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A review from
the Federal Reserve Bank
of Chicago

NOVEMBER/DECEMBER 1988

**The grass may not be greener:
Commercial banks
and investment banking**

**A note on the increase in
noninsured commercial banks**

**Real boats rock: Monetary policy
and real business cycles**

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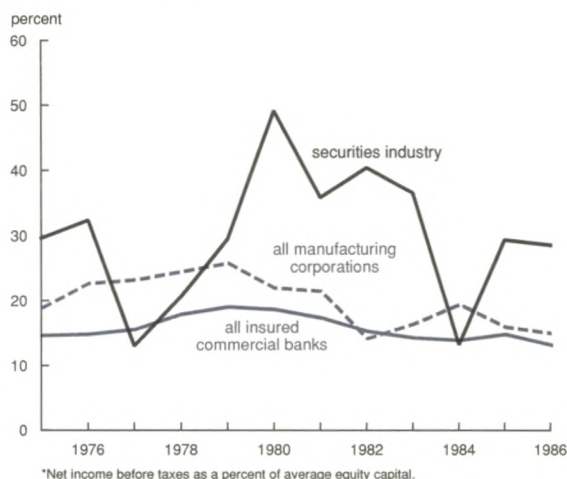
Betsy Dale

As profitability in traditional commercial banking services has increasingly come under pressure, some banks have attempted to bolster shrinking profits by expanding into fee-intensive activities, many of which have been dominated by the securities industry since the 1930s. Persistently higher overall earnings in this industry relative to others have led to a widespread perception that at least certain parts of the securities business are substantially more profitable than commercial banking.¹ (See Figure 1.) Consequently, some commercial banks have increased their permissible securities operations and they have escalated their efforts to chip away at the legislative and regulatory barriers that currently prohibit them from engaging in a broader range of securities activities.

The securities activities of commercial banks are principally governed by the Banking Act of 1933 (or Glass-Steagall Act) and the Bank Holding Company Act of 1956. These laws imposed limitations on bank and bank holding company participation in many securities activities and prohibited others completely. But, through a succession of regulatory rulings and court decisions over the years, banking firms have won approval to engage in many previously restricted activities. (See Table 1.) Commercial banking organizations are now able to participate in securities activities that generate more than half of the gross revenues of all securities firms and may underwrite securities of types that account for at least 80 percent of the dollar value of all new issues.² Some of the investment banking activities of commercial banks, however, still have restrictions and limitations placed on them that do not apply to investment banks. As a result, this hinders the ability of commercial banking firms to compete successfully with investment banks.

This article examines the success of commercial banks in providing permissible investment banking services and analyzes the profit potential for recently approved and currently proscribed activities.³ At this time, commercial

Figure 1
Profitability comparisons*



banks seem to have done well in areas where they are permitted to compete, but still do not enjoy the market shares that investment banks command. However, banks' experience with new underwriting powers is too recent to make a fair judgement regarding their future success, but immediate profitability in these areas does not look too promising. As for commercial bank entry into currently impermissible areas, significant barriers will remain even if legal prohibitions are removed. These barriers may make it difficult for many banks to break successfully into these markets and may delay their profitability for several years while they gain expertise and build market share.

Permissible activities

During the 1980s, an increase in nonbank competition for certain types of lending services and a booming securities market, which en-

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Table 1
Selected permissible domestic commercial bank
securities activities*
(August 1988)

	<u>Year started**</u>
Underwriting, distributing, and dealing	
U.S. Treasury securities	Always
U.S. federal agency securities	Various years
Commercial paper (third party)	1988
Mortgage and consumer paper-backed securities	1988
Municipal securities	
General obligation	Nearly always
Some revenue bonds	1968
All revenue bonds	1988
Private placement (agency capacity)	Always
Mergers and acquisitions	Always
Offshore dealing in Eurodollar securities	Always
Brokerage	
Limited customer	Always
Public retail (discount)	1982
Securities swapping	Always
Financial and precious metal futures brokerage and dealing	1983 [†]
Financial advising and managing	
Closed-end funds	1974
Mutual funds	1974
Restricted	Always
Research advice to investors	
Separate from brokerage	1983
Combined with brokerage	
Institutional	1986
Retail	1987

*Federal Reserve member banks or bank holding company affiliates.

**After the Civil War. Different dates may apply to national and state banks and among state banks. With some exceptions, the earliest date is shown. Regulatory rulings frequently concluded that a specific activity was permissible before the date of ruling. If the activity was halted by enactment of the Glass-Steagall Act, the date of renewed activity is given.

[†]Restricted to futures contracts for which banks may hold the underlying security or that are settled only in cash.

SOURCE: Updated from George G. Kaufman and Larry R. Mote, "Securities Activities of Commercial Banks: The Current Economic and Legal Environment," *Staff Memoranda*, Federal Reserve Bank of Chicago, 88-4 (1988).

couraged corporate borrowers to raise funds directly through capital markets, narrowed spreads on traditional commercial banking services. Rather than lose valued clients, banks found ways to unbundle their lending activities and to play a role in their customers' direct financings in the capital markets. In addition to providing off-balance-sheet guarantees and selling loans, U.S. commercial banks have been aggressively expanding the operations of the securities activities in which they are permitted to engage. Such activities include brokerage services, advice on mergers and acquisitions, private placement of securities, underwriting

general obligation bonds of states and municipalities, and investment banking activities abroad. The lure of hefty fees and commissions has prompted new interest in these activities which, though they have long been open to banks, were considered incidental to their primary services.

These activities not only offer attractive fees, but are also logical areas for bank expansion. Banks already have close contacts with a large base of business and municipal customers to whom they have provided credit and other services over the years, putting them in a favorable position to expand the scope of services they offer to an existing client base. Moreover, banks have engaged in these activities to some extent for many years and already have a degree of expertise. Until recently, however, banks played only a minor role in these non-banking areas and active expansion came only after banks recognized the need to develop sources of noninterest income to augment declining revenues from both domestic and international lending.

Overall, commercial banks have made significant strides in most securities activities in which they are competing directly. It has been estimated that in 1986 commercial banks had a composite market share of 10 to 30 percent in such activities.⁴ Nevertheless, most banks are still only minor players whose market shares are dwarfed by Wall Street firms. (See Table 2.) Aside from the fact that commercial banks have been aggressive competitors in these areas for only a few years, a number of other reasons can explain their current competitive position.

Municipals

In the tax-exempt market, for example, a number of factors came into play that diminished both the opportunities and the profitability in this area. Over the years, banks have been active participants in underwriting municipal bonds despite the fact that they have been excluded from a large segment of this market. Commercial banks may underwrite general obligation (GO) bonds, which are backed by the full credit and taxing power of the issuing municipality, but until very recently have been prohibited from underwriting most kinds of municipal revenue bonds.⁵ Banks' market share of the municipal GO market averaged 60 percent in the early 1970s, but de-

Table 2
Comparative market shares
1987

	Top 10 commercial banks		Top 10 investment banks	
	\$volume	deals	\$volume	deals
	(-----percent-----)			
Municipal underwriting	9.5	5.4	54.0	22.3
GO bonds	20.3	8.7	41.2	13.1
Revenue bonds	5(e)	3(e)	60.2	30.7
Private placements*	25.3	30.0	61.5	58.1
Mergers & acquisitions**	4.0	4.5	77.3	30.1
Eurobond underwriting	6(e)	n.a.	19(e)	n.a.

*Market shares of 8 top commercial and investment banks.

**Figures are approximations reflecting an adjustment for multiple credits on advisory assignments.

n.a.—Not available.

(e)—Estimate.

NOTE: Commercial and investment banks that rank among the top 10 are not necessarily the same in each activity.

SOURCE: IDD Information Services; IDD Information Services/PSA Municipal Database; and author's estimate.

clined fairly steadily in the early 1980s to about 27 percent in 1984.⁶

While many large and medium-size banks have been attempting to strengthen public finance operations during the last 10 years, some investment banks, flush with profits from the bull market of recent years, began aggressively entering this market as a means of diversifying. Profitability soon came under pressure because some investment banks viewed their activities in this market as a loss leader. Valuing relationship-building more than profits, investment bankers were willing to cut margins very thin.⁷ Further compounding this situation was a change in the tax law in 1986, which reduced the attractiveness of municipal securities and contributed to a dramatic decline in the volume of new issues.⁸ (See Figure 2.) The intense competition created by an increasing number of players competing for a declining volume of business narrowed spreads and reduced profitability to the point where some commercial and investment banks pulled out of the tax-exempt market.

As banks scramble for a bigger slice of a shrinking pie, investment banking firms have increasingly gone after smaller regional issues that they would not have bothered with a few years ago. In the past, these issues were handled largely by commercial banks, but banks have found it difficult to compete effectively with the superior capital base, proven exper-

tise, and distribution capabilities of some Wall Street firms now bidding for these deals. Banks are recognized leaders in the distribution of municipal bonds and are frequently included in networks managed by others, but to increase market share they must not only work to retain existing relationships with local government borrowers, but also convince a broader group of issuers of their underwriting capabilities. One thing holding them back is the shortage of recognized talent in the field, together with banks' reluctance to change a corporate culture that is unwilling to pay salaries adequate to attract qualified personnel.⁹

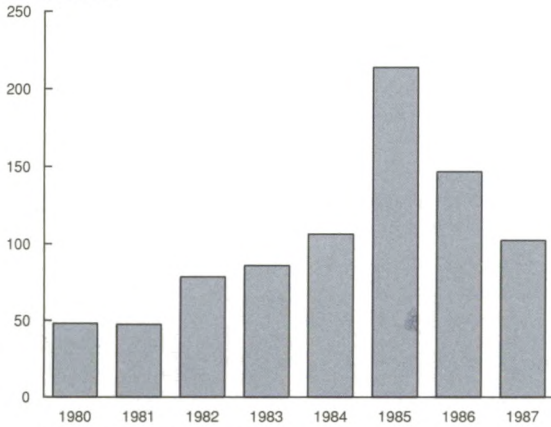
Private placements

While there are still restrictions on the kinds of public underwriting banks may engage in, banks may privately underwrite virtually all types of securities. These transactions involve placing an entire issue with a limited number of large investors rather than through a public offering.¹⁰ In the past, many banks viewed such placements as a consolation prize for failing to win a corporation's loan business and neither welcomed nor solicited such business. From 1975 to 1984, banks' market share of all placements was between 4 and 9 percent.¹¹ More recently, banks have been attracted by the fee income generated by such services, usually based on a percentage of the offering price. By 1986, their overall market share of traditional deals involving debt securities had increased to an estimated 26 percent.¹²

Despite these recent gains, the private placement market continues to be dominated by the large Wall Street firms. In 1987, the eight largest commercial bank competitors placed \$34 billion of the dollar value of securities placed by all firms. By contrast, the top eight securities firms completed deals worth \$83 billion, more than twice the value of placements completed by the top banks. Banks have made their greatest strides in placing "plain vanilla" deals requiring only a small group of investors. But, because banks' network of contacts with professional investors is still less extensive than that of their Wall Street rivals, their ability to compete is impaired when wider distribution outlets are needed. Industry experts also say that commercial banks have yet to take full advantage of their contacts with corporate borrowers because of poor coordi-

Figure 2
The municipal bond market
 Volume of new issues has declined . . .

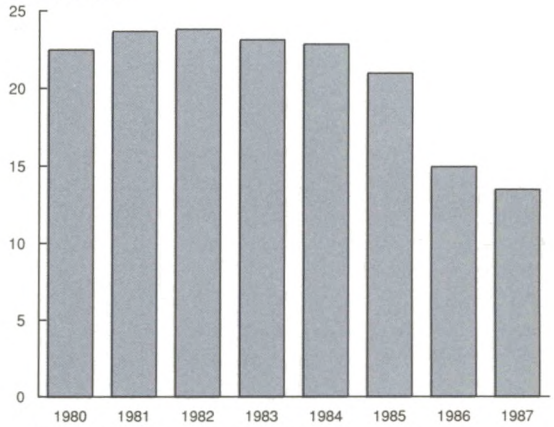
value of new issues of
 long-term municipal bonds
 billions of dollars



SOURCE: *Federal Reserve Bulletin*.

. . . and underwriting has become less profitable

average underwriter compensation for
 fixed-rate issues of \$10 million or more
 dollars per \$1000



SOURCE: *Wall Street Journal and Securities Data Co.*

nation between their commercial loan operations and capital markets groups.¹³

Mergers and acquisitions

Although some commercial banks have made impressive strides in offering merger and acquisition advisory services, even the largest bank merger operations continue to be overshadowed by Wall Street firms in the business.¹⁴ Bankers Trust, for example, was the top ranked commercial bank advisor in 1987, completing 42 deals worth \$6.2 billion. By contrast, the top investment bank advisor (Goldman Sachs) completed 134 deals worth a total of \$63.5 billion.¹⁵ While this provides a good indication of the distance between the most successful commercial and investment bank advisors, the measurement of overall market shares is more difficult. Many deals, especially large ones, have a number of advisors on both the acquirer and target sides, and available data on rankings gives full credit to each advisor on the deal. Nevertheless, by this measure commercial banks were advisors in only 7.4 percent of the \$216.7 billion volume completed in 1987, while the top four investment bank advisors were involved in 90 percent.¹⁶ Based on these figures, it is clear that banks are included in only a small portion of advisory assignments, so far.

Aside from the relatively recent entry of banks as active participants in this arena, se-

veral factors prevented them from being among the top players. Once again, banks' progress has been slowed by their inability or unwillingness to offer compensation adequate to attract top deal makers. Another factor is that banks have usually backed away from deals involving hostile takeovers of longtime clients that might jeopardize lending relationships.¹⁷ Banks are generally more active in friendly deals, which tend to be at the low end of the market in transaction size.

Perhaps the most significant factor, however, is the Glass-Steagall restrictions. Underwriting and dealing in corporate securities are fundamental to many merger strategies. The fact that commercial banks are prohibited from engaging in these activities has limited their access to and experience with trading markets. While banks are developing knowledge and skill in these markets, they will have to overcome the perception that they lack adequate expertise to accurately gauge markets and provide sound advice in structuring a deal.

Overseas activities

Glass-Steagall prohibitions do not apply to the activities of U.S. banks in the Euromarket, and many of the nation's largest commercial banks have operated offshore outlets there for years. Until a few years ago, however, their dominance in the market for international syndicated loans kept their pri-

mary focus on traditional lending services. In the early 1980s, the percent of capital raised in international markets by such loans fell dramatically while the share of capital raised by bond issues rose sharply.¹⁸ This massive shift in market preference for funding vehicles prompted an attempt by banks to offset lost interest income with fees from underwriting and trading in Eurobonds and from currency and interest rate swaps. Banks' success in these areas is far from uniform.

So far, the role of U.S. banks in underwriting international bonds remains quite small. In 1986, they were estimated to have only 10 percent of this market.¹⁹ One reason for this poor showing is the degree of competition to participate in new Eurobond issues. Many houses fiercely compete not only for the role of lead manager but also for a position on tombstones. Furthermore, aggressive bidding for new issues has led to mispricing and low profit margins.²⁰

The intensity of this competition has made breaking into the ranks of top managers, or even being included in distribution syndicates, particularly difficult.²¹ Subsidiaries of U.S. banks are also disadvantaged by their relatively short track record in this area. Even U.S. investment banks, which have used their domestic freedom to develop both expertise and customer relationships in offshore markets, have to fight for prominence among their European and, increasingly, Japanese peers.²² Thus, the small Eurobond market share captured by U.S. banks may be explained partly by a reluctance of some to expend a great deal of effort in a market where the competition is stiff and the profits are slim.

Although they have enjoyed little success in Eurobond underwriting, U.S. banks have found other international securities activities more rewarding. In fact, some banks that maintain a presence in this market have more interest in secondary market trading than in managing new issues.²³ An increasing proportion of international bond issues are driven by currency and interest rate swaps, and commercial banks are the clearly dominant participants in this area. In 1986, U.S. banks accounted for 70 percent of the activity in foreign exchange markets, and five money center banks alone generated over \$1 billion in foreign exchange trading income that year.²⁴

New underwriting powers

In 1987, rulings by two regulatory agencies granted banks certain additional securities underwriting powers. Banks were not immediately able to launch into these new areas, however, as there was considerable uncertainty as to whether the courts and Congress would allow these decisions to stand.

The first of these decisions was by the Federal Reserve, which ruled in April that commercial banks could underwrite commercial paper, municipal revenue bonds (MRBs), and mortgage-backed securities (MBSs).²⁵ The activities were to be conducted through non-bank subsidiaries and limitations were imposed on the extent to which banks could engage in these new areas. In July, the Fed also approved underwriting of securities backed by consumer receivables (CRBs).²⁶ But, after a suit filed by the Securities Industry Association (SIA) challenging the Fed's initial ruling resulted in a stay on the new powers being imposed by the courts, the Fed stayed the effect of their approval to underwrite CRBs as well. Even without this suit, however, implementation would have been delayed. Congress imposed a moratorium beginning in March which prohibited all federal banking agencies from granting any new nonbanking powers for one year. The moratorium was designed to halt bank entry into new areas until the Congress could consider the issues further.²⁷

The second ruling came in June when the Office of the Comptroller of the Currency issued its opinion that national banks could underwrite and deal in MBSs and CRBs directly, without limitations on the extent of involvement in such activities and without segregating them in a nonbank subsidiary.²⁸ This position was expressed in a letter to Security Pacific supporting its bid to sell mortgage pass-through securities under this interpretation. Security Pacific's issuance and underwriting of a major portion of that issue became the subject of another suit by the SIA.²⁹

However, even while the congressional moratorium was in effect and challenges to the legality of these powers were still before the courts, several large banks began to participate in the underwriting of issues they brought to market. Marine Midland Bank co-managed a \$600 million issue backed by auto loans in June³⁰ and Citibank helped underwrite \$150.1

million of mortgage-backed securities in September.³¹ In April 1988, Chemical Bank went furthest in testing the limits of Glass-Steagall when it became the first bank to lead-manage a \$257.4 million issue backed by its own auto loans.³² Others expressed interest in lead-managing their own receivables deals, but were hesitant to do so until they had a clear go-ahead from regulators.

At this writing, the legal status of these underwriting powers is only partially resolved. The congressional moratorium ended without any legislative action on this issue, so the ban on further regulatory approvals was lifted. The Fed's ruling was allowed to stand when, in June 1988, the Supreme Court refused to review a lower court's decision upholding Fed approval of these activities.³³ This cleared the way for the twelve large banking companies thus far granted authority to begin exercising the new powers.³⁴ The issue of whether national banks can underwrite asset-backed securities directly is still pending before the court. So, while some banks continue to gingerly test the waters under the Comptroller's ruling, most have chosen to remain inactive until the legality of the new powers is clarified.

Meanwhile, commercial banks have gained considerable experience in privately placing asset-backed securities. In 1987, eight commercial banks or subsidiaries of BHCs privately placed 136 issues (32 percent of the market), valued at \$7.9 billion. Three commercial banks ranked among the top 10 firms to privately place asset-backed securities.³⁵

Small spreads

Unfortunately, spreads on these new underwriting instruments appear small, and anecdotal evidence on the profitability of underwriting these securities is not encouraging. In fact, profits from underwriting commercial paper, mortgage-backed securities and municipal revenue bonds were so slim that a number of commercial and investment banking firms have scaled back operations or pulled out of these markets. Salomon Brothers, the nation's leading underwriter, created a stir in the market when it announced in October 1987 that it was dismantling its commercial paper operations and closing its 200-person municipal finance department.³⁶ But soon afterward, other firms announced they were also exiting

the public finance business in whole or in part, and several others announced plans to trim commercial paper operations.

The commercial paper market is generally not a high-margin business, and spreads have narrowed as a result of increased competition. Underwriting margins on new municipal revenue bonds, suffering the pressures of the tax-exempt market noted above, are half what was common a few years ago,³⁷ although spreads may improve somewhat as players exit the market. The spreads for underwriting mortgage-backed pass-through type securities have declined as this market has matured and the deals have become standardized.

As for underwriting securities backed by consumer loans, investment bankers are reporting only meager profits so far and do not expect them to increase until deals in this fledgling market become more standardized. The structure of a deal depends in part on the character of the underlying assets. It is also affected by the objectives of the originator and the legal, regulatory, and accounting environment in which the issuer operates. Vehicles are being developed which allow issuers of asset-backed securities to make continuous offerings with a minimum of additional work, but packaging most deals is still very labor-intensive and costly. Fees tend to be thin because while most deals are similar, none are identical and they can take up to a year to complete.³⁸ Underwriting spreads appear to be lower on repeated transactions of a similar type by a particular issuer, and to be higher on first issues and rise with the complexity of the deal.

Implications for currently proscribed powers

Of all the securities activities currently prohibited for banks, perhaps the most coveted is the ability to underwrite corporate stocks and bonds. One reason for banks' eagerness to enter this area is that it appears to be highly profitable.³⁹ The ability to underwrite these securities could also assist banks in strengthening their foothold in other areas, such as mergers and acquisitions, and enable them to develop expertise that could enhance their competitive position abroad. But, while this activity appears attractive, the obstacles to successful entry are immense.

Underwriting involves three major functions: origination, underwriting, and distribution. Origination includes designing the issue in terms of the type and quantity of the security to be offered, pricing, timing, and other features. This function also often includes handling the paperwork and administration, or "managing the books," for the issue. Underwriting proper is a risk-bearing function, as the underwriter purchases the new securities and runs the risk of having to resell them at a lower price than was paid to the issuer. The distribution function is the actual resale of the acquired securities to the public. The origination function is usually performed by one lead firm, sometimes with a co-manager, and a group of other firms is brought in on the deal to spread the risk and help distribute the securities.

The most lucrative of these functions is being the lead manager of an issue. The benefits which accrue to this firm go beyond the extra fee earned by managers, which is usually 20 percent off the top of the gross spread.⁴⁰ Additionally, firms compete for this position because it adds to a firm's reputation and prestige, thereby enhancing the chances of acquiring the business of other issuers as well as the repeat business of existing clients. Moreover, the managing firm's ability to select the other firms that may participate in the distribution syndicate, as well as set the size of each firm's participation, is perceived as a form of market power.

Table 3
Concentration in corporate underwriting management 1987

Dollar volume of issues managed by:*

	Top 5 (-----percent-----)	Top 10	Top 15
All issues	63.5	86.3	92.7
Debt issues	68.2	91.3	96.8
Straight debt	68.7	91.7	97.0
Convertible debt	58.1	82.0	92.4
Mortgage-related debt	63.9	89.0	96.6
Asset-backed debt	95.7	99.9**	--
Equity issues	50.4	77.0	87.5
Common stock	46.4	72.5	84.3
Preferred stock	64.9	93.4	99.3
Initial public offering	49.3	69.2	81.7

*Full credit given to lead manager.

**Reflects the top 8 lead underwriters.

SOURCE: IDD Information Services, as reported in *Investment Dealers' Digest*, January 11, 1988.

Obstacles to banks

Breaking into the ranks of top managers would be a formidable task for banks because of the structure of this market and the barriers that limit entry. Underwriting management is highly concentrated in a small number of firms. (See Table 3.) This situation has persisted for years and is the result of many factors. Most corporations solicit public funds infrequently; the success of an issue can be critical to their future prospects, so they must select a managing underwriter carefully. Issuers place a high value on an investment bank's reputation, track record, personnel quality, and size. Expertise in the issuer's industry is especially important. As investment banking firms often specialize in certain industries, the number of houses with qualified personnel is limited. The result has been the relatively stable relationships of issuing firms with particular underwriters that have come to characterize this market.⁴¹

Although becoming one of the top managers would be very difficult, there could be avenues open for new bank entrants to acquire the necessary expertise that do not appear to be insurmountable. Leading underwriters cater mainly to the largest issuers, roughly the Fortune 1000.⁴² Small and medium-sized firms are not large enough to attract the attention of large Wall Street firms, and rely on smaller regional broker-dealers who act as managing underwriters for local issuers. The number of regional firms that perform as managing underwriters is relatively small and banks might find that they could enter these more local markets with somewhat greater ease. Participation in these smaller issues could then aid banks in building a reputation for successful deals that could earn them the attention of larger corporations.

The requirements for entry into the cadre of top distribution syndicates are slightly less onerous, but not insignificant. The first requirement is adequate capitalization. Not only must firms have sufficient funds to commit to large blocks of securities before they are resold, but the SEC requires that underwriters also have net excess capital to cover 30 percent of the estimated value of the securities underwritten. In and of itself, this should not present a serious obstacle for quite a number of banking

organizations, some of which are more highly capitalized than large investment banking firms. The resources needed to establish and operate an underwriting affiliate are likely to be quite high, however, and may eliminate smaller organizations as potential entrants. The greater risks associated with underwriting and dealing in corporate securities is likely to raise regulatory minimum capital requirements for banks that establish such operations. In addition, these nonbank operations would need to be adequately insulated from the banking activities of the organization, requiring additional capital to maintain separate personnel and organizational structures.

The second requirement is the need for extensive and proven capabilities to distribute securities quickly. The success of major players stems from their extensive retail outlets or networks of institutional investors who purchase large blocks of securities. Though banks have developed some distribution channels through participation in municipals and private placements, these activities do not bring them into contact with some of the major investor categories of corporate securities. This suggests that commercial bank distribution capabilities would need to be broadened and strengthened considerably before they could meet this requirement. Barriers to entry are further reinforced by the underwriters' desire for cooperative relationships in distribution syndicates, which leads them to rely repeatedly on the same group.

Rule 415

A Securities and Exchange Commission (SEC) rule that went into effect in March 1982 may have mixed implications for commercial bank participation in both managing and distributing certain corporate issues. Rule 415 enables corporations to register their securities with the SEC but leave them on the shelf for up to two years until the markets are advantageous. Use of this shelf registration rule has increased since implementation, and in 1987 accounted for 46 percent of the dollar value of publicly offered corporate securities.⁴³ One result has been that issuers have shown more willingness to shop around for underwriting firms to handle deals still on the shelf.⁴⁴ This has caused some weakening in longstanding

client-firm relationships that could improve the chances for commercial bank entry.

Another aspect of this off-the-shelf underwriting does not augur as well for banks. Because securities are registered in advance, issues can be brought to market more quickly than in a traditional filing. The underwriter therefore has a shorter time to price the issue, scout for buyer interest, build a syndicate, or determine the accuracy of information disclosed by the issuer.⁴⁵ This accelerated processing has tended to lead to the use of smaller syndicates, more "internalized" (or nonsyndicated) deals, and more "bought deals" where the underwriter takes the whole issue. Managing such issues requires sufficient capitalization to carry large blocks of the new issue, in-house distribution capabilities, and personnel with appropriate expertise to price the issue and gauge the market quickly, all of which tend to favor the large investment banks.

The preceding discussion illustrates that, aside from the legal roadblocks to bank participation in corporate underwriting, there are a number of other obstacles as well. Time and considerable resources would be needed to build these operations. And, because it would be new terrain for banks, the relative level of expertise they could bring and the lack of a successful track record would put them at a considerable disadvantage, making it very difficult to make significant inroads. All of these factors imply that if legal prohibitions to bank entry into underwriting corporate securities were lifted, banks would not only need to have strong capitalization and trained personnel to enter this market but would also have the difficult task of luring clients away from firms with a 50-year head start both in establishing successful client-firm relationships and in building market share.

Impact of greater commercial bank penetration

It is difficult to project how deeply commercial banks will be able to penetrate into these new markets or how profitable nonbanking activities will be in the long run. It does appear, however, that bank expansion and profitability in these areas will be limited by two factors. First, given the huge startup costs, and in some instances the level of capitalization required, it is quite possible that only a handful

of the nation's 14,000 commercial banks will be able to establish significant investment banking operations. Even in currently permissible activities, not all banks have the willingness or wherewithal to participate.⁴⁶ Small banks that do engage in these activities in their local market are unlikely to do so on a scale that would significantly affect the dominance of Wall Street firms. This implies that the number of new entrants that will be competing for market share with the major investment banks may be limited.⁴⁷

Second, the legal ability to enter new nonbanking areas is no guarantee of profitability. The increased competition caused by commercial bank entry into currently proscribed activities can be expected to reduce spreads somewhat. Also, as banks gain experience and reputation, there could be more competitive pressure in areas where they currently operate, reducing these spreads further. Banks that commit substantial resources to building nonbank operations and survive the early lean years to achieve respectable market shares may not be rewarded with the hefty fees that previously prevailed.

Thus far, most commercial banks have had only limited success in their quest for non-interest income through nonbanking activities. However, investment banking divisions at large commercial banks have been in place for less than 10 years, and it is obvious that these banks already have some of the necessary ingredients to succeed. Banks that have developed a strong presence have done so in specific market niches, largely because they developed strategies that reflected their existing customer base and areas of expertise.

Despite these encouraging advances, most still report that expansion into these areas has contributed only marginally to profitability.⁴⁸ These banks have apparently been willing to forego immediate rewards and remain in the market for other reasons. Theirs is a longer-term strategy based on the hope that identification with investment banking products and a growing reputation will eventually lead to an increase in market share and thus provide leverage for entering into other areas.

Overall, though, bankers have discovered that what they thought were the greener pastures of high investment banking fees are not so easily attained. Profitability is not as-

sured to those who enter and years of unprofitable operation may be required.

¹ One reason for these higher returns is that some of the activities in which securities firms engage involve more risk than permissible commercial bank activities. Although the issue of risk is central to the controversy surrounding the wisdom of repealing or liberalizing prohibitions against increased bank participation in securities activities, it is beyond the scope of this article. See, for example, Elijah Brewer, III, Diana Fortier, and Christine Pavel, "Bank Risk From Nonbank Activities," *Economic Perspectives*, Federal Reserve Bank of Chicago, (July/August 1988), pp. 14-26 and John H. Boyd and Stanley L. Graham, "Risk, Regulation, and Bank Holding Company Expansion into Nonbanking," *Quarterly Review*, Federal Reserve Bank of Minneapolis, Vol. 10 (Spring 1986), pp. 2-17.

² George G. Kaufman and Larry R. Mote, "Securities Activities of Commercial Banks: The Current Economic and Legal Environment," Federal Reserve Bank of Chicago, *Staff Memoranda* 88-4 (1988), pp. 29-30.

³ Throughout this article, "commercial bank" refers to banks as well as their nonbank affiliates.

⁴ Jed Horowitz, "There's Life after Glass-Steagall for Wall Street, Report Says," *American Banker*, December 2, 1987, pp. 3, 8.

⁵ Revenue bonds are issued to finance corporate undertakings such as the construction of health care, pollution control, and public power utilities. This type of issue is considered more risky because interest payments are tied to revenues from the projects they finance and are not backed by the governmental unit that issues them. Andrew Albert, "Bankers Trust First in Tax-Exempt Financing," *American Banker*, July 16, 1987, pp. 1, 11-12, 15. A few exceptions to this general prohibition were made in the late 1960s, permitting banks to underwrite issues for housing and higher education.

⁶ *Recent Trends in Commercial Bank Profitability: A Staff Study*, Federal Reserve Bank of New York, 1987, p. 321.

⁷ Andrea Bennett, "Regionals Expect to Fill Gap in Municipal Bonds," *American Banker*, December 23, 1987, pp. 1, 2, 14.

⁸ The Tax Reform Act of 1986 ended the 80 percent tax deduction banks could take for the cost of buying and carrying municipal bonds and undercut the tax-exempt status of the bonds for some investors. Matthew Kreps, "Tax Act Pushes Banks to Cut Municipal Bond Holdings," *American Banker*, December 23, 1987, p. 16. See also Alexandra

From Cash Cow To a White Elephant," *American Banker*, December 4, 1987, pp. 1, 12.

⁹ For a discussion of the compensation issue and other internal impediments banks must overcome, see Terese Kreuzer, "Can Banks Be Top Notch Investment Bankers?" *Bankers Monthly*, October 1987, pp. 43-50.

¹⁰ The SEC does not require registration of securities involved in these private sales. In order to qualify for this exemption, however, the issue must meet certain criteria. Except for some smaller issues, no general solicitation of the public is allowed, and there are limitations on the number and sophistication of purchasers. Because disclosure laws do not apply, a private sale of unregistered securities is generally limited to investors who are capable of independent evaluation of the merits and risks of a prospective investment.

¹¹ *Recent Trends in Commercial Bank Profitability: A Staff Study*, *op. cit.*, p. 321.

¹² "There's Life after Glass-Steagall for Wall Street, Report Says," *op. cit.*, p. 3.

¹³ Brad Rudin, "Investment Banks Retain Dominance," *Pensions and Investment Age*, October 5, 1987, pp. 17, 20.

¹⁴ Andrew Albert, "Citibank Tops Bankers Trust as No. 1 in Mergers," *American Banker*, July 14, 1986, pp. 1, 19.

¹⁵ Jed Horowitz, "Banks Garner Few Domestic Merger Deals," *American Banker*, April 7, 1988, pp. 1, 22-23.

¹⁶ Phyllis Feinberg, "M&A Rankings Show Increased Concentration," *Investment Dealers' Digest*, January 25, 1988, pp. 44-47.

¹⁷ In 1988, however, Morgan Guaranty advised F. Hoffmann-La Roche & Co. in an unsuccessful \$4.2 billion bid for Sterling Drug Inc., a longtime client of Morgan. "Banks Garner Few Domestic Merger Deals," *op. cit.*, p. 23.

¹⁸ From 1982 to 1986, the percent of international capital raised by syndicated bank loans fell from 55 percent to 13.5 percent. Over the same period, the share of capital raised by bond issues rose from about 42 to 65 percent. M. S. Mendelsohn, "US Banks Keep a Hand in International Bonds," *American Banker*, July 18, 1986, pp. 1, 15.

¹⁹ "There's Life after Glass-Steagall for Wall Street, Report Says," *op. cit.*, p. 3.

²⁰ Richard M. Levich, "A View from the International Capital Markets" in *Deregulating Wall Street: Commercial Bank Penetration of the Corporate Securities Market*, edited by Ingo Walter (New York: John Wiley & Sons, 1985), p. 275.

²¹ This is significant because in Eurobond underwriting, the returns are even more heavily skewed toward managers than in the domestic market. In a typical underwriting, the lead manager and co-manager (if any) will claim half the fees, the underwriting group would share about 38 percent of the fees, and the selling group would share the remaining 12 percent. *Ibid*, p. 275 (footnote 58), quoting from M. S. Mendelsohn, *Money on the Move*, (New York: McGraw-Hill, 1980, pp. 184-190).

²² In 1987, only three U.S. investment banks were among the top 10 Eurobond bookrunners, and only seven were included among the top 50. Five Japanese firms ranked among the top 10 in 1987, up from only three in 1986. "Annual Financing Report," *Euromoney*, March 1988, pp. 4-6.

²³ "US Banks Keep a Hand in International Bonds," *op. cit.*, p. 15.

²⁴ "There's Life after Glass-Steagall for Wall Street, Report Says," *op. cit.*, p. 3.

²⁵ This ruling was in response to a series of applications filed by three large bank holding companies in 1987. The Fed held that underwriting and dealing in commercial paper, MRBs, and MBSs were permissible under the BHC Act and did not violate the Glass-Steagall Act as long as a subsidiaries' underwriting and dealing in such securities constituted no more than 5 percent of its total gross revenues and the subsidiary underwrote no more than 5 percent of the domestic market in such securities. See "Citicorp, J. P. Morgan & Co. Incorporated, and Bankers Trust New York Corporation," *Federal Reserve Bulletin*, Vol. 73 (June 1987), pp. 473-508.

²⁶ Although the bank holding companies included in the initial decision had also sought to underwrite securities backed by consumer loans, the Fed delayed approval until it could consider the issue further. Authorization to underwrite CRBs came in July, and was made subject to similar limitations. See "Chemical New York Corporation, The Chase Manhattan Corporation, Bankers Trust New York Corporation, Citicorp, Manufacturers Hanover Corporation, and Security Pacific Corporation," *Federal Reserve Bulletin*, Vol. 73 (September 1987), pp. 731-735.

²⁷ The moratorium was contained in the Competitive Equality Banking Act of 1987 (CEBA), and prohibited regulatory approval of any new securities, real estate, or insurance activities. CEBA was enacted in August, but the moratorium was imposed retroactively, to be in effect from March 6, 1987 to March 1, 1988.

²⁸ The Comptroller's decision was based, among other things, on a national bank's authority to sell its own or "any other lawfully acquired assets." Jed Horowitz, "Comptroller Approves Asset-Backed

Securities," *American Banker*, June 19, 1987, pp. 1, 14.

²⁹ The SIA had been pressing the Comptroller to issue a written opinion on recent deals of this kind so it would have a basis to bring a lawsuit against the regulator. *Ibid*, p. 1.

³⁰ "Marine Plays it Safe In Asset-Backed Offering," *Asset Sales Report*, November 16, 1987, pp. 1, 5. This issue came to market before the Comptroller's letter to Security Pacific.

³¹ "Citibank Stretches the Limits," *Asset Sales Report*, October 19, 1987, p. 3.

³² "Chemical Bank Offers First Deal," *Asset Sales Report*, April 25, 1988, p. 5.

³³ Robert Guenther, Robert E. Taylor, and Stephen Wermiel, "Supreme Court Backs Fed's Approval for Securities Underwriting by Banks," *Wall Street Journal*, June 14, 1988, pp. 3, 18.

³⁴ The twelve banks affected by this ruling are Bankers Trust, Chemical, Citicorp, Chase, Manufacturers Hanover, Morgan, Security Pacific, PNC Financial Corp., Marine Midland Banks Corp., First Interstate Bancorp., Bank of New England, and Bank of Montreal. *Ibid*, p. 18.

³⁵ "First Boston Tops Private Placements," *Asset Sales Report*, March 21, 1988, p. 5.

³⁶ "Salomon Sheds Low-Margin Businesses," *American Banker*, October 13, 1987, pp. 1, 23.

³⁷ Michael Quint, "Into the Breach," *United States Banker*, June 1988, pp. 12-13.

³⁸ See Janet Lewis, "The Asset-Backed Explosion," *Institutional Investor*, April 1988, pp. 191-195.

³⁹ Direct data on the profitability of investment banking services is difficult to obtain, but studies have suggested that there is a lack of competitive vigor in certain types of underwriting that enables investment banks to maintain spreads, and therefore profits, at levels that exceed the cost of providing such services and earning a reasonable rate of return for the level of risk involved. For a discussion and further references, see Thomas A. Pugel and Lawrence J. White, "An Analysis of the Competitive Effects of Allowing Commercial Bank Affiliates to Underwrite Corporate Securities" in *Deregulating Wall Street: Commercial Bank Penetration of the Corporate Securities Market*, edited by Ingo Walter (New York: John Wiley & Sons, 1985), pp.

93-139. See also Kaufman and Mote, *op. cit.*, pp. 22-23.

⁴⁰ The gross spread is the difference between the price the issuer receives for its securities and the price investors pay for them, usually expressed as a percentage of the gross proceeds of the issue.

⁴¹ See Pugel and White, *op. cit.* pp. 100-112. The authors discuss studies by Hayes, et al. on corporate affiliations with investment banking houses. [Samuel L. Hayes III, A. Michael Spence, and David Van Praag Mark, *Competition in the Investment Banking Industry*, (Cambridge: Harvard University Press, 1983).] The results generally suggest that larger, high-quality clients tend to affiliate with leading firms.

⁴² *Ibid*, p. 106.

⁴³ Based on data in SEC Monthly Statistical Review, August 1988, Vol. 47 No. 8, tables M-450 and M-465.

⁴⁴ Pugel and White, *op. cit.*, p. 116.

⁴⁵ The Securities Act of 1933 requires issuers to disclose information pertinent to the public's decision about whether to purchase a firm's securities. It also requires investment banks to ascertain whether the information is true and complete. The shortened processing time of issues brought to market under this rule leaves little time for this "due diligence." For this reason the SEC has limited the use of Rule 415 to larger, better known, publicly owned corporations. *Ibid*, p. 114.

⁴⁶ Indeed, where state regulators have granted more liberal securities powers for state chartered banks than are permitted for either federally chartered banks or bank holding companies, few banks seem to be taking advantage of the expanded powers. See Barbara A. Rehm, "State Banks Wary of Using New Powers," *American Banker*, April 11, 1988, pp. 1, 6.

⁴⁷ Of course, if Glass-Steagall restrictions were to be substantially eliminated, and with them the prohibition against bank affiliation with securities firms, major bank holding companies could "buy" rather than compete for market share by acquiring an existing securities firm.

⁴⁸ See Andrew Albert, "Why Banks Bother with Public Finance, and How the Big Three Are Succeeding," *American Banker*, July 16, 1988, pp. 1, 12, 14 and "US Banks Keep a Hand in International Bonds," *op. cit.*

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FEDERAL RESERVE BANK
OF CHICAGO

A note on the increase in noninsured commercial banks

Nancy N. Andrews, George G. Kaufman, and Larry R. Mote

According to data published in the *Annual Statistical Digest* of the Board of Governors of the Federal Reserve System, the number of commercial banks that are not insured by the Federal Deposit Insurance Corporation (FDIC) more than tripled between 1970 and 1986 from fewer than 200 to more than 600.¹ Although noninsured banks accounted for only 1 percent of all 13,688 commercial banks in 1970 and less than 5 percent of all 14,866 reported commercial banks in 1986, the increase in their numbers accounted for almost 40 percent of the reported 1,200 increase in the total number of commercial banks.

It is surprising that there should be such a strong demand for the services of noninsured depository institutions at this particular time. The recent sharp increase in the number of failures of depository institutions—commercial banks and thrift institutions—to the highest levels since the banking crisis of the early 1930s has increased the value to the public of the protection afforded by federal deposit insurance. Authorized by the Banking Act of 1933 and implemented for banks in 1934, federal deposit insurance has been expanded through the years to cover larger and larger amounts at a broader range of depository institutions. Today, it guarantees the par value of accounts at chartered commercial banks, savings banks, savings and loan associations, and credit unions up to \$100,000 per separate account.

Federal deposit insurance is widely considered to be a valuable advantage that these institutions have over their competitors, such as money market funds. Indeed, it is doubtful whether, in the absence of such deposit insurance, many (if any) depositors would maintain their funds in any of the many savings and loan associations that are currently insolvent by generally accepted accounting principles (GAAP) but have not yet been closed by the Federal Savings and Loan Insurance Corporation. Without federal deposit insurance, these institutions would be unable to repay all of their depositors in full and on time.

Both because of the increased value of federal deposit insurance and because the number of banks in the country or in a particular local or regional market is widely used as a surrogate for the intensity of competition, it is of interest to explore the reasons for the extraordinarily sharp increase in the reported number of noninsured banks. Careful examination of the data leads to the conclusion that the increase is to a large extent illusory and reflects primarily the inclusion of noncommercial banking institutions and the double counting of U.S. branches of foreign banks. Because noninsured banks are part of the total number of banks, the overstatement of noninsured banks also overstates the total number of banks in the country and in many local markets. If the number of banks is to be used as a measure of bank market structure or competition, it needs to be corrected for this bias.

The Board of Governors has collected data on the total number of banking institutions for many years. These data are obtained from many sources, including records of charters granted to new institutions. Bank organizers may obtain charters either from the Comptroller of the Currency, if they wish to establish a national bank, or from the individual state departments of financial institutions, if they wish to establish a state bank.

But, departments of financial institutions in many states are also empowered to grant charters to other depository institutions, such as trust companies that do not conduct deposit and other banking business or industrial (Morris Plan) banks, which are more like consumer loan companies or credit unions than commercial banks. These institutions are included in the total number of noninsured banks in the Board's data base. Clearly, if the num-

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Table 1

Adjustments to number of banks

	1980	1986
Total commercial banks, <i>Annual Statistical Digest</i>	14,836	14,866
Total commercial banks, current Board data base*	14,884	14,879
Less reported noninsured banks	- 436	- 640
Reported insured banks	14,448	14,239
Minus member nondeposit trust companies**	- 14	- 13
Plus insured branches of foreign banks, adjusted for double counting***	+ 14	+ 23
Insured banks, adjusted	14,448	14,249
Plus noninsured banks, adjusted	+ 115	+ 214
Total commercial banks, adjusted	14,563	14,463

*Differs from figure in *Annual Statistical Digest* because of revisions, the inclusion for 1980 of banks in Puerto Rico and the Virgin Islands, and other unexplained discrepancies.

**Nondeposit trust companies that are members of the Federal Reserve System had been included in the number of noninsured banks prior to 1986 but were included with insured member banks in the 1986 *Annual Statistical Digest* table.

***Although some U.S. branches of foreign banks obtained FDIC insurance after 1978, they continued to be reported in the noninsured category. They must be added back to get the total number of insured banks.

ber of banks is to be consistent and economically meaningful, these institutions should be excluded.

In addition, the U.S. branches of foreign banks are included in the count of noninsured commercial banks in the Board's listing.² Although most U.S. branches of foreign banks do engage in the business of commercial banking, the reported number of noninsured banks is greatly inflated by the way in which U.S. branches of foreign banks are treated. Every U.S. branch of a foreign bank is recorded as a separate bank, even if two or more branches of the same foreign bank are in the same state. The basic reason for this treatment, which differs from that accorded branches of domestic banks, is noneconomic. It occurs because branches of foreign banks are required to submit separate call reports (financial statements) to regulators. This gives rise to the potential for two types of double counting: double counting of multiple branches of a foreign bank in the same state, and—because, in contrast to U.S. banks, foreign banks are permitted to establish branches across state lines—double counting of offices of the same foreign bank in more than one state.

It is important to recognize that double counting at the national level does not necessarily constitute double counting at the state level. For example, if a foreign bank has

branches both in California and in New York, it is entirely appropriate that the bank be counted in the totals for both states; it represents one of the competing banking organizations within each state. However, when the data are aggregated to the national level, the bank should be counted only once. Thus, the national total should be smaller than the sum of the state totals.

Some of the branches of foreign banks should even be excluded from the state totals because their banking activities are sharply limited. Although the International Banking Act of 1978 grandfathered the activities of existing out-of-state branches of foreign banks, it required each foreign bank to declare a "home state" and prohibited any newly established branches in other states from engaging in deposit-taking activities (except those related to international business). Thus, branches of foreign banks established in other states since 1978 do not offer a full line of commercial banking services. They have been retained in the state totals in this study because of the difficulty in identifying the scope of activities conducted by individual branches.

Careful examination of the Board's data base for 1980 and 1986 revealed that many of the noninsured institutions included could not accurately be classified as commercial banks. Industrial banks, primarily in Colorado, ac-

Table 2
Number of noninsured banks in 1986, by state

	Adjustments							Breakdown of noninsured banks				
	ASD*	Board's current data base	Less insured branches of foreign banks	Reported total noninsured banks	Less industrial banks	Less nondeposit trust companies	Less double- counted branches of foreign banks	Total noninsured banks, adjusted	Incorporated banks			
									Noninsured branches of foreign banks	As defined under Bank Holding Company Act	Nonbank banks	Private banks
AL	0	0		0				0				
AK	1	1		1				0				
AZ	7	7		7				0				
AR	3	3		3	1			0				
CA	50	50	7	43		18	3	22	22			
CO	79	86**		86	81	5		0				
CT	1	1		1		1		0				
DE	3	3		3		3		0				
DC	3	3		3		0		3	3			
FL	13	13		13		13		0				
GA	1	1		1		1		0				
HI	4	4		4		4		0				
ID	0	0		0		0		0				
IL	68	69**	10	59		20		39	38	1		
IN	3	3		3	1	1		1				1
IA	1	1		1		1		0				
KS	2	2		2		1		1		1		
KY	2	2		2		1		1		1		
LA	1	1		1		1		0				
ME	1	1		1		1		0				
MD	1	1		1		1		0				
MA	9	9	3	6		0		6	5		1	
MI	2	2		2		0		2		1	1	
MN	2	2		2		1		1		1		
MS	2	2		2		2		0				
MO	5	5		5		5		0				
MT	1	1		1		1		0				
NE	5	5		5	1	4		0				
NV	1	1		1		1		0				
NH	3	3		3		3		0				
NJ	3	3		3		3		0				
NM	2	2		2		2		0				
NY	237	237	35	202		24	15	163	160	1		2
NC	2	2		2		2		0				
ND	2	2		2		1		1		1		
OH	3	3		3		2		1		1		
OK	8	8		8		5		3		3		
OR	9	9		9		4		5	5			
PA	16	16	2	14		7		7	3			4
RI	14	14		14	10	3		1			1	
SC	0	0		0		0		0				
SD	0	0		0		0		0				
TN	5	5		5	1	3		1		1		
TX	14	14		14	1	8		5		1		
UT	3	3		3		3		0				4
VT	1	2**		2		2		0				
VA	0	0		0		0		0				
WA	14	14		14		3		11	10		1	
WV	0	0		0		0		0				
WI	8	7**		7		7		0				
WY	1	1		1		1		0				
PR	10	10		10		1	5	4	1	3		
VI	6	6		6		1	3	2	2			
50 states + PR and VI												
Total	632	640	57	583	96	181	26	280	249	16	4	11
Interstate double-counting								-66	-66			
U.S. total, adjusted								214	183			

*Data taken from the *Annual Statistical Digest*

**Differs from table in *Annual Statistical Digest* because of unexplained discrepancies.

counted for 121 of the 414 noninsured banks reported in 1980 and for 96 of the 583 noninsured banks for 1986. Nondeposit, non-bank state-chartered trust companies accounted for 95 of the total reported noninsured banks in 1980 and for 181 in 1986.³

Double counting of noninsured foreign branches within the same state, particularly in New York, accounted for 30 reported noninsured banks in 1980 and 26 in 1986. In addition, 39 of the reported noninsured banks represented double counting of the same foreign bank in more than one state in 1980. The equivalent number was 66 in 1986.⁴ The increase reflects rapid expansion across state lines of branches of foreign banks.

If the reported number of noninsured banks were adjusted to eliminate industrial banks, nondeposit nonmember trust companies, and double counting of noninsured U.S. branches of foreign banks, the number would decline by more than 50 percent from 414 to 154 in 1980 and from 583 to 280 in 1986. The adjustments are detailed in Table 1. Of the adjusted 154 non-FDIC insured banks in 1980, 130 were branches of different foreign banks, 11 were incorporated commercial banks, and 13 were nonincorporated or private banks. In 1986, the adjusted 280 noninsured banks consisted of 249 branches of different foreign banks; 20 incorporated banks, including 4 nonbank banks; and 11 private banks.⁵ Thus, 77 percent of the noninsured banks in 1980 and 89 percent of those in 1986 consisted of branches of different foreign banks. Moreover, all the growth in the actual number of noninsured banks between 1980 and 1986 may be attributed to increases in the number of foreign banks operating branches in the United States.

Although a similar analysis of reported noninsured banks was not undertaken for other years, it is unlikely that the results would differ greatly. Thus, there appears to have been no actual increase in the number of domestically chartered noninsured banks in recent years. In addition, both the number of commercial banks in the country and its rate of growth are somewhat lower than is evidenced by the reported figures. This is particularly true in Colorado, where a large number of industrial banks were included, and in New York State, where multiple branches of foreign banks were double counted. For 1980, making the suggested ad-

justments to the number of noninsured banks would reduce the total reported number of commercial banks in the United States from 14,884 to 14,563 (noninsured banks would decline from 436 to 115 and insured banks would remain unchanged). In Colorado, the number would decline from 442 to 323 and in New York from 317 to 285. Similarly, in 1986, the adjustments would reduce the total number of banks in the country from 14,879 to 14,463 (noninsured would decline from 640 to 214 and insured would increase from 14,239 to 14,249). The number of banks in Colorado would decline from 552 to 466, and the number in New York from 441 to 402. The adjustments to the data by individual state are shown in Table 2. If similar adjustments were made to the number of insured banks, the numbers would decline even further.

The Board of Governors has recently announced that the table, "Banks and branches—Number in operation," in the *Annual Statistical Digest* will be revised. Beginning with the data for December 31, 1987, all branches of foreign banks will be excluded. This eliminates the problem of double-counting, but, because many of the branches of foreign banks offer all of the services offered by domestic banks, it results in understating the number of commercial banks. Thus, users of data on number of banks would be well advised to pay careful attention to how the data were compiled and what they do and do not include.

¹ Table 76, "Banks and branches—Number in operation, December 31, 1986, by state," *Annual Statistical Digest* (Washington, D.C.: Board of Governors of the Federal Reserve System, 1987), p. 190. The number of the table varies for earlier years.

² Before the enactment of the International Banking Act of 1978, U.S. branches of foreign banks were not eligible for FDIC insurance. When they did become eligible, the Board continued to list those that obtained FDIC insurance as noninsured banks. The number of insured U.S. branches of foreign banks was 22 in 1980 and 57 in 1986. These have been excluded from the data on noninsured banks in this article. In addition, banks in Puerto Rico and the Virgin Islands were added to the Board's 1980 data base to make it comparable to the 1986 base. There are other minor discrepancies between the Board's current data base for the two years and the figures published in the *Annual Statistical Digest*. The term "total reported number of noninsured

banks," as used in the remainder of this article, is based on the Board's data base rather than the *Digest* table, excluding insured branches of foreign banks and including banks in Puerto Rico and the Virgin Islands for both years.

³ A number of these institutions are members of the Federal Reserve System. Because they have no deposits, they are not subject to the usual requirement that member banks be insured. Prior to 1986, they were counted in the *Annual Statistical Digest* tables as nonmember, noninsured banks. In 1986 they were shifted to the state member bank category. There were 14 such trust companies in 1980 and 13 in 1986.

⁴ The same types of double counting occur for insured branches of foreign banks. Adjusting the number of insured branches of foreign banks for

double counting reduces the reported number of insured banks by 8 in 1980 and by 34 in 1986. A small number of foreign banks (one in 1980, three in 1986) have some branches that are insured and some that are noninsured. The data used here were not adjusted for double counting across the two categories.

⁵ Nonbank banks are institutions that, although chartered as commercial banks, either do not accept demand deposits or do not make commercial loans. Therefore, they were not considered banks under the Bank Holding Company Act before its amendment in 1987. However, in view of the small number of nonbank banks and because most of them do offer a broad range of banking services to individuals, it was decided to retain them in the final totals.

Real boats rock: Monetary policy and real business cycles

Steven Strongin

In the last fifteen years, economists' understanding of the economy has changed dramatically. Events have forced economists to reassess many of their most cherished assumptions about the way the economy works. Key economic relationships seem to disappear completely, only to reappear later with a casual indifference to professional opinion. The economy has pointedly and repeatedly demonstrated that it is a very complicated entity, capable of a great range of behavior. And the explanations that economists have developed to cope with this rudely apparent complexity bring into question the way economic policy has traditionally been analyzed.

This article outlines some of the major intellectual trends that have evolved in response to recent experience, paying special attention to how events have changed economists' understanding of economic policy, specifically monetary policy.

Since 1973, we have experienced three significantly different federal tax codes, three significantly different monetary regimes, and three different market assessments of basic commodity price trends. The value of imported goods as a percentage of total goods purchased has risen from 18 percent in 1980 to 26 percent in 1986. Foreign capital flows now account for 18 percent of U.S. capital needs. It is still unclear how economic theory will ultimately be affected by these events. Yet, a number of lessons are clear.

The U.S. economy is more sensitive to international markets, both capital and goods markets, than was commonly supposed. The tremendous diversity of economic experience among various sectors and regions, as well as the more celebrated effects of changes in the price of oil, have made it apparent that many fluctuations in the economy have less to do with changes either in domestic policy or demand conditions than economists had thought. The notion that supply conditions in terms of either input prices, competitive conditions, or technology are partially responsible for business cycle fluctuations is no longer an easily dis-

missed footnote in the history of economic thought but a major focus of current research.

The idea that real economic events such as oil shocks are responsible for some significant part of the volatility in economic activity implies directly that business cycle phenomena (including recessions and certain accelerations in inflation, as well as less dramatic events) may be necessary and natural responses to economic events. The policy implications of this are neither subtle nor small. Policymakers and economists have usually assumed that large changes in real growth and inflation represented mistakes that policy should attempt to correct. If this is not always the case, then the policy debate must be revised to deal with the possibility that bad economic news is not in itself sufficient reason for policy to act. In a world where supply factors matter, stabilization policy, while not necessarily wrong, is also not necessarily right. No longer can someone merely point to a recession and conclude that policy failed. The source of the offending event must be considered in order to evaluate whether a better outcome was really possible.

In a world where changes in supply are important, policy decisions are almost always a series of trade-offs between different goals. For instance, if policy seeks to make U.S. firms more competitive with foreign corporations by lowering the value of the dollar, it will generate a higher inflation rate. The higher inflation rate will reduce the standard of living of American workers even as the lower dollar creates more jobs for them. For business, the consequences are just as double-edged. While the lower dollar makes U.S. firms more competitive and attracts foreign capital for U.S. firms to build new factories with, it makes those same firms vulnerable to foreign takeover.

The standards by which economic policy is judged need to be revised. It can no longer be maintained that the economy would chug along at a solid 3-3.5 percent real growth rate

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no inflation if policy were run correctly. As the saying goes, "real boats rock."

Pre-oil-shock notions

Policy as repairman. The Keynesian notion of policy was one of managing an economy which, at least at the macroeconomic level, was incapable of managing itself. Greatly influenced by the Great Depression, Keynesian theory^{1,2} believed the economy is subject to large demand shocks that can incapacitate much of the country's production capacity. It followed from this view of the economy that the primary goal of policy is to offset demand shocks and prevent the resulting recessions from endangering the economic health of the nation. Fundamental to this viewpoint was the notion that cyclical fluctuations were due to largely unexplainable "animal spirits." Simply put, recessions were due to an economy in error and the goal of policy was to correct that error.

The IS-LM models used by the Keynesians, being primarily static in nature, caused economists to emphasize the current health of the economy rather than the prospects for healthy growth. Thus, during the heyday of Keynesian analysis, policy paid far more attention to current unemployment than to GNP growth.

Unemployment was viewed as a measure of an economy's failure to use all available resources. Within this paradigm, it is clear that the goal of policy is to create enough current demand to assure that all available resources are fully utilized. Tomorrow will be taken care of by tomorrow's policies. The intuitive appeal of this approach to policymakers is clear: If resources are not being used, then clearly they are being wasted. Trade-offs through time were largely ignored; they were not part of the theory. Keynesians believed implicitly in immediate and forceful counter-cyclical policies.

This gap in the Keynesian paradigm leads to some well known difficulties, such as policies biased toward inflation. The greatest failure of the Keynesian approach was its complete inability to cope with the stagflation of the early 1970s. In the Keynesian world, inflation means growth. This failure paved the way for the ascendancy of monetarism.

Policy as the problem In the monetarist's paradigm,^{3,4} the economy left to itself is a sta-

ble, healthy, dynamic entity that can be and often is disrupted by inappropriate policies, especially monetary policies. The heart of this analysis shares much with the Keynesian world view in that most problems originate in inappropriate levels of demand and that those problems manifest themselves in unnecessary and harmful economic fluctuations. However, the monetarist's paradigm argues that the inappropriate level of demand is the result of bad policy. Monetarists believe that if policy is stable (a steady 4 percent money growth is the most common definition of stable policy used by monetarists) then demand will remain stable, and the economy will experience steady non-inflationary growth.

The Keynesian and monetarist frameworks differ primarily in their assumptions about the ability of economic agents to make good decisions about the economy as a whole. Monetarists, unlike the Keynesians, hold that economic agents will make good decisions unless they are misled by policymakers. According to monetarists, the primary way policymakers mislead economic agents is by printing excess money. The extra money leads to excess spending that in turn leads to increased inflation and lower growth.

The monetarist paradigm is more dynamic in outlook than the Keynesian but it still does not have any formal structure for making policy trade-offs through time. There is no need in the monetarist paradigm to make trade-offs. If policy follows a strict 4 percent money-growth rule, the economy will do everything right.

Although it is hard to find policy prescriptions more different than the monetarists' and Keynesians', they both share the fundamental belief that policy can achieve stable growth, full employment, and zero inflation by the constant application of their policy recommendations. They both hold that economic outcomes can be consistently altered in a predictable way by policy. Thus, in their view, policy is ultimately responsible for all that happens in the macroeconomy.

Policy begins to lose its punch. The stagflation of the early 1970s was monetarism's big break. The Keynesian framework which had dominated macroeconomic policy for a generation was in serious trouble. Monetarism was in ascendancy. However, economic ideas were germinating that would transform

monetarism's basic policy message into something that its originators would have trouble recognizing.

The rational expectations hypothesis⁵ introduced the idea that economic agents could not be routinely fooled by policymakers. If economic agents are as smart as the monetarists hold, then they should also use information about future policy in an efficient manner. And if economic agents do rationally forecast future policy, then it will be impossible for policymakers to systematically fool those agents into carrying out the policymakers' wishes. The implications of this observation for policy analysis are large. If economic agents' actions are based on optimal forecasts of policymakers' attempts to fool them, then they will only be fooled by the random component of policy. This clearly destroys the ability of policymakers to "manage" the economy. Policymakers can mess things up by following random policies but they have no ability to systematically help the economy. Deviations from a policy rule hurt the economy because they are hard to forecast. And, even stranger, it doesn't really matter what the rule is, as long as economic agents can accurately forecast policy actions. In this context, a 4 percent money growth rule follows not from a classical monetarist argument, but from the observation that four is a very easy number to predict.⁶ This framework, more than any other, argued that having a rule is the best policy.

The world becomes unstable. Within the context of the rational expectations literature, the new classical approach^{7,8} provides a more complete theoretic structure. In the new classical paradigm, economic agents are dynamic optimizing agents with full information processing capabilities. Every economic agent becomes not only a full service economic forecasting firm but also a full service corporate planning department. The primary policy consequences of this approach are twofold. Not only are economic agents difficult to mislead, but structural relationships in the economy became less stable. Because economic agents act on implicit forecasts, different economic regimes lead to whole new decision rules. Policymakers have to deal with the expectations of economic agents but they can not count on consistent responses even to surprises. Policymakers in the new classical world were in a two-party guessing game.

This rational expectations paradigm formally introduced the notion that policy affects macroeconomic welfare by distorting the intertemporal allocation of resources. Economic agents, by attempting to optimize, would try to match opportunity costs across periods and would err when policy caused prices to be improperly set. Within the context of these models, the markets are perfect, in the sense that profit opportunities for intertemporal arbitrage are equal between the market and the government. As a result, policy, if it can do anything, can only distort the prices at which that arbitrage takes place and thus hinder the economy.

A substantial subgroup^{9,10} of the profession took issue with these policy conclusions, and pushed forward the notion that there were sufficient non-neutralities in money growth in the real world to allow plenty of room for consistent counter-cyclical policy action. What is interesting about this literature in terms of policy is that this analysis, like all of that preceding, maintained with very few exceptions that stability is good and instability is bad. The goals of policy, up to this point, are uniformly toward stability. The argument is centered around the effects of policy. Does policy correct or create the instability? All sides still hold that the economic nirvana of stable growth and zero inflation is possible if policymakers would follow *their* advice.

This is hardly surprising. From Keynes onward there have been virtually no sources of volatility in the real economy that have not involved someone making a mistake, according to economists. Although the questions about who exactly was making the mistake created many heated arguments, everyone agreed that *someone* made a mistake. It is also hardly surprising that, faced with the economic events since 1973, this world view did not hold up too well.

Post oil shock developments

Supply factors demand equal time. Beginning with the first oil shock, the economy has not behaved in ways that could be explained by previous demand-based models. The oil shocks shifted supply curves, creating upward price pressures at the same time they drove output down. Demand shifts cannot create that combination of events. The Reagan

Administration's 1981 tax law changes may have oversold their own direct supply-side effects, but the effect those tax law changes had on the value of the dollar had substantial real supply-side effects.

Many American firms simply could not compete in world markets with the price wedge that the 1981 tax bill created in the currency market. And while it is not the role of this paper to discuss exactly how the 1981 tax bill created that wedge, the wedge did indeed exist until the passage of tax reform, which returned U.S. companies to competitive health with a vengeance. Many subtle arguments may exist about arbitrage and Purchasing Power Parity, but nothing described the situation better during the peak of the wedge at the end of 1986 than a Harrod's department store ad. The ad claimed that it was possible for an American to fly to London and, by Christmas shopping in Britain, save enough to pay for airfare and hotel. The existence of such gross arbitrage opportunities provides more than a prima facie case that there were some serious distortions in the currency markets.

The effects of the price wedge were substantial. Policy efforts based on increasing the level of demand had their effects leached away by import growth. As a result, during much of this period demand growth substantially outstripped GNP growth. Inflation was reduced to artificially low levels as U.S. firms were forced to cut profit margins below long-run equilibrium just to stay in business.

Today, with the advent of tax reform we are seeing many of the price wedge effects in reverse as the economy corrects itself: GNP growth exceeding domestic demand growth, inflation artificially high, and the Japanese facing difficulties with their profit margins.

Since 1973 every aspect of macro performance has been significantly affected by "supply shocks". Real growth has been both helped and hindered by supply factors. Inflation has been both elevated and lowered. And, further, we have seen the effects of policy become attenuated in the face of larger forces.

We do not yet have a clear understanding of all of these supply-based phenomena. Nonetheless, we need to consider what the existence of substantial supply shocks implies for economic policy and for monetary policy in particular.

Real business cycles, or optimally bad times. A real business cycle is an aggregate fluctuation whose root cause is a variation in fundamental supply factors.¹¹ The basic economics of business cycles is very simple. If it becomes harder to produce goods, because a fundamental input such as oil has become scarce or because there has been a sudden change in international competitiveness, then it may no longer pay to produce as much, and a recession follows. As the shortage ends, or as production techniques adjust to new circumstances, production will increase.

The key element in the notion is that the increase in costs is, at least in part, only temporary. Only if tomorrow's goods will significantly undersell today's is there a good business reason for closing down. This is one of the reasons why the first oil shock in 1973, which was widely believed to be temporary, had so much more impact on production than the 1979 shock, which was viewed as permanent. Thus, temporary supply shocks make it perfectly possible to have a recession or a temporary increase in inflation without any mistakes being made.

Two key aspects distinguish the real business cycle models from all the paradigms examined so far.^{12,13} First, business cycles exist without any mistakes. Second, they are optimal. Social welfare is maximized by allowing non-trivial fluctuations in economic performance. The policy consequences of these two aspects of real business cycle analysis are enormous. They bring into question the whole framework of stabilization policy. Economic stability had been synonymous with good policy. *Within a real business cycle context it is just as easy to suppose that a countercyclical policy will over-stabilize the economy.*

The intellectual break here is hard to overestimate. The whole policy goal structure of the last 50 years is turned upside down by taking changes in supply conditions seriously. The Keynesian framework started with the assumption that the mere existence of a business cycle was sufficient to demonstrate a major market failure that needed correcting. The monetarists countered that the existence of a business cycle was the result of misguided and inappropriate policy and that if the Keynesian types could just leave well enough alone business cycles would largely disappear. Rational expectations analysis took this argument one

step further. It held that the market can correct for all but random policy and that business cycles were the result of random policy actions. But, in all three cases the business cycle was the symptom of a problem that it was the role of economic policy to cure.

Now, the whole mind set of policy analysis must be reassessed. The vocabulary of policy analysis may need to be rebuilt around the possibility of "good" recessions or "good" inflation. The intellectual transition will not be easy. We cannot say that all cycles are necessarily optimal. Or that there is no role for stabilization policy. But we can say that the justifications will have to be very different from what they have been.

The rest of this paper examines these issues and makes some suggestions about that new vocabulary. But a short digression to discuss how future real business cycle models may differ from today's is now in order.

New issues for old models. One obvious thing about supply-based cycles is that they may not be repeatable: A random disturbance happens only once. It may be that most shocks are enough alike that they can all be treated the same, as today's models assume, but it is equally likely that many shocks, such as oil shocks, may not be so amenable to models with stable supply functions. While each of the three oil shocks we have experienced in the last 15 years has been of approximately the same size in terms of price movements, each has had substantially different macroeconomic effects. Many reasons exist to explain the difference among oil shocks, yet the issues raised by the differing responses cannot be dismissed.

A supply shock carries with it the potential for a fundamental shift in the economic structure of an economy. As the supply curve is shifted, wealth and earning power are redistributed. While preferences may not actually shift, the relative weights across consumers may mimic such a shift at the macro level. (Saving behavior on an international basis certainly showed this kind of response after the first oil shock.) Thus, one supply shock could, from an economist's viewpoint, be the equivalent of a whole new economy. In the face of a whole new economy, it would be unreasonable to hold the policy regime constant. The current fashion of developing macro models which hold underlying structure as constant as possible may need to be abandoned.

It is also quite possible that a lack of data or repeated experience with a particular type of shock may force a return to some ad hoc constructions in macro modeling. This is not to say that economists will backtrack to Keynesian-style models, but only that we may need to use economic intuition to model the instabilities directly and that the models of those instabilities may have insufficient data to be estimated or verified.

Another significant development will be an effort to integrate industry and regional considerations with macro models. Supply shifts not only create macro disturbances but also micro ones. (Just compare Boston's and Houston's economies over the last 15 years.) It is at this level rather than economy-wide that structural stability is likely to be found. This is not the micro foundations modeling of the early 1970s or the representative agent optimization techniques of new classical analysis, but industry-, geographic-, and demographic-based analysis that takes into account the micro eddies in the macro ocean. We may be able to build models of price adjustment and output of individual sectors based on their own supply conditions. These models will allow some of the macro instabilities due to changes in industrial structure and shifts in the relative importance of various demographic groups that result from supply shifts to be analyzed if not accurately predicted.

New ways of looking at policy

In analyzing the policy implications of real business cycles, the first necessary adjustment is to recognize that policy, aside from being good or bad, random or predictable, is unavoidable. The way in which many real business cycle models have kept policy neutral is to simply not include it. Other have included it in very straightforward rational expectations usage as unexpected money. I submit neither of these approaches is adequate. The first, simply omitting policy, is clearly insufficient. The second approach misses a fundamental aspect of the real business cycle literature. By allowing events to create disturbances in real intertemporal scarcity, significant uncertainty about real intertemporal scarcity is created. Should policy obscure these economic signals, it will have real effects. While a money shock definition may or may

not be technically correct, it provides no insight into the distortions created by inappropriate policies.

An alternative approach^{14,15} is borrowed from micro policy analysis. Monetary policy should be interpreted as a price wedge in the intertemporal asset market. Policy has an effect only if it distorts a market price, specifically the intertemporal market price of credit. While this is inherently a nominal interest rate policy definition, it is very different from the classical Keynesian one. Here rates are measured relative to the marginal product of capital. *The key point is the emphasis on intertemporal prices. Interest rates are interpreted as a measure of intertemporal financial scarcity. Thus, a neutral monetary policy is one where financial intertemporal scarcity equals real intertemporal scarcity, and monetary policy is the wedge between financial and real intertemporal scarcity.*

The links to past definitions are fairly straightforward. In a world where real scarcity is constant, a stable money demand function without foresight would produce a monetarist definition of policy, and a stable money demand function with foresight gives you a rational expectations definition of policy. The Keynesian notion of policy would hold if the analysis were collapsed to one period. The key is that policy only has effects by distorting market prices, so that whether or not there are significant non-neutralities in the money supply process, the same notion of policy holds. In addition, we gain the advantage of avoiding the current difficulties by defining money in a useful way in a deregulated electronic world.

Unfortunately, interest rates are not the only prices that policy can distort. As we have seen demonstrated dramatically in the last six years, distortions in international currency markets can have large effects on the U.S. economy. Thus, the price distortion concept will need to include more than one asset. In some sense, it requires the inclusion of a whole structure of intertemporal prices both in domestic and foreign markets, although financial-market arbitrage reduces the relevant prices to the domestic term structure and current and future foreign exchange prices.

However, new policy definitions and supply-based models do not in any way invalidate either the monetarist or rational expectations lessons about policy; they simply make implementing them that much more difficult.

Policy can still clearly disturb the economy. In an economy that has reasonably efficient markets, it is difficult, though not impossible, for policy to have positive marginal product and the potential for significant social loss due to policy-created price distortions remains quite high.

So what is policy supposed to do?

The easier question is, "What is policy not supposed to do?" Clearly, it should not seek to destabilize the economy. Just because a cycle may be optimal does not make it optimal. Likewise, policy should not seek to automatically stabilize the economy because real business cycles clearly cause all economic variables, both financial and real, to vary through time. Policy should not seek to artificially stabilize some particular variable above all others.

Real business cycle analysis points out a whole new set of limitations of policy. Not only can policy not create the full-employment prosperity of the Keynesian models, it cannot, or at least should not, seek to provide the steady, even growth and steady prices that the monetarists so value. Rather, it suggests a world where policy should seek to fit in and be as unobtrusive as possible. When supply shocks hit, it may be best to batten the hatches and sail into the wind.

Such a policy would clearly avoid the dangers of systemic inflationary excesses that seemed to characterize policy in the late 1970s. Policy would be run so that everything in the economy could be explained without reference to policy. This is a sort of real business cycle monetarism. It lacks only a mathematically compact rule.

It is interesting to note just how close this view of policy fits the Federal Reserve's own public statements. Academics have usually viewed the Federal Reserve as a big fish in a small pond. The internal view is of a small fish in a large ocean. In some ways the real business cycle literature is closer to the older institutional view of the role of Federal Reserve policy, that of providing a sympathetic financial environment for the conduct of business. If you examine the Federal Open Market Committee's reports to Congress, it is very clear that it is trying to do exactly what has been described in this article. Whether it has been successful or not remains a question. Analysts

outside the Federal Reserve have always viewed this line of argument as mere bureaucratic hedging.

Changing justifications

In the context of real business cycles literature, justifications for more activist policies require new arguments as well. Market imperfection arguments have often been used to explain the existence of business cycles or at least their “exaggerated amplitude,” thus providing opportunity for activist policy. These arguments take on new importance in a real business cycle context. They also lose their conclusions. In a real business cycle context, activist policies require the same justification that has always been required in economics, save macro policy, a cost-benefit analysis. It is no longer sufficient to demonstrate the ability to stabilize the economy to justify action. It must first be demonstrated that the fluctuation under consideration is suboptimal. Then it must be shown that the gain from intervening in the economy is greater than the loss from disrupting necessary adjustments in the economy. If the intervention dampens useful cycles, that will be part of the cost of intervention.

I believe that it is precisely this type of analysis that will come to dominate the policy process in the years to come. We must consider what is to be gained by action and what is to be lost. It is possible that we may come to the conclusion that economic policy has caused the economy to be substantially less volatile than it should be.

There will likely be arguments about the human costs of instability being traded off against the lower total social welfare that results from stabilization policies. This is a classic economic argument that, up until now, has been absent from the monetary policy debate, which has historically assumed stable growth is high growth.

The evaluation of policy

One of the more difficult aspects of this line of argument is deciding how to judge the success of policy. In a world where recessions can be called good, what constitutes failure? The obvious answer, that performance must be measured against what other policies would have produced, is perfectly true and largely

useless. The answer lies with the notion of market distortion.

There are some things that only policy can do. Systemic inflations, massive trade deficits unrelated to the true marginal product of physical capital, and multi-year recessions are clear evidence of failed policies, though not necessarily of failed monetary policy. Marginal judgments may not be possible, but an economy which is being severely disturbed is not hard to spot. The inability to reallocate resources from low-marginal-product industries to high-marginal-product industries is a sign of an economy which is growing too fast. An economy where the size and volatility of price increases are hindering investment planning is suffering from an overactive monetary policy.

Resource allocation is critical. Policy can harm the economy by interfering with the correct allocation of resources. Conversely, policy can assist the economy by helping in the correct allocation of resources. Thus, it is the easy flow of resources that must be the final measure of policy effectiveness. As suggested earlier, policy must rely on common sense and so must its evaluation. While it may be hard to formalize the exact nature of bad policy, it is not that difficult to spot bad policy by observing its bad outcome. This is precisely the role of the Federal Reserve’s Humphrey-Hawkins testimony before Congress. It is unlikely that the real-business-cycle paradigm will substantially quiet Federal Reserve critics.

Conclusions

The policy implications of the real business cycle literature are large. They point on the whole to policies that in the literature have always been referred to as discretionary. However, there is a big difference between discretionary and random. Policy in a real business cycle world must be very aware of its limitations. The most important message to policymakers from the real business cycle literature is, “Don’t try to do too much” and the primary lesson for critics of monetary policy is, “Don’t expect too much”.

¹ See Keynes, John Maynard, *The General Theory of Employment, Interest, and Money*, London: Macmillan, 1936.

² See Hicks, John, "Mr. Keynes and the Classics: A Suggested Interpretation," *Econometrica*, Vol. 5, April 1937, pp. 147-59.

³ See Freidman, Milton, "The Role of Monetary Policy," *American Economic Review*, Vol. 58, March 1968, pp. 1-17.

⁴ See Friedman, Milton, and Anna J. Schwartz, *A Monetary History of the United States: 1867-1960*, Princeton: Princeton University Press, 1963.

⁵ See Barro, Robert J., "Unanticipated Money, Output and the Price Level in the United States," *Journal of Political Economy*, Vol. 86, August 1978, pp. 549-80.

⁶ See Lucas, Robert E., Jr., "Roles, Discretion and the Role of the Economic Advisor," *Rational Expectation and Economic Policy*, ed. Stanley Fischer. National Bureau of Economic Research, Chicago, 1980, pp. 199-210.

⁷ See Lucas, Robert E., Jr., "Econometric Policy Evaluation: A Critique," *Carnegie-Rochester Conference on Public Policy*, Vol. 1, 1976, pp. 19-46.

⁸ See Sargent, Thomas, and Neil Wallace, "Rational Expectations, the Optimal Monetary Instrument, and the Optimal Money Supply Rule," *Journal of Political Economy*, Vol. 83, April 1975, pp. 241-547.

⁹ See Fischer, Stanley, "Long-term Contracts, Rational Expectations, and the Optimal Money Supply Rule," *Journal of Political Economy*, Vol. 85, February 1977, pp. 191-206.

¹⁰ See Taylor, John B., "Staggered Wage Setting in a Macro Model," *American Economic Review*, Vol. 69, May 1979, pp. 108-13.

¹¹ This is a somewhat broader class of model than the Kydland-Prescott real business cycle models in that it allows for a larger variety of supply shocks.

¹² See Long, John B., and Charles I. Plosser, "Real Business Cycles," *Journal of Political Economy*, Vol. 91, February 1983, pp. 39-69.

¹³ See Barro, Robert, and Robert King, "Time Separable Preferences and Intertemporal Substitution Models of the Business Cycle," *Quarterly Journal of Economics*, Vol. 99, November 1984, pp. 817-39.

¹⁴ See Laurent, Robert D., "An interest rate-based indicator of monetary policy," *Economic Perspectives*, Federal Reserve Bank of Chicago, Vol. 12, No. 1, January/February 1988, pp. 3-14.

¹⁵ See Mote, Larry R., "Looking back: The use of interest rates in monetary policy," *Economic Perspectives*, Federal Reserve Bank of Chicago, Vol. 12, No. 1, January/February 1988, pp. 15-29.

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