 1985.

**Durable goods manufacturing.** Texas durable goods manufacturing output also grew faster than that of the nation during the 1970s (Chart 6). In addition, with the oil economy as a buoy, durable goods manufacturing in the state did not suffer swings in output as severe as those of the nation. The effect of the 1982 fall in oil prices was to delay the recovery of Texas durable manufacturing industries after the 1981–82 recession. When the 1985–86 oil price decline hit, durable goods production in Texas went into another slump while that in the nation did not.

The durable goods industries performing the poorest clearly have been those with the strongest ties to the energy industry. Oil field machinery, for example, is an important component of

Chart 5
Texas Total Industrial and Manufacturing Production

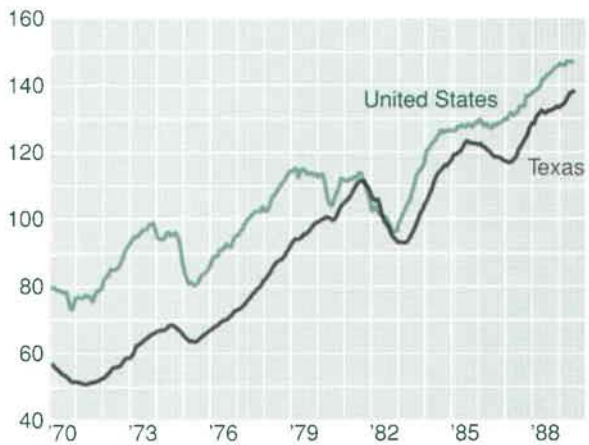
(Indexes, 1982 = 100)




SOURCE: Federal Reserve Bank of Dallas.

Chart 6
Durable Goods Production

(Indexes, 1982 = 100)




SOURCES: Board of Governors, Federal Reserve System, Federal Reserve Bank of Dallas.

Table 1
**Declines in Industry Output in Texas in Selected Periods**

| Industry | First downturn | Decline | Second downturn | Decline |
|---|---|---|---|---|
| Total industrial production | August 1981–March 1983 | –9.53 | January 1986–March 1987 | –6.26 |
| Mining | September 1981–March 1983 | –11.12 | August 1985–September 1986 | –15.64 |
| Manufacturing | July 1981–February 1983 | –10.07 | January 1986–December 1986 | –2.70 |
| Durable | September 1981–March 1983 | –16.30 | July 1985–February 1987 | –5.24 |

SOURCE: Federal Reserve Bank of Dallas.

nonelectrical machinery production in Texas (Chart 7). Another example is primary metals production, which provides drill pipe and structural steel to the extraction industry, and which has not recovered as much in Texas as it has nationally since the 1981–82 recession (Chart 8).

Texas durable goods manufacturing constitutes about 27 percent of total industrial output in the state and 49 percent of manufacturing output. During both the 1981–82 and the 1985–86 oil price downturns, durable goods manufacturing output declined more than overall manufacturing output (Chart 9 and Table 1). For the earlier decline, durables output declined 16.3 percent, compared with roughly 10 percent for total manufacturing. During the most recent downturn, durables output fell by slightly more than 5 percent, roughly double the percentage decline in overall manufacturing output. The larger decline for durable goods production conforms to the typical behavior of this industry during a business cycle— durable goods are generally subject to larger output swings. Nevertheless, during the second oil price downturn, Texas durables production fell less than did overall industrial production because, in percentage terms, mining output fell by much more.

**Nondurable goods manufacturing**. Nondurable goods manufacturing in Texas has not performed as well as its national counterpart (Chart 10). In fact, not a single nondurable component industry has achieved faster output growth than its national counterpart. The Texas index for paper and allied products rose above that for the nation in early 1989, after lagging behind for most of the previous decade.

Chemicals and related products and petroleum and coal products, the latter group being primarily the refining industry, are the two largest Texas manufacturing industries (Table 2). Chemicals output in 1988 and early 1989 grew faster in Texas than in the nation. However, Texas chemicals output showed slower growth rates, if not declines, when compared to the nation for most of the previous six years (Chart 11). Likewise, Texas' output of petroleum and coal products has generally increased less than the nation's during the 1980s (Chart 12). Slow growth in these two components would have been sufficient to cause Texas nondurable goods manufacturing output to lag that of the nation, even if growth in other components had been near the national rate.

Apparel manufacturing provides a contrast with other nondurable goods manufacturing industries in Texas. After experiencing a far more

Chart 7
Nonelectrical Machinery Production

(Indexes, 1982 = 100)


SOURCES: Board of Governors, Federal Reserve System. Federal Reserve Bank of Dallas.

Chart 8
Primary Metals Production

(Indexes, 1982 = 100)


SOURCES: Board of Governors, Federal Reserve System. Federal Reserve Bank of Dallas.

severe slump in the state than in the nation in the early 1980s, apparel manufacturing has grown far faster in Texas than it has nationally (Chart 13).

We know that, nationally, nondurable goods manufacturing exhibits smaller output swings during business cycles than durable goods manufacturing. TIPI confirms this for Texas (Chart 14) for the 1974–75, 1981–83, and 1986–87 recessions.

**Utilities**. Electric power and natural gas

Table 2
**Texas Industry Weights and Factor Shares, 1986**
(Percent)

| Industry (SIC Code) | Gross product Share | Factor shares Labor | Capital |
|---|---|---|---|
| Lumber and wood products (24) | 1.5 | 36.9 | 63.1 |
| Furniture and fixtures (25) | 0.5 | 50.5 | 49.5 |
| Stone, clay, and glass products (32) | 2.5 | 34.6 | 65.4 |
| Primary metal industries (33) | 1.8 | 40.9 | 59.1 |
| Fabricated metal products (34) | 3.5 | 52.5 | 47.5 |
| Machinery, except electrical (35) | 6.0 | 45.3 | 54.7 |
| Electric and electronic equipment (36) | 5.8 | 54.4 | 45.6 |
| Transportation equipment (37) | 4.2 | 64.7 | 35.3 |
| Instruments and related products (38) | 1.0 | 60.1 | 39.9 |
| Total durable goods | 26.8 | — | — |
| Food and kindred products (20) | 4.8 | 39.6 | 60.4 |
| Apparel and other textile products (23) | 1.1 | 50.0 | 50.0 |
| Paper and allied products (26) | 1.2 | 51.2 | 48.8 |
| Printing and publishing (27) | 2.9 | 52.1 | 47.9 |
| Chemicals and allied products (28) | 7.2 | — | — |
| Petroleum and coal products (29) | 8.8 | — | — |
| Rubber and miscellaneous plastics products (30) | 1.4 | 45.2 | 54.8 |
| Total nondurable goods | 27.4 | — | — |
| Total manufacturing | 54.2 | — | — |
| Mining except oil and gas (10,12,14) | 0.6 | 66.7 | 33.3 |
| Oil and gas extraction (13) | 34.7 | — | — |
| Total mining | 35.3 | — | — |
| Electric utilities (491) | 8.0 | — | — |
| Gas utilities (492) | 2.4 | — | — |
| Total utilities | 10.4 | — | — |
| Total industrial production | 100.0 | — | — |

SOURCES OF PRIMARY DATA: American Gas Association.
Bureau of Economic Analysis, U.S. Department of Commerce.
Energy Information Administration, U.S. Department of Energy.

utilities constitute about 10 percent of total industrial output in Texas. Natural gas utilities include only those firms involved in the transmission and distribution of natural gas, not in its extraction. Both sectors, of course, respond to changes in other energy markets. But because both are heavily regulated, their output behavior is also influenced by changing regulatory environments. No attempt is made here to describe in detail the effects of energy prices and regulation or their interaction. One interesting effect of the oil price decline in 1982, however, is the sharp accelera-

Chart 9
Texas Manufacturing and Durable Goods Production


SOURCE: Federal Reserve Bank of Dallas.

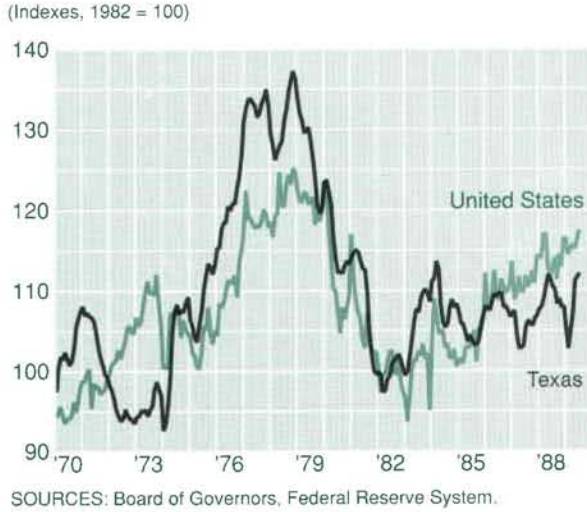
Chart 10
Nondurable Goods Production


SOURCES: Board of Governors, Federal Reserve System.
Federal Reserve Bank of Dallas.

Chart 11
Chemicals and Allied Products Production


SOURCES: Board of Governors, Federal Reserve System.
Federal Reserve Bank of Dallas.

Chart 12
Petroleum and Coal Products Production

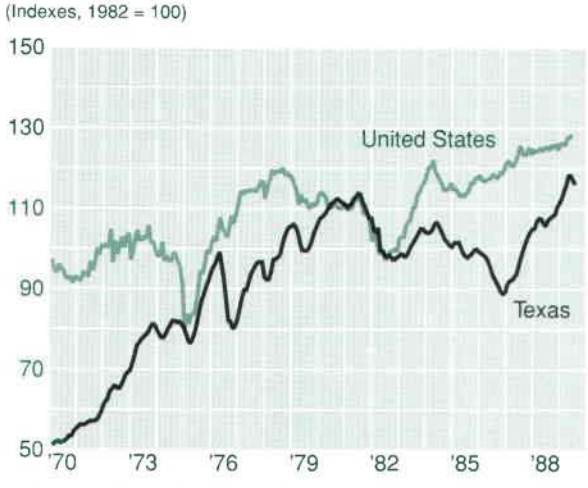



SOURCES: Board of Governors, Federal Reserve System.
Federal Reserve Bank of Dallas.

tion of electric power production (Chart 15). After a flat performance from 1970 to 1982, electric power generation rose sharply from 1982 to 1986, before flattening again after 1986.

During the 1970s and early 1980s, natural gas utilities suffered declining output. Two factors account for this decline. One is the restriction placed on the industrial uses of natural gas during this period. Because of its importance for residential heating, some industries, notably the electric power industry, were prohibited from using natural gas in new facilities. A second factor is the substitution of other fuels as energy sources. Both of these effects resulted from rising prices.

Chart 13
Apparel and Allied Products Production



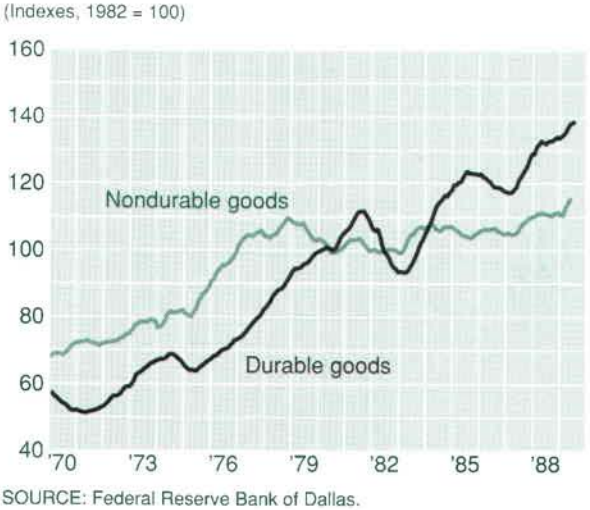

SOURCES: Board of Governors, Federal Reserve System.
Federal Reserve Bank of Dallas.

## Conclusion

TIPI provides a useful tool for analyzing the Texas economy. By providing monthly estimates of the output of the Texas industrial sector, the index can be used to analyze intertemporal, interregional and interindustrial changes in economic conditions.

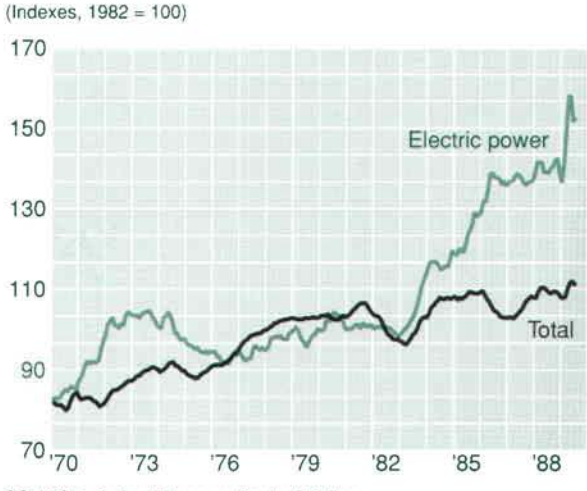
TIPI shows the degree to which manufacturing buoyed the Texas economy in the 1980s and the degree to which the mining sector has hindered it. TIPI also shows that despite declining oil prices, the importance of defense spending in the state, the national economic expansion, and the declining dollar enabled some Texas industries to grow faster than their national counterparts in recent years.

Chart 14
Texas Durable and
Nondurable Goods Production




SOURCE: Federal Reserve Bank of Dallas.

Chart 15
Texas Total Industrial and
Electric Power Production




SOURCE: Federal Reserve Bank of Dallas.

## Appendix
## How Is TIPI Constructed?

Researchers at the Federal Reserve Bank of Atlanta pioneered the methodology used to construct TIPI.[1] In fact, each of the regional production indexes currently in use in the Federal Reserve System relies on the Atlanta method.[2] Numerous articles have been written on the methodological aspects of constructing industrial production indexes. Previous research conducted at the Federal Reserve Bank of Dallas supports the use of the Atlanta method on grounds of both accuracy and minimization of the resources necessary to produce the index on a continuing basis.[3] For several industries, however, we employ techniques that differ considerably from the basic Atlanta method. We will describe these deviations subsequently.

### Atlanta method

Assuming that firms maximize profits in perfectly competitive markets and employ a two-factor linear homogeneous production function, then according to Euler's Theorem,[4] the net physical product of an industry, $Q$, can be written

$$(1) \qquad Q = MP_L \bullet L + MP_K \bullet K,$$

where $MP_L$ is the marginal product of labor, $L$ is units of labor, $MP_K$ is the marginal product of capital, and $K$ is units of capital. Multiplying both sides of equation 1 by product price, $P$, reveals that

$$(2) \quad P \bullet Q = P \bullet MP_L \bullet L + P \bullet MP_K \bullet K,$$

or

$$(3) \qquad VA = VMP_L \bullet L + VMP_K \bullet K,$$

where $VA$ is nominal value added, $VMP_L$ is the value of the marginal product of labor, and $VMP_K$ is the value of the marginal product of capital. Under the assumptions of profit maximization under competition, $VMP_L = P_L$ and $VMP_K = P_K$, where $P_L$ is the price of labor, or wage rate, and $P_K$ is the price of capital. Therefore,

$$(4) \qquad VA = P_L \bullet L + P_k \bullet K,$$

which states that nominal value added is the sum of the wage bill and the capital bill. Multiplying the first term of equation 4 by $(VA/VA) \bullet (L/L)$ and the second term by $(VA/VA) \bullet (K/K)$, and then rearranging terms, we have

$$(5) \quad VA = \frac{P_L \bullet L}{VA} \bullet \frac{VA \bullet L}{L} + \frac{P_K \bullet K}{VA} \bullet \frac{VA \bullet K}{K}.$$

Noting that $VA/P = Q$, dividing through by product price, and rearranging terms results in

$$(6) \quad Q = \left[\frac{P_L \bullet L}{VA}\right] \bullet \left[\frac{Q}{L}\right] \bullet L + \left[\frac{P_K \bullet K}{VA}\right] \bullet \left[\frac{Q}{K}\right] \bullet K.$$

[1] See Pyun (1970) and Strobel (1978).

[2] As stated earlier, the Federal Reserve Bank of Dallas has produced the Texas Industrial Production Index continuously since 1958, using a variant of the Atlanta method since 1983. The Federal Reserve Bank of San Francisco introduced an index in 1973, which is no longer in production, also using the Atlanta method (Walsh and Butler 1973). Since 1987, the Federal Reserve Banks of Chicago, Cleveland, Richmond, and Philadelphia have introduced manufacturing indexes using the Atlanta method. See Schnorbus and Israilevich (1987); Bryan and Day (1987); Bechter, Chmura and Ko (1988); and Hamer (1989).

[3] See Fomby (1986). Very recent research conducted at the Federal Reserve Bank of Chicago offers new insights into this question. See Israilevich, Schnorbus, and Schneider (1989).

[4] For a proof, see Chiang (1974, 407–10).

To simplify the notation, let labor's share in value added, $(P_L \bullet L)/VA$, be denoted $S^L$, let the productivity of labor, $(Q/L)$, be denoted $\Pi^L$, let capital's share in value added, $(P_K \bullet K)/VA$, be denoted $S^K$, and let the productivity of capital, $(Q/K)$, be denoted $\Pi^K$. Letting $t$ denote a given time period, equation 6 can be rewritten as

$$(7) \quad Q_t = S_t^L \bullet \Pi_t^L \bullet L_t + S_t^K \bullet \Pi_t^K \bullet K_t,$$

which states that, in any time period, physical output (or real value added) consists of the weighted contributions of labor and capital, where each factor's contribution is the amount of that factor used, multiplied by its productivity, and where the weights are each factor's share of total nominal value added. Equation 7 provides the basis for estimating monthly industrial production. Substituting actual or estimated values for factor usage, factor productivities, and factor shares into equation 7 results in the monthly estimate of production for an industry.

## Data considerations

Practitioners of industrial production indexes using the Atlanta method must make choices regarding the data to use in equation 7. Data availability and quality can vary regionally and over time. The following sections describe decisions we made at the Federal Reserve Bank of Dallas.

**Benchmarking**. Benchmarking an index is the process of ensuring that long-run movements in the generated monthly production index correspond to long-run movements in the known annual output measure. TIPI is the first regional index to be benchmarked to new data on gross state product available from the Bureau of Economic Analysis of the U.S. Department of Commerce. Other regional production indexes are benchmarked (as were previous versions of TIPI) to value-added data published by the Census Bureau of the U.S. Department of Commerce in its Censuses and Annual Surveys of Manufactures.

There are several advantages to using the BEA data. First, BEA has devoted considerable effort to providing value added estimates that improve on those available from the Census Bureau.[5] The terms *value added* and *gross product* will be used interchangeably. The principal improvement is that BEA has subtracted an estimate of the cost of purchased services from the Census Bureau measure of value added. Thus, some output attributed by the Census Bureau to each industry is properly attributed to the service sector by BEA. Second, using gross product eliminates a methodological inconsistency that results from using GNP price deflators with value-added data. Third, the BEA data are available annually from 1963 to 1986, including data from 1979 to 1981, when the Census Bureau did not publish Annual Surveys of Manufactures at the state level. Finally, BEA provides annual estimates of gross product in mining industries, whereas the Census Bureau's value-added estimates are available only at five-year intervals in the Census of Mining.

**Labor**. We take the labor input to be the product of employment and average weekly hours, as reported monthly in the Bureau of Labor Statistics' Establishment Survey. With one exception, data on Texas total employment and average weekly hours are available for all two-digit industries back to at least 1967. Average weekly hours for instruments and related products (SIC 38) are unavailable before 1972. During the 1967–71 period, variation in the labor input for that industry is solely due to variation in employment.

**Capital**. Because electricity powers much modern capital equipment, the TIPI methodology uses electricity consumption to proxy the usage of capital. This is a common

[5] For details, see Bureau of Economic Analysis (1985).

technique validated by previous research.[6] The Federal Reserve Bank of Dallas Statistics Department collects electric power data from a panel of Eleventh District electric utilities that report electricity sales by SIC code.

A phenomenon that somewhat limits the value of the electric power data is that of cogeneration. Cogeneration is the simultaneous generation of electricity and useful heat from a single fuel source. The Public Utility Regulatory Policies Act of 1978, which requires utilities to buy power from private cogenerators, and the Natural Gas Policy Act of 1978, which limits the use of natural gas as fuel for utilities but not for cogenerators, combined to spur the growth of cogeneration.

Because the panel of electric power producers that report to the various Federal Reserve Banks was defined prior to the rapid growth of cogeneration, the impact of cogeneration is not captured in the data available to us.[7] For example, a decline in the amount of electricity purchased by a manufacturing firm from an electric utility may be due to bringing a new cogeneration system online and not due to a decline in its actual power consumption.

Cogeneration is so important in the chemicals industry that the historical data on electric power sales do not adequately proxy electric power usage by that industry. Therefore, we treat the chemicals industry as if it employed a single-factor production process. This is unfortunate because chemicals production is one of the most capital-intensive manufacturing industries, and it has the second largest share of value added in manufacturing. The fact that cogeneration is important in the petroleum refining industry as well does not present a problem since we employ a modified technique to estimate output in that industry, as seen below. We suspect that the unusual volatility in the electric power series for paper and allied products is due to cogeneration, although we have not investigated this matter closely.[8]

**Factor shares**. We calculate the labor share as the ratio of payroll, as reported in the 1986 Annual Survey of Manufactures, to total 1986 nominal gross Texas product, as reported by BEA. The capital share must be, according to our assumptions, 1 minus the labor share.[9] We assume the factor shares to be invariant over the period covered by the index. As noted above, we assume that the labor share for chemicals is equal to 1. Table 1 in the main text reports the factor shares for all industries included in TIPI whose output we estimate using the Atlanta method.

**Productivity**. The Atlanta method requires monthly estimates of the productivity of each factor of production. Output, and therefore productivity, however, is available only annually. We derive the monthly factor productivity estimates by assuming that productivity grows exponentially between the annual observations. The rate of factor productivity growth during the period after the last actual annual observation is an important methodological concern. The methods that practitioners of regional production indexes most commonly employ include extrapolating a *long-run* productivity growth rate, extrapolating the *most recently observed* growth rate, and *fixing* productivity at its most recently observed level.

None of these choices, in our view, are good. Examining the data indicates that productivity tends to rise and fall as output rises

[6] See Moody (1974).

[7] As this is written, the Board of Governors of the Federal Reserve System is investigating means to augment the national sample of electric power generators to broaden the coverage of cogenerators.

[8] Cogeneration is extensive in pulp manufacturing. The industry recycles its waste products as a fuel to generate electricity as well as to provide process heat.

[9] Dividing both sides of equation 5 by VA and canceling proves this statement.

and falls—that is, productivity is pro-cyclical. None of the above-mentioned methods account for cyclical movements in productivity; in fact, they are likely to result in estimates of production that understate the magnitude of both peaks and troughs in the business cycle. We adopted a technique to extrapolate factor productivity in a manner that allows incorporation of both trend and cyclical components. We regress first differences in annual real gross product for each industry on first differences in annualized man-hours and/or electric power usage. Based on these results, we forecast annual output as closely to the present as possible. Finally, we use the forecasted values to compute factor productivity. At present, gross product data are available only through 1986, so we must forecast them through 1988 using this procedure. We assume constant factor productivity growth after 1988.

### Exceptions to the Atlanta method

The Board of Governors of the Federal Reserve System, in constructing the U.S. Industrial Production Index, emphasizes the desirability of collecting actual production data whenever possible instead of estimating output from labor and capital data.[10] At the regional level, very little such data are available. Nevertheless, for several important industries, it is possible to collect timely monthly data that we can use to estimate monthly changes in production more closely than we could by using changes in labor data or electric power usage.

**Oil and gas extraction**. Actual monthly data on Texas crude oil production, natural gas production and the level of exploration activity are available. We use these measures to drive monthly movements in the index for oil and gas extraction (SIC 13), but we benchmark the series historically to BEA's estimates of gross product in that industry. The method we use is as follows: we follow the normal Atlanta method, except that in performing the calculations, we use oil production, gas production, and the Hughes rotary rig count *as if* they were the factors of production in a three-factor production process. The "factor shares" in this case are estimated shares in SIC 13 gross product attributable to the three "factors." It is useful to think of this as a method that combines measures of oil production, natural gas production, and exploration activity into an overall index for SIC 13, while constraining long-term movements to follow those of gross product in the industry.

**Petroleum and coal products**. Although a measure of input, not output, the amount of crude petroleum refined is often used as a measure of refining output.[11] In the current revision of TIPI we introduced a modified procedure. Again, we follow the Atlanta procedure computationally, except that here we perform the computation as if refiners use a single-factor production process, where the "factor" is runs of crude petroleum. Crude runs to refineries, therefore, strongly influence month-to-month movements in the index for petroleum and coal products, although the long-run pattern must follow that of gross product in the industry.

**Electric and gas utilities**. BEA reports gross state product strictly at the two-digit SIC level. SIC 49 covers electric and gas utilities and sanitary services. We prefer not to include sanitary services in TIPI, both for the sake of comparability with previous versions of TIPI and for the sake of comparability with the U.S. Industrial Production Index. We therefore estimate annual Texas value added ourselves—for electric utilities, from the income and expense statements of Texas electric utility companies[12] and, for gas utilities, from

[10] See Board of Governors of the Federal Reserve System (1986, 21, 33).

[11] The U.S. Industrial Production Index for refining, for example, is simply an index of crude runs to refineries.

data reported in *Gas Facts*, published annually by the American Gas Association.

Timely monthly data on total power generated by Texas electric utility companies and natural gas transmitted by gas utilities are available from the Department of Energy and the Texas Railroad Commission, respectively. We use these data to drive monthly movements in TIPI's electric and gas utility industries.

We employ the same technique for these industries as we do for petroleum and coal products. Movements in electric power generation and natural gas transmission strongly influence month-to-month movements in the indexes for electric utilities and gas utilities, respectively, but we benchmark the series historically to estimates of value added in these industries.

### Miscellaneous considerations

**Seasonal adjustment and smoothing**. We seasonally adjust all primary monthly series using a variant of the Census Bureau's X-11 procedure prior to incorporation into the index calculation. In addition, to ensure that monthly movements of all series contain, on average, more information than statistical noise, we convert the monthly series to centered moving-average form wherever appropriate.[13]

**Aggregation**. TIPI and other industrial production indexes differ in how industry aggregates are calculated. Ordinarily, production indexes are aggregated using weights that are based on the distribution of value added across industries. This is necessary because one or more of the components of the aggregate are not available in dollar terms For example, the amount of crude oil refined is used as a proxy for refinery production. It is interesting to note, however, that because the industry weights are based on a value-added distribution, a dollar figure for value added is needed for at least one year.

TIPI takes a somewhat different approach. We construct monthly real value-added series for *all* industries. Therefore, it is a straightforward procedure to sum the components into aggregates. Only after we have formed all the real value-added aggregates do we convert to index form. The apparent avoidance of using industry weights is illusory. In constructing real value added , we are implicitly fixing relative prices to be those existing in one single year. In constructing TIPI, we denominate value added in terms of 1986 dollars, that is, we chose relative prices in 1986. Implicitly, this is *equivalent* to using the 1986 value-added industry distribution to weight the individual industry *indexes* to form aggregates.[14] A corollary to this is that it would be wrong to use 1986 price deflators to construct real value added, and then use 1982 value-added weights to form the aggregates. Table 1 shows the relative importance of all TIPI industries in total industrial production according to BEA's 1986 gross product estimates.[15]

### Revision schedule

It is useful to think of the Texas Industrial Production Index as an ongoing experiment. As new techniques or data become available, or when existing data are revised by the issuing agency, we will revise TIPI to incorpo-

[12] See, for example, Energy Information Administration (1988).

[13] The smoothing process is based on the concept of months for cyclical dominance, which is the number of months it takes, on average, for the cyclical component of a time series to dominate the irregular component. For details, see Shiskin (1961, 535–46).

[14] We base real value added in 1986 dollars (which is the same as using 1986 industry weights) to ensure that recent month-to-month movements in the indexes are as accurate as possible.

[15] See previous explanation on our calculation of value added in the electric and gas utility industries.

rate the new information.

At a minimum, we revise TIPI annually , following the U.S. Bureau of Labor Statistics' annual two-year revision of its Establishment Survey data. Also at that time, we incorporate other recently released or revised data, and we update the seasonal adjustments. Finally, whenever updated gross product data become available from the Bureau of Economic Analysis, we rebenchmark all series.

## Sources of error

We will address three main sources of inaccuracy. First, TIPI can only be as accurate as the primary data upon which it relies. As we mentioned earlier, as these data are revised by the issuing agencies, we will incorporate the improved data into our TIPI estimates. Second, in extrapolating factor productivities beyond the most recently available gross product data, statistical error is introduced. It is possible for this error to be greater than that generated by using alternative procedures. For now, we prefer what we consider to be a more accurate approach (that is, to try to capture both trend and business-cycle effects), but we will reevaluate as we make future revisions. Finally, the necessity of using national price deflators is unfortunate. Still, regional price information may become available.

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