

FEDERAL RESERVE BANK OF KANSAS CITY

Economic Review



Third Quarter 1992

*The North American Free Trade Agreement:
What Is at Stake for U.S. Agriculture?*

Policy Implications of Recent M2 Behavior

Is Purchasing Power Parity a Useful Guide to the Dollar?

*Changes in Financial Intermediation:
The Role of Pension and Mutual Funds*

Are Bank Loans Still Special?

Economic Review

Federal Reserve Bank of Kansas City

Third Quarter 1992

Volume 77, Number 3

- The North American Free Trade Agreement:
What Is at Stake for U.S. Agriculture?* 5
By Alan Barkema
- Policy Implications of Recent M2 Behavior* 21
By Bryon Higgins
- Is Purchasing Power Parity a Useful Guide to the Dollar?* 37
By Craig S. Hakkio
- Changes in Financial Intermediation:
The Role of Pension and Mutual Funds* 53
By Gordon H. Sellon, Jr.
- Are Bank Loans Still Special?* 71
By Sean Beckett and Charles Morris
-

Contents

The North American Free Trade Agreement: What Is at Stake for U.S. Agriculture? 5

By Alan Barkema

U.S. agriculture has a keen interest in the proposed agreement to create a North American free trade area. The NAFTA would pull down trade barriers between the United States and Mexico and further open the door to a rapidly growing market for U.S. farm exports.

The impact of an approved NAFTA on North American farm trade may still depend heavily on the outcome of the global trade talks. The Uruguay Round of the General Agreement on Tariffs and Trade are still in progress. But a long dispute between the European Community and the United States over farm trade issues has stalled—and may sink—the Uruguay Round, despite six years of negotiation. Still, many of the most important farm trade issues are global rather than regional in scope.

With the NAFTA on the horizon for U.S. agriculture, Barkema examines three important questions: What are the major farm trade issues in the NAFTA? What benefits can U.S. agriculture expect from freer North American trade? And, how successful is the NAFTA likely to be in reforming farm trade on the continent?

Policy Implications of Recent M2 Behavior 21

By Bryon Higgins

Monetary growth has proven to be somewhat disappointing in recent years as a guide for conducting the Federal Reserve's monetary policy. Growth of the narrow aggregate, M1, became increasingly unreliable in the 1980s as an indicator of the future course of the economy and inflation. M2, the broader measure of money, replaced M1 as a policy guide, but it too has become unreliable.

M2 growth may soon return to a more normal relationship with the goals of monetary policy. But what if M2 growth remains unreliable for several more years? Worse yet, what if its properties have been so altered that M2 will never again be predictably related to policy goals?

Higgins argues that the erratic behavior of M2 in recent years is symptomatic of fundamental changes that are likely to continue. As a result, the Federal Reserve may need to reassess the framework for conducting monetary policy.

Is Purchasing Power Parity a Useful Guide to the Dollar? 37

By Craig S. Hakkio

Some academic and business economists use the concept of purchasing power parity to help predict the foreign exchange value of the dollar. *Purchasing power parity* (PPP) is a measure of the dollar's equilibrium value—the exchange rate toward which the dollar moves over time. Because the value of the dollar is currently below its PPP value, PPP advocates argue that the dollar is undervalued and therefore likely to rise.

Other economists acknowledge that PPP may help forecast the value of the dollar over the long run but doubt its usefulness as a short-run guide. They often cite the 1970s, when the dollar frequently strayed from its PPP value and sometimes took years to return. They also note that economic and political forces regularly buffet the dollar, keeping its value away from equilibrium. Thus, even though the dollar is currently below its PPP value, these economists maintain there is no guarantee it will rise in value in the near term. Hakkio argues that PPP is a useful guide to the dollar in the long run and—to a lesser extent—in the short run.

Changes in Financial Intermediation: The Role of Pension and Mutual Funds

53

By Gordon H. Sellon, Jr.

Since the late 1970s, the U.S. financial system has undergone considerable stress. Many traditional intermediaries, such as thrifts, banks, life insurance companies, and investment banks, have suffered large losses, and some have failed. Most analyses of these problems have focused on the difficulties of these institutions in adapting to the inflationary environment of the 1970s and 1980s.

Sellon argues that some of the problems of these traditional intermediaries have deeper roots. Over the postwar period, the rapid growth of pension and mutual funds has increased competition for household savings. While competition has opened up new business opportunities for some traditional intermediaries, it has undermined the profitability of others. As a result, many traditional intermediaries have been forced to adapt to new roles in the financial system. Recognizing the influence of pension and mutual funds is important both for understanding the causes of recent financial problems and for deciding what regulatory changes might be appropriate to ensure the future health of the financial system.

Are Bank Loans Still Special?

71

By Sean Beckett and Charles Morris

During the recent recession, many businesses had problems getting new bank loans. The weakness in bank lending to businesses, some believe, contributed importantly to the downturn in economic activity.

Those who blame the recession on weak bank lending believe that banks are the only source of credit for most business firms—that is, bank loans are special. In recent years, however, rapid growth of nonbank sources of business credit, such as finance companies and commercial paper, has led others to believe that bank loans have become less special. If these other sources of business credit are in fact good substitutes for bank loans, then a slowdown in bank lending is not as damaging to the economy.

Beckett and Morris examine evidence on whether other sources of business credit have recently become better substitutes for bank loans—that is, whether bank loans are less special than they used to be. The results of the examination suggest that bank loans are becoming less special.

The North American Free Trade Agreement: What Is at Stake for U.S. Agriculture?

By Alan Barkema

U.S. agriculture has a keen interest in the proposed agreement to create a North American free trade area. As proposed, the North American Free Trade Agreement, or NAFTA, would pull down trade barriers between the United States and Mexico and further open the door to a rapidly growing market for U.S. farm exports.

Efforts to create a free-trade area in North America began with the Canadian-U.S. trade agreement, or CUSTA, which went into effect in 1989. The NAFTA would extend the new free trade area to Mexico. While Canada is a party to the new NAFTA accord, the major players are Mexico and the United States because the CUSTA has already addressed many major farm trade issues between the United States and Canada.

The NAFTA negotiations got under way in June 1991 and concluded with the announcement in August by President Bush that negotiators from the three nations had reached agreement. The draft text of the proposed accord was released early in September. Before the new trade accord can go

into effect, Congress must give approval.

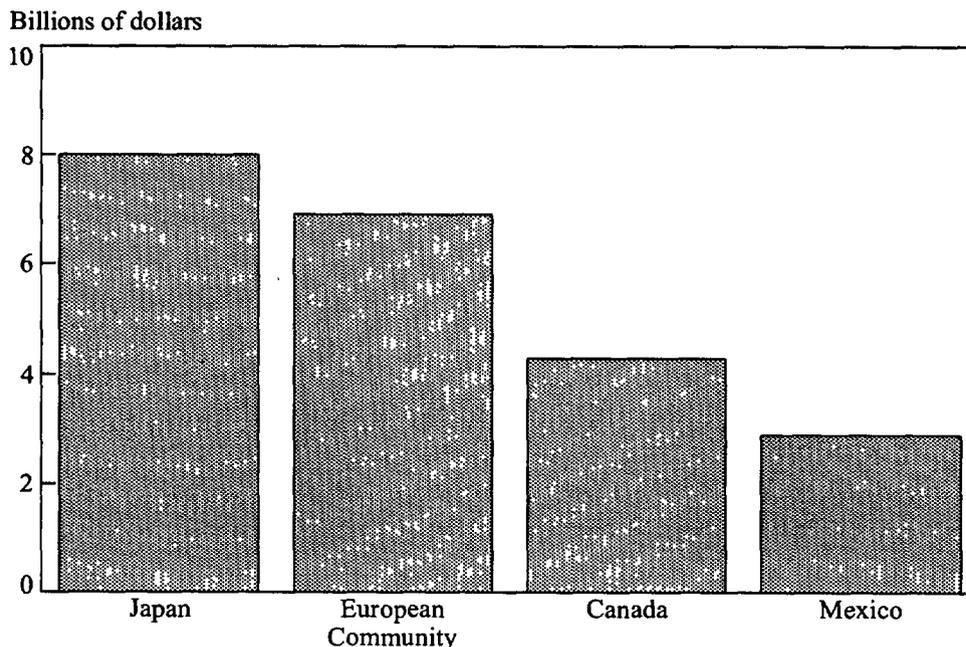
The steps to Congressional approval of the NAFTA treaty are spelled out under the timetable of the "fast-track authority." According to the fast-track timetable, the President must notify Congress of his intent to enter into the new trade accord at least 90 calendar days before he signs the agreement. Once the agreement is signed, Congress has 90 session days (about eight months) to approve the new agreement and any implementing legislation on a thumbs-up or thumbs-down vote without amendment. If approved, the NAFTA would most likely go into effect in January 1994.

The impact of an approved NAFTA on North American farm trade may still depend heavily on the outcome of the global trade talks. The Uruguay Round of the General Agreement on Tariffs and Trade (GATT) are still in progress. But a long dispute between the European Community and the United States over farm trade issues has stalled—and may sink—the Uruguay Round, despite six years of negotiation. Still, many of the most important farm trade issues are global rather than regional in scope, a fact that both the CUSTA and the proposed NAFTA have acknowledged.

With the NAFTA on the horizon for U.S. agriculture, three important questions stand out:

Alan Barkema is a senior economist at the Federal Reserve Bank of Kansas City. Tim Sheesley, an assistant economist at the bank, and Creg Shaffer, a research associate, helped prepare the article.

Chart 1
U.S. Agricultural Exports, 1990-92 Average



Source: U.S. Department of Agriculture, Economic Research Service.

What are the major farm trade issues in the NAFTA? What benefits can U.S. agriculture expect from freer North American trade? And, how successful is the NAFTA likely to be in reforming farm trade on the continent?

This article explores these three questions. The first section provides an overview of farm trade in North America and describes the major farm trade flows and trade barriers. The second section assesses the potential gains in U.S. net farm exports with freer North American trade. The third section considers the NAFTA's prospects for pulling down farm trade restrictions in North America. The article concludes that the NAFTA could provide modest benefits to U.S. agriculture, but the industry's gains in the NAFTA still depend heavily on the outcome of the Uruguay Round.

AN OVERVIEW OF NORTH AMERICAN FARM TRADE

Tearing down trade barriers in North America is of keen interest to U.S. agriculture because Canada and Mexico are key markets for U.S. farm products. While farm trade between Canada and Mexico is relatively small, large volumes of farm products flow between the United States and each of its two closest neighbors.

Canada and Mexico are U.S. agriculture's third and fourth largest markets after Japan and the European Community (EC) (Chart 1). In recent years, these two neighbors of the United States have purchased nearly a fifth of all U.S. farm exports. Dominating U.S. farm exports to Mexico are grains and oilseeds and livestock products. The

Table 1

U.S. Farm Trade with Canada and Mexico in 1990

U. S. exports	To Canada		To Mexico	
	\$1,000	%	\$1,000	%
Livestock and products	802,216	19	662,068	26
Grains, oilseeds, and products	848,609	20	1,287,490	50
Fruits, juice, and vegetables	1,709,397	41	237,020	9
Other	837,193	20	367,038	14
Total	4,197,415	100	2,553,616	100

U.S. imports	From Canada		From Mexico	
	\$1,000	%	\$1,000	%
Livestock and products	1,491,822	47	466,199	18
Grains, oilseeds, and products	775,334	25	71,298	3
Fruits, juice, and vegetables	280,211	9	1,346,360	52
Other	605,018	19	726,851	28
Total	3,152,385	100	2,610,708	100

Source: U.S. Department of Agriculture, Economic Research Service.

major farm exports to Canada are horticultural products (fresh and processed fruits and vegetables), grains and oilseeds, and livestock products (Table 1).

The United States is also a critically important market for Mexican and Canadian farmers, absorbing more than three-fourths of Mexico's farm exports and about a third of Canada's. Mexico's major food sales to the United States are warm weather crops—primarily fresh fruits and vegetables, fruit juice, and other tropical crops like coffee and sugar—crops that generally complement the seasonal production in the U.S. Sun Belt states. In addition, annual imports of feeder cattle from Mexico have risen to about a million head in recent years, supplementing the relatively tight supply in the United States. Canada's major farm exports to the United States are feeder cattle, various meat products (especially pork), and grain and oilseed products.

Barriers to farm trade in North America

The NAFTA seeks to remove the numerous barriers that restrict agricultural trade in North America. The primary players in the proposed accord are the United States and Mexico. Many farm trade issues between Canada and the United States were previously addressed in the CUSTA. And farm trade issues between Canada and Mexico are less important due to the almost negligible volume of farm trade between the two countries.¹ Mexico uses an array of tariff and nontariff barriers to protect its many small farmers from the rigors of foreign competition. The United States restricts imports to protect the domestic horticultural industry and to ensure the safety of food imports from Mexico (Table 2).

Mexican trade barriers. Opening the border to farm imports from the United States and else-

Table 2

Major Restrictions on Farm Trade Between Mexico and the United States

	Import restrictions imposed by:	
	Mexico	United States
Livestock products	<ul style="list-style-type: none"> ◦ 20% tariff on most pork products ◦ 10% tariff and license requirement on poultry products ◦ 10-20% tariff and license requirement on most dairy products ◦ Sanitary requirements 	<ul style="list-style-type: none"> ◦ Dairy and meat quotas ◦ Tariffs on many dairy, meat, and poultry products ◦ 1.2% tariff on live cattle ◦ Sanitary requirements
Grains and oilseeds	<ul style="list-style-type: none"> ◦ 0-20% tariff on most grains ◦ Seasonal 10% tariff on soybeans ◦ Seasonal 15% tariff on sorghum ◦ License requirements 	<ul style="list-style-type: none"> ◦ Some small tariffs
Horticultural products	<ul style="list-style-type: none"> ◦ 10-20% tariff ◦ License requirements 	<ul style="list-style-type: none"> ◦ Seasonal tariffs of up to 25% on many fresh vegetables ◦ 35% tariff on dried onions, garlic, cantaloupe, melons ◦ Phytosanitary regulations

Source: U. S. Department of Agriculture, Foreign Agriculture Service 1991a, 1991b, 1992.

where is an especially sensitive issue for Mexico. The Mexican government has a long tradition of safeguarding the interests of the nation's large number of small farmers.² About a third of the Mexican population live in rural areas and about a fourth are employed in production agriculture. The primary objective of Mexican farm policy is to boost incomes for small farmers, thereby minimizing rural unrest and slowing the pace of migration to Mexico City and other crowded urban areas. An important component of Mexican farm policy is restricting imports of low-cost farm products from the United States and elsewhere. By blocking farm imports at the border, Mexican farm policy pushes up farm prices and incomes (see appendix).

Mexico restricts imports of U.S. farm products with tariffs and import license requirements. Tariffs range up to 15 percent for grain and oilseed products and up to 20 percent for various meat, dairy, and horticultural products. Overall, the average tariff on U.S. farm exports to Mexico is about 5 percent.

License requirements are a thinly veiled method of enforcing import quotas. They are the primary restriction on many of the most important U.S. farm exports to Mexico. In many years, import licenses for corn and wheat are not granted until the entire domestic crop is used. Import licenses for horticultural crops effectively close the Mexican border to U.S. imports during the Mexican harvest season. And a combination of

license requirements with tariffs limits imports of U.S. poultry and dairy products.

U.S. trade barriers. The United States also maintains barriers to food imports from Mexico. Tariffs protect domestic producers from foreign competition, and stringent technical regulations on food imports guard the quality and safety of the U.S. food supply.³ The average tariff facing Mexican farm exports to the United States is about 6 percent, slightly greater than the average tariff facing U.S. farm exports to Mexico (USDA).⁴ But Mexican farm exports to the United States are subject to relatively few quantitative restrictions—quotas or import licensing schemes. The U.S. horticultural industry receives the greatest protection from Mexican imports. The average tariff on U.S. imports of horticultural products from Mexico is about 8 percent, and seasonal tariffs of up to 35 percent are assessed during the U.S. harvest season (USDA, Foreign Agricultural Service 1991a).

Quality, health, and sanitary standards play a prominent role in regulating U.S. imports of horticultural and livestock products from Mexico. For example, the United States strictly regulates the use of farm chemicals on imported horticultural crops.⁵ Mexican authorities also cooperate with the U.S. Department of Agriculture to limit the spread of the Mediterranean and Mexican fruit flies into U.S. citrus producing areas. Imports of fresh citrus products are generally restricted to those grown in a few areas of Mexico that have been certified “fly free.” And the United States maintains strict health and sanitary standards on livestock product imports to ensure a healthful food supply and prevent the spread of contagious livestock diseases prevalent in Mexico.⁶

HOW MIGHT THE NAFTA BENEFIT U.S. AGRICULTURE?

One measure of the benefit U.S. agriculture might receive from the NAFTA is the potential gains in net exports of each of the major com-

modities U.S. farmers sell to Mexico.⁷ But these gains from the NAFTA must be measured against a background of rapidly growing Mexican demand for U.S. farm products. As Mexican food demand grows and trade barriers fall, net exports of most U.S. farm products should rise.

The turnaround in the Mexican economy

The strength of Mexican demand for U.S. farm products is a key factor in the outlook for gains in U.S. farm trade with Mexico in the years ahead. Even without changes in trade rules in the prospective NAFTA, U.S. farm exports to Mexico should grow as Mexico continues to rely on its leading farm trade partner to fill bigger shortfalls in domestic food production. If the NAFTA could eliminate or significantly reduce the barriers that block trade between Mexico and the United States, the door to the rapidly growing Mexican market for U.S. farm products would open even wider.

A sea change in Mexico's economic policy has reinvigorated the nation's economy, and further gains in consumer incomes and food demand lie ahead. Beginning in 1985, Mexico began freeing its economy from protectionist trade measures and state controls that had virtually ensured the nation's chronic inefficiency and stagnation.⁸ With the dramatic policy shift, real GDP growth is expected to reach 5 to 6 percent a year by the mid-1990s (Shane and Stallings).

Stronger income growth will boost food demand in Mexico. On average, Mexican consumers spend more than a third of their incomes on food, a far higher proportion than in higher income countries like the United States (Table 3). As incomes rise in the rejuvenated economy, Mexican consumers will make upgrading their relatively low-quality diets a priority.⁹ Meanwhile, the Mexican population is much younger and growing more than twice as fast as the U.S. population. Growing incomes and a relatively young, rapidly growing population are a potent recipe for boosting food demand.

Prospects for U.S. farm exports

How will U.S. net farm exports to Mexico change if the NAFTA is implemented? Quantitative analyses of how the specific provisions of the proposed agreement will affect farm trade are not yet available. But several earlier studies frame the likely effects of a reduction in farm trade barriers between Mexico and the United States.

Livestock products. Increased meat consumption is likely to anchor the improvement in Mexican diets and boost meat imports from the United States. Mexican meat production has generally kept pace with current domestic consumption, leaving a relatively small gap to be filled by imports from the United States. Early on, the Mexican livestock industry probably could not keep pace with a surge in meat demand, creating an opportunity for U.S. meat producers to fill a widening meat supply gap.¹⁰ But in the years ahead, expansion in Mexican meat production is likely with the improving investment climate in Mexico. Growing Mexican meat production would limit the gains in U.S. meat exports.

While a reduction in trade barriers could pave the way for modest gains in U.S. meat exports to Mexico, it could also open the door to increased U.S. imports of Mexican feeder cattle. A key concern of U.S. cattle ranchers is that a stampede of Mexican feeder cattle into the U.S. would drive down domestic feeder cattle prices.¹¹ As Mexican meat production rises, however, the supply of Mexican feeder cattle available for export to the United States will probably shrink, easing competitive pressures for U.S. ranchers. Overall, freer trade with Mexico would probably provide a modest net benefit to the U.S. livestock industry.

Grains and oilseeds. Growth in the Mexican food market could have the biggest impact on U.S. grain and oilseed exports. But reducing Mexico's trade barriers will be a key to achieving the market's full potential. Expanded meat production in Mexico will spark increased demand for grains and oilseeds (mainly corn and soybeans) to feed

Table 3

Indicators of Food Demand in Mexico and the United States

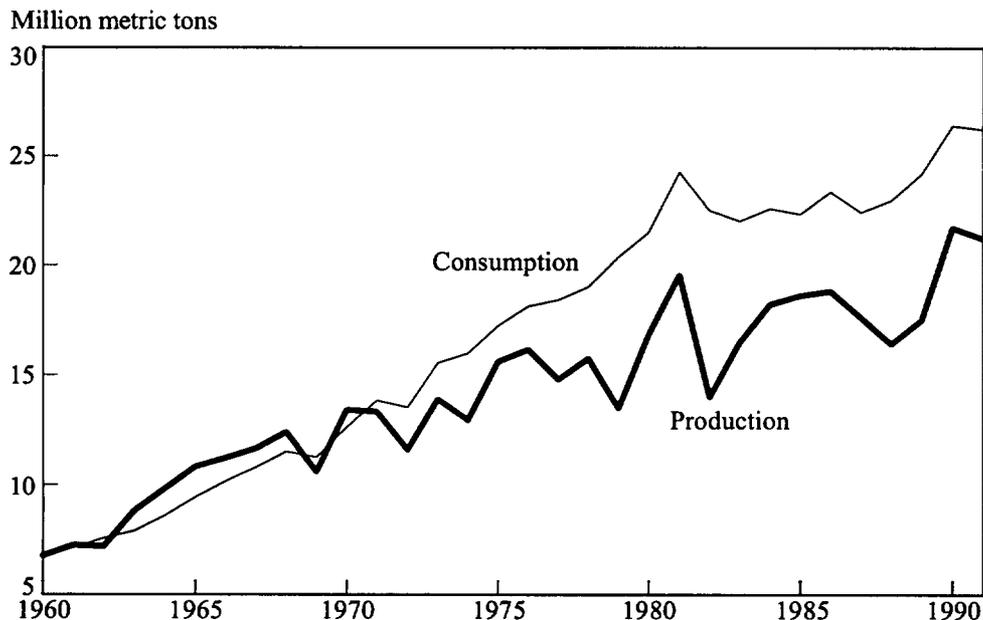
	Mexico	United States
GNP per capita (1990)	\$2,490	\$21,790
Annual GDP growth (%)		
1980-88	.5	3.2
1988-90	2.9	2.4
Food share of household consumption (%)	35.0	13.0
Annual population growth 1988-2000 (%)	1.9	.8
Share of population under 14 years old (%)	38.6	21.6

Source: The World Bank and author's calculations.

the nation's larger herds and flocks. Mexico's ability to boost grain production, however, is constrained by limited rainfall and irrigation. Mexico has long relied on U.S. farmers to fill the large gap between domestic grain production and consumption (Chart 2). In recent years, U.S. grain exports to Mexico have averaged about 6 million metric tons, roughly three-fourths of Mexico's total grain imports. Thus, a spurt in Mexico's food demand would create a prime opportunity to boost U.S. grain exports.

U.S. grain exports to Mexico would probably increase somewhat even without a change in trade rules, although an easing of Mexico's tight restrictions would allow an even bigger increase. Peterson estimates that by 1995 Mexican imports could

Chart 2

Grain Production and Consumption in Mexico

Source: U.S. Department of Agriculture, Economic Research Service.

jump about 25 percent for corn and wheat and 6 percent for soybeans with no changes in trade rules (Table 4). If the entire increase in Mexican imports came from the United States—an only slightly optimistic assumption—total U.S. exports would increase 2 percent for corn and marginally for wheat and soybeans. But if Mexico's restrictions on grain imports were completely eliminated, these gains in U.S. exports could triple.¹² Thus, the NAFTA would at best push up total U.S. grain and oilseed exports several percentage points, a significant but still modest increase.

Horticultural products. Contrary to perceptions, the growing Mexican market could also create new export opportunities for fruit and vegetable producers in the southwestern United States. Mexican consumption of horticultural

products is likely to surge as consumers improve their diets. But Mexican fresh fruit and vegetable growers may be hard pressed both to supply a growing domestic market and to expand exports to the United States. Most Mexican producers are small farmers without access to the latest production technologies. Expansion in the Mexican horticultural industry may require investment by producers from the United States and elsewhere (Cook). Thus, growing food demand in Mexico could ease the pressure U.S. producers might otherwise feel from larger imports from Mexico under freer trade.

Still, Mexico is the leading supplier of horticultural products to the United States, and U.S. imports of some Mexican products could expand as trade restrictions fall away. A favorable climate

Table 4

Prospective Gains in Mexican Grain Imports by 1995

	Current trade rules			Free trade		
	Increase in Mexican imports		Increase in total U.S. exports	Increase in Mexican imports		Increase in total U.S. exports
	(1000 metric tons)	(percent)	(percent)	(1000 metric tons)	(percent)	(percent)
Corn	977	25.5	2.1	2,814	73.4	5.9
Wheat	141	24.7	.4	429	75.0	1.2
Soybeans	99	6.0	.6	348	21.2	2.0

Sources: Peterson and author's calculations.

enabling production of fresh vegetables which are out-of-season in the United States is Mexico's primary competitive advantage.¹³ The presence of Mexican and Mediterranean fruit flies in Mexican production regions will constrain U.S. imports of fresh fruit from Mexico. But imports of Mexican orange juice could increase as tariffs fall, creating greater competition for Florida orange juice producers (Spreen). And increased investment by U.S. firms in the Mexican food processing industry could boost U.S. imports of various canned and frozen fruits and vegetables (USITC).

Thus, the outlook for the U.S. horticultural industry under the NAFTA is mixed. The NAFTA could boost exports to Mexico for some products and boost imports from Mexico for others. On balance, freer trade with Mexico could have a modest negative effect on the U.S. horticultural industry.

Net gains. In sum, freer North American trade would benefit some parts of U.S. agriculture more than others. U.S. feedgrains producers would reap the biggest rewards, as export sales rise to fuel larger meat and poultry production in Mexico. The U.S. livestock industry could also expect a slight gain in net export sales, but the U.S. horticultural

industry may feel increased pressure from Mexican imports.

Overall, freer trade in North America should result in a net gain in U.S. farm exports, but the gains are likely to be modest. For example, even a doubling of U.S. export sales to Mexico—a prospect which seems optimistic at this time—would boost total U.S. farm exports only 7 percent.¹⁴ Meanwhile, a modest increase in farm imports from Mexico is likely. On balance, an overhaul of trade rules with Mexico would probably add a few percentage points to total U.S. net farm exports.

HOW MUCH REFORM CAN THE NAFTA DELIVER?

The draft text of the NAFTA accord proposes a major overhaul of farm trade rules in North America. After a lengthy transition period, the NAFTA promises to eliminate most barriers to farm trade on the continent. Still, some vexing farm-trade problems will remain, since many of the most difficult problems require a *global* rather than a *regional* solution. This section summarizes the major farm-trade provisions of the proposed

NAFTA accord and draws on lessons learned in the CUSTA and the Uruguay Round to highlight the NAFTA's likely successes and shortcomings.

Farm trade provisions in the NAFTA

As proposed, the NAFTA would spell out separate bilateral agreements on farm trade between Mexico and the United States and between Canada and Mexico. The CUSTA would continue to regulate farm trade between Canada and the United States. The greatest contribution of the proposed NAFTA to farm trade is the eventual elimination of tariff and nontariff barriers between the United States and Mexico. But the gains will unwind slowly, thanks to a lengthy transition period and "safeguard" provisions. Moreover, the new agreement makes virtually no headway in scaling back trade-distorting farm subsidies.¹⁵

Tariff and nontariff barriers. The NAFTA will change the rules of farm trade between the United States and Mexico most significantly by tearing down tariff and nontariff trade barriers. Tariffs on some farm products would be eliminated immediately, while others would be phased out during a period of 5, 10 or 15 years. The longest phase-out period would be reserved for producers who are most sensitive to trade liberalization, including corn producers in Mexico and producers of sugar, orange juice, and various other horticultural crops in the United States.

The NAFTA would also eliminate immediately all nontariff barriers—like the licensing requirements Mexico uses to restrict imports of U.S. grain. But for some products the old nontariff barriers would be replaced with a system of quotas and tariffs designed to duplicate their restrictive effect on imports. These new restrictions would gradually be removed during the transition period. For example, the licensing requirement restricting U.S. corn sales to Mexico would be eliminated when the NAFTA goes into effect, but U.S. exporters would be allowed to ship only 2.5 million metric tons (MMT) to Mexico duty free in the

first year of the new agreement. Additional corn exports in excess of the 2.5 MMT quota would be constrained by a new 215 percent tariff.

These restrictions on U.S. corn exports to Mexico would be phased out during a 15-year transition period by increasing the duty-free quota by 3 percent per year and by decreasing the tariff on exports in excess of the quota.¹⁶ Thus, the NAFTA promises to open the door for U.S. corn exports to Mexico, but the door would swing open slowly.

The NAFTA also proposes changes to rules on trade in livestock products between the two nations. The agreement would remove Mexico's import license requirement on imports of U.S. poultry, and tariffs on most meat and poultry products would be phased out in 10 years. Mexican imports of most U.S. beef products would remain tariff-free.

The prospective agreement also includes strong "rules of origin" to prevent non-NAFTA countries from unfairly benefitting from the reduction in trade barriers within the new free-trade area. In brief, these rules would limit the NAFTA's preferential trade rules to products produced in the NAFTA countries. Products produced in a non-NAFTA country and shipped through one NAFTA country into another would not be eligible for the NAFTA's lower tariffs. The rules of origin are especially important for many manufactured products, such as automobiles and textiles, and some agricultural products, notably sugar.

Safeguard provisions. To ease the adjustment of some industries to freer trade, the NAFTA proposes a set of safeguard provisions, in addition to a long transition period. The safeguard provisions allow the importing country to reimpose tariffs during the first ten years of the agreement whenever imports rise to a trigger level. Thus, producers are protected from a surge in imports as they gradually adjust to freer trade.

In the United States, the safeguard provisions apply to imports of tomatoes, onions, eggplants,

Chili peppers, squash, and watermelons, which comprise about 15 percent of total U.S. farm imports from Mexico. In Mexico, the safeguard provisions apply to imports of live swine, pork products, potato products, and apples, which comprise about 3 percent of total U.S. exports to Mexico.

Farm subsidies. In contrast to the NAFTA's promised gains in phasing out tariff and nontariff barriers, the new agreement would wind down farm subsidies little, if at all. The proposed agreement identifies two types of farm subsidies: domestic supports, which encourage excess production, and export subsidies, which push farm products onto world markets at discount prices. But the agreement offers little reduction in trade distortions caused by either.

The NAFTA text acknowledges the production and trade distorting effects of domestic supports and encourages Canada, Mexico, and the United States to adopt policies which have minimal effects on production and trade. But the proposal provides no guidelines or timetable for reducing domestic supports, effectively deferring the issue to the Uruguay Round.¹⁸

Similarly, export subsidies are virtually untouched by the prospective agreement. The proposal recognizes that export subsidies are inappropriate within the free trade area, due to the disruption they can cause in the markets of an importing country. Nevertheless, the proposal allows for the use of export subsidies within the free trade area to counter subsidized exports from non-NAFTA nations.¹⁹ The proposal also spells out several rules on the use of export subsidies in the new free trade area. These include a provision for consultations between the exporting and importing countries and a requirement that a NAFTA exporting country provide three days' notice of its intent to introduce a subsidy on exports to another NAFTA country.²⁰ But otherwise, the prospective NAFTA promises no reduction in export subsidies, deferring this issue—along with domestic supports—to the Uruguay Round.²¹

Lessons from the CUSTA

The CUSTA, which will continue to apply to farm trade between Canada and the United States, provides useful insight into how effective the NAFTA will be in reforming farm trade between Mexico and the United States. In many ways, the CUSTA was prologue to the NAFTA, illustrating the limitations of regional trade negotiations to achieve meaningful farm trade reform during a global trade conflict. The CUSTA tinkered at the edges of farm trade reform, addressing bilateral trade irritants between Canada and the United States while deferring the most substantive issues to the Uruguay Round.²²

The CUSTA's greatest success was eliminating tariffs on food and agricultural products. Under the CUSTA, all tariffs on farm trade between Canada and the United States will be phased out by 1998, a process already well under way. But even the gradual elimination of tariffs, one of the most visible farm trade barriers, was carefully limited by "snap-back provisions" similar to the safeguards proposed in the NAFTA. The snap-back provisions of the CUSTA allow either the United States or Canada to reinstate tariffs on horticultural products whenever it appears that imports have pushed domestic product prices or planted acreage below certain levels. The snap-back provisions were written into the CUSTA at the insistence of the Canadian horticultural industry, which feared increased competition from a more efficient U.S. industry.

The CUSTA also set a precedent for deferring farm subsidies to the Uruguay Round. In the CUSTA, Canada agreed to drop the license requirement on imports of U.S. grain if grain subsidies become smaller in the United States than in Canada. But the agreement did not require subsidies to be lowered. The CUSTA's only contribution to subsidy reduction was an agreement by the two nations not to subsidize exports to each other. As a part of this agreement, Canada removed the transportation subsidy on shipments of durum

wheat from its west coast ports to the United States.

But even this simple regional agreement on export subsidies is almost unworkable in a global trading environment replete with subsidized exports. For example, Canada complains that subsidized sales of U.S. wheat to northern Africa and other parts of the world, which are also important markets for Canadian wheat, have the same effect on Canadian wheat growers as subsidized sales to Canada. Still, the United States is reluctant to stop its wheat export subsidies for fear of losing important markets to subsidized shipments from the EC. Thus, the vexing problems resulting from incomplete treatment of export subsidies in the CUSTA sound a note of warning for the NAFTA as well.

Despite the CUSTA's shortcomings, however, farm trade between Canada and the United States widened during the first two years of the agreement. Farm exports from each country to the other increased about 30 percent, while exports to other countries stayed nearly flat (Goodloe and Simone). Thus, even though the NAFTA shares several shortcomings with the CUSTA, it may bolster farm trade between Mexico and the United States. Still, the longer transition period in the NAFTA suggests that gains in U.S. farm trade may evolve more slowly with Mexico after the NAFTA than with Canada after the CUSTA.

Lessons from the Uruguay Round

Neither the prospective NAFTA nor the CUSTA has diminished the importance of the Uruguay Round to world food trade.²³ Competition in the world food market has flared into a global farm trade war. The major producers bar farm imports from entering their domestic markets, while they dump their subsidized surpluses abroad. An agreement in the Uruguay Round would end this global dispute by pulling down tariffs and nontariff barriers to farm trade, reducing farm production and export subsidies, and harmonizing technical regulations. The United States has led

the call for a reduction in these trade distorting farm policies, but no nation is willing to change its own farm and trade policies unless other nations—principally the EC—follow suit.²⁴

Failure of the Uruguay Round would limit the flexibility for Canada, Mexico, and the United States to make further changes in farm policies they deem vital to competing in the world market. Against such a backdrop, little real progress is likely in reducing farm subsidies regionally beyond the rhetorical support achieved in the CUSTA and proposed in the NAFTA. For example, Canada and the United States would remain reluctant to wind down farm subsidies that encourage the production and export of surplus grain while still locked in a trade dispute with the European Community and others. Meanwhile, Mexico would be reluctant to reduce the support it furnishes to its myriad small corn farmers.

On the other hand, a successful Uruguay Round would simultaneously accomplish many of the NAFTA's goals. Canada, Mexico, and the United States are all Uruguay Round participants, and a global agreement requiring open borders and lower subsidies would resolve many of the problems remaining in the NAFTA. In that event, the only remaining objective of the NAFTA would be to make additional marginal gains by relieving trade irritants that are unique to North America.

PROSPECTS FOR THE NAFTA

Mexico's limited means of improving diets for a population growing in size and affluence will create a natural market for many U.S. farm exports. Most segments of U.S. agriculture—especially feedgrains producers—look forward to increasing their sales to Mexican consumers. But numerous trade barriers block U.S. farmers from the growing Mexican market.

The reduction in barriers to farm trade between Mexico and the United States promised in the NAFTA is laudable. The proposed NAFTA's greatest achievement in reforming farm trade

would be to completely eliminate nontariff and tariff barriers. But these trade barriers will fall gradually—especially for corn and other grains, which promise the largest trade gains for U.S. producers. While the provisions of the new agreement are phased in, gains in U.S. farm sales to Mexico are more likely to be caused by further income growth in Mexico rather than by changes in trade rules under the NAFTA.

The slow pace of the Uruguay Round, which would liberalize farm trade worldwide, has focused attention on the NAFTA as an important step toward freer farm trade. But despite the lowering of barriers to farm trade in the NAFTA, the regional accord is likely to be a poor substitute for a global GATT agreement.

If the Uruguay Round fails, the global dispute over farm trade will continue. In North America and the rest of the world, certain critical farm and trade policies that boost domestic farm incomes and guard against subsidized foreign competition would remain in place. In contrast, a successful

Uruguay Round would wind down barriers to farm trade and bring an end to the global contest of farm subsidies. The Uruguay Round would achieve globally much of what the NAFTA seeks regionally. Thus, a successful Uruguay Round would erect a much higher platform for launching the NAFTA. The NAFTA could then focus on smoothing the relatively minor farm trade irritants that may still remain in North America.

The NAFTA appears to hold modest benefits for U.S. agriculture, particularly if the Uruguay Round succeeds. But an evaluation of the NAFTA also hinges on the benefits freer trade offers to Mexico and parts of the U.S. economy outside of agriculture.²⁵ Mexican consumers are almost certain to be big winners in a NAFTA, as they gain greater access to lower cost food imports from the United States. Meanwhile, expansion in nonfarm trade could boost economic activity and employment in both nations. In the end, these broader issues may determine if the proposed NAFTA is implemented.

APPENDIX

Farm Policy in Mexico

Mexican farm policies boost incomes of small farmers by supporting prices of farm products and by subsidizing purchases of farm inputs, such as petroleum products, credit, irrigation, and crop insurance. CONASUPO (Compania Nacional de Subsistencias Populares SA), the Mexican analog of the U.S. Commodity Credit Corporation, is the government entity responsible for implementing Mexican farm programs. CONASUPO buys commodities from farmers at high prices and sells to consumers at lower prices, supporting farm incomes while reducing consumer food costs. The high producer prices are in turn supported by trade barriers that limit the inflow of cheaper farm products from the United States and elsewhere.

The effects of these farm and trade policies are a

Table A-1

Producer and Consumer Subsidy Equivalents in Mexico

(Amounts in percent)

<u>Product</u>	<u>Producer subsidy equivalent</u>	<u>Consumer subsidy equivalent</u>
Corn	75	-59
Sorghum	59	-40
Wheat	20	-1
Soybeans	52	-42
Drybeans	-16	89

mixed blessing. Farmers gain because the policies boost farm incomes. Consumers lose because the policies push up food prices and taxes, despite the government's planned objective of reducing food costs.

The effects of government policies on farm incomes and consumer costs are measured with the producer subsidy equivalent (PSE) and the consumer subsidy equivalent (CSE). The PSE is the gain in farm incomes resulting from government policies and is expressed as a percentage of farm product sales. Similarly, the CSE is the

increase in consumer food costs and taxes expressed as a percentage of food costs.²¹ The policy-induced transfer of income from consumers to producers in Mexico is the biggest for corn, a staple in the Mexican diet (Table A-1). The U.S. Department of Agriculture estimates that government policies account for nearly three-fourths of farm income from corn production in Mexico. Meanwhile, consumer expenditures for corn products would be 60 percent lower in the absence of Mexican farm and trade policies.

ENDNOTES

¹ Mielke describes Canada's role in the NAFTA as largely defensive. Canada seeks to ensure that a special trade deal between the United States and Mexico does not cause Canadian exports to be displaced by Mexican farm products in the U.S. market or by U.S. products in the Mexican market.

² Protection of small farmers has been the cornerstone of Mexican farm policy since the Mexican Revolution of 1910. A major goal of the revolution was to make land available for small farmers, a principle that was institutionalized in the land reform provisions of the Constitution of 1917 (Grindle; Yates). Only recently was the constitution, which created a communal system of small, subsistence farms, amended to allow corporate investment in farming and private rental and sales of farmland.

³ Both nations set quality, health, and sanitary standards for imports of most farm products, especially livestock and horticultural products. Ideally these technical regulations are based on firm scientific evidence of a legitimate health or safety risk. Otherwise, artificial health or safety concerns could be used to conceal an unfair trade barrier. For example, U.S. exporters complain that restrictions Mexico imposed on hog imports from the United States following a hog cholera outbreak in Mexico in 1989 were unfair, because the United States is free of the disease (U.S. General Accounting Office).

⁴ Mexico's status as a developing country makes it eligible for lower tariffs than many other countries under the U.S. Generalized System of Preferences.

⁵ Heightened concerns about the safety of the U.S. food supply have focused attention on the use of farm chemicals on horticultural crops imported from Mexico. One recent study, however, found that chemical residues on farm products imported from Mexico were similar to those on products produced domestically. And the study found no evidence that different standards regulating the use of farm chemicals in Mexico gave Mexican producers an unfair advantage over U.S. producers (Newman).

⁶ Only a few red meat plants in Mexico have been approved by the USDA to export meat products to the United States, and imports of Mexican poultry products are blocked by the absence of an U.S. approved poultry inspection system in Mexico (Rosson and others).

⁷ The evaluation criterion used here, gains in net export sales, views the prospective NAFTA from the perspective of the U.S. farmer. An alternative criterion, such as changes in the availability and cost of food, would view the impact of the prospective agreement from the consumer's perspective. The NAFTA would have little effect on consumer food costs in the United States, because the agreement would result in only slight changes in total U.S. farm trade flows. In contrast, free trade could sharply reduce the cost of food in Mexico by giving Mexican consumers access to cheaper food produced in the United States (see appendix).

⁸ Since joining the GATT in 1986, Mexico has dropped its highest tariff to 20 percent, well below the GATT maximum of 50 percent. Meanwhile, the number of state enterprises, which are generally very inefficient businesses, has fallen from 1,155 to about 120, and many of those remaining are scheduled for sale or liquidation. Aspe (p. 148) applauds these changes in Mexican policy and succinctly summarizes the link between protectionist trade policies and a weak economy stating, "It is painfully obvious that those few countries that still subscribe to protectionist policies are only walking further down that primrose path to self-sufficiency—and poverty."

⁹ Per capita consumption in Mexico is almost double the U.S. level for cereal products and less than half the U.S. level for meat, milk, and horticultural products.

¹⁰ A recent study by Lee and others suggests rising incomes in Mexico and other middle-income countries tend to favor U.S. exports of value-added beef products—like fresh, frozen, or prepared beef—rather than live animals or products that have received less processing.

¹¹ For example, Rosson and others estimate that imports of Mexican feeder cattle pushed down U.S. feeder cattle prices about 7 percent in 1990.

¹² Another recent study also suggests growing incomes in Mexico could trigger significant potential gains in U.S. sales of corn, wheat, and soybeans. The sensitivity of U.S. exports to income growth in the importing country is larger in Mexico than in most other major U.S. export markets for all three crops. Estimated export elasticities suggest a 1 percent increase in Mexican income would boost U.S. exports 1.84 percent for soybeans, 1.95 percent for wheat, and 2.72 percent for corn (Davison and Arnade).

¹³ The advantage of lower labor wage rates in Mexico is partially offset by lower productivity (Cook).

¹⁴ The U.S. Department of Agriculture projects U.S. farm exports to Mexico at \$3 billion in 1992. Total U.S. farm exports are projected at \$40 billion.

¹⁵ Information in this section describing the proposed NAFTA is drawn from the draft text of the agreement, released September 8 (Office of the U.S. Trade Representative, 1992b) and from the proposed tariff schedule (U.S. Department of Agriculture, Foreign Agriculture Service, 1992). For less detailed, preliminary summaries of the NAFTA text, see U.S. Department of Agriculture, 1992; Office of the Press Secretary; the Governments of Canada, the United Mexican States, and the United States of America; and Office of the U.S. Trade Representative, 1992a.

¹⁶ The over-quota tariff would be reduced 24 percent during the first 6 years of the agreement and then reduced in a series of equal annual steps.

¹⁷ The 20-percent tariff on imports of U.S. pork products would be replaced with a tariff rate quota, which would also be phased out over 10 years.

¹⁸ The draft text states that the NAFTA countries "recognize that domestic support measures can be of crucial importance to their agricultural sectors but may also have trade distorting effects and effects on production. The Parties further recognize that domestic support commitments may result from the agriculture negotiations in the Uruguay Round of multilateral trade negotiations under the GATT." The NAFTA countries are encouraged to "move toward domestic support policies that: (a) have minimal or no trade distortion effects or effects on production; or (b) are exempt from domestic support reduction commitments under the GATT." (Office of the U.S. Trade Representative 1992b, Article 705, page 7-2).

¹⁹ According to Article 706 of the draft text, "...the Parties affirm that it is inappropriate for a Party to provide export subsidies for the export of an agricultural good to the territory of another Party *when there are no other subsidized imports of that good into that other Party* [author's emphasis]." (Office of the U.S. Trade Representative 1992b, p. 7-3)

²⁰ The agreement enables the exporting NAFTA country to

request consultation with another NAFTA country that is buying subsidized imports from a non-NAFTA country. If the importing country adopts a mutually agreed measure to counter the external subsidy, the exporting NAFTA country will not introduce its own export subsidy. The agreement would also establish a Working Group on Agricultural Subsidies "to work toward elimination of all export subsidies in connection with trade in agricultural goods between the Parties." (Office of the U.S. Trade Representative, 1992b).

²¹ The proposed NAFTA endorses the global elimination of export subsidies stating, "The Parties recognize that export subsidies may have serious prejudicial effects on importing and exporting Parties, and the Parties share the objective of achieving the multilateral elimination of export subsidies for agricultural goods. The Parties shall cooperate in an effort to achieve an agreement in the *General Agreement on Tariffs and Trade* which eliminates export subsidies on agricultural goods." (Office of the U.S. Trade Representative 1992b, Article 706, p. 7-3).

²² This discussion highlights several major provisions of the CUSTA. See Goodloe and Goodloe and Simone for a more comprehensive discussion of the CUSTA and its relationship to the NAFTA.

²³ Other issues also tie together the GATT and NAFTA. The GATT frowns on regional trade deals on theoretical grounds. The underlying principle of the GATT is that all nations should be treated equally in trade. Thus, each is to extend its best trading terms—most-favored nation (MFN) status—to all other nations. Regional trade deals are a direct violation of the MFN principle.

The problem with a regional trade accord is that the preferred trading terms within the free-trade region can unfairly divert trade from other nations. Still, the GATT will allow free-trade areas to form if they encompass substantially all trade among the member countries and if they do not increase trade barriers to nonmember countries. These conditions help minimize the diversion of trade to member countries from nonmember countries, which may possess a comparative advantage. Generally, the potential for trade diversion, which is harmful to world economic welfare, is small when the members of a new free-trade area are already major trading partners—such as the three participants in the NAFTA. The exchange between Krugman and Bergsten provides a more extensive discussion of the relative merits of global and regional trade reform.

²⁴ Wonnacott and Lutz (p. 60) attribute the slow pace of progress in the international trade talks to two problems, the "free-rider" problem and the "convoy" problem. Free riders hope to leave their trade barriers high while benefiting from the reduction in trade barriers elsewhere. Meanwhile, "the speed of the convoy moving toward freer trade is limited by the speed of the slowest ship."

²⁵ The effects of freer trade on other sectors of the Mexican economy might ease the adjustment facing Mexican agriculture. One study found that the NAFTA would stimulate employment growth in Mexico and have little effect on the overall level of employment in the United States. But real incomes would be likely to fall for unskilled workers and rise

for skilled workers in the United States (USITC). Another study found a net gain of 130,000 jobs in the United States and 609,000 jobs in Mexico (Hufbauer and Schott).

²⁶ Webb and others provide more detailed definitions and the formulas for calculating both PSEs and CSEs.

REFERENCES

- Aspe, Pedro. 1991. "Mexico's Macroeconomic Adjustment and Growth Perspectives," *Policy Implications of Trade and Currency Zones*, Federal Reserve Bank of Kansas City, pp. 147-56.
- Bergsten, C. Fred. 1991. "Commentary: The Move Toward Free Trade Zones," *Policy Implications of Trade and Currency Zones*, Federal Reserve Bank of Kansas City, pp. 43-57.
- Cook, Roberta L. 1991. "Implications of the North American Free Trade Agreement (NAFTA) for the U.S. Horticultural Sector," *North American Free Trade Agreement Effects on Agriculture*. Park Ridge, Ill.: American Farm Bureau Research Foundation.
- Davison, Cecil W., and Carlos A. Arnade. 1991. "Export Demand for U.S. Corn, Soybeans, and Wheat," U.S. Department of Agriculture Economic Research Service, Technical Bulletin no. 1784.
- Food and Agricultural Policy Research Institute. 1992. "Implications of the GATT Agreement for World Commodity Markets, 1993-98: An Analysis of the Dunkel Text on Agriculture," Center for Agricultural and Rural Development, Iowa State University, Ames, Iowa and Center for National Food and Agricultural Policy, University of Missouri-Columbia.
- Goodloe, Carol. 1991. "A North American Trading Block: The Relationship of CUSTA to MUSTA," paper presented at the XXI International Conference of Agricultural Economists, Tokyo, Japan, August.
- Goodloe, Carol, and Mark Simone. 1992. "A North American Free Trade Area for Agriculture: The Role of Canada and the U.S.-Canada Agreement," U.S. Department of Agriculture, Economic Research Service, Agriculture Information Bulletin no. 644.
- The Governments of Canada, the United Mexican States, and the United States of America. 1992. Description of the Proposed North American Free Trade Agreement, August 12.
- Grindle, Merilee S. 1990. "Agrarian Reform in Mexico: A Cautionary Tale," in Roy L. Prosterman, Mary N. Temple, and Timothy M. Hanstad, eds., *Agrarian Reform and Grassroots Development: Ten Case Studies*. Boulder, Colo.: Lynne Rienner Publishers, pp. 179-204.
- Hufbauer, Gary, and Jeffrey Schott. 1992. *North American Free Trade: Issues and Recommendations*. Washington: Institute for International Economics.
- Krugman, Paul. 1991. "The Move Toward Free Trade Zones," in *Policy Implications of Trade and Currency Zones*, Federal Reserve Bank of Kansas City, pp. 7-41.
- Lee, Jung-Hee, David Henneberry, and David Pyles. 1991. An Analysis of Value-Added Agricultural Exports to Middle-Income Developing Countries: The Case of Wheat and Beef Products, *Southern Journal of Agricultural Economics*, pp. 141-54.
- Mielke, Karl D. 1991. "A Canadian Perspective of a North American Free Trade Agreement for Agriculture," *NAFTA: North American Free Trade Agreement Effects on Agriculture*, vol. 1. Park Ridge, Ill.: The American Farm Bureau Research Foundation.
- Newman, Mark. 1991. "Pesticide Regulations and the NAFTA Negotiations. *NAFTA: North American Free Trade Agreement Effects on Agriculture*, vol. 1. Park Ridge, Ill.: The American Farm Bureau Research Foundation.
- Office of the Press Secretary. 1992. The North American Free Trade Agreement: Fact Sheet. The White House, August 12.
- Office of the U.S. Trade Representative. 1992a. Overview: The North American Free Trade Agreement, August 12.
- Office of the U.S. Trade Representative. 1992b. North American Free Trade Agreement: Text prepared September 6, 1992.
- Peterson, E. Wesley F. 1991. "Implications of a Free Trade Agreement with Mexico for U.S. Grain and Oilseed Exports." *North American Free Trade Agreement Effects on Agriculture*, Park Ridge, Ill.: The American Farm Bureau Research Foundation.
- Rosson, C. Parr III, Ernest E. Davis, Eduardo Segarra, Amy L. Angel, Kris Schulties, and DuBoise White. 1991. "The U.S. Mexico Free Trade Agreement: Issues and Implications for the U.S. Livestock and Meat Sector." *North American Free Trade Agreement Effects on Agriculture*. Park Ridge, Ill.: The American Farm Bureau Research Foundation.
- Shane, Mathew, and David Stallings. 1991. "The Mexican Economy in the 1990s: Markets Are In; State Control Is Out." Agriculture Information Bulletin no. 635, Washington, U.S. Department of Agriculture Economic Research Service.
- Spreen, Thomas H. 1991. "Analysis of the Impact of the North American Free Trade Agreement in the U.S. Citrus

- Industry." *North American Free Trade Agreement Effects on Agriculture*. Park Ridge, Ill.: American Farm Bureau Research Foundation.
- U.S. Department of Agriculture. 1991. "Agriculture in a North American Free Trade Agreement: An Interim Review," Washington.
- U.S. Department of Agriculture. 1992. Fact Sheet: The North American Free Trade Agreement, Benefits for U.S. Agriculture, August 12.
- U.S. Department of Agriculture, Foreign Agricultural Service. 1991a. *Horticultural Review*. Washington: U.S. Department of Agriculture.
- U.S. Department of Agriculture, Foreign Agricultural Service. 1991b. "Mexican Import Tariff for Agricultural Commodities," Gedes Voluntary Reports MX 1011 and MX 1012.
- U.S. Department of Agriculture, Foreign Agricultural Service. 1992. NAFTA Side-by-Side Tariff Schedule, September 2.
- U.S. General Accounting Office. 1990. "U.S. Mexico Trade: Trends and Impediments in Agricultural Trade." Briefing report to the Chairman, Committee on Agriculture, House of Representatives.
- United States International Trade Commission. 1991. "The Likely Impact of a Free Trade Agreement with Mexico." USITC Publication 2353, Washington, USITC.
- Webb, Alan J., Michael Lopez, and Renata Penn. 1990. *Estimates of Producer and Consumer Subsidy Equivalents*. Washington: U.S. Department of Agriculture Economic Research Service.
- Wonnacott, Paul, and Mark Lutz. 1989. "Is There a Case for Free Trade Areas?" in Jeffrey J. Schott, ed., *Free Trade Areas and U.S. Trade Policy*. Washington: Institute for International Economics, pp. 59-84.
- Yates, P. Lamartine. 1981. *Mexico's Agricultural Dilemma*. Tucson: The University of Arizona Press.

Policy Implications of Recent M2 Behavior

By Bryon Higgins

Monetary growth has proven to be somewhat disappointing in recent years as a guide for conducting the Federal Reserve's monetary policy. Growth of the narrow aggregate, M1, became increasingly unreliable in the 1980s as an indicator of the future course of the economy and inflation. As a result, the FOMC deemphasized M1 growth and eventually discontinued its use altogether. Since then, the broader M2 measure of money has been the preeminent variable used in implementing monetary policy.

Unfortunately, M2 has also become unreliable over the last two years. The growth of M2 in the 1990s has been much slower than can be explained by traditional relationships to income and interest rates. The M2 slowdown has resulted in part from special factors that have overshadowed traditional relationships. If such factors are merely temporary, M2 growth may soon return to a more normal relationship with the goals of monetary policy. Most analysts have implicitly assumed this would be the case.

But what if M2 growth remains unreliable for several more years? Worse yet, what if its properties have become so altered that M2 will never

again be predictably related to policy goals? The Federal Reserve would then be forced to reassess the framework for implementing monetary policy.

This article argues that the erratic behavior of M2 in recent years is symptomatic of fundamental changes likely to continue impairing the usefulness of M2 as a policy guide. As a result, the Federal Reserve will probably need to reassess the framework for conducting monetary policy. The first section reviews the history of using monetary growth rates in the conduct of monetary policy. The next section reviews empirical evidence to determine what has caused the slowing of M2 growth in recent years. The final section evaluates the extent to which persistence of these factors will continue to diminish the usefulness of M2 in the conduct of policy.

MONETARY AGGREGATES AND MONETARY POLICY

The Federal Reserve has used various monetary aggregates over the years in the conduct of monetary policy. The role played by the aggregates has also varied depending on circumstances. At times, a monetary aggregate has approached the status of an intermediate target that is the focal point of policy actions. At other times, one or more aggregates have been the preeminent variable among the many that provide information about the economy or inflation. To fully appreciate

Bryon Higgins is vice president and associate director of research at the Federal Reserve Bank of Kansas City. Carol Manthey, a research associate at the bank, helped prepare the article.

the quandary resulting from the recent puzzling behavior of M2, it is useful to review the history of using monetary growth in the implementation of monetary policy.

Intermediate target or information variable

There is considerable confusion about the role monetary aggregates should play—even about the role they have played—in the conduct of policy. Part of this confusion stems from lack of precision in terminology. The distinction between intermediate target variable and information variable is particularly critical for understanding what properties are desirable for a monetary aggregate used in the conduct of policy.

An intermediate target is a variable that can be controlled so as to achieve the desired policy goals. To serve this role, a variable must first be reliably related to the goal variables of monetary policy, which can usefully be summarized by the growth rate of nominal income. For a monetary aggregate serving as a policy target, the ratio of income to the aggregate—its velocity—must be predictable. In the simplest of all cases, velocity would be constant and nominal income would grow at the same rate as the money stock. Keeping the money stock growing at a constant rate would ensure that nominal income would grow at the same rate.

This points up the second requirement for a target variable, its controllability. A target variable need not itself be subject to direct control, but it must be strongly and predictably influenced by the policy instruments that can be directly controlled. For example, the Federal Reserve influences monetary growth by adjusting reserve requirements, the discount rate, or the amount of securities acquired through open market operations. If this influence is sufficiently precise, the Fed could achieve monetary growth very near the rate corresponding to the desired growth of income. Such reasoning underlies the call by Milton Friedman and other monetarists to focus solely on

monetary growth as an intermediate target to help achieve monetary policy goals.

Instead, the Federal Reserve has for the most part used monetary aggregates as information variables. An information variable provides information about the prospective behavior of policy goals. Unlike target variables, information variables need not be subject to control by manipulating policy instruments. Moreover, a monetary aggregate can be used as an information variable in conjunction with other real and financial variables that may also shed light on the future course of the economy. Because it is not the sole focus of policy, an information variable need not be as closely and reliably related to policy goals as a target variable must be. The conditions for using a monetary aggregate as an information variable are thus much less demanding than for using it as a policy target. For most of the past two decades, Federal Reserve officials have argued that no monetary aggregate met the stringent requirements for a target variable. Monetary aggregates have served instead primarily as information variables. The major exception to this was an experiment in the early 1980s with controlling M1.

The rise and fall of M1

Monetary aggregates came to play an increasingly important role during the 1970s, primarily because Congress expressed the legal mandate for the Fed more specifically in terms of monetary growth. In 1975, for example, Congress passed a resolution requiring the Fed to report on its objectives for monetary growth. This requirement was embodied in law with the 1978 Humphrey-Hawkins Act, which also mandated semiannual reports to Congress that have become the focus of Congressional oversight of the Federal Reserve. Increased emphasis on controlling monetary growth no doubt also reflected a desire to halt, and eventually reverse, the runaway of inflation that characterized the 1970s.

Alarm about inflation led the Fed in October

1979 to adopt a program for controlling inflation through enhanced control of monetary growth. At the time, M1 was generally considered the most theoretically appealing measure of money because it included only assets used for transactions purposes. Monetary control was to be improved in part by implementing new operating procedures that were based on using a nonborrowed-reserves rather than a federal-funds-rate operating variable. Since most reserves were held against transactions deposits, use of a reserves operating variable lent itself to controlling M1 growth. Under the new procedures, M1 growth above the target path would result in the demand for reserves growing faster than the supply of nonborrowed reserves. Through this mechanism, excessive M1 growth would automatically result in higher interest rates, which eventually would dampen inflationary pressures. The change in operating procedures was thus intended to support the overall objective of restraining inflation by keeping M1 growth within its target range.

The results of the program were far different than had been expected. Control of M1 growth, for example, continued to be elusive due to several special factors distorting M1. Soon after President Carter announced in March 1980 a special credit control program, both the economy and M1 began to nosedive. By summer, M1 had fallen far below its target range, but it rebounded sharply after the credit control program was ended. For the year as a whole, M1 growth was within or, if measured differently, above the target range. Alternative measures of M1 were necessary in the early 1980s because such new accounts as NOWs were being introduced. The Federal Reserve responded by redefining the monetary aggregates in 1980. Even after settling on a definition that seemed to make sense in the long run, the transitional problems surrounding inflows into newly authorized accounts were formidable.

Moreover, uncertainty about M1 remained even after the transition to NOW accounts was complete. By the fall of 1982, M1 growth was far

above its target range even though the U.S. economy was mired in the worst recession in decades and inflation showed signs of abating. This anomalous behavior led the FOMC in October 1982 to abandon the new operating procedures and to place somewhat less emphasis on M1 as a policy guide. However, after unexpectedly accelerating even further in 1983, M1 growth seemed to return to "normal" in 1984. The period of normalcy was short-lived, however, as M1 growth again skyrocketed to 12 percent in 1985 and 15.5 percent in 1986.

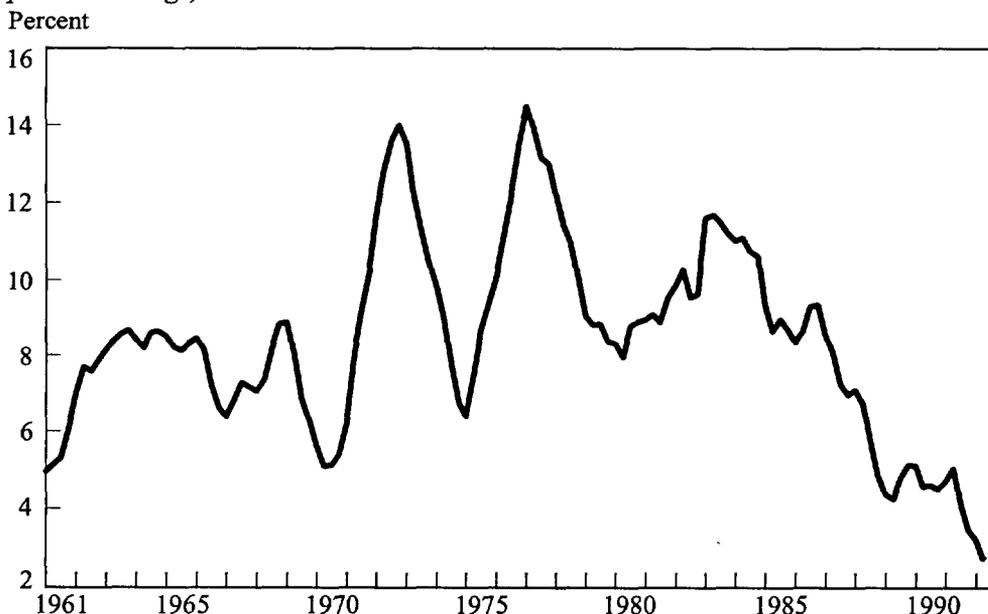
The FOMC finally concluded that the fundamental properties of M1 had been permanently altered by financial deregulation. The sensitivity of M1 growth to interest rate changes, for example, had been so heightened by deregulating the interest paid on personal checking accounts that M1 growth over periods as long as a year was dominated by the behavior of interest rates. As a result, M1 growth no longer bore much relation to ultimate policy goals over the short and intermediate runs. The FOMC thus discontinued target ranges for M1 in 1987.

Since then, M2 has become the preeminent information variable for the Federal Reserve's monetary policy. Although the FOMC also sets annual growth ranges for M3 and debt, M2 has clearly been the most important of the financial aggregates in policy implementation. M2 growth, for example, is more frequently referred to than any other variable in the FOMC's record of policy actions. Moreover, M2 growth relative to its range is thought by some to be the most important single means for communicating the goals of monetary policy to the Congress and the public. The persistent sluggish growth of M2 in recent years, however, has raised questions about whether it has become too unreliable to serve as the preeminent information variable for monetary policy.

Extent of the M2 slowdown

The slowdown in M2 growth in recent years is unprecedented. The trend growth rate of M2,

Chart 1
M2 Growth
 (Eight-quarter average)



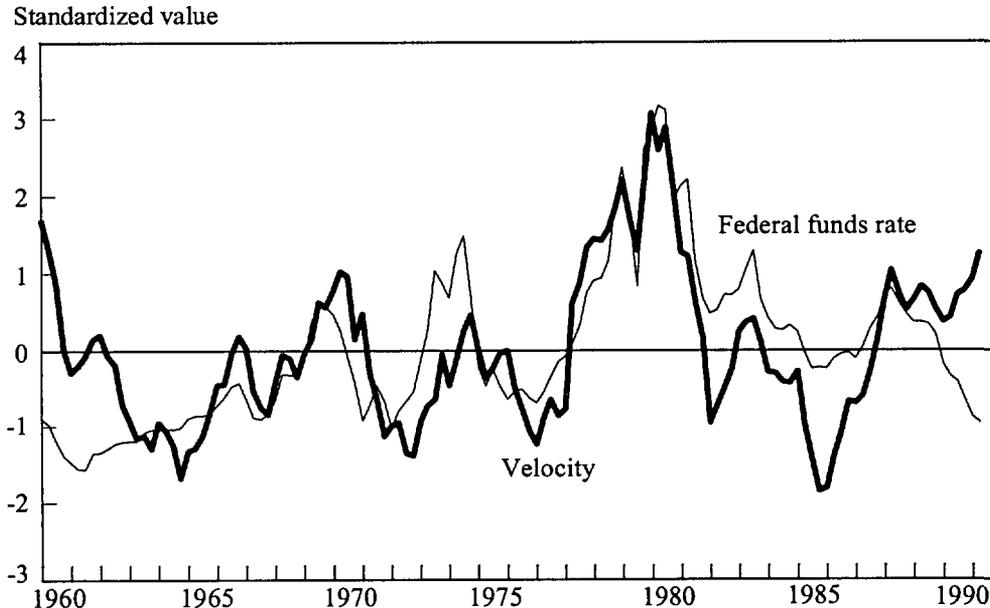
Source: Board of Governors of the Federal Reserve System.

defined as the average growth rate over a two-year period, has declined from 9.3 percent in late 1986 to only 2.7 percent by mid-1992 (Chart 1). Through the second half of the 1980s, slower M2 growth was not so puzzling. Market interest rates were generally trending upward over this period, so the opportunity cost of holding deposits increased, especially for such liquid deposits as checking accounts and money market accounts on which rates adjust only sluggishly. In these circumstances, a slowing of M2 growth could be explained by the standard relationship of M2 to income and interest rates.

Continued slowing of M2 growth since market interest rates peaked in early 1989 is much more of an enigma. One factor contributing to sluggish M2 growth is the slowdown in economic

growth. The overall economy began to grow more slowly about the same time M2 growth inexplicably fell off. Over the three years ending in the second quarter of 1992, real GDP growth averaged only 0.9 percent, down substantially from the 3.2 percent in the preceding three years. The sluggish rate of economic growth in recent years, together with accompanying lower inflation, has surely contributed to the M2 slowdown. Other factors have also contributed, however. This can be seen by examining the velocity of M2, which summarizes the relation of M2 to real output and the price level (Chart 2). The velocity of M2 has remained fairly constant over the past several quarters, indicating that M2 has grown at about the same rate as the sum of the growth rate of real output and the rate of inflation. Such stability of

Chart 2

M2 Velocity and Interest Rates

Note: The series are standardized by subtracting from a given value in a series the mean of the series and dividing the result by the standard deviation of the series.

Sources: Board of Governors of the Federal Reserve System and the Department of Commerce, Bureau of Economic Analysis.

velocity would not be surprising during a period of unchanged market interest rates. When market interest rates are declining, however, the velocity of M2 typically falls. The reason for this direct relationship between velocity and interest rates is that a fall in market interest rates lowers the opportunity cost of holding M2 deposits. Individuals and firms thus hold more deposits relative to their spending, causing M2 growth to accelerate relative to income, and velocity to decline. The puzzle about M2 growth in recent years is why the very large drop in market interest rates has failed to stimulate M2 growth relative to income growth as much as would be expected on the basis of past relationships.

Simulations with a standard money demand function illustrate just how much M2 behavior has

departed in recent years from past relationships. Staff members at the Board of Governors of the Federal Reserve System have developed such a model of the demand for M2. The estimated equation can be used to show how much M2 would have increased in recent years given the slow growth of nominal income and the decline in market interest rates. From the \$3,094 billion level in the second quarter of 1989, the equation predicts that M2 would normally have increased 21 percent to \$3,743 billion by the second quarter of 1992. Instead, M2 increased only 12 percent to \$3,465 billion. Thus, M2 has grown only about half as much as predicted over the past three years. Such a large shortfall from what can be explained by past relationships is the puzzle that several analysts have set out to solve.

As background in resolving this puzzle, it is useful to identify which component of M2 accounts for most of the shortfall. As shown in Chart 3, an outflow of funds from time deposits is the most obvious aberration. Since a peak in 1991:Q1, time deposits at banks and thrifts have declined almost \$200 billion. In contrast, the components of M2 that have no specific maturity have on balance continued to increase. Explaining weak M2 growth, therefore, must entail an understanding of why time deposits have declined so much.

CAUSES OF THE M2 SLOWDOWN

Several factors may have contributed to weak M2 growth in recent years. But the impact of some factors may have been only temporary, while the impact of others may have been more lasting. For the Federal Reserve to draw conclusions about how M2 should be used in the conduct of policy, it is important to determine the persistence of the major factors depressing M2 growth. If the major causes of the M2 slowdown are all transitory, the FOMC may want to deemphasize M2 only temporarily. On the other hand, if some of the major causes are longer run changes in the financial system, the FOMC is more likely to search for alternatives to using M2 as the preeminent information variable for monetary policy. For these reasons, it is useful to review the empirical evidence on the permanent as well as the temporary factors causing the recent M2 slowdown. Most analysts attribute the slowdown to reduced demand for M2 by households and businesses or reduced supply of M2 by depository institutions.

Factors reducing the demand for M2

One factor reducing the demand for M2 is the progressive steepening of the yield curve in recent years. Although both short-term and long-term interest rates have trended down since the spring of 1989, the total decline has been far greater for short-term rates. The rate on 3-month Treasury

bills, for example, has declined almost 5 1/2 percentage points since the spring of 1989, while the yield on 30-year Treasury bonds has fallen less than 1 1/2 percentage points. The return on long-term financial assets has thus become increasingly attractive relative to the return on such assets as short-term time deposits, whose yields closely track short-term market interest rates. Explosive growth of stock and bond mutual funds in recent years, for example, may have come in part at the expense of consumer time deposits.

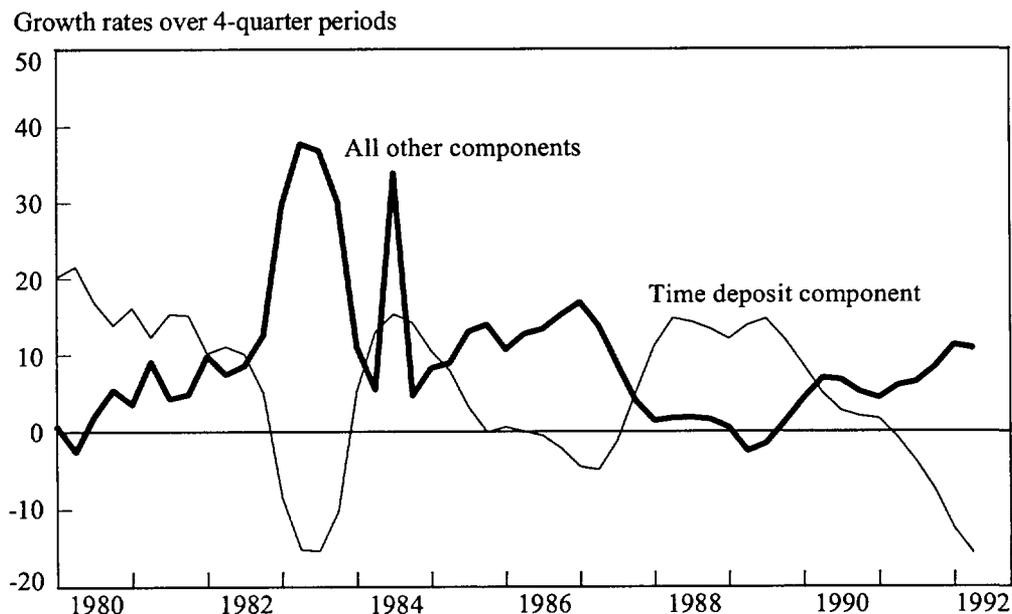
To some extent, reduced demand for M2 in recent years is a manifestation of longer term trends in financial markets. Many M2 deposits have become much closer substitutes for other financial assets since deposit rates were deregulated in the early 1980s. Enhanced substitutability would be expected to lead to an increase in the responsiveness of depositors to changes in the spread between market rates and deposit rates. Increased availability of bond and stock mutual funds, for example, may have increased the responsiveness of the demand for time deposits to changes in long-term interest rates. If so, the reduction in time deposits due to the sharp upward slope of the yield curve would be much more pronounced now than in previous decades.

Factors reducing the supply of M2

One factor contributing to the decline in M2 supply is a long-run trend toward less of a role for banks and thrifts in providing credit. The share of new credit extended by banks and thrifts to non-financial U.S. firms declined from more than 60 percent in the early 1960s to less than 40 percent by the mid-1980s. An increasing fraction of such credit was extended directly in money and capital markets or through nondepository financial intermediaries. This downward trend in the amount of intermediation through banks and thrifts has accelerated sharply in recent years, thus leading to a pronounced decline in the supply of M2.

Another reason for reduced supply of M2 is a

Chart 3

Growth of Components of M2

Source: Board of Governors of the Federal Reserve System.

sharp slowdown in loan growth. Total loans at banks and thrifts have declined so far in the 1990s. Resolution of S&L failures after the passage of FIRREA accounts for much of the slower loan growth at thrifts. But the reasons for slower loan growth at banks are more varied. The national recession and a subpar recovery help explain why the demand for bank loans moderated. Lower demand was also accompanied by restricted supply, however, as banks became more cautious due to higher capital requirements and the collapse of real estate prices on much of the east and west coasts. The combination of a credit crunch and sluggish economic activity reduced the need for banks and thrifts to compete aggressively for funds. As a result, the rates offered on time deposits may have been lowered even more than

would be expected for the given decline in market interest rates. Before rates on consumer deposits were deregulated in the early 1980s, the effect on M2 would have been negligible because banks and thrifts did not treat consumer time deposits as managed liabilities. Since deregulation, however, consumer time deposits have come to be used almost as much for liability management as are large negotiable certificates of deposits. As a result, the supply of M2 now depends on the amount needed by banks and thrifts to fund loan growth.

Competition for funds may have been further reduced by the liquidation of failed thrifts. Throughout most of the 1980s, the impaired financial condition of many S&Ls required them to pay a premium in order to attract funds. Many such S&Ls, especially those that tried to "grow out of"

their troubles, resorted to deposit brokers, which gathered funds nationwide by paying higher rates than were generally available at local institutions. To retain customers in the face of such intense competition, many banks and solvent S&Ls found it necessary to maintain deposit rates higher than normal. As insolvent S&Ls were taken over by the Resolution Trust Company, the previously inflated CD rates began to recede. Not only were contracts abrogated on CDs at failed institutions but also their local competitors reduced offering rates, especially at institutions that acquired the deposits of a failed S&L. The resolution of insolvent S&Ls thus reinforced weak loan growth in limiting the rate competition for funds.

In summary, the long-run trend toward less depository credit has been reinforced in the last few years by reduced competition for funds because of S&L insolvencies and sluggish growth of bank lending. Both have contributed to a reduced supply of M2 deposits, which together with reduced demand for M2 deposits due to more attractive rates on long-term assets, produced the unprecedented sluggish M2 growth in recent years. One useful way of analyzing the recent slowdown is to examine empirical evidence on both the short-run and long-run factors reducing M2 growth.

Short-run factors

Resolutions of insolvent thrifts by the RTC are generally thought to account for much of the weakness in M2. In a recent study, for example, Duca uses a variable to measure the total impact of RTC activities on M2. By including a variable measuring the cumulative value of deposits at failed thrifts in an M2 demand equation, he significantly improves the equation's ability to explain the M2 slowdown. The increased risk of holding M2 deposits is deemed to be one of the reasons for this improvement. The other reason Duca cites for the significance of the RTC variable is that depositors at failed thrifts may respond more quickly to alterna-

tive rates than if their deposits were allowed to mature. By exercising a call option on such deposits, the RTC forces depositors to evaluate alternative assets. The combined effects of RTC activity, according to Duca, account for most of the M2 shortfall. He concludes that "until its completion, the thrift resolution process could continue to create a missing M2 phenomenon" (p. 19). This process should not, according to Duca, have any lasting effect on the behavior of M2, however. He finds, for example, that thrift resolution activity has not changed the interest elasticity of demand for M2.

Several other studies have also attempted to gauge the effects of RTC activity on M2 deposits. One of the first was by Carlson and Parrott. They test the hypothesis that restructuring the thrift industry led to changes in the pricing of deposits. Although surveys ask banks and thrifts about the most common rate paid on each deposit category, the changes in pricing may have been altered in ways that would not fully be captured by the surveys. The rates on high-tiered and brokered deposits may have been reduced substantially as RTC funding was substituted for private funding. Yet such reductions might not have much effect on the rate paid most commonly on deposits. Carlson and Parrott thus use the change in thrift deposits as a proxy for the effect of RTC resolutions on the rates offered on M2 deposits. Their equation with this proxy better explains the M2 shortfall. According to these results, RTC resolutions have temporarily reduced the supply of M2 deposits by enabling banks and S&Ls to compete less aggressively for deposits. In a follow-up study, Carlson and Byrne emphasize that "the effects of restructuring influence the adjustment of M2 to its equilibrium level but do not affect the equilibrium level itself." And following a similar strategy, Duca reaches a similar conclusion about the importance of deposit pricing for the M2 shortfall.

Feinman and Porter offer several pieces of evidence to bolster this conclusion. They show that brokered CDs began to decline about the time

that widespread S&L closings began. This decline would be expected to lower the average rate paid on time deposits. The lower offering rate would not be captured in the survey measures of deposit rates, however, because rates on brokered CDs are unlikely to affect the most common rate paid. Similarly, banks have chosen to pare the rates offered on their highest yielding MMDAs rather than on the more common accounts. Feinman and Porter conclude from this and similar evidence on other offering rates that banks and thrifts have pursued M2 deposits less aggressively than before RTC resolutions began.

Another reason for not pricing deposits more attractively is the weakness of bank loan growth. Motley finds that the change in bank loans is a significant determinant of M2 growth. He does not emphasize this aspect of his empirical work, perhaps because his article was published before the recent credit crunch began. His results nonetheless are consistent with the view that sluggish growth of bank loans, whether due to overzealous regulation or to weak demand for bank loans, may have led banks to offer relatively unattractive rates on such managed liabilities as retail time deposits. If so, resumption of normal growth in bank lending could lead to more aggressive pricing of time deposits and a consequent increase in M2 growth.

Compounding the effect of unattractive offering rates on time deposits has been increasingly attractive rates on alternative assets. Outflows from low yielding time deposits into such higher yielding assets as bond and stock mutual funds have contributed to the M2 slowdown. The rate of return on these funds has become increasingly attractive in recent years because long-term interest rates have declined much less than short-term interest rates.

Duca finds only a small effect on M2 from transfers into bond mutual funds. He shows that inflows to bond funds surged in the early 1990s as the yield on bond funds rose relative to the yield on time deposits, which are generally less than one year in maturity. Duca estimates the effect of

inflows to bond funds by adding various types of bond fund series to M2. He finds that adding bond funds to M2 yields an aggregate that can more easily be explained by a conventional money demand equation than can M2 by itself. He concludes that large inflows to bond funds in recent years depressed M2 growth somewhat. His results suggest, however, that inflows to bond funds, while statistically significant, explain at most about one-fourth of the total M2 shortfall.

A different impression is given by Wenninger and Partlan. They do not conduct statistical tests but do note that rapid sales of bond mutual funds, together with a steepening yield curve, coincided with the slowdown of M2 growth. They conclude that this and other demand-side factors, when added together, could be quite important in explaining the recent weakness in M2.

An even more important role for the yield curve and bond fund explanation is found by Feinman and Porter. They estimate a simple model of M2 demand using the difference between the 30-year Treasury bond yield and 3-month Treasury bill rate. This difference has increased about 250 basis points in recent years. From their estimated equation, Feinman and Porter conclude that more than two-thirds of the total M2 shortfall may be due to the steepening yield curve. One reason a steeper yield curve led to large deposit outflows, they argue, is that banks have been more aggressive in pricing short-term CDs than in pricing longer maturity CDs. Feinman and Porter also report on an experimental model that includes as explanatory variables market yields on Treasury securities of various maturities. While not yielding superior results before deposit interest rate deregulation, the model outperforms alternative models in recent years. In fact, the experimental model *fully* explains the M2 slowdown in the early 1990s.

The results from this experimental model reinforce earlier findings of Carlson and Parrott. They also include longer term market interest rates in a money demand function. Doing so improves the fit of their equation. Unfortunately, they do not

report how much of the M2 shortfall might be due to yield curve effects.

In summary, actions of both depository institutions and their customers have contributed to the recent M2 shortfall. Banks and thrifts offered relatively low rates on time deposits because of slow loan growth and ample availability of funds due to RTC resolutions. Individual depositors have reacted by transferring funds into longer term assets, especially bond and stock mutual funds. The preponderance of evidence shows that both short-run factors are important in explaining the recent M2 shortfall.

Long-run factors

Less attention has been given to how long-run changes may have contributed to the recent M2 shortfall. Several authors note that longer run trends in financial markets have provided fertile ground for portfolio shifts to alter M2 growth. Wenninger and Partlan, for example, argue that shifting funds out of M2 deposits has become easier in recent years because such alternatives as bond and stock mutual funds have become more readily available. But empirical estimates of the importance of such long-run trends on M2 demand are scarce, in part because of the paucity of data. What evidence is available, however, supports the view that changes in financial markets have permanently altered the interest elasticity of demand for M2, made retail time deposits instruments of liability management, and reduced the size of the depository sector.

Motley finds that deregulation of deposit rates since the late 1970s has reduced the sensitivity of demand for M2 to changes in short-term market interest rates. Before 1980, a rise in short-term market interest rates would appreciably slow M2 growth as depositors transferred funds out of deposits whose yield was constrained to remain below market rates. But the same M2 demand equation estimated with data since 1980 indicates that changes in market interest rates have a negli-

gible—and statistically insignificant—effect on the demand for M2 in the long run.

A very different finding is reported by Feinman and Porter. They agree that the interest elasticity of demand changed substantially in the 1980s, but the change suggested by their regression results is toward sensitivity to a wider range of market interest rates. Feinman and Porter find that over the last decade the demand for M2 has responded significantly to intermediate-term and long-term market interest rates as well as to short-term rates. The experimental model estimated using the full range of market interest rates accurately predicts the M2 growth slowdown in the 1990s. According to this finding, the recent M2 shortfall has been entirely due to persistently high interest rates beyond the very short end of the yield curve.

The experimental model developed by Feinman and Porter has important implications. It implies that long-run changes in the financial system are responsible for much of the seemingly mysterious outflows from time deposits in recent years. The authors themselves do not emphasize this implication, though, perhaps in part because they recognize that “the unprecedented nature of the ongoing changes in financial intermediation and regulation make it difficult to quantify precisely these effects [causing weak M2 growth].”

Another prospective long-run trend is the growing use of small time deposits for liability management. Motley provides evidence on the response of offering rates on time deposits to changes in market interest rates. His regression results show that offering rates on small time deposits now adjust as much to changes in market interest rates as do rates on large CDs. Unlike the period when rates on retail time deposits were constrained by Regulation Q ceilings, banks now use both retail and large CDs as managed liabilities. As a result, the responsiveness of M2 to changes in short-term market interest rates has declined substantially. In the long run, the amount of M2 deposits desired by the public is hardly

affected at all by the level of market interest rates because the opportunity cost of holding time deposits is unaffected. This change in deposit pricing behavior has become a permanent feature of the supply of M2.

Wenninger and Partlan provide visual confirmation that offering rates on small CDs closely mirror market interest rates. A graph of the difference between 6-month consumer CD rates and 6-month Treasury bill rates, for example, shows wide divergence between the two rates before deposit rate deregulation. Since deregulation, however, the differential has remained very narrow, never exceeding 50 basis points. Wenninger and Partlan point out that the use of retail CDs as managed liabilities implies that the growth rate of M2 can be affected from the supply side depending on the strength of bank loan growth. This link between M2 growth and bank loan growth may help explain why weak M2 growth accompanied the credit crunch in recent years. But the link could persist long after all vestiges of the recent credit crunch have vanished.

Feinman and Porter argue that recent events surrounding thrift resolutions are merely an accentuated part of the long-run decline in the size of the depository sector. They demonstrate that the share of total credit extended by depository institutions began to trend down long before the precipitous drop in recent years. One implication of this secular decline in the size of the depository sector is that the long-run supply of M2 deposits would also be declining. Rechanneling of credit demands outside depository institutions would normally be accompanied by a decline in deposit offering rates relative to market rates. Even after the effect of RTC resolutions fade, therefore, the supply of M2 deposits will continue on a downward trend. As a result, "the long-run value of the velocity of M2, $V2^*$, will be permanently higher."

Summary

Too little time has passed for researchers to

determine precisely the importance of the various factors reducing M2 growth in recent years. Authors using the same data, for example, come to different conclusions about whether RTC resolutions of failed thrifts were the principal reason for the M2 slowdown. On net, the evidence supports the conclusion that balance sheet restructuring by banks and by their depositors has led to a substantial reduction in time deposits. This restructuring resulted in part from such special factors as a sharply upward sloping yield curve, resolution of failed S&Ls, and sluggish growth in bank lending. Abrupt portfolio shifts were made easier, however, by long-run trends set in force by financial deregulation. For that reason, the recent unusual behavior of M2 might not be an isolated instance that the Federal Reserve can confidently predict will not recur under different circumstances in the future. Moreover, financial deregulation may have so altered the properties of M2 that its role in the conduct of monetary policy might need to be reevaluated.

IMPLICATIONS FOR MONETARY POLICY

Persistently weak M2 growth has led the FOMC to deemphasize its importance in the conduct of monetary policy. In his recent midyear report on monetary policy to Congress, Chairman Greenspan explained why the Committee did not adjust the annual growth range for M2 despite the substantial shortfall from the existing range:

[Specifying a new range] would carry the presumption that the new range was clearly more consistent with broader economic objectives, and in view of the uncertain relationships involved, the FOMC did not want to convey that impression.... In light of the difficulties predicting velocity, signals conveyed by monetary data will have to continue to be interpreted together with other sources of information about economic developments.

In the terminology of this article, Chairman Greenspan's comments indicate that M2 is currently not reliable enough to serve as the preeminent information variable for monetary

policy, but rather as one of many information variables that guide monetary policy.

What then are the prospects that M2 can be reinstated as the principal policy guide in the future? The answer depends in part on how much longer special factors continue to retard M2 growth. But the answer also depends on whether unwinding of the special factors causes unusually rapid M2 growth for a while and on whether the longer run forces resulting from deregulation have so altered M2 that its use in monetary policy is limited.

Prospective behavior of M2

Some of the factors distorting M2 growth in recent years may begin to abate soon. Resolution of failed thrifts, for example, is projected to peak in 1993. Outlays by the RTC are thus likely to decline sharply beginning in 1994. Soon thereafter, the competition for funds might intensify as the deposit inflows from failed thrifts cease. Offering rates on deposits, especially high-tiered deposits, would be expected to increase relative to market interest rates as banks and surviving thrifts bid for depositors' funds. High-rate, brokered CDs are nonetheless unlikely to be nearly as important in the future as they were in the second half of the 1980s, when insolvent thrifts had to pay premium rates to attract deposits. The growth rate of M2, however, might be temporarily boosted above its long-run equilibrium rate as deposit offering rates rise faster than market interest rates for a while. Such a temporary spurt in M2 growth would be all the more likely if the unwinding of thrift resolutions happens to coincide with a strengthening of loan demand. The resulting intense competition for deposits could push offering rates on deposits well above equilibrium levels.

Reversal of flows between bond mutual funds and M2 deposits could also lead to a temporary burst of M2 growth. The flows have been primarily out of time deposits in recent years as the steep yield curve increased the attractiveness of longer

term assets. But the yield curve could flatten over the next few years due to maturing of the current economic expansion and a reduction in the long-run rate of inflation expected by financial market participants. As short-term interest rates approach, and perhaps eventually exceed, long-term rates, time deposits will become increasingly attractive. Funds may thus begin to flow out of bond funds into M2 deposits. If so, the growth rate of M2 would be temporarily elevated due to reversal of the flows between M2 deposits and bond funds.

Taking account of the likely future course of the two major factors depressing M2 growth in recent years, the problem for the Federal Reserve by the mid-1990s might well be excessively rapid M2 growth. The FOMC within the next few years might thus be confronted with explaining to the Congress, the public, and financial markets how rapid M2 growth is consistent with monetary policy goals. A convincing explanation would be particularly important to prevent a rise in expected inflation just as reasonable price stability might be within reach.

Even though a spurt of M2 growth is the most likely outcome, too little is understood about the cause of the M2 slowdown to predict accurately the course of M2 growth over the next few years. Such uncertainty warrants considerable caution in interpreting the growth rate of M2, at least until researchers have enough data to more confidently determine the reasons for the recent behavior of M2.

Prospective properties of M2

In addition to the growth spurt that may occur in the next few years, the Federal Reserve must be concerned about whether the properties of M2 will make it useful in policy implementation. The empirical evidence cited above suggests that the determinants of M2 growth may well change. Some of these changes could detract from the Federal Reserve's ability to control M2 growth, thereby precluding using it as a policy target similar to the way M1 growth was used from 1979 to 1982.

One such change is a decline in the responsiveness of M2 to short-term market interest rates. Motley's results suggest that the public's demand for M2 is likely to be largely unaffected by changes in money market rates. The offering rate on M2 deposits, especially time deposits, will so closely mirror market rates that the opportunity cost of holding liquid assets in depository institutions will be small and relatively unaffected by the level of money market rates. This property of M2 has both positive and negative aspects for monetary policy.

The positive aspect is that M2 growth may be more highly correlated to nominal income growth than in the past. With less responsiveness to short-term market interest rates, it could be argued that income will become the only significant determinant of the demand for M2. This by itself would seem to enhance the usefulness of M2 both as a target variable or an information variable for monetary policy. Nominal income growth is generally thought to be closely related to ultimate policy goals since it comprises inflation and growth in real income. Controlling growth of an aggregate the demand for which is primarily determined by income growth should enable the Federal Reserve to indirectly control income growth and, in the absence of unexpected supply shocks, achieve its goals for inflation and real output.

Unfortunately, the ability to control M2 will be seriously impaired. Like most central banks, the Federal Reserve has relied mainly on a short-term interest rate as the instrument for achieving monetary growth objectives. Open market operations and discount rate policy can be used to keep the federal funds rate at whatever level is deemed appropriate. Since other money market interest rates closely track the funds rate, the Federal Reserve can thereby strongly influence the general level of short-term interest rates. But if the demand for M2 does not depend on market rates, the ability is lost to use open market operations and the discount rate to influence M2 growth.

It might have been plausible in the past that the Federal Reserve could nonetheless control

monetary growth from the supply side. The textbook explanation of how a central bank could control monetary growth by estimating the money multiplier and injecting or absorbing reserves as necessary is in all cases an oversimplification. During some periods, however, the Federal Reserve has used money multiplier relationships to derive a reserve path consistent with monetary growth objectives. But doing so now would be virtually impossible as a means of controlling M2 growth. Time and savings deposits no longer have reserve requirements. As a result, the multiplier relationship between M2 growth and reserve growth would be highly uncertain. Controlling M2 from the supply side is probably no longer a feasible alternative to the rapidly disappearing ability to control M2 growth from the demand side using an interest rate operating variable. Overall, then, the negligible elasticity of M2 demand with respect to short-term interest rates that is implied by Motley's empirical work might preclude the close control over M2 growth necessary for using M2 as a policy target.

In contrast, the same feature should enhance the attractiveness of M2 as an information variable. The close correlation between M2 growth and nominal income growth implies that the Federal Reserve could gain information about likely inflation and output developments by monitoring M2 growth. Assuming there are no major supply or demand disturbances of the kind evident in the last two or three years, unexpected slowing of M2 growth could reliably be interpreted as portending weak growth in output. Similarly, unexpected strength in M2 growth would suggest an imminent acceleration of inflation. The Federal Reserve could then adjust policy instruments as appropriate in light of this information.

In contrast, the greater sensitivity of M2 to long-term interest rates would reduce the usefulness of M2 as an information variable. The findings of Feinman and Porter suggest that M2 growth is increasingly affected by the shape of the yield curve. If researchers could pin down the

precise relationship between M2 growth and interest rates at various maturities, there would be no problem in interpreting M2 growth. Such certitude appears several years away, however. Only recently have bond and stock funds, for example, been accessible enough to make them good substitutes for time deposits. Too little information is available to determine precisely what effect such funds will ultimately have on the sensitivity of M2 to long-term interest rates.

Another factor contributing to the uncertainty of the relation between M2 and income is the use of small time deposits for liability management. Wenninger and Partlan among others have documented that banks now adjust offering rates on time deposits as necessary to attract loanable funds. The growth rate of M2 is thus likely to remain dependent on the growth of loans, which can be affected by either loan supply or loan demand. Dependence on loan demand might not appreciably distort the relationship between income and M2 since loan demand is itself related to income growth. Changes in the willingness to supply loans, on the other hand, can arise for reasons largely unrelated to economic growth or inflation. The recent credit crunch, for example, is generally thought to have resulted in part from banks' attempts to meet higher regulatory capital standards. Recurrence of such regulatory effects on bank lending could on occasion seriously distort the relation of M2 to income. During those occasions, M2 would not be a useful information variable for monetary policy.

The informational content of M2 growth could also be impaired by variations in the speed at which credit flows are channeled away from depository institutions. The downward trend in the share of total credit extended by depository institutions, as noted by Feinman and Porter, has occurred in fits and starts. If interstate branching were authorized and the Glass-Steagall Act repealed, the banking system might even increase its share of lending for a while. The supply of M2 deposits would thus increase relative to income,

thereby lowering the velocity of M2. Alternatively, continued shrinkage of the depository sector would tend to raise the velocity of M2 at a rate that depends on the degree to which financial innovations and regulations channel borrowing away from depository institutions. To the extent that the Federal Reserve cannot accurately gauge the effects this process was having on M2, its usefulness as an information variable will be reduced.

Overall, the prospective properties of M2 may change its role in the conduct of policy. The reduced sensitivity to short-term interest rates effectively precludes using M2 as a policy target. It may nonetheless remain useful as an information variable. However, susceptibility to changes in the slope of the yield curve, in the growth of bank credit, and in the size of the depository sector will continue to require considerable judgment about what M2 growth portends for future output and inflation. M2 is therefore unlikely to be reliable enough in the future to be restored as the preeminent information variable for monetary policy.

Alternative monetary targets

In light of the ongoing uncertainty about M2, some economists have proposed redefining the monetary aggregates. The primary goal of such a redefinition would be to produce an aggregate whose properties make it more amenable to use in the conduct of policy.

One proposal is to exclude time deposits from M2. Motley, for example, argues that deregulation of deposit interest rates has resulted in M2 including two fundamentally different kinds of assets. Rates on transactions and savings deposits adjust little to changes in market interest rates, but rates on time deposits adjust rapidly and completely. Consequently, the behavior of time deposits is very different from the behavior of other M2 assets. Moreover, Motley argues on both theoretical and empirical grounds that time deposits should not be included in the same monetary measure with deposits that are immediately avail-

able. His empirical findings confirm that omitting time deposits from M2 would in some ways increase its usefulness for monetary policy. Because the empirical evidence is mixed, though, Motley recommends that an aggregate omitting time deposits be used only as a supplement to M2 in the conduct of policy.

Instead of narrowing M2, as Motley suggests, other economists advocate broadening M2 to include more assets. Poole, for example, would include institution-only money market mutual funds in M2 because they have similar properties to other M2 assets. Although not explicitly advocating redefinition of the aggregates, Duca uses an adjusted measure that includes bond funds to help explain the M2 shortfall in recent years. Like Poole's expanded measure, the aggregate constructed by Duca has grown faster than M2 in recent years due to the rapid growth of mutual funds. These expanded M2 measures have thus been more closely related to income in the 1990s than has the traditional M2. Redefining M2 on the basis of the most recent evidence, although appealing in some ways, runs the risk of mistaking a coincidence of timing with long-run stability. For this reason, redefinition of monetary aggregates would require more extensive empirical evidence on the properties of the proposed aggregate over a longer time period.

Such evidence is provided by Feinman and Porter. They compare both narrower and broader aggregates to M2 based on variability, stability of demand functions over time, and Granger causality tests. The least desirable by all criteria are narrower measures, which suffer from the same problems as M1 in terms of extreme interest sensitivity. The broader aggregates behave much like M2 over the sample period as well as for

simulations over a more recent period. None seems to explain the M2 shortfall using estimated relations over a longer period. In short, there is little reliable evidence that redefining the monetary aggregates would yield a monetary measure more able than M2 to serve as the principal guide for monetary policy.

CONCLUSION

It is too soon to be certain about the policy implications of the recent M2 slowdown. Too few data are available to sort out with confidence the major causes of the slowdown, let alone to predict its long-run consequences. Given the experience with M1, however, it should not automatically be assumed that the M2 slowdown is merely a temporary aberration due to special factors. Special factors have almost certainly played a role, but so have the general properties of M2 in a deregulated financial environment in which the importance of depository institutions is waning.

The implication is that the Federal Reserve may need to consider contingency planning in case M2 never again can serve as the principal focus of monetary policy. One response might be to seek an alternative definition of money that would provide a new policy guide. But one should also admit the possibility that in a deregulated financial environment no monetary aggregate may be reliably enough related to policy goals to become the preeminent information variable. In that case, the appropriate response might well be to design a new framework for implementing policy and communicating to the Congress and the public. Such a framework would presumably rely less on growth ranges for monetary aggregates.

REFERENCES

- Baba, Yoshihisa, David F. Hendry, and Ross M. Starr. 1988. "U.S. Money Demand, 1960-1984," Discussion Papers in Economics, No. 27, Nuffield College, Oxford, England, January.
- Bryan, Michael F., and John J. Erceg. 1992. "The Business Cycle, Investment, and a Wayward M2: A Midyear Review," Federal Reserve Bank of Cleveland *Economic Commentary*, July.
- Carlson, John B., and Sharon E. Parrott. 1991. "The Demand for M2, Opportunity Cost, and Financial Change," Federal

- Reserve Bank of Cleveland *Economic Review*, 2nd Quarter.
- Carlson, John B., and Susan M. Bryne. 1992. "Recent Behavior of Velocity: Alternative Measures of Money," Federal Reserve Bank of Cleveland *Economic Review*, 2nd Quarter.
- Davis, Richard G., editor. 1990. *Intermediate Targets and Indicators for Monetary Policy*, Federal Reserve Bank of New York.
- DRI. 1991. U.S. Forecast Summary, October.
- Duca, John. 1992. "The Case of the Missing M2," Federal Reserve Bank of Dallas *Economic Review*, 2nd Quarter.
- Federal Reserve Bank of San Francisco. 1990. *Weekly Letter*, September 28.
- Feinman, Joshua, and Richard D. Porter. 1992. "The Continuing Weakness in M2," Board of Governors of the Federal Reserve System, Finance and Economic Discussion Series no. 209, September.
- Friedman, Benjamin M. 1988. "Lessons on Monetary Policy from the 1980s," *Journal of Economic Perspectives*, Summer.
- Furlong, Fred, and Bharat Trehan. 1990. "Interpreting Recent Money Growth," Federal Reserve Bank of San Francisco *Weekly Letter*, September 28.
- Kasriel, Paul, and Robert Laurent. 1991. "Closing Depository Institutions and Fed Funds Targeting—The Case of an Inadvertently Contractionary Monetary Policy," October 29.
- Latta, Cynthia. 1991. "The M2 Puzzle," *Ten-Year Projections*, Special Study, November.
- Melton, William C. 1985. *Inside the Fed*. Homewood, Ill.: Dow Jones-Irwin.
- Moore, George R., Richard D. Porter, and David H. Small. 1990. "Modeling the Disaggregated Demands for M2 and M1: The U.S. Experience in the 1980s," in Peter Hooper and others, eds., *Financial Sectors in Open Economies: Empirical Analysis and Policy Issues*. Washington, D.C.: Board of Governors of the Federal Reserve System.
- Motley, Brian. 1988. "Should M2 Be Redefined?" Federal Reserve Bank of San Francisco *Economic Review*, Winter.
- Platt, Elliott. 1991. "The Money Supply Puzzle," *Bond Market*, October.
- Poole, William. 1991. "Is Weak Money Growth Strangling Economic Recovery?" Statement before the Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs, House of Representatives, November 6.
- Shadow Open Market Committee (SOMC). 1991. *Policy Statement and Position Papers: September 29-30, 1991*. Bradley Policy Research Center, Industry Policy Studies, Working Paper Series IP 91-02.
- Small, David H., and Richard D. Porter. 1989. "Understanding the Behavior of M2 and V2," Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin*, April.
- The Wall Street Journal*. 1991. "The Outlook: Money-Supply Puzzle Is Troubling the Fed," October 7.
- Weninger, John, and John Partlan. 1992. "Small Time Deposits and the Recent Weakness in M2," Federal Reserve Bank of New York *Quarterly Review*, Spring.

Is Purchasing Power Parity a Useful Guide to the Dollar?

By Craig S. Hakkio

Some academic and business economists use the concept of purchasing power parity to help predict the foreign exchange value of the dollar. *Purchasing power parity* (PPP) is a measure of the dollar's equilibrium value—the exchange rate toward which the dollar moves over time. Because the value of the dollar is currently below its PPP value, PPP advocates argue that the dollar is undervalued and therefore likely to rise.

Other economists acknowledge that PPP may help forecast the value of the dollar over the long run but doubt its usefulness as a short-run guide. They often cite the 1970s, when the dollar frequently strayed from its PPP value and sometimes took years to return. They also note that economic and political forces regularly buffet the dollar, keeping its value away from equilibrium. Thus, even though the dollar is currently below its PPP value, these economists maintain there is no guarantee it will rise in value in the near term.

This article argues that PPP is a useful guide to the dollar in the long run and—to a lesser extent—in the short run. The first section of the article defines the concept and discusses why most economists believe it is a useful long-run guide. The second section shows the dollar generally moves toward its PPP value in the long run. The

third section shows that in the short run the dollar generally moves toward its PPP value only when deviations from PPP are unusually large. Because today's dollar is not unusually low relative to PPP, the measure says little about whether the dollar will rise in the near term.

WHAT IS PURCHASING POWER PARITY?

Economists use three concepts of purchasing power parity to explain why goods in one country should cost the same as identical goods in another country. The *law of one price* relates exchange rates to prices of individual goods in different countries. *Absolute PPP* relates exchange rates to overall price levels. And *relative PPP* relates exchange rates to inflation rates. While the law of one price and absolute PPP are intuitively appealing as theories of exchange rates, relative PPP is more useful empirically.

The law of one price

The law of one price is the simplest concept of PPP. It states that identical goods should cost the same in all countries, assuming it is costless to move goods between countries and there are no impediments to trade, such as tariffs or quotas. Before the costs of goods in different countries can be compared, however, prices must first be con-

Craig S. Hakkio is an assistant vice president and economist at the Federal Reserve Bank of Kansas City. Eric A. Thomas, an assistant economist at the bank, helped prepare the article.

verted to a common currency. Once converted at the going market exchange rate, the prices of identical goods from any two countries should be the same. After converting pounds into dollars, for example, a sweater bought in the United Kingdom should cost the same as an identical sweater bought in the United States.

In theory, markets enforce the law of one price. Specifically, the pursuit of profits tends to equalize the price of identical goods in different countries. Suppose the sweater bought in the United States was cheaper than the sweater bought in the United Kingdom after converting pounds into dollars. A U.S. exporter could make a profit by buying the U.S. sweater and selling it in the United Kingdom. Such profit opportunities would persist until the law of one price held. Exploiting these opportunities should ensure that the price of the sweater eventually equalizes in both countries, whether prices are expressed in dollars or pounds.¹

In practice, however, the law of one price does not always hold. International trade is far more complicated than suggested by simple economic theories. For example, the cost of transporting goods from one country to another limits the potential profit from buying and selling identical goods with different prices. In addition, tariffs and other impediments to trade potentially drive a wedge between the prices of identical goods in different countries. As a result, instead of focusing on a particular good or service when applying the PPP concept, most analysts focus on market baskets consisting of many goods and services. Hence, the concept of absolute PPP.

Absolute PPP

Absolute PPP extends the law of one price to general price levels. It argues that a basket of goods and services should cost the same in all countries after converting prices to a common currency. If the law of one price holds “on average” for all goods and services and if price

levels in different countries are constructed in exactly the same way, absolute PPP should hold. The pursuit of profits, which caused the law of one price to hold, would also cause PPP to hold.

Absolute PPP provides an equilibrium measure of exchange rates—the PPP exchange rate. This hypothetical exchange rate equalizes the prices of identical market baskets in two different countries. More precisely, the PPP exchange rate equals the ratio of overall price levels in two countries (see box).² For example, the PPP exchange rate between the dollar and the pound is the ratio of the overall price level in the United Kingdom to that in the United States. This ratio reflects the purchasing power of the dollar in the United States relative to the purchasing power of the pound in the United Kingdom.

As an equilibrium concept, the PPP exchange rate provides a measure of a currency’s long-run foreign exchange value. When the foreign exchange value of the dollar equals its PPP value, there should be no tendency for the dollar’s value to rise or fall. In contrast, when the dollar diverges from its PPP value, market forces should push it back. Most economists believe the PPP exchange rate equals the market exchange rate only in the long run. In the short run, the actual exchange rate can deviate from its equilibrium level. Thus, at any particular moment, the dollar is likely to differ from its PPP value. But over time the dollar is likely to gravitate toward PPP.

While absolute PPP has considerable appeal as a theory of exchange rates, in practice it generally fails for two reasons. First, the law of one price does not always hold—even “on average.” Second, price levels in different countries are calculated using imperfect price indexes. These indexes are based in different years, include different market baskets of goods and services, and weight the various components of the market baskets differently. As a result, the simple ratio of price levels may not be an adequate measure of equilibrium exchange rates.

Relative PPP

A better measure of equilibrium exchange rates is relative PPP. While absolute PPP asserts that exchange rates depend on the ratio of price levels in different countries, relative PPP asserts that exchange rate changes depend on differences in inflation rates. Thus, relative PPP is simply the concept of absolute PPP expressed in growth rates. Relative PPP says that the foreign exchange value of a currency tends to rise or fall at a rate equal to the difference between foreign and domestic inflation. For example, if U.K. inflation exceeds U.S. inflation by five percentage points, the purchasing power of the dollar rises 5 percent relative to the pound. Therefore, the foreign exchange value of the dollar should rise 5 percent per year.

Because relative PPP follows directly from absolute PPP, relative PPP clearly holds if absolute PPP holds. But relative PPP may hold even if absolute PPP does not. Even if the exchange rate is not *equal* to the ratio of foreign to domestic price levels as required under absolute PPP, it may be *proportional* to the ratio. If this proportion is fixed, relative PPP holds.³ This condition is less restrictive than the condition that exchange rates precisely equal the ratio of foreign to domestic price levels. As a result, relative PPP is more likely to hold than absolute PPP. For this reason, most economists study relative, rather than absolute, PPP. And this article tests PPP using the relative PPP concept.⁴

Although relative PPP is more likely to hold than absolute PPP, relative PPP is still controversial. Economists disagree about how exchange rates are determined. While some theories of exchange rate determination suggest PPP holds, other theories do not.⁵ These other theories generate equilibrium exchange rates that differ from PPP exchange rates.

In addition, common sense suggests that relative PPP is unlikely to hold over very short periods of time. Finding that the market exchange rate temporarily deviates from the PPP rate would not

be surprising for two reasons. First, exchange rates fluctuate minute by minute because they are set in financial markets. Price levels, in contrast, are sticky and adjust slowly. Because exchange rates move quickly while prices move slowly, deviations from PPP will arise. However, deviations from PPP should disappear as prices have time to adjust.

The exchange rate may also deviate from its PPP rate during periods of fixed exchange rates, such as the Bretton Woods regime of 1948 to 1973. During such periods, the market exchange rate usually remains fixed even though inflation differentials among countries change. Thus, at any single point in time, the exchange rate is unlikely to equal its PPP rate. But a fixed exchange rate regime does not mean exchange rates never change. History is rife with examples of currency devaluation and revaluation. When deviations from PPP develop, the exchange rate can be adjusted through a devaluation or revaluation. In this way, deviations from PPP may be eliminated through a change in government policy rather than through market forces. Thus, PPP might hold over long periods of time even during periods of fixed exchange rates.

IS PPP A USEFUL GUIDE TO THE LONG-RUN VALUE OF THE DOLLAR?

Many economic decisions require predicting the value of the dollar over the next few years. Businesses contemplating building a factory overseas, for example, must look years ahead in evaluating whether the project is viable. The future value of the dollar is one key factor affecting the project's viability. A large rise in the value of the dollar five years from now could sharply reduce the value of profits repatriated to the United States.

Similarly, policymakers must look years ahead in planning monetary policy. A long-term decline in the value of the dollar, for example, could make achieving price stability more difficult by steadily raising the dollar price of imported goods and services. Thus, for both businesses and policymakers, a reliable guide to the long-run

value of the dollar, such as PPP, would be helpful.

For PPP to be a useful long-run guide, the dollar must generally move toward its PPP rate over time. While the dollar might differ from its PPP rate in the short run, it must tend back toward its PPP rate in the long run. This section shows that PPP does hold in the long run. While deviations of the exchange rate from PPP generally result in exchange rate movements back toward PPP, achieving PPP generally takes a long time. Three types of evidence support this conclusion. First, simple charts comparing actual exchange rates with PPP exchange rates over long periods of time suggest that PPP holds in the long run. Second, statistical tests show that deviations from PPP eventually result in exchange rate movements back toward PPP and that the likelihood of such movements increases over time. Finally, statistical examination shows that it generally takes several years to achieve PPP.

Actual and PPP exchange rates

Actual and PPP exchange rates tend to move together over long periods of time. From the turn of the century to today, the value of the dollar against other major currencies has generally moved in concert with the dollar's PPP exchange rate on a yearly average basis. Looking at annual data over long periods focuses attention on long-run movements in exchange rates, minimizes the influence of purely short-run factors, and reveals long-term relationships.

A typical relationship is the long-term link between the pound/dollar exchange rate and its PPP rate (Chart 1, panel A). The rise in the pound/dollar exchange rate throughout the period from 1900 to 1990 generally mirrored the rise in the pound/dollar PPP rate. Similar long-term relationships (not shown) are apparent for the value of the dollar against the yen, mark, and Canadian dollar.

In addition to moving in similar directions, actual and PPP exchange rates have tended to converge over time. Although exchange rates have

deviated from PPP—often for long periods—these deviations have always tended to disappear (Chart 1, panel B).⁶ For the pound/dollar exchange rate, the deviations have been large, ranging between plus and minus 30 percent. The deviations have also persisted for long periods. For example, the dollar was below its PPP rate from 1911 to 1927 and above its PPP rate from 1946 to 1962. But the dollar eventually fell whenever it was above its PPP rate and eventually rose whenever it was below its PPP rate. Although the deviations have at times been large, for the period as a whole the average deviation was only -2 percent. Thus, with deviations of the exchange rate from its PPP rate diminishing over time, PPP appears to hold in the long run.

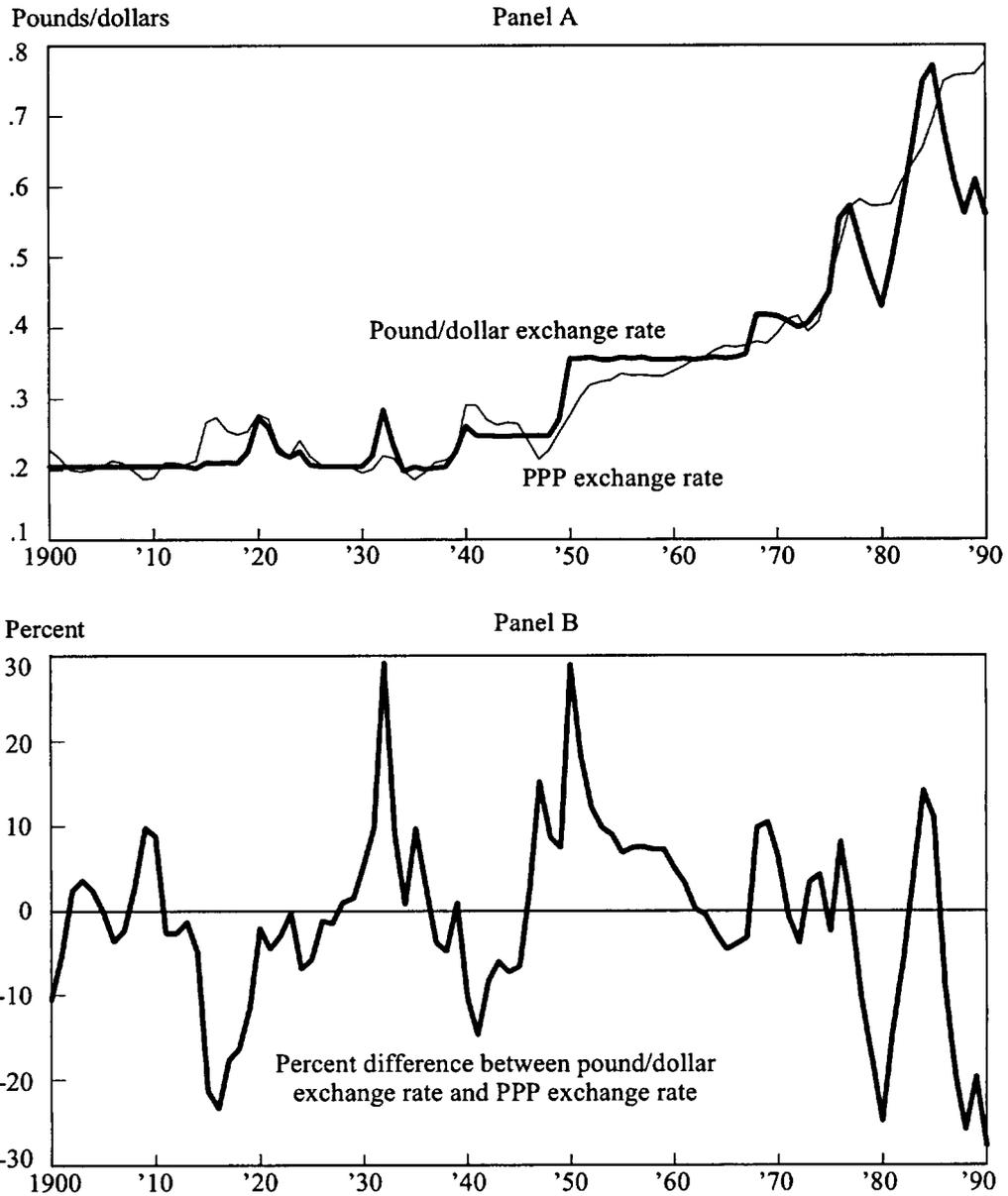
Likelihood of convergence to PPP

Various statistical tests can be used to determine more rigorously whether PPP holds in the long run. One approach is to estimate the probability that an exchange rate moves toward its PPP rate over a given time period. For example, what is the probability that the dollar will fall over the next year or two if it is currently above its PPP rate? Calculating such probabilities accounts for the uncertainty inherent in predicting future movements in the dollar and provides a test of long-run PPP.

For PPP to hold in the long run, the probability of the dollar moving closer to PPP over long periods should be greater than the probability of it moving away from PPP. For example, the probability of the dollar moving toward PPP in the next year might be 55 percent and the probability of the dollar moving away from PPP might be 45 percent. As the time period gets longer, the probability of moving toward PPP increases. Over the next five years, for example, the probability of the dollar moving toward PPP might rise to 75 percent, while the probability of it moving away from PPP might fall to 25 percent.

For PPP to be useful, the probability that the exchange rate moves toward its PPP rate must be

Chart 1
PPP and the Pound/Dollar Exchange Rate



Source: Lee (1978).

greater than 50 percent.⁷ To see why, suppose the exchange rate is currently above its PPP exchange rate. A probability of 50 percent means there is a 50-50 chance the exchange rate will rise and a 50-50 chance the exchange rate will fall. In other words, for predicting the future exchange rate, flipping a coin is as reliable as using PPP. As a result, in this case, the PPP exchange rate conveys little useful information.⁸ In contrast, a probability of 90 percent means an analyst could be confident that the exchange rate would fall. In this case, the PPP exchange rate conveys useful information about the long-run value of the exchange rate.

Based on estimated probabilities of convergence of actual exchange rates to PPP exchange rates, PPP is a useful long-run guide to the value of the dollar against the pound, yen, mark, and Canadian dollar (Table 1).⁹ The probability that any of the four exchange rates will move closer to their PPP rate in the next one to six years is between 54 and 79 percent. Averaging across all four currencies, the probability that the exchange rate will move toward its PPP rate in the next year is 59 percent.

At all time horizons, the pound/dollar exchange rate has a higher probability of moving closer to PPP than the other dollar exchange rates. The probability that the pound/dollar exchange rate moves closer to its PPP rate in the next year is 64 percent and increases to 79 percent in six years. Probabilities for the other exchange rates, while somewhat smaller, are still over 50 percent. They increase over time from an average of 57 percent in one year to 66 percent in six years. Because all estimated probabilities indicate a greater than 50-50 chance of moving toward PPP, they imply that PPP may be useful as a long-run guide to the dollar.

Length of time to convergence

Another way to test the value of PPP as a long-run guide is to estimate the length of time

required to achieve PPP when the exchange rate deviates from PPP. If it takes decades to eliminate a deviation, PPP may have limited appeal as a guide to even the long-run value of the dollar. However, if PPP is generally achieved in a matter of years rather than decades, PPP may have considerable appeal as a long-run guide.

Several years are generally required for the pound/dollar exchange rate to equal its PPP rate (Chart 2). The number of years it takes for the pound/dollar exchange rate to reach its PPP rate is shown on the chart's horizontal axis. The height of the bar at a given number of years shows the percentage of time it took that many years or less for the pound/dollar exchange rate to equal its PPP rate. For example, about 20 percent of the time, it took one year or less for the exchange rate to equal its PPP rate. About 40 percent of the time, it took two years or less. And about 50 percent of the time, it took three years or less. Because about half of the time three years or less were required to eliminate a deviation from PPP, three years is an estimate of the average time needed to achieve PPP.

For the other currencies, it generally took about six years for the exchange rate to equal its PPP rate. Specifically, the average time to eliminate a deviation was nine years for the yen, five years for the mark, and six years for the Canadian dollar. While five years may seem like a long time, businessmen and policymakers frequently have planning horizons of five or more years. As a result, information about the value of the dollar five years hence is generally useful. Because PPP provides such information, it is potentially a useful long-run guide to the dollar.

IS PPP A USEFUL SHORT-RUN GUIDE?

Businesses and policymakers would also like a guide to the value of the dollar over the next few months. Such a guide would help businesses determine when they should repatriate profits. And policymakers could use a short-run guide to the

Table 1

PPP As a Long-run Guide to the Dollar

Probability that the exchange rate moves toward the PPP exchange rate in:	Yen	Mark	Pound	Canadian dollar
1 year	60	54	64	57
2 years	60	65	70	64
3 years	66	61	72	60
4 years	65	60	72	60
5 years	66	64	78	65
6 years	64	65	79	68

Note: The sample period is from 1900 to 1989; the base period is 1900–13. Probabilities are reported as percentages. The probability of moving toward *PPP* in *k* periods is calculated as:

$$\frac{NOBS_{PPP}}{NOBS_{TOTAL}} \times 100,$$

where $NOBS_{PPP}$ is the number of times the exchange rate moves toward the *PPP* exchange rate in *k* periods, and $NOBS_{TOTAL}$ is the total number of observations.

More formally,

$$NOBS_{PPP} = \text{Number of observations where } [e_{t+k} < e_t \text{ and } e_t > PPP_t] + \\ \text{Number of observations where } [e_{t+k} > e_t \text{ and } e_t < PPP_t],$$

$$NOBS_{TOTAL} = \text{Number of observations where } e_t \neq PPP_t,$$

e_t = exchange rate at time *t*, and

PPP_t = *PPP* exchange rate at time *t*.

dollar as one of many variables providing information about the appropriate stance of monetary policy over the short run.

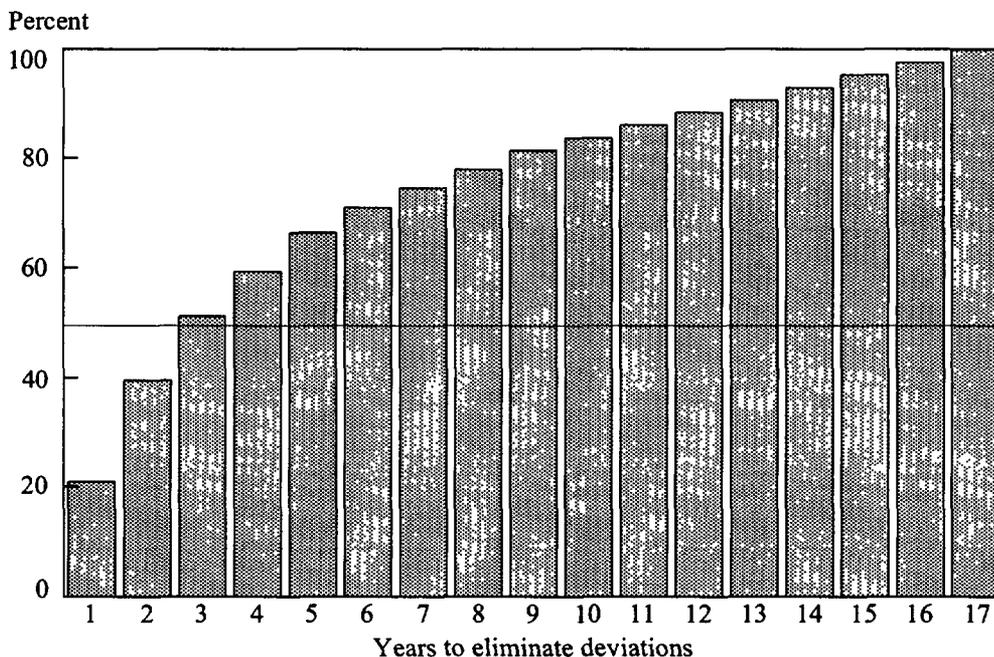
The usefulness of *PPP* as a short-run guide is tested by examining monthly exchange rate movements from January 1974 to July 1991, the period of the current floating exchange rate regime. First, the same methodology used to examine long-run *PPP* is used to test short-run *PPP*. Not surprisingly, *PPP* fails these stringent tests for usefulness. Then, the usefulness of *PPP* is examined using less-stringent tests. These tests show that, under certain

circumstances, *PPP* may be a useful guide to short-run movements in the dollar.

Stringent tests for the short-run usefulness of PPP

Market exchange rates and *PPP* rates do not move together from month to month nearly as closely as they do over longer horizons. For example, the relationship between the pound/dollar exchange rate and its *PPP* rate from 1974 to 1991 was weak (Chart 3, panel A).¹⁰ While both rates

Chart 2
Years Before Pound/Dollar Equals PPP Rate



rose during the period, the short-run relationship between the pound/dollar exchange rate and its PPP rate was much weaker than the long-run relationship.

Although the pound/dollar exchange rate occasionally equaled its PPP rate during the period, deviations from PPP were large and persistent (Chart 3, panel B). Each time the dollar rose above its PPP rate, it eventually declined; and each time it dipped below its PPP rate, it eventually rose. Still, the pound/dollar rate often far exceeded its PPP rate. For example, in March 1985 the dollar was overvalued 57 percent relative to PPP. And for almost 5½ years, from June 1981 to February 1987, the dollar stayed above its PPP rate. Thus, as a guide to month-to-month movements in the pound/dollar exchange rate, the PPP rate is highly

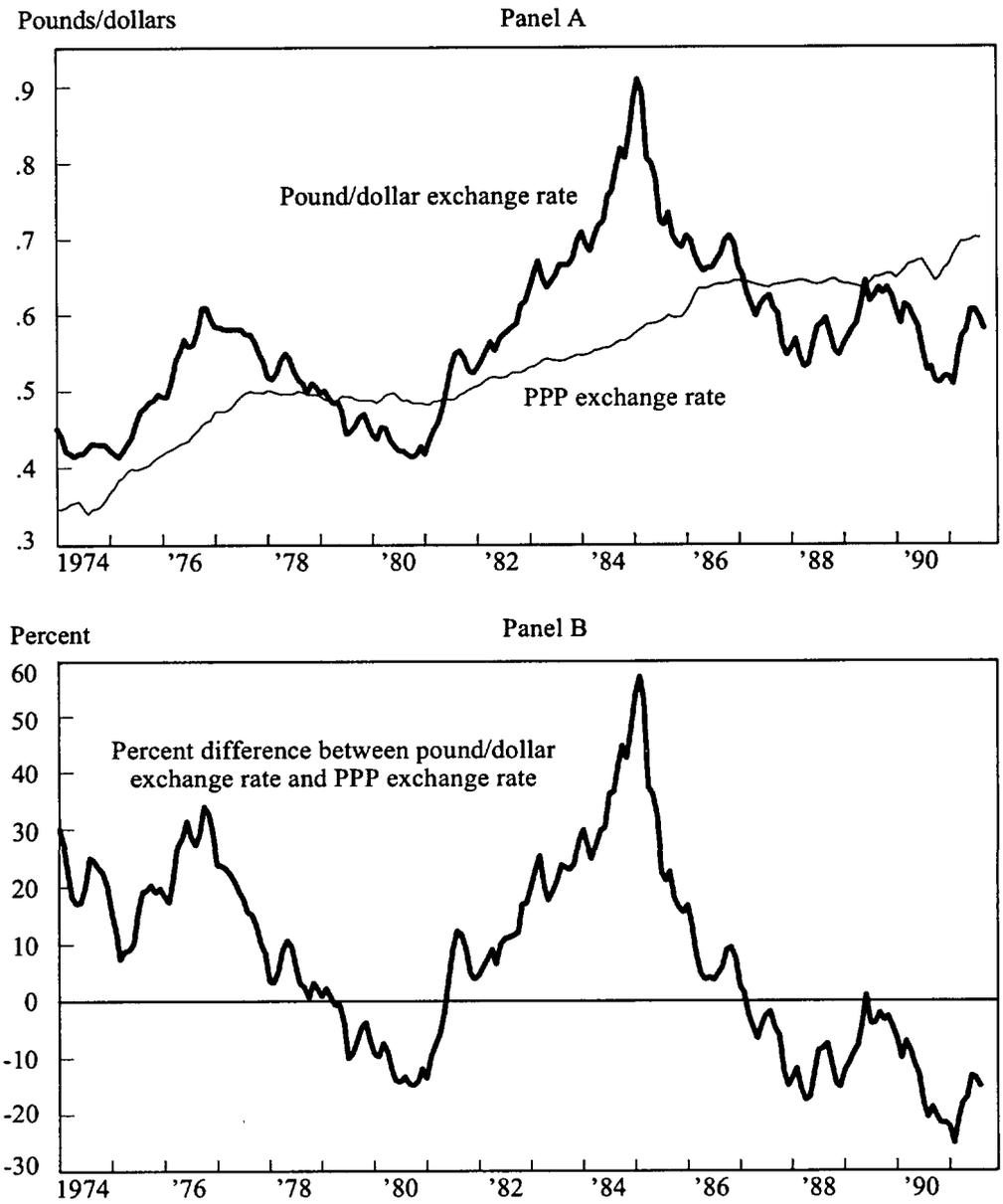
suspect.

PPP is also unreliable as a guide to short-run movements in the value of the dollar against the yen, mark, and Canadian dollar (Table 2). Based on the 1974-91 experience, the probability that the exchange rate moves toward its PPP rate within six months ranged from 45 percent for the mark to 60 percent for the Canadian dollar. In the case of the mark, a 45 percent probability implies that the exchange rate moved in the wrong direction relative to PPP 55 percent of the time. For the yen and Canadian dollar, the results are only slightly stronger. The probability that the yen/dollar exchange rate moves toward its PPP rate ranged from 54 percent (for one month) to 58 percent (for six months). The probability that the Canadian dollar/U.S. dollar exchange rate moves toward its

Chart 3

PPP and the Pound/Dollar Exchange Rate

January 1974 - August 1991



Source: Board of Governors.

Table 2

PPP As a Short-run Guide to the Dollar

Probability that the exchange rate moves toward the PPP exchange rate in:	Yen	Mark	Pound	Canadian dollar
1 month	54	44	54	52
2 months	54	42	53	49
3 months	56	45	50	57
4 months	57	44	51	57
5 months	57	45	50	59
6 months	58	45	51	60

Note: The sample period is from 1974:1 to 1991:7; the base period is 1980:1–1982:12. The probabilities are calculated as in Table 1.

PPP rate ranged from 52 percent (for one month) to 60 percent (for six months).

The time required for exchange rates to equal their PPP rates casts further doubt on PPP as a useful short-term guide to the dollar during the 1974-91 period (Chart 4). About 10 percent of the time, four months were needed for the pound/dollar exchange rate to equal its PPP rate. About 80 percent of the time, up to 47 months were needed. And about 50 percent of the time—the “average” time required to achieve PPP—about 23 months were needed.

The average time required for the other exchange rates to return to their PPP rates varied widely. The average time was 19 months for the Canadian dollar, 22 months for the Japanese yen, and 53 months for the German mark.

Less stringent tests for the short-run usefulness of PPP

Testing whether the exchange rate always moves toward its PPP rate within six months, however, may be too stringent. Many economists believe that the margin of error in estimating the

PPP exchange rate is 10 percent (Levich, p. 15). If true, it is not surprising that the dollar fails to move toward the estimated PPP exchange rate when it differs only slightly from the estimated rate.

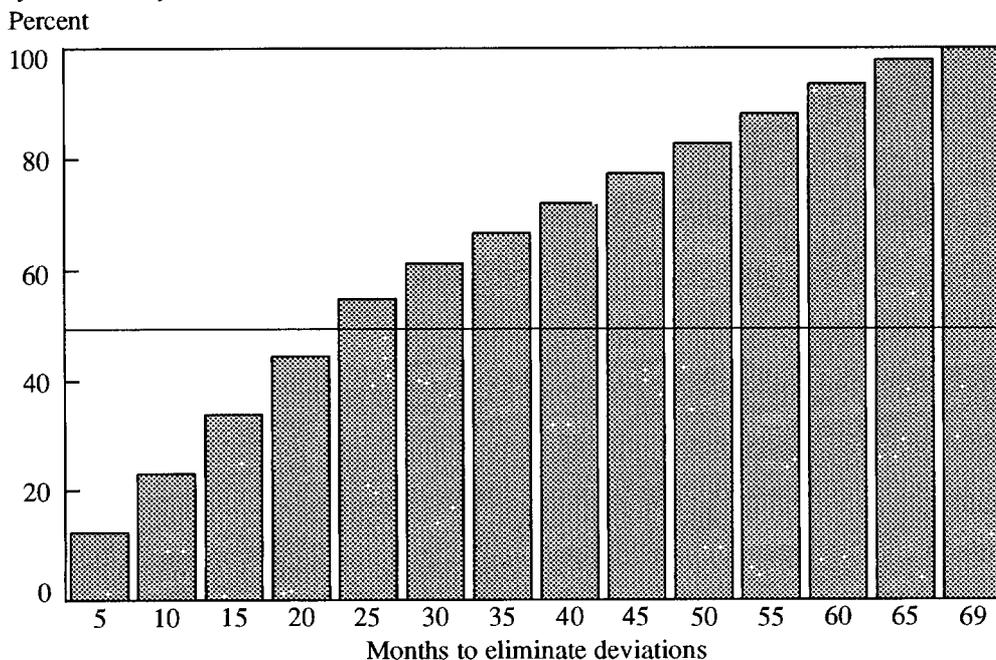
Figure 1 illustrates the margin of error problem. In the figure, the thin solid line is the estimated PPP exchange rate and the two dotted lines represent the band of uncertainty in estimating the PPP rate. In other words, all that investors and policymakers really know is that the “true” equilibrium rate lies somewhere between the two dotted lines. The heavy solid line is the actual exchange rate. Consider the exchange rate at point A. At point A, the exchange rate is above the estimated PPP rate but within the band of uncertainty. If the true equilibrium value is given by the thin solid line, then a rising exchange rate is inconsistent with PPP. However, if the true equilibrium value is given by the upper dotted line, then a rising exchange rate is consistent with PPP. Therefore, changes in the exchange rate when it is between the dotted lines may or may not be consistent with PPP.

Another reason the previous tests may be too stringent is that there may be a zone in which PPP

Chart 4

Months Before Pound/Dollar Equals PPP Rate

January 1974 - July 1991



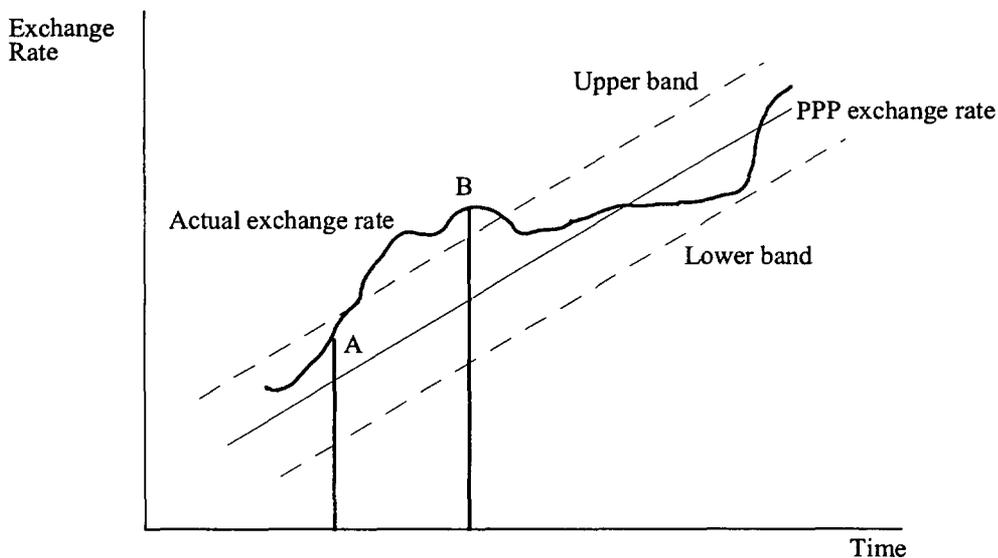
forces are weak. Many political and economic events cause the dollar to rise or fall, independent of what PPP implies. For example, news in 1990 that the United States attacked Iraq put upward pressure on the dollar. More recently, news that West Germany tightened monetary policy put downward pressure on the dollar. When events like these happen, movements in the dollar depend on how far the dollar is from PPP. When the dollar is far from PPP, market forces are likely to push the dollar toward PPP. But when the dollar is near PPP, market forces can push the dollar in either direction.

Figure 1 illustrates this argument. Suppose that policymakers were certain that the thin solid line was the true equilibrium value of the dollar. The two dotted lines now represent the band of

weak PPP forces. Even though the exchange rate is above its PPP rate at point A, other forces can dominate PPP forces so that the exchange rate may rise or fall. However, if the exchange gets too far out of line, such as at point B, then PPP forces are likely to cause the exchange rate to decline.

It is possible to test for a band of uncertainty or a band of weak PPP forces. The tests are similar to those performed previously. Now, however, the question is whether the exchange rate falls when it is above a threshold level and rises when it is below a threshold level. Suppose the threshold in Figure 1 encompasses 75 percent of the deviations from PPP.¹¹ The question then becomes: What is the probability that the exchange rate will fall, given that it is above the top dotted line (at a point such as B) and that it will rise, given that the

Figure 1
Less-Stringent Tests of PPP



exchange is below the bottom line?

Statistical tests show that when the exchange rate is far from its estimated PPP value (outside the band of uncertainty or the band of weak PPP forces), it is likely that the exchange rate will move toward its PPP rate in the near term (Table 3). The probability of moving toward the band in one month is fairly strong for the value of the dollar relative to all currencies except the mark. While the probability for the mark is only 50 percent, the probability for the other exchange rates ranges from 55 percent for the pound/dollar exchange rate to 63 percent for the yen/dollar exchange rate. Furthermore, the probability of the rates moving toward the band in six months is even higher, ranging from 63 percent for the mark to 80 percent for the Canadian dollar.¹²

CONCLUSIONS

Evidence presented in this article suggests purchasing power parity is a useful long-run guide to the dollar. With the dollar currently estimated to be about 20 percent below its PPP value against the mark and the yen, the dollar is likely to rise against these currencies over the next several years.

It is also found that PPP is less useful as a short-run guide to the dollar. Only when deviations from PPP are unusually large is the dollar more likely to move toward PPP than away from PPP in the short run. Current estimates of the dollar's value relative to PPP suggest the near-term outlook for the dollar is uncertain. This uncertainty stems from possible measurement error in

Table 3

A Narrow Version of PPP As a Short-run Guide to the Dollar

Probability that the exchange rate moves toward the PPP exchange rate in:	Yen	Mark	Pound	Canadian dollar
1 month	63	50	55	61
2 months	61	54	58	57
3 months	61	59	59	65
4 months	69	61	62	70
5 months	69	62	63	74
6 months	70	63	75	80

Note: Boundary set so that 75 percent of the observations are within the boundary. The sample period is from 1974:1 to 1991:12; the base period is 1980:1–1982:12. The probabilities are calculated as in Table 1, but using only those observations that fall outside the 75 percent boundary.

estimating the dollar's PPP rate. In addition, the current 20 percent deviation of the dollar from PPP is not clearly outside the zone of weak PPP forces.

As a result, while the value of the dollar is likely to rise over the next few years, the dollar's outlook over the near term remains uncertain.

BOX

The PPP Exchange Rate

The relation between the U.S. price level and the PPP exchange rate can be seen mathematically. In the case of the pound/dollar exchange rate, the PPP exchange rate is defined as follows:

$$PPP = \frac{P^{UK}}{P^{US}}$$

where (1)

PPP = the PPP exchange rate,

P^{UK} = the UK price level, and

P^{US} = the U.S. price level.

If all prices in the United States double, P^{US} doubles. The purchasing power of the dollar falls by half because the U.S. basket of goods now costs twice as much in dollar terms. Holding U.K. prices fixed, the pound/dollar PPP exchange rate falls by half. Since the purchasing power of the dollar is half what it used to be, a foreigner will pay only half as much for a dollar. That is, the PPP exchange value of the dollar falls by half.

The equation also demonstrates the equal value, under absolute PPP, of identical baskets of goods and services in the United States and United Kingdom. Recall that the U.S. price level in equation 1 is the dollar value of a basket of U.S. goods. Multiplying both sides of the equation by the U.S.

price level yields:

$$PPP \times P^{US} = P^{UK}$$

The left-hand side of the equation is now the pound value of the U.S. basket of goods, and the right-hand side is the pound value of the U.K. basket of goods. When both baskets are valued in the same currency at the PPP exchange rate, the values are equal. This equality reflects the law of one price, which says that the price of a specific good in the United States and the United Kingdom should be the same when expressed in pounds.

Absolute PPP can be viewed as an extension of the quantity theory of money to an international economy. According to the quantity theory of money, an increase in the supply of money leads both to an increase in the price level and to a decline in the exchange rate. An increase in the U.S. price level means a dollar purchases fewer goods; a decline in the exchange rate means a dollar purchases fewer units of foreign currency. For both reasons, the increase in the money supply reduces the purchasing power of money. According to PPP, the increase in the price level and the decline in the dollar are equal. Equation 1 reflects this equality.

ENDNOTES

¹ The law of one price provides that each good potentially has its own exchange rate. For example, the exchange rate for sweaters equals the price of U.K. sweaters divided by the price of U.S. sweaters. If the U.S. price of sweaters is \$100 and the U.K. price of sweaters is £50, the exchange rate for sweaters equals £50/\$100 or £0.50/\$. If the law of one price holds strictly, this PPP exchange rate for sweaters equals the market exchange rate.

² Price levels, in turn, may be measured by a number of

indexes, including the consumer price index, producer price index, and the fixed-weight and implicit GDP deflators. Because there are only a handful of price indexes, there are only a few possible ways to measure absolute PPP exchange rates.

³ If there is a constant factor of proportionality, PPP can be written as:

$$e^{PPP} = \theta * \frac{P^{UK}}{P^{US}}$$

Taking the growth rate of both sides yields relative PPP

because the growth rate of the constant term is zero. Kenichi Ohno (1990) estimates this factor of proportionality.

⁴ Testing relative PPP first requires computing the relative PPP exchange rate. While the concept of relative PPP provides a formula for computing changes in the PPP exchange rate, it does not provide a means for computing the levels. An initial PPP exchange rate is therefore needed to serve as an anchor in converting changes in the PPP exchange rate to levels. Once an initial exchange rate is known, PPP exchange rates can be calculated for all other time periods. But how is the initial exchange rate chosen?

One way to choose an initial exchange rate is to assume that PPP held in some base year. For example, suppose PPP held in 1980, so that the PPP exchange rate in 1980 equaled the actual exchange rate. In the case of the pound/dollar exchange rate, the assumption could be written mathematically as:

$$e_{1980} = e^{PPP} = \theta * \frac{p^{UK}}{p^{US}}$$

According to relative PPP, the change in the PPP exchange rate between 1980 and 1981 would equal the inflation differential between the United States and the United Kingdom. Knowing the PPP rate in 1980 and the change in the PPP rate between 1980 and 1981 provides an estimate of the PPP rate in 1981. Continuing in this way leads to a time series of PPP exchange rates.

Choosing a different base year yields a different PPP exchange rate. Since it is impossible to say with certainty that PPP held in some particular base year, there is no such thing as *the* PPP exchange rate. By choosing several different base years, the results are not prejudiced by this base-year problem.

⁵ If shocks are always money shocks, then most theories suggest that PPP is correct. However, if shocks are also real

shocks that lead to changes in relative prices, then PPP would be incorrect.

⁶ To make the deviation in 1900 comparable to the deviation in 1980, the chart plots the percentage deviation between the exchange rate and the PPP rate.

⁷ The probability that the exchange rate moves toward PPP plus the probability that it moves away equals 100 percent. Therefore, if the probability of moving toward PPP is greater than the probability of moving away, the probability of moving toward PPP must be greater than 50 percent.

⁸ If the probability is less than 50 percent, then a deviation from PPP is most likely going to get larger. But the calculation only says that the deviation will get larger; it does not say how large. Therefore, the PPP exchange rate contains little useful information.

⁹ As in Chart 1, the base period is 1900-13. The results using other base periods are similar.

¹⁰ The base period for calculating PPP was 1980-82 because several economists have argued this was a period of equilibrium. See Krugman and others.

¹¹ The choice of 75 percent is arbitrary—60 percent or 90 percent would also have been possible. If one believes that 25 percent of the deviations from PPP are “large,” then a 75 percent band is appropriate.

¹² In addition, the exchange rate quickly moves to the edge of its band. It takes from three to six months for the exchange rate to return to the edge of its boundary whenever it is above the upper boundary or below the lower boundary. Of course, this information is limited. The exchange rate quickly moves to the edge of its band, but the band is wide—covering 75 percent of the exchange rate observations.

REFERENCES

- Krugman, Paul R. 1985. “Is the Strong Dollar Sustainable?” in *The U.S. Dollar—Recent Developments, Outlooks, and Policy Options*, a symposium sponsored by the Federal Reserve Bank of Kansas City, August 21-23.
- Lee, M. H. 1978. *Purchasing Power Parity*. New York: Dekker.
- Levich, Richard M. 1985. “Gauging the Evidence on Recent Movements in the Value of the Dollar,” in *The U.S. Dollar—Recent Developments, Outlooks, and Policy Options*, a symposium sponsored by the Federal Reserve Bank of Kansas City, August 21-23.
- Ohno, Kenichi. 1990. “Estimating Yen/Dollar and Mark/Dollar Purchasing Power Parities,” *IMF Staff Papers*. International Monetary Fund, September.

Changes in Financial Intermediation: The Role of Pension and Mutual Funds

By Gordon H. Sellon, Jr.

Since the late 1970s, the U.S. financial system has undergone considerable stress. Many traditional intermediaries, such as thrifts, banks, life insurance companies, and investment banks, have suffered large losses and some have failed. Most analyses of these problems have focused on the difficulties of these institutions in adapting to the inflationary environment of the 1970s and 1980s.

Some of the problems of these traditional intermediaries have deeper roots, however. Over the postwar period, the rapid growth of pension and mutual funds has increased competition for household savings. While competition has opened up new business opportunities for some traditional intermediaries, it has undermined the profitability of others. As a result, many traditional intermediaries have been forced to adapt to new roles in the financial system.

This article examines the impact of pension and mutual funds on the postwar financial system. Recognizing their influence is important both for understanding the causes of recent financial problems and for deciding what regulatory changes might be appropriate to ensure the future

health of the financial system.

The first section of the article describes the growth of pension and mutual funds over the postwar period and their increasing importance in the financial system. The second section examines how their success has undermined or enhanced the fortunes of traditional intermediaries. The third section describes how pension and mutual funds have affected the overall intermediation process and examines some of the implications for financial regulation.

THE RISE OF PENSION AND MUTUAL FUNDS

By offering greater portfolio diversification and professional investment management, pension and mutual funds have dramatically altered the investment options available to the individual investor. Their success is reflected in a shift away from traditional forms of intermediation and a significant restructuring of household balance sheets.

Features of pension and mutual funds

In the early 1950s, individual investors faced very limited investment options. Most households placed their savings in deposits at banks and thrifts or in life insurance policies that combined insurance with low-interest savings. Wealthier individ-

Gordon H. Sellon, Jr. is an assistant vice president and economist at the Federal Reserve Bank of Kansas City. Dan Roberts, an assistant economist at the bank, assisted in the preparation of this article.

uals also bought corporate stocks and bonds. However, purchases of the stocks and bonds of individual companies required considerable sophistication by the investor or reliance on the research and investment advice of the investment banks providing brokerage services.

Pension and mutual funds substantially altered the investment landscape. By pooling funds from a large number of investors to purchase a diversified portfolio of assets, pension and mutual funds provide individual investors with a low-cost method of diversifying their asset portfolio. For example, pension funds combine employer and employee retirement contributions to purchase a large portfolio of stocks and bonds. Mutual funds allow individual investors to purchase shares of the fund that represent ownership interests in a large pool of assets selected by the fund. This proportional ownership allows investors with limited funds the opportunity to purchase assets that are available only in large denominations.

Another important feature of pension and mutual funds is professional management. Because the choice of individual assets in a fund is the responsibility of investment advisors or fund managers, individual investors can participate in a broad range of investments without the need for detailed knowledge of the individual companies issuing the stocks and bonds.

Despite these general similarities, pension and mutual funds have significant differences. Most importantly, pension plans have a fiduciary responsibility to deliver promised pension benefits and are subject to extensive federal and state regulation. These restrictions play a major role in guiding the investment decisions of pension plans. Moreover, because they are retirement oriented, pension plans invest almost exclusively in corporate stock and long-term corporate and government bonds.

In contrast, mutual fund investment policies are driven more by market forces than by restrictions or preferences of sponsoring organizations. Firms selling mutual funds derive their profit-

ability mostly from the size of funds under their management. Thus, they tend to offer a wide range of investment options to maximize the amount of funds under their management. Mutual funds are also subject to fewer regulations than pension funds. Their principal regulatory requirement is that they adequately inform investors as to the risks and expenses associated with investment in specific funds.¹ Finally, unlike pension plans, most mutual funds are not retirement oriented. Thus, investment inflows and outflows are more uncertain and liquidity management is a more important part of investment decisions than in the case of pension funds.

Growth and development

Pension and mutual funds have experienced strong growth over the postwar period. Much of the increase in pension fund assets has been channeled into the stock market. In contrast, while mutual funds originally focused on stocks, much of their recent growth can be attributed to funds specializing in money market and other fixed income assets.

Pension fund growth over the postwar period has been due to increased pension coverage and increased value of contributions.² At the end of the Second World War, there were relatively few pension plans. Much of the increase in pension fund assets during the 1950s and 1960s resulted from the creation of new plans as retirement benefits became an important part of collective bargaining and other salary negotiations (Munnell, pp. 7-13). Indeed, the proportion of the labor force covered by private employer plans doubled from 15 percent in 1950 to 31 percent in 1970 (Kotlikoff and Smith, Woods). Since 1970, the formation of new employer plans has slowed, and recent growth in pension assets has tended to result from an increased value of contributions rather than from expanded coverage.³

While all types of pension plans have experienced strong growth in the postwar period, the

pattern of growth has differed according to the type of plan. During the 1950s, 1960s, and early 1970s, much of the increase in pension assets resulted from the expansion of private pension plans. Since the late 1970s, however, growth in private plans has slowed, while state and local plans and insured pension plans have accelerated (Chart 1).⁴

Federal tax policy has been a principal factor behind pension fund growth (Munnell, pp. 30-61). Federal tax law permits the deduction of employer pension contributions. In addition, neither employee contributions nor interest on pension assets are currently taxable to employees, and taxes are deferred until retirement. Thus, there are significant economic incentives for employers to pay benefits in the form of pension contributions and for individuals to save through a pension plan rather than through a taxable form of saving.

Pension plan investment policies have undergone considerable changes over the postwar period. Because of their commitments to pay retirement benefits, pension plans have concentrated their investments in long-term assets. At the beginning of the postwar period, pension plans held mostly bonds that had been acquired during the Second World War. During the 1950s and 1960s, the strong performance of the stock market offered much higher returns, and stocks became a more important part of the investment portfolio (Chart 2).⁵

This increased emphasis on stocks, coupled with strong growth in the size of pension funds, has made pension funds a sizable force in the stock market. Indeed, in 1952, pension funds held only 1 percent of corporate stock outstanding; by the end of 1991, they held 25 percent.

Mutual funds have also become more prominent in the postwar period. Initially, growth was due almost entirely to savings flowing into equity funds. Indeed, over the 1952-70 period, mutual funds held an average of 87 percent of assets in stocks. Growth was particularly strong from the late 1950s to late 1960s as a booming stock market attracted considerable investor interest. However,

the enormous increase in stock transaction volume in the late 1960s led to back-office problems at brokerage firms that prevented many investors from completing stock purchases and sales. Partly as a result of these problems, individual investors abandoned the stock market, causing equity holdings by mutual funds to fall throughout the 1970s (Chart 3).⁶

The mutual fund industry responded to this decline in business by diversifying its investment offerings. The industry created money market mutual funds in the early 1970s in an attempt to capture funds moving out of the stock market. The initial modest success of money funds was followed by explosive growth in the late 1970s (Chart 3). Investors discovered that money funds were an attractive alternative, not to stocks, but to bank and thrift deposits when market interest rates rose above the regulated rates paid by banks and thrifts.

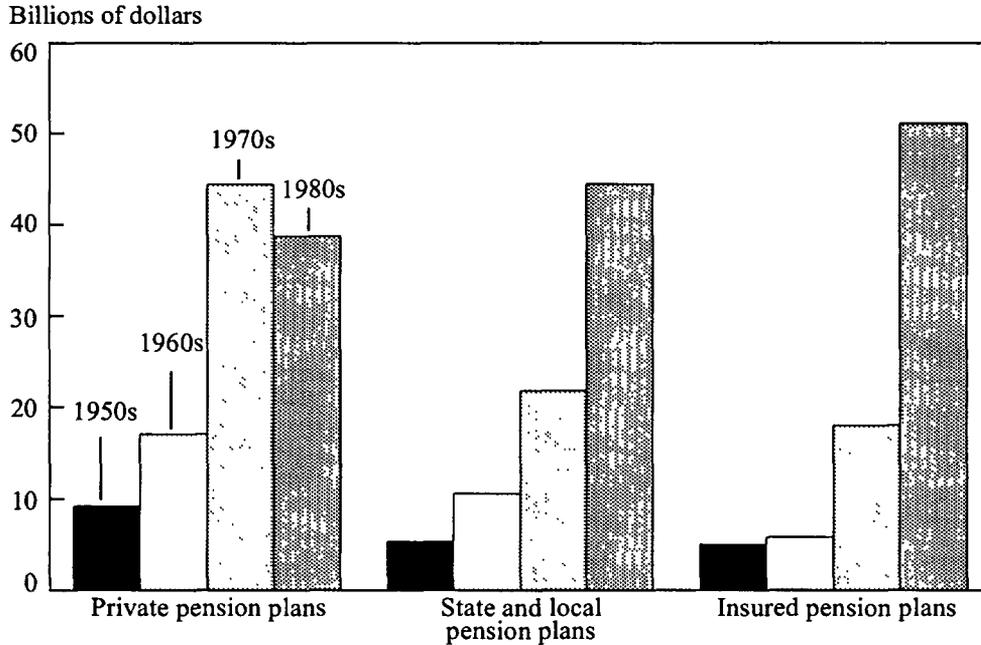
The success of money funds led to the development of additional types of fixed-income funds such as tax-exempt municipal bond funds in the late 1970s and junk bond funds in the 1980s. While equity purchases resumed as the stock market revived in the 1980s, money market and other fixed-income assets accounted for much of the growth in mutual fund assets during the 1980s (Chart 3).

The growth of money funds and fixed-income funds has reduced the concentration of stocks in mutual funds portfolios. Thus, while stocks made up almost 90 percent of fund portfolios in 1970, the proportion had fallen to 29 percent in 1991. Still, over the entire postwar period, mutual funds, like pension funds, have become a greater force in the stock market. While mutual funds held only 2 percent of outstanding corporate stock in 1952, by 1991 this share had risen to 9 percent.

Effects on household balance sheets

The impressive growth of pension and mutual funds over the postwar period has led them to take on expanded significance in the financial system. One measure of their impact can be found by

Chart 1
Growth of Pension Plans



Note: Mean net acquisition of real financial assets by decade.
Source: Flow of Funds Accounts, Federal Reserve System.

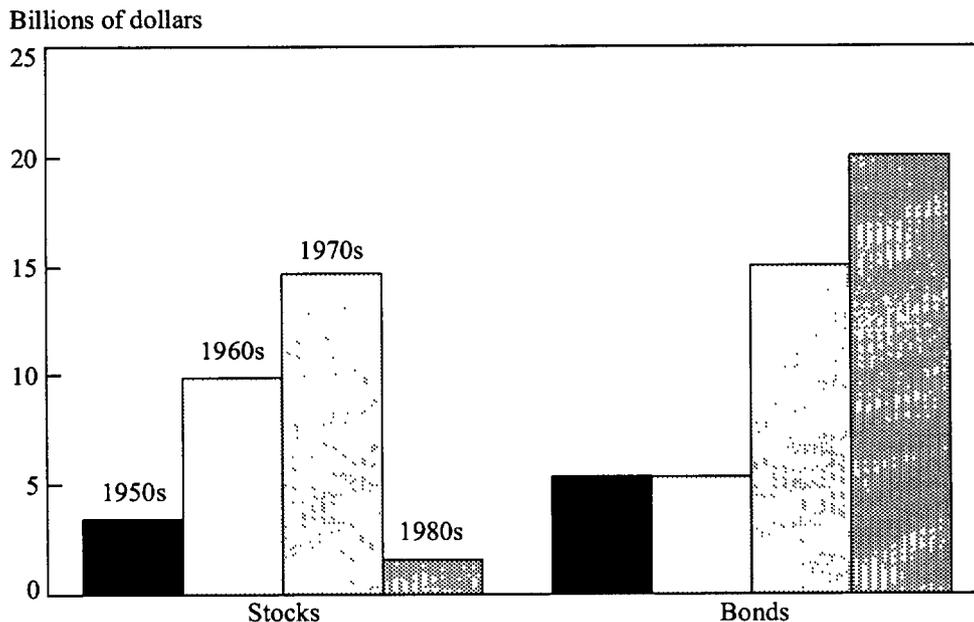
looking at the changes in household savings patterns.⁷ In the early 1950s, pension and mutual funds played a relatively small role in household savings decisions. For example, in 1952, households held only 6 percent of their financial assets in pension funds and less than 1 percent in mutual funds.⁸ By 1991, however, households placed 27 percent of their financial assets in pension funds and nearly 10 percent in mutual funds.

The growing share of pension and mutual funds in household assets has clearly affected other forms of saving. Broadly speaking, households have three types of savings options: direct holdings of securities (stocks and bonds), indirect holdings of securities (through pension and mutual funds), and holdings of liabilities of traditional intermediaries (banks, thrifts, and

insurance companies). Over the postwar period, there has been a pronounced shift in household savings patterns away from direct holdings of securities and liabilities of traditional intermediaries toward indirect holdings of assets through pension and mutual funds (Chart 4).⁹

The gains by pension and mutual funds have come at the expense of a wide range of other financial assets (Chart 5). Over the postwar period, households have significantly reduced their direct holdings of stocks and purchases of life insurance. Thus, direct holdings of stock fell from 32 percent of household financial assets in 1952 to 18.5 percent in 1991. Similarly, life insurance declined from 12 percent of household financial assets in 1952 to only 3 percent in 1991. Households also reduced the

Chart 2
Assets of Private Pension Plans



Note: Mean net acquisition of real financial assets by decade.
Source: Flow of Funds Accounts, Federal Reserve System.

shares of bonds and bank and thrift deposits in their portfolios, by somewhat smaller amounts.

CHALLENGES TO TRADITIONAL INTERMEDIARIES

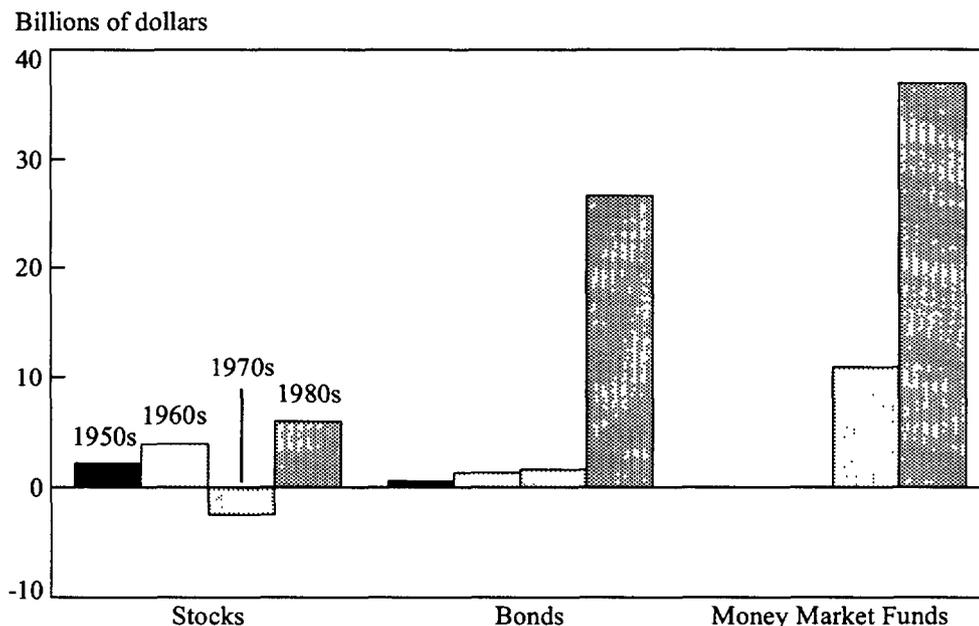
By altering the allocation of household savings, pension and mutual funds have affected the health and viability of many traditional intermediaries. Some intermediaries have been hurt by a loss of market share and reduced profitability, while others have benefited by providing financial services to pension and mutual funds. The impact has varied greatly across institutions because of functional specialization imposed by regulation and by industry practice.

The role of specialization

The financial system of the early 1950s was highly specialized. Intermediaries performed a narrow range of functions and faced limited competition within and across industry lines. This specialization was partly due to the historical development of the financial services industry but more importantly to the financial regulatory structure set up during the 1930s. Because of this specialization, traditional intermediaries were affected very differently by the growth of pension and mutual funds.

At the beginning of the postwar period, there were four major types of financial intermediaries, each with a well-defined role in the financial system. While banks, thrifts, and life insurance com-

Chart 3
Mutual Fund Assets



Note: Mean net acquisition of real financial assets by decade.
 Source: Flow of Funds Accounts, Federal Reserve System.

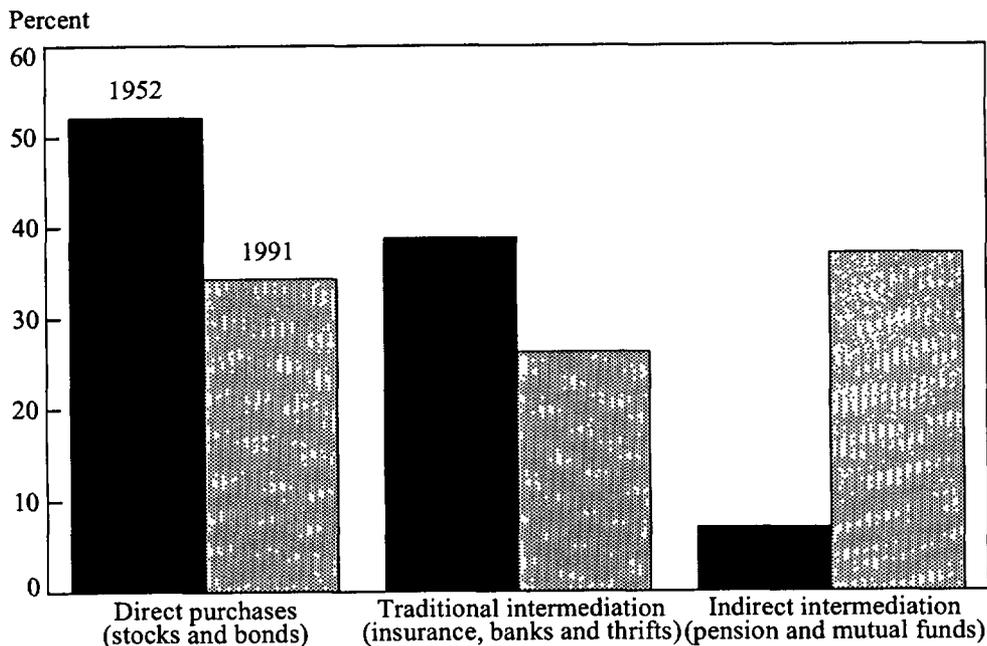
panies were very similar in the way they attracted household savings through deposits or deposit-like insurance products, they had very different investment objectives. For example, life insurance companies channeled most of their funds into long-term corporate bonds, whereas banks concentrated on short-term business lending and thrifts specialized in home mortgage lending. In contrast, investment banks played a much different role in the intermediation process. Rather than attracting household savings and investing in other sectors of the economy, investment banks handled the underwriting of new corporate stock and bond issues and the distribution of these securities to households.

This specialization was shaped both by the historical evolution of these intermediaries and by

government regulation. For example, banks had traditionally focused on short-term business lending and thrifts on home mortgage lending. More significant, however, was the regulatory structure set up during the Depression. In an attempt to prevent a reoccurrence of the financial crises of the 1930s, intermediaries were locked into narrow roles and competition was greatly restricted both within industries and across industry lines (Huertas).

One of the more significant restrictions was the separation of commercial and investment banking. Prior to the 1930s, commercial banking and investment banking operations were generally performed within a single organization. Following the Depression, these functions were legally separated. Commercial banks were not permitted to underwrite or distribute corporate stock and

Chart 4

Intermediation of Household Saving

Note: The chart shows each category as a percent of household financial assets.
Source: Flow of Funds Accounts, Federal Reserve System.

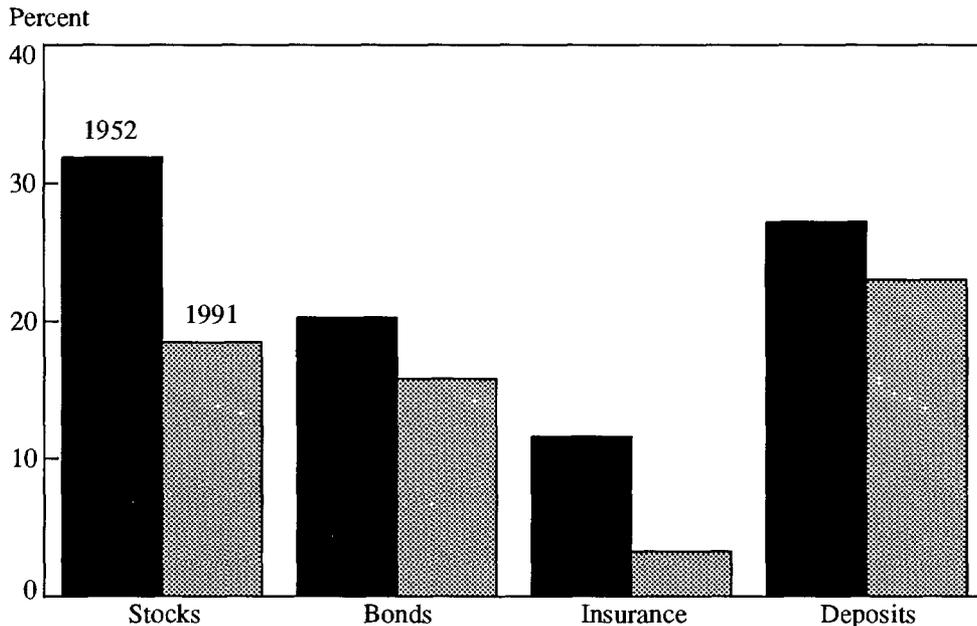
bonds and were forbidden to hold corporate stock in their investment portfolio. Investment banks, in turn, were not allowed to accept household deposits and make commercial loans. The effect of these restrictions was to artificially separate long-term and short-term corporate finance. Businesses could borrow short-term funds only from commercial banks and could obtain long-term funding only through investment banks.

Regulation also limited the activities of life insurance companies and thrift institutions. Although life insurance companies were the largest single purchaser of corporate debt, state insurance regulations prohibited significant investment in corporate equity. Thrift institutions could not make commercial or consumer loans and were forced to specialize in long-term, fixed-

rate home mortgages.

Specialization was further promoted by restrictions on competition resulting from additional regulation and industry practice. For example, competition among banks and thrifts was limited by legal restrictions on branching and by deposit interest rate ceilings. In contrast, in the less-regulated investment banking industry, competition was restricted by industry practice (Hayes, Spence, and Marks). The industry consisted of a small number of "wholesale" firms that exercised tight control over the underwriting of new stock and bond issues and a much larger number of "retail" brokerage firms that distributed securities to investors through extensive branch networks. Traditional industry practice dictated that the two types of firms did not compete in each

Chart 5

Declining Shares of Household Saving

Note: The chart shows components of the categories "Direct Purchases" and "Traditional Intermediation" in Chart 4.
Source: Flow of Funds Accounts, Federal Reserve System.

other's line of business.

This specialization shaped the impact of pension and mutual funds on traditional intermediaries. For some intermediaries, pension and mutual funds posed a competitive threat that undermined the profitability of their specialized franchise. Thus, faced with a shift of household funds to pension and mutual funds, some intermediaries were forced to reduce the prices of their services or raise the rates paid on their liabilities. Profitability of some intermediaries was also threatened to the extent that businesses could sell debt directly to pension and mutual funds rather than relying on lending by traditional intermediaries.

At the same time, other traditional intermediaries benefited from the growth of pension

and mutual funds. The sheer size of the funds made them an attractive market for traditional intermediaries providing investment management and advice, trading expertise, and risk-management services. Moreover, the profitability of the mutual fund industry made it an attractive target for intermediaries forced to seek new lines of business.

Impact on traditional intermediaries

The growth of pension and mutual funds has affected a wide range of traditional intermediaries. The impact on individual intermediaries has depended both on their specialization and on their ability to adapt to these changes. Generally speaking, the life insurance industry has benefited most from the success of pension and mutual funds

while banks and thrifts have been adversely affected. The impact on the investment banking industry has been mixed. Smaller retail firms have been hurt, while larger retail firms and wholesale firms have gained.

Investment banking. The growth of pension and mutual funds has had its most direct and visible effect on the investment banking industry. By affecting both the volume of stock transactions by individual investors and industry pricing practices, pension and mutual funds have undermined the profitability of the retail portion of the investment banking industry. The result has been increased consolidation among smaller retail firms and increased competition between retail and wholesale firms. At the same time, however, larger retail firms and wholesale firms have successfully adapted to these challenges by reorienting their business from the individual to the institutional investor.

The postwar period has seen a significant reduction in the participation of individual investors in the stock market (Chart 6). In 1952, for example, households held 91 percent of corporate stock outstanding, largely because of the restrictions on stock holdings by banks, thrifts, and life insurance companies cited above. By 1991, however, the share of stock held by individuals had fallen to 53 percent. In contrast, the share of stock held by pension and mutual funds rose from 3 percent in 1952 to 34 percent in 1991. Even more dramatically, households have been net sellers of stock in all but one year since 1958.

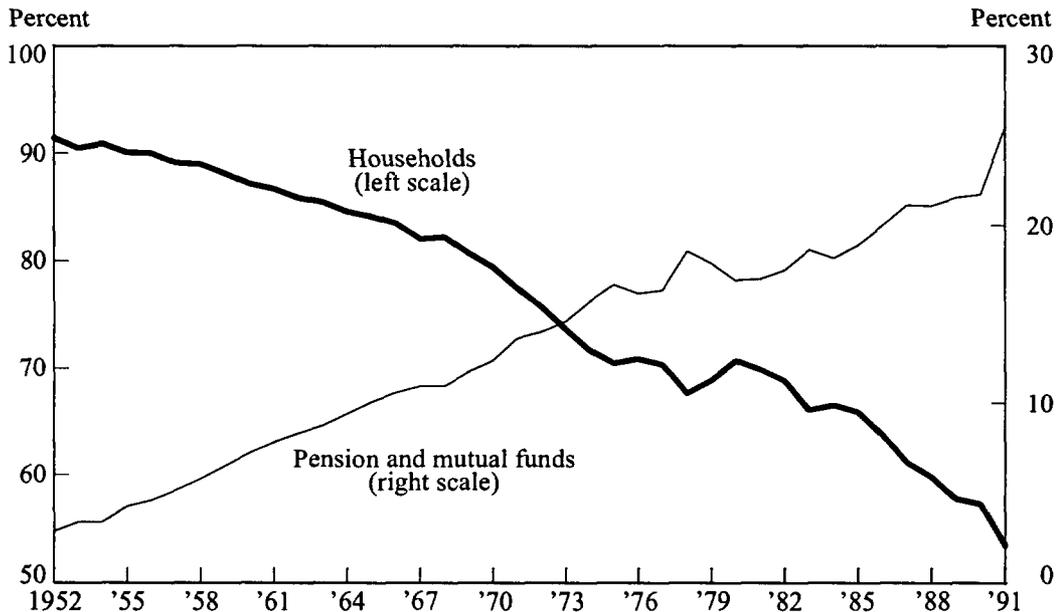
The declining role of individual investors in the stock market has reduced the profitability of brokerage firms catering to individual investors. Reduced trading volume has lowered the commission income of these retail firms, making it more difficult for them to support the large overhead costs of providing research and investment advisory services to individual investors. In contrast, wholesale firms, which are much less dependent on trading volume, have been less affected by this shift in stock buying patterns.

Pension and mutual funds have also altered the commission structure of the stock market (Seligman, pp. 466-86). The New York Stock Exchange (NYSE) traditionally employed a fixed-commission fee structure, with no volume discounts. But pension and mutual funds wanted lower fees based on the large volume of their transactions. In addition, these funds did not want to pay for research and investment advisory services geared toward the individual investor. Responding to pressure from pension and mutual funds that began moving their business away from the NYSE as well as political pressure to lower rates for individual investors, the SEC deregulated NYSE commissions in 1975. Pension and mutual funds as well as individual investors who used newly created discount brokerage firms benefited greatly from this change. However, many traditional retail brokerage firms with a large investment in research and investment advisory services saw their profitability erode even further.

The retail portion of the investment banking industry adjusted to these changes through consolidation and diversification (Hayes, Auerbach, and Hayes, pp. 81-107). During the 1970s, many smaller brokerage firms failed or were merged into stronger firms. Larger retail firms diversified their operations by moving into such areas as underwriting that had traditionally been reserved for wholesale firms. Still others set up mutual funds in an attempt to recapture the business of individual investors.

Reflecting the changes in household portfolios, the investment banking industry also shifted its emphasis away from the individual investor toward providing services for pension and mutual funds. Many firms discovered new profit opportunities in providing trading expertise and risk-management products and advice. Thus, the industry played an important role in the development and use of new products like swaps and options designed to control the risk exposure of pension and mutual fund portfolios (Warshawsky).

Chart 6
Holdings of Corporate Equity



Source: Flow of Funds Accounts, Federal Reserve System.

The investment banking industry has been able to adapt to these changes because of the relative absence of regulatory restrictions preventing the development of new lines of business. As the least regulated of traditional intermediaries, investment banks have been able to offer new products and services without the need for extensive changes in regulations and legislation.

Life insurance companies. The life insurance industry has generally benefited from the growth of pension and mutual funds. By managing increasing amounts of pension fund assets, life insurance companies have been able to offset sluggish growth in household demand for traditional life insurance products. However, the ability of the life insurance industry to adapt to this new market has been slowed by continued regulatory restric-

tions on equity holdings.

Like stock holdings, the share of life insurance in household portfolios has declined significantly over the postwar period (Chart 5). Unlike stocks, however, the reduced share resulted from slow growth of life insurance products rather than from an outright reduction in investor holdings. This weakness reflects a consumer shift away from traditional life insurance products (insurance combined with savings) toward term insurance and investment in other higher yielding financial assets. During the 1950s and 1960s, this weak demand for life insurance products translated into very slow growth in industry assets.

Beginning in the mid-1970s, however, growth in industry assets accelerated sharply (Chart 7). Most of this increase was due to rapid growth in

Chart 7

Growth of Life Insurance Company Assets

Source: Flow of Funds Accounts, Federal Reserve System.

assets of private pension funds managed by life insurance companies. As a result, management of pension fund assets has now replaced sale of life insurance as the principal business of the life insurance industry (Chart 8).

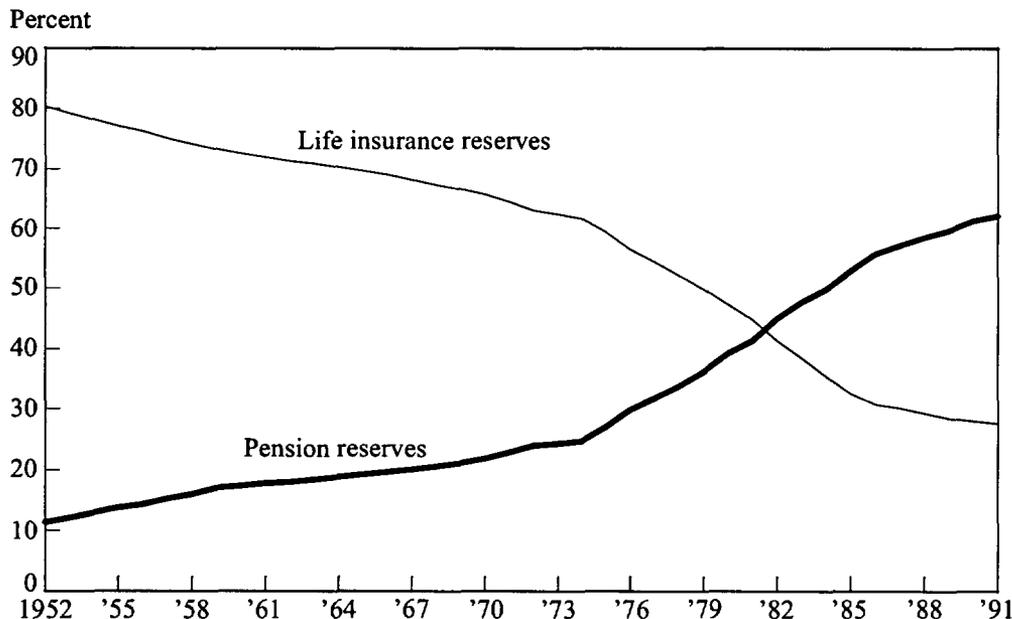
Growth in pension assets was stimulated by changes in pension and tax laws. A key factor behind this growth was a 1974 revision in pension fund laws that encouraged pension funds to turn over fund management to life insurance companies and extended pension plan eligibility to the self-employed.¹⁰ Asset growth was also boosted during the 1980s by tax law changes which encouraged the establishment of pension plans and IRAs for the self-employed as well as the sale of tax-deferred annuities to individuals.

Thus, like the investment banking industry,

the life insurance industry has adjusted to the changing demand for its traditional products by diversifying into other financial services. In addition to managing pension fund assets, many larger life insurance companies have sponsored mutual funds and some have purchased investment banking firms.

However, unlike investment banking, the ability of the life insurance industry to adapt has been slowed by a regulatory environment that has not kept pace with these changes. Most significant have been restrictions on equity holdings. As noted earlier, life insurance companies have been strictly limited in the amount of corporate stock held in their investment portfolio. Currently, a maximum of 10 percent of the portfolio can be invested in equity. Some relief has come in the

Chart 8

The Changing Emphasis of Life Insurance Companies

Note: Life insurance and pension reserves are expressed as a percentage of life insurance company liabilities.
Source: Flow of Funds Accounts, Federal Reserve System.

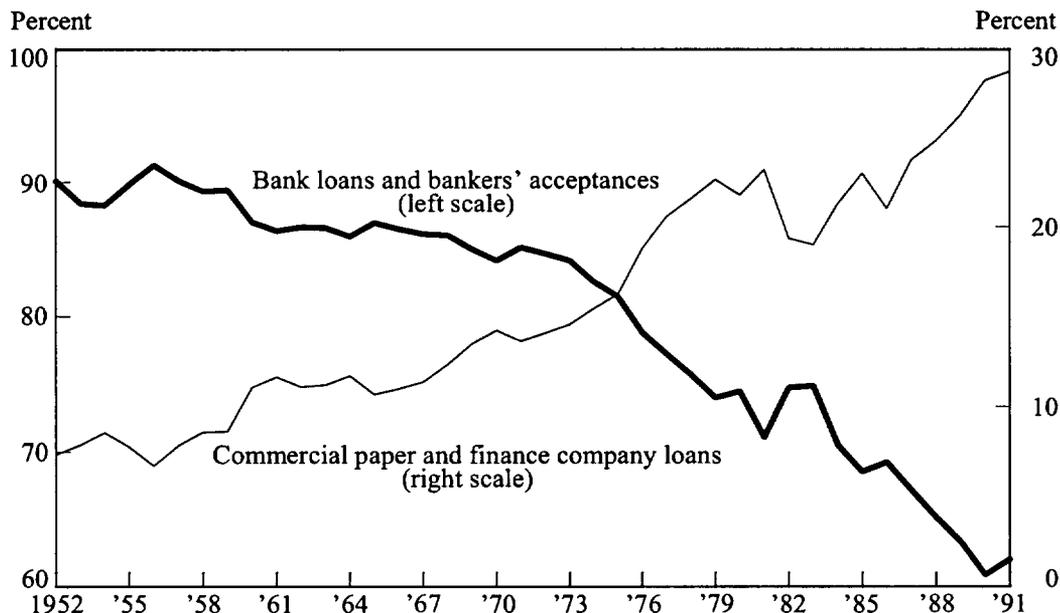
creation of “separate accounts,” which allow pension fund assets to be segregated from the investment portfolio and invested exclusively in equity or other high-yield assets. Still, life insurance companies have been at a disadvantage when competing with other managers of pension fund assets, such as bank trust departments, which do not face similar portfolio restrictions.¹¹

Depository institutions. In contrast to life insurance companies, banks and thrifts have been adversely affected by the growth of pension and mutual funds. Profitability has been squeezed by direct competition with money market funds. Pension and mutual funds have also supported the growth of alternatives to traditional bank and thrift lending. Moreover, as the most highly regulated intermediaries, banks and thrifts have had consid-

erable difficulty in adjusting to these changes in the competitive environment.

The development of money market funds in the early 1970s fundamentally changed the market for consumer deposits. Prior to money market funds, deposit markets were local; that is, banks and thrifts relied on local deposits to make local loans. Competition for deposits was severely limited by branching laws and by interest rate ceilings on deposits. Money funds increased competition for deposits by attracting funds away from banks and thrifts that did not pay competitive market rates on deposits. Money funds were also the primary stimulus to the deregulation of deposit interest-rate ceilings in the early 1980s. For many depository institutions, competition with money market funds resulted in a higher cost of funding

Chart 9

Banks Declining Share of Short-Term Business Credit

Source: Flow of Funds Accounts, Federal Reserve System.

and lower profitability.

Money market funds have also undermined the profitability of banks' short-term business lending by supporting the expansion of the commercial paper market. Large corporations can issue commercial paper as an inexpensive alternative to bank lending. In addition, smaller firms can borrow from finance companies which obtain much of their short-term funding in the commercial paper market. Over the postwar period, banks' share of the market for short-term business credit has declined dramatically as businesses have increasingly turned to finance company loans and direct issuance of commercial paper (Chart 9).¹²

Since the late 1970s and early 1980s, much of the large inflow of household savings into money market funds has been channeled into the purchase

of commercial paper. Indeed, money funds currently hold 36 percent of their assets in commercial paper and 34 percent of all commercial paper outstanding. By purchasing large amounts of commercial paper, money funds have supported these alternatives to bank lending.

Pension and mutual funds have also played a key role in the securitization of mortgage and consumer loans. Securitization began in the 1970s with the development of the government-sponsored market for mortgage-backed securities (Sellon and Van Nahmen). The basic idea behind mortgage securitization was to package individual, illiquid mortgage loans held by thrifts into marketable securities. These securities could then be sold to investors such as pension funds, mutual funds, and life insurance companies to increase the

flow of funds into housing. The success of mortgage-backed securities led to the securitization of consumer loans in the mid-1980s. Thus, individual consumer loans held by banks and finance companies were repackaged into marketable securities to be sold to investors.¹³

Like the expansion of the commercial paper market, the securitization of consumer and mortgage loans has put additional pressure on bank and thrift profitability. As additional funds have flowed from pension and mutual funds into housing and consumer finance, returns to these types of lending have been lowered, reducing bank and thrift profitability.¹⁴

Squeezed by a higher cost of funds, lower returns to lending, and declining market share, banks and thrifts have been pushed to seek new lines of business. Thrift institutions were permitted broader lending powers as part of the deregulation process in the early 1980s and began making increasing amounts of commercial and consumer loans. Banks responded to a loss of market share in short-term business lending partly by moving into other types of lending and partly by moving back into a limited range of permissible investment banking activities. Thus, banks increased their real estate lending and have attempted to offer a broader range of financial services, including underwriting and distributing securities, sponsoring mutual funds, and selling insurance products.

Strict regulation has limited the ability of banks and thrifts to adjust to these challenges. Large losses on new types of lending by thrifts led to a reversal of the deregulation process and a return to mandated specialization in mortgage lending. The ability of banks to adapt has also been slowed by loan losses and concerns over the solvency of the bank insurance fund. Indeed, when presented with a package of deposit insurance reforms and expanded bank powers in 1991, Congress approved measures to protect the deposit insurance system but declined to approve new bank powers and activities.

IMPLICATIONS FOR FINANCIAL INTERMEDIATION AND REGULATION

Beyond their impact on individual intermediaries, pension and mutual funds have been responsible for broader changes in the intermediation process. The growth of pension and mutual funds has helped expand investment and borrowing options for households and firms and has enhanced the efficiency of financial intermediation. But, by altering the roles of traditional intermediaries, pension and mutual funds have also contributed to the increased instability of financial markets in recent years. These changes in the intermediation process raise important questions about the future regulation of financial institutions.

Changes in the intermediation process

As discussed in the preceding section, the postwar financial system was highly structured and highly regulated. Enforced specialization and limited competition promoted the primary goal of financial regulation—to eliminate a repeat of the financial crises of the 1930s. The emphasis on stability had two important costs, however. First, households and firms had a narrow range of investment and borrowing options. Second, the system was inefficient because regulation prevented household savings from flowing to the best investment projects, raising the overall cost of financial intermediation.

The growth of pension and mutual funds has helped overcome both of these limitations. On the one hand, the range of investment and borrowing options has expanded. Through pension and mutual funds, individual investors have access to a wider and more diversified set of investment opportunities. Similarly, firms have a greater range of borrowing options, especially for short-term finance.

At the same time, pension and mutual funds have helped make the intermediation process more efficient. Previously, deposit and capital

markets were artificially separated by restrictions on intermediary activities and location. As a consequence, deposit and lending rates differed across regions and were not closely tied to capital market rates. Now, however, competition from the commercial paper market and the securitization of mortgage and consumer loans have tied loan rates more closely to capital market rates. And, the development of money market funds has made deposit rates more responsive to capital market rates. As a result, household savings flow more readily to the best investment opportunities, improving the efficiency of the intermediation process.

The cost of these gains, however, has been a more fragile, less stable financial system. Since the 1970s, failures of traditional intermediaries have increased sharply, and failures of thrifts and banks have been at the highest levels since the 1930s.

While it would be too simplistic to attribute these failures directly to the growth of pension and mutual funds, it would be equally naive to ignore the relationship. Increased competition spawned by the growth of pension and mutual funds has contributed to lower profitability of traditional intermediaries, making them more vulnerable to external shocks. Thus, for example, a depository institution whose capital has been eroded by competitive pressures on profits is less likely to withstand unexpected loan losses or unfavorable interest rate movements. Lower capital also increases the incentive for risk-taking by those intermediaries whose liabilities are government-insured. In addition, lower profitability and loss of market share give traditional intermediaries a strong incentive to seek new lines of business. To the extent that the risks of these new activities are not recognized and managed, losses on these activities may increase the likelihood of failure.¹⁵

Implications for financial regulation

The recurring financial crises in recent years have led to renewed debate about the regulation of

financial intermediaries. One issue is whether the deregulation process that began in the 1970s should continue or, perhaps, be reversed. A related issue is whether regulation should be harmonized across intermediaries that provide similar financial services.

Financial intermediaries have traditionally been subject to more regulations than other businesses. Some regulation stems from the fiduciary responsibilities of intermediaries entrusted with the savings of less-sophisticated investors. Other regulation comes from the disruptive effects of financial panics and crises on economic activity. Thus, where failures of ordinary businesses might be tolerated and even encouraged as part of the normal working of competitive markets, failures of financial intermediaries have been seen as more costly.

The balance between regulation and competition has changed over time. After the Depression, the pendulum swung heavily in favor of increased financial regulation. By the 1970s and early 1980s, however, there was considerable momentum to deregulate financial markets and institutions, to reverse many of the restrictions imposed during the 1930s. Two significant regulatory changes were the elimination of interest rate ceilings on bank and thrift deposits and the expansion of permissible activities for thrifts beyond home mortgage lending. Much of the stimulus for this deregulation came from recognizing the disadvantages of traditional intermediaries faced with increased competition from unregulated competitors, such as pension and mutual funds. Indeed, there was considerable concern that many traditional intermediaries would fail without deregulation.

The momentum toward deregulation clearly slowed toward the end of the 1980s as large loan losses led many thrifts and banks to fail. Thus, thrifts found their expanded powers removed and banks found it increasingly difficult to get legislative approval for expanded activities. Much of the recent emphasis in regulation has been on rebuilding capital and reducing risk-taking. In fact, most discussions of expanded powers for banks have

focused on the perceived risks of new activities and on whether banks have adequate capital to undertake these risks.

The recent retreat from deregulation may be short-sighted, however, in light of the longer run changes in the intermediation process. While there are clearly risks to further deregulation, the alternatives may be equally risky. If the franchise value of traditional intermediaries continues to be undermined by competition from pension funds, mutual funds, and other less-regulated intermediaries, traditional intermediaries may not be viable unless they are allowed to adjust to meet this competition. For example, if banks are squeezed out of their traditional market for short-term commercial lending but are not permitted new activities, it is not clear what role banks will play in the intermediation process. Thus, while some intermediaries may fail if they are allowed to undertake new activities, others may fail if they are not permitted this freedom. Indeed, the only realistic alternative to further deregulation may be consolidation of traditional intermediaries, through failure or merger.

A closely related issue is whether regulation should be harmonized across competing intermediaries. Differential regulation was possible in the early postwar financial system because of the specialization of intermediaries and absence of direct competition. In the current environment where specialization has broken down and intermediaries desire to perform a broad range of financial services, differential regulation may no longer work. In the current system, it may not be possible to regulate one intermediary that offers many of

the same services as an unregulated intermediary. Continuing differential regulation may put some intermediaries at a competitive disadvantage, increasing the likelihood of failure and decreasing the stability of the financial system.

SUMMARY

The growth of pension and mutual funds over the postwar period has had profound effects on the U.S. financial system. By affecting household savings patterns, pension and mutual funds have altered the roles of traditional financial intermediaries and have changed the intermediation process.

The growth of assets in pension and mutual funds has been associated with a shift by households away from direct purchases of investment securities and with diminished use of bank deposits and life insurance. These shifts have adversely affected some traditional intermediaries but have helped others. In both cases, traditional intermediaries have been given incentive to shift into new lines of business.

The competition of pension and mutual funds with traditional intermediaries has opened up new investment and borrowing options for households and firms. This competition has also helped break down barriers to the flow of savings and investment and so has improved the efficiency of the intermediation process. At the same time, the increased financial instability of recent years may also be partly attributable to this increased competition. This instability, in turn, raises significant questions about the regulation of traditional intermediaries.

ENDNOTES

¹ Mutual funds must register with the Securities and Exchange Commission (SEC), which is the industry's primary regulator.

² This article covers only private sector pension plans and state and local government plans. It omits any discussion of the Social Security System and federal government retirement plans.

³ Private pension coverage has actually declined somewhat in the 1980s (Bloom and Freeman). Moreover, employer

contributions to private plans have fallen as well, largely as a result of changes to pension fund laws (Warshawsky).

⁴ The term "insured pension plans" is somewhat misleading in that it refers merely to pension plans that are managed by life insurance companies and not to the insurance status of such plans.

⁵ Most of this shift occurred in private, noninsured pension plans. Plans managed by insurance companies (insured plans)

were limited in stock holdings by restrictions on equity holdings by insurance companies (Munnell, pp. 92-99; Wright). Some state and local government plans also faced portfolio restrictions that limited equity purchases. As seen in Chart 5, pension fund acquisition of stocks slowed significantly in the 1980s, reflecting both the dramatic shift of corporate financing from equity to debt and the effects of the 1987 stock market drop.

⁶ Reduced participation of individual investors during this period has been attributed to a variety of factors including back-office problems and the growing dominance of institutional investors like pension and mutual funds (Seligman, pp. 450-56). Indeed, during the 1970s, while stock holdings of individual investors and mutual funds declined, stock purchases by pension funds increased.

⁷ While this article focuses on the impact of pension and mutual funds on the intermediation process, considerable research has been done on a related issue—the impact on the overall level of saving. For a discussion of this research, see Munnell and Yohn.

⁸ Data are from the Flow of Funds, Board of Governors of the Federal Reserve System. In these accounts, the household sector includes households, personal trusts, and nonprofit organizations. In this article, household financial assets are defined as total financial assets of the household sector minus equity in noncorporate business. Thus, the focus of this article is on intermediation through tradeable financial assets.

⁹ For a comprehensive discussion of changes in the intermediation process in the early postwar period, see Goldsmith (1965, 1968).

¹⁰ The Employee Retirement Income Security Act of 1974 (ERISA) made fundamental changes in pension regulations aimed primarily at strengthening protection of employee

benefits. However, some of these changes encouraged plan sponsors to turn over management to insurance companies. For example, an increased reporting burden raised the cost of plan administration, particularly for small plans. Also, some sponsors of “overfunded” plans terminated the plans, buying life insurance annuities to provide promised benefits and using the excess cash for other corporate purposes. For further discussion, see Munnell, pp. 130-46; and Warshawsky.

¹¹ For a more comprehensive discussion of life insurance companies in the postwar period, see Wright; Curry and Warshawsky.

¹² A more detailed discussion of these issues can be found in Beckett and Morris. An additional factor in the increased competition for short-term commercial lending is the role of foreign banks. Not only have banks lost market share to commercial paper and finance companies, but U.S. banks have lost significant ground to foreign banks. For additional discussion of this issue, see McCauley and Seth.

¹³ Since the development of the mortgage-backed securities market in the early 1970s, the proportion of mortgages securitized has risen to 40 percent. And since 1988, over 12 percent of consumer credit has been securitized.

¹⁴ Not all of the effects of securitization have been adverse. Indeed, some individual banks and thrifts have benefited by earning fee income from the securitization process or by improving portfolio liquidity by holding securities rather than whole loans. However, to the extent that securitization is eroding the traditional banking business of managing credit risk, the overall return to traditional intermediation is lower.

¹⁵ As evidence, it is notable that many of the losses of thrifts, banks, insurance companies, and investment banks have occurred with new activities or new products.

REFERENCES

- Auerbach, Joseph, and Samuel L. Hayes III. 1986. *Investment Banking and Diligence: What Price Deregulation?* Cambridge, Mass.: Harvard Business School Press.
- Beckett, Sean, and Charles S. Morris. 1992. “Are Bank Loans Still Special?” Federal Reserve Bank of Kansas City, *Economic Review*, 3rd Quarter.
- Bloom, David E., and Richard B. Freeman. 1992. “The Fall in Private Pension Coverage in the U.S.,” National Bureau of Economic Research, Inc., working paper no. 3973, January.
- Curry, Timothy, and Mark Warshawsky. 1986. “Life Insurance Companies in a Changing Environment,” Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin*, July.
- Goldsmith, Raymond W. 1965. *The Flow of Capital Funds in the Postwar Economy*. New York: National Bureau of Economic Research.
- Goldsmith, Raymond W. 1968. *Financial Institutions*. New York: Random House.
- Hayes, Samuel L. III. 1979. “The Transformation of Investment Banking,” *Harvard Business Review*. January-February.
- Hayes, Samuel L. III, A. Michael Spence, and David Van Praag Marks. 1983. *Competition in the Investment Banking Industry*. Cambridge, Mass.: Harvard University Press.
- Huertas, Thomas F. 1987. “Redesigning Regulation: The Future of Finance in the United States,” in proceedings of *Restructuring the Financial System*, a symposium sponsored by the Federal Reserve Bank of Kansas City, August 20-22.

- Kotlikoff, Laurence, and Daniel E. Smith. 1983. *Pensions in the American Economy*. Chicago: The University of Chicago Press.
- McCauley, Robert N., and Rama Seth. 1992. "Foreign Bank Credit to U.S. Corporations: The Implications of Offshore Loans," Federal Reserve Bank of New York, *Quarterly Review*, Spring.
- Munnell, Alicia H. 1982. *The Economics of Private Pensions*. Washington, D.C.: The Brookings Institution.
- Munnell, Alicia H., and Frederick O. Yohn. 1992. "What Is the Impact of Pensions on Saving?" in Zvi Bodie and Alicia Munnell, eds. *Pensions and the Economy*. Philadelphia: University of Pennsylvania.
- Seligman, Joel. 1982. *The Transformation of Wall Street*. Boston: Houghton, Mifflin Co.
- Sellon, Gordon H. Jr., and Deana Van Nahmen. 1988. "The Securitization of Housing Finance," Federal Reserve Bank of Kansas City, *Economic Review*, July/August.
- Warszawsky, Mark Jr. 1988. "Pension Plans: Funding, Assets and Regulatory Environment," Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin*, November.
- Woods, John R. 1989. "Pension Coverage Among Private Wage and Salary Workers: Preliminary Findings from 1988 Survey of Employee Benefits," U.S. Department of Health and Human Services: Social Security Administration, *Social Security Bulletin*, October.
- Wright, Kenneth M. 1991. "The Structure, Conduct, and Regulation of the Life Insurance Industry," in proceedings of *The Financial Condition and Regulation of Insurance Companies*, a conference sponsored by the Federal Reserve Bank of Boston, June.

Are Bank Loans Still Special?

By Sean Beckett and Charles Morris

During the recent recession, many businesses had problems getting new bank loans. Increases in problem loans, the need to raise capital, and stricter regulatory oversight combined to discourage banks from extending new credit, particularly to businesses. The weakness in bank lending to businesses, some believe, contributed importantly to the downturn in economic activity.

Those who blame the recession on weak bank lending believe that banks are the only source of credit for most business firms—that is, bank loans are special. In recent years, however, rapid growth of nonbank sources of business credit has led others to believe that bank loans have become less special. Finance companies now vie with banks to meet firms' financing needs, and commercial paper allows many firms to raise funds directly from credit markets rather than through banks. If these other sources of business credit are in fact good substitutes for bank loans, then a slowdown in bank lending is not as damaging to the economy.

This article examines evidence on whether other sources of business credit have recently become better substitutes for bank loans—that is, whether bank loans are less special than they used to be. The results of the examination suggest that bank loans are becoming less special. The first

section of the article explains why bank loans have traditionally been special. The second section examines the rise of substitutes for bank loans. The third section presents evidence that nonbank sources of credit are becoming better substitutes for bank loans.

WHY HAVE BANK LOANS BEEN SPECIAL?

Business firms get credit either by issuing debt securities to investors or by taking out a loan from a financial intermediary. Loans have been the source of credit for most firms because financial intermediaries have cost advantages over individual investors in gathering information about borrowers. And banks have been the source of most loans because they have had other cost advantages over other financial intermediaries. Thus, bank loans have been the source of credit for most firms—that is, bank loans have been special.

Before making a loan, all lenders—whether investors in bonds, nonbank lenders, or banks—need information about borrowers due to the risk that the loan might not be repaid. To determine the creditworthiness of a borrower, a lender gets information about the borrower's character, financial strength, business prospects, management skill, and any other factors that might affect the likelihood of repayment. After collecting the information, the lender then decides whether the loan is worth the risk.

After a loan is made, lenders must monitor the

Sean Beckett is a senior economist and Charles Morris is an assistant vice president and economist at the Federal Reserve Bank of Kansas City. Dan J. Roberts, an assistant economist at the bank, helped prepare the article.

borrower because the likelihood of repayment can fall. For example, the borrower's business prospects or financial condition may deteriorate, or the borrower may engage in activities that decrease the likelihood of repayment. By monitoring the borrower, the lender can recognize these events and can call the loan or refuse to renew it when it matures.

Most businesses obtain funds by taking out a loan from a financial intermediary rather than by issuing bonds to a number of investors. In general, businesses want to borrow more than an individual investor is willing to lend. As a result, a business must borrow from a number of investors either directly or indirectly through a single financial intermediary that pools their funds.¹ If investors provide the funds directly, each investor has to gather information about and monitor the borrower. In this case, each investor bears the full cost of information gathering and monitoring.² But if a financial intermediary provides the funds, the information gathering and monitoring are done only once, and each investor bears only a small fraction of the cost.³ Thus, most businesses take out loans because it is cheaper to get loans from financial intermediaries than to sell bonds to individual investors.

While loans have an advantage over debt securities when information and monitoring are important, loans still need not come from a bank. Such nonbank lenders as finance companies also pool the funds of individual investors and therefore could have the same advantage as banks in gathering information and monitoring. Thus, for a bank loan to be special, banks must have some other advantage over their competitors.

Over the years, banks have generally been able to fund loans at a lower cost than nonbank lenders for two reasons. First, a large fraction of bank deposits are insured, while the liabilities of nonbank lenders are not. Since deposit insurance makes bank deposits safer than the liabilities of nonbank lenders, banks are able to attract funds at a lower interest rate than nonbank lenders (Diamond and Dybvig). Second, banks are not

allowed to pay interest on demand deposits. Since demand deposits historically have been the primary method of making payments, banks have been able to attract demand deposits even though they pay no interest.⁴

Banks have also had a cost advantage over nonbank lenders in monitoring a borrower's condition after a loan is made. Because borrowers typically have a deposit account at the bank that makes them a loan, it is virtually costless for a bank to observe a borrower's deposits over time. This information helps the bank evaluate the variability of the borrower's cash flows and, in turn, the borrower's ability to repay the loan (Black; Fama).

THE RISE OF ALTERNATIVES TO BANK LOANS

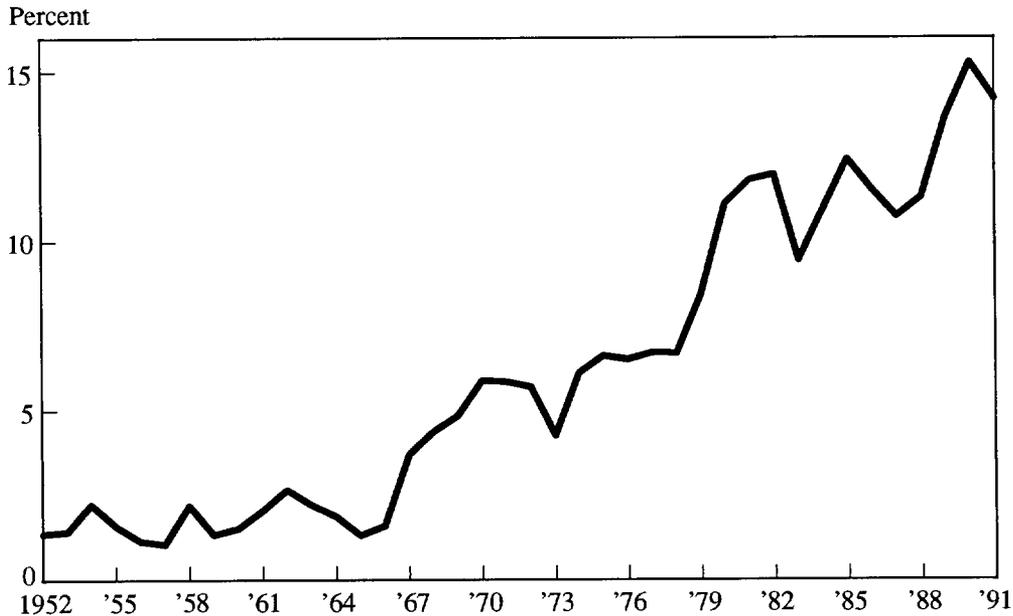
Over the past several years, banks have faced greater competition from credit markets and from nonbank lenders. These competitors have captured market share from banks by finding ways to overcome the traditional cost advantages of banks. For some business firms, these other sources of credit may be good substitutes for bank loans, but for other firms, they may not be.

How do other sources of credit compete with bank loans?

There are two alternatives to bank loans: debt securities and loans from nonbank lenders. The debt security most comparable to a bank loan is commercial paper, and the most important nonbank lenders for loans to small and medium-sized businesses are finance companies.

Commercial paper. Commercial paper is a promissory note that has many of the characteristics of a bank loan. It can be issued quickly, in varying amounts, and with varying but short maturities that closely match a business's needs for cash. Maturities range from 1 to 270 days, with the most common maturity being 30 days. The

Chart 1
Commercial Paper's Share of Business Borrowing



Note: Outstanding commercial paper issued by nonfinancial corporations as a share of short-term business borrowing.
 Source: Flow of Funds, Board of Governors of the Federal Reserve System.

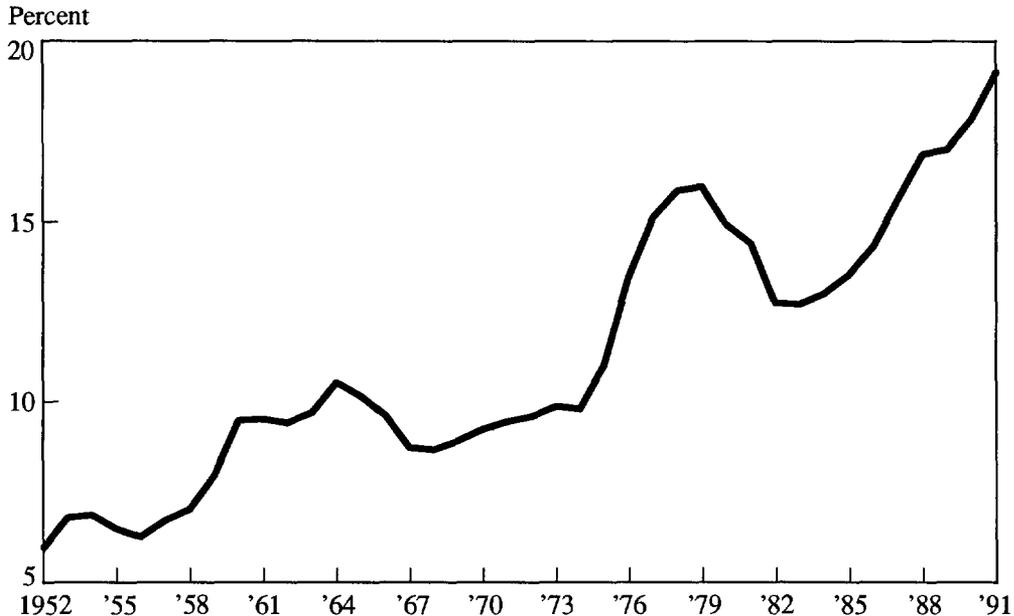
most common denomination is \$1 million. Like most bank loans, commercial paper is unsecured.

While commercial paper has been issued since the early 1800s, nonfinancial firms did not become active issuers until the mid-1960s (Chart 1). Commercial paper—which never exceeded 3 percent of short-term borrowing by nonfinancial corporations prior to 1966—has grown steadily since 1966 to about 15 percent of total short-term business borrowing today. In 1966, banks found it difficult to raise funds because market interest rates rose above regulatory ceilings on certificates of deposit (CDs). When this loss of funds forced banks to reduce their lending, corporations turned to the commercial paper market to replace the loans banks could no longer supply. Some corporations discovered commercial paper was

cheaper than bank loans and continued issuing commercial paper even when bank loans became available again.

Commercial paper can compete with bank loans today because credit rating firms, such as Moody's and Standard and Poor's, provide the information gathering and monitoring services traditionally performed by a bank. When commercial paper is issued, credit rating firms are paid to examine the issuing firm's financial health and prospects. The rating firm publishes its findings in the form of a credit rating, which summarizes the issuing firm's likelihood of defaulting on its obligation to repay the commercial paper investors. The rating firm continues to monitor the issuing firm's condition and revises the initial credit rating if that condition changes. Thus, lend-

Chart 2
Finance Companies' Share of Business Borrowing



Note: Finance company loans to nonfinancial corporations as a share of short-term borrowing.
 Source: Flow of Funds, Board of Governors of the Federal Reserve System.

ing by many individual investors is competitive with lending by financial intermediaries because investors do not individually bear the full costs of information gathering and monitoring.

Finance company loans. Commercial finance companies offer business loans that compete with bank loans. Finance companies typically make asset-based loans, which are loans secured by accounts receivable, inventories, or equipment. Most of these loans have a short or medium term to maturity, although loans secured by long-lived vehicles or equipment are sometimes long term. Finance companies fund their loans by issuing commercial paper.

Commercial finance companies' share of short-term business borrowing has grown over the last 40 years (Chart 2). Before 1960, finance com-

pany loans accounted for just 7 percent of short-term business borrowing. By the late 1960s, the share increased to around 10 percent. Today, the finance company share is about 20 percent.

Commercial finance companies arose because banks traditionally would not make asset-based loans. Banks believed that firms who needed to pledge collateral were not creditworthy. In recent years, however, the stigma attached to asset-based lending has disappeared, and banks now also make these loans (Compton).

Finance companies' share of business lending has increased in recent years because banks have lost some of their cost advantages. First, the introduction of interest-bearing transactions accounts in the 1980s forced banks to pay for funds formerly held in demand deposits.⁵ Second, the share

of bank deposits held in CDs has increased. Because CD rates are typically higher than finance company commercial paper rates, the increased share of CDs has further eroded banks' cost advantage over finance companies. Third, bank capital requirements have been raised in recent years. Finally, banks must comply with a host of costly regulations that do not apply to finance companies, and the burden of these regulations has increased.⁶

Are these alternatives good substitutes for bank loans?

Disagreement exists about whether commercial paper and finance company loans are good substitutes for bank loans. Because businesses issue significant amounts of commercial paper and obtain large quantities of finance company loans, some people argue they are good substitutes for bank loans. However, other people argue commercial paper and finance company loans are not good substitutes for bank loans because they are not available to many firms.

Commercial paper has many of the attributes of bank loans. Like bank loans, commercial paper is unsecured and has a short term. Because it can be issued quickly in varying amounts and maturities, commercial paper offers firms the same flexibility as bank loans in meeting their changing needs for cash. Thus, for firms large enough to issue commercial paper, it is a good substitute for bank loans.

For the vast majority of firms, however, commercial paper is not a good substitute because only the largest and most creditworthy firms can issue it. The most common denomination of commercial paper is \$1 million, an amount beyond the short-term borrowing capacity of most firms. In addition, small and medium-sized firms that are financially sound cannot issue commercial paper because it is too costly for them to purchase credit ratings.

Finance company loans are good substitutes for bank loans for firms that can pledge collateral.

For example, a company that wants to buy new equipment can use the equipment as collateral for a finance company loan. In addition, a firm can obtain a line of credit from a finance company by pledging existing assets as collateral (National Commercial Finance Association).

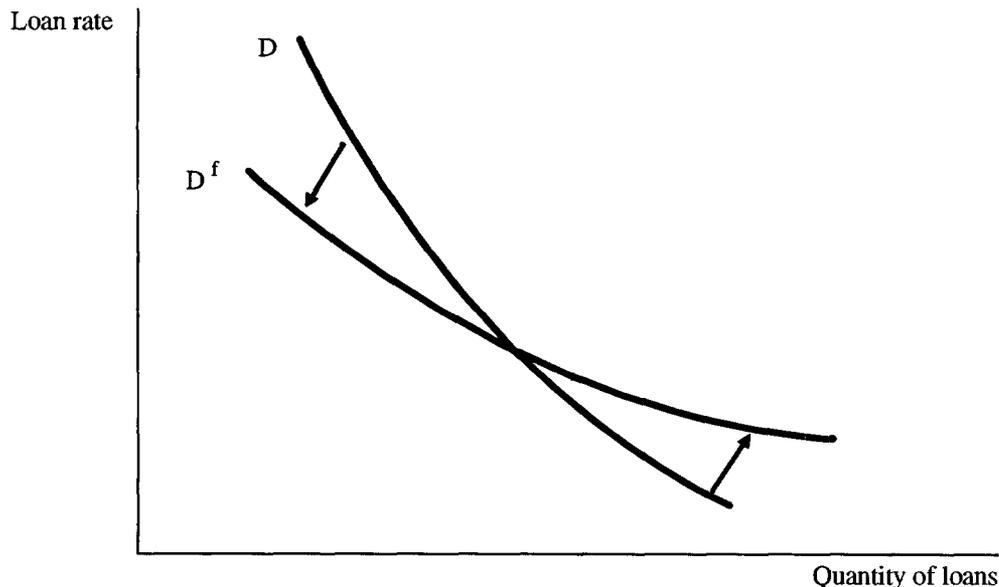
But for many firms, finance company loans may not be good substitutes for bank loans. For example, service firms hold small or no inventories and use relatively little equipment. Thus, these firms have insufficient collateral to obtain significant quantities of asset-based, finance company loans.

While many firms cannot issue commercial paper or obtain finance company loans on their own, they still can get credit indirectly from these sources. The primary source of finance for many of these firms is trade credit, the credit extended when suppliers allow customers to delay payment for delivered goods. If suppliers have access to commercial paper and finance company loans, they can offer trade credit on reasonable terms even when banks are cutting back on business loans. In this case, the firms with access to alternative credit sources transmit the benefits of these alternatives to the credit-hungry firms.

ARE BANK LOANS STILL SPECIAL?

Commercial paper and finance company loans have clearly become important sources of credit for some firms, but it is not clear that these sources of credit are generally good substitutes for bank loans. One way to determine whether these sources have become better substitutes in recent years is to examine the demand for bank loans. Examining the demand for loans is useful because the demand for loans changes in predictable ways as substitutes become more available. As discussed below, the behavior of bank loans over the last 30 years provides some evidence that the demand for loans has changed as predicted. In other words, there is some evidence that bank loans are less special today than they were in the past.

Figure 1

The Demand for Loans Becomes Flatter When Substitutes Are More Available***Substitutes and the demand for bank loans***

The demand for bank loans shows how changes in the price of loans affect the amount of loans borrowers want (Figure 1). The price of a loan is measured by its interest rate, which is shown on the vertical axis of the figure. The quantity of bank loans is measured along the horizontal axis.

The demand curve (labeled D in the figure) shows that borrowers want to borrow fewer funds from a bank as the loan rate rises. To see why, suppose a firm plans to take out a bank loan to invest in new equipment. If the loan rate rises, the profitability of the investment falls. As a result, the firm may decide to forego the investment. Alternatively, the firm may decide to finance at least part of the equipment purchase with a substitute

source of funds, such as commercial paper, a finance company loan, or internal funds. In any case, the firm borrows fewer funds from a bank.

The slope of the demand curve, which measures the willingness of firms to reduce their borrowing from banks as the loan rate rises, depends on the availability of substitutes. Specifically, the greater the availability of substitutes, the flatter the curve. The flatter curve in Figure 1, D^f , represents the demand for bank loans after good substitutes become more available. When there are no good substitutes for bank loans (curve D), the demand curve is relatively steep because borrowers will pay whatever interest rate is required to obtain the loans they need to finance their operations. However, when good substitutes are more available (curve D^f), firms will tolerate only

small increases in loan rates before they switch to other sources of credit. In this case, the demand curve is relatively flat, indicating small increases in the loan rate will cause large decreases in the quantity of loans.⁷

How to test for the availability of substitutes

One way to see whether good substitutes for bank loans are more available today than in the past is to see whether the loan demand curve has become flatter in recent years. Theoretically, this could be done directly by estimating a loan demand equation and seeing whether loans have recently become more sensitive to changes in loan rates.⁸ But good data on loan rates are not available, so an indirect approach must be taken to detect changes in the slope of the loan demand curve.⁹

One indirect method is to see how the quantity of bank loans responds to factors that shift the supply of and demand for loans—that is, factors other than the loan rate. Specifically, shifts in the supply of loans have a larger impact on the quantity of loans when the demand curve is flatter. In contrast, shifts in the demand curve have a smaller impact on the quantity of loans when the demand curve is flatter. Thus, it is possible to infer that substitutes have become more available if (1) the impact of supply shifts has increased over time, and (2) the impact of demand shifts has decreased over time. The advantage of this indirect approach over attempting to estimate the demand curve directly is there are good measures both of the quantity of loans and of the factors that shift supply and demand.

To understand why the impact of supply and demand shifts changes with the availability of substitutes, first consider a shift in the supply of bank loans (upper panel of Figure 2). The supply of loans will shift when factors that affect a bank's cost of making loans change. For example, higher capital requirements for banks, tighter regulatory standards on loans, or tighter monetary policy that

increases banks' cost of funds all raise the cost of making a loan. The higher cost reduces the profitability of making loans at any given loan rate. Thus, banks are less willing to make loans at any given loan rate.¹⁰ This increase in costs is represented by a leftward shift in the loan supply curve, from S_0 to S_1 , causing the quantity of loans to fall from L_0 to L_1 .

As the loan demand curve becomes flatter, the same leftward shift in the loan supply curve causes a greater decline in loans. The lower panel of Figure 2 depicts the same decline in the supply of loans as in the upper panel. However, the demand curve, D^f , is flatter in the lower panel, reflecting the greater availability of substitutes for bank loans. In this case, borrowers are more willing to shift out of bank loans and into substitute sources of finance when the supply of loans declines. As a result, the quantity of loans falls from L_0 to L_1^f which is a larger decline than the one from L_0 to L_1 in the upper panel. Thus, if substitutes for bank loans have become more available in recent years, changes in factors that shift the supply of loans cause larger changes in the quantity of loans than in the past.

A variety of factors can shift the demand for bank loans (upper panel of Figure 3). For example, if firms expect a decrease in the demand for their goods, they may trim their inventories and forego planned investment in new equipment. As a result, they will borrow fewer funds for any given loan rate. This change is represented as a leftward shift in the loan demand curve, from D_0 to D_1 , which causes the quantity of loans to decrease from L_0 to L_1 .

As the loan demand curve becomes flatter, the same leftward shift in the demand curve causes a smaller decline in loans. The lower panel of Figure 3 shows the same fall in the demand for loans as in the upper panel. That is, the demand curve shifts the same distance to the left at any given price in both panels. However, the quantity of loans falls from L_0 to L_1^f when the demand curve is flatter, a smaller drop than the decline from L_0 to L_1 in the upper panel. Thus, if substitutes for bank loans

Figure 2
Change in Supply of Loans

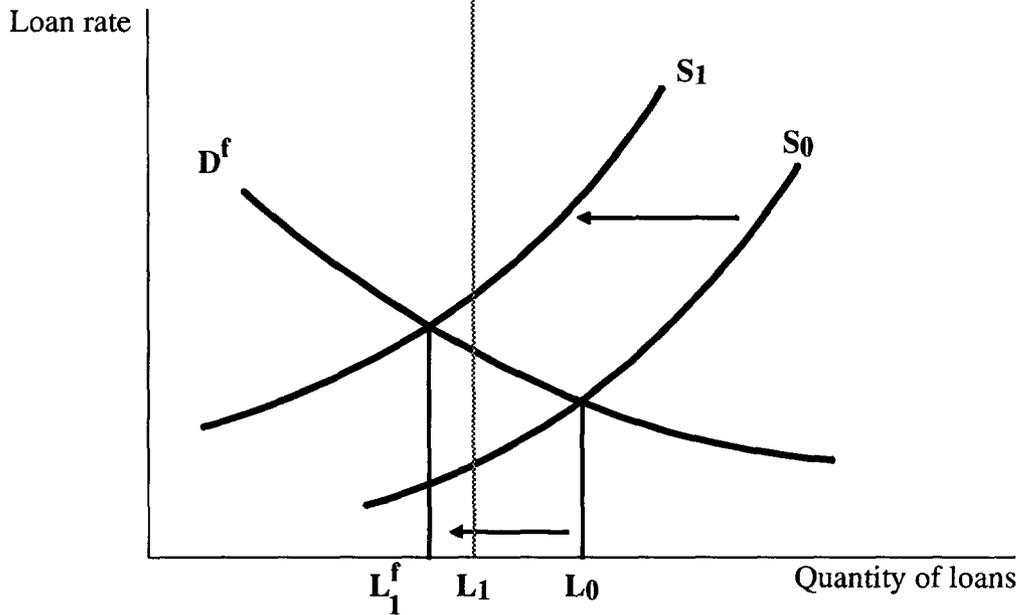
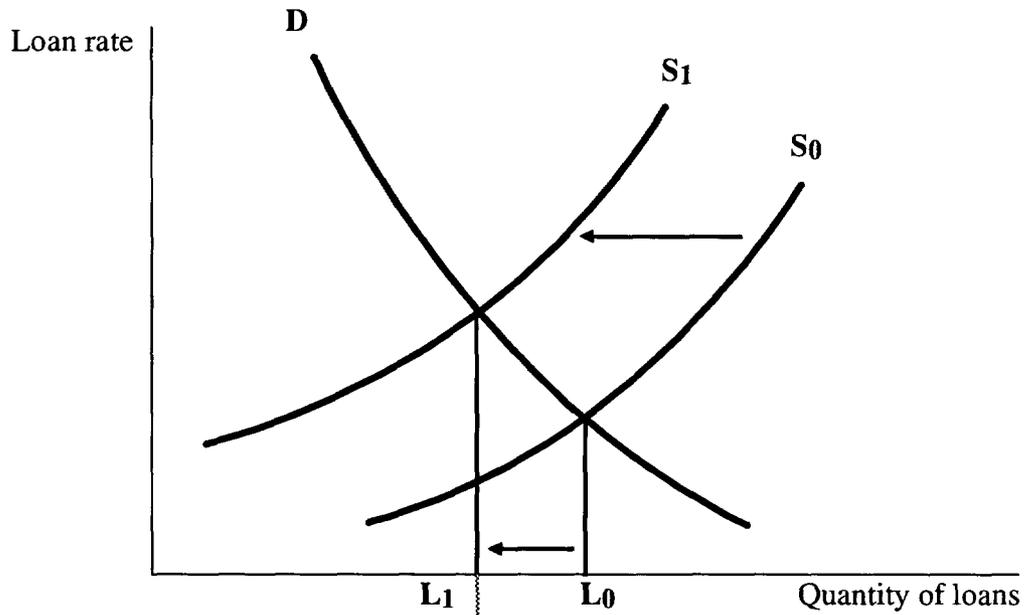
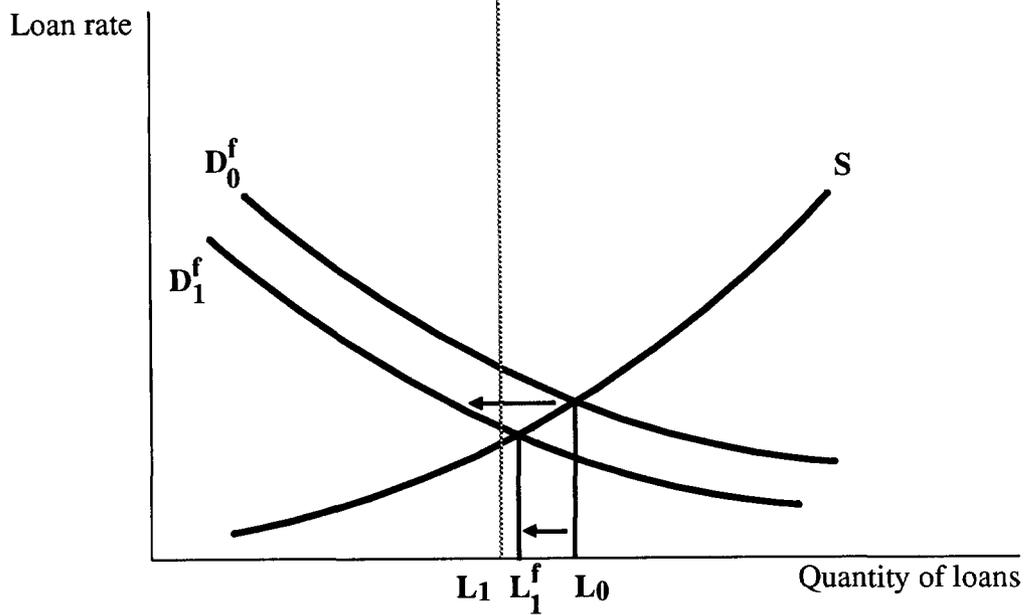
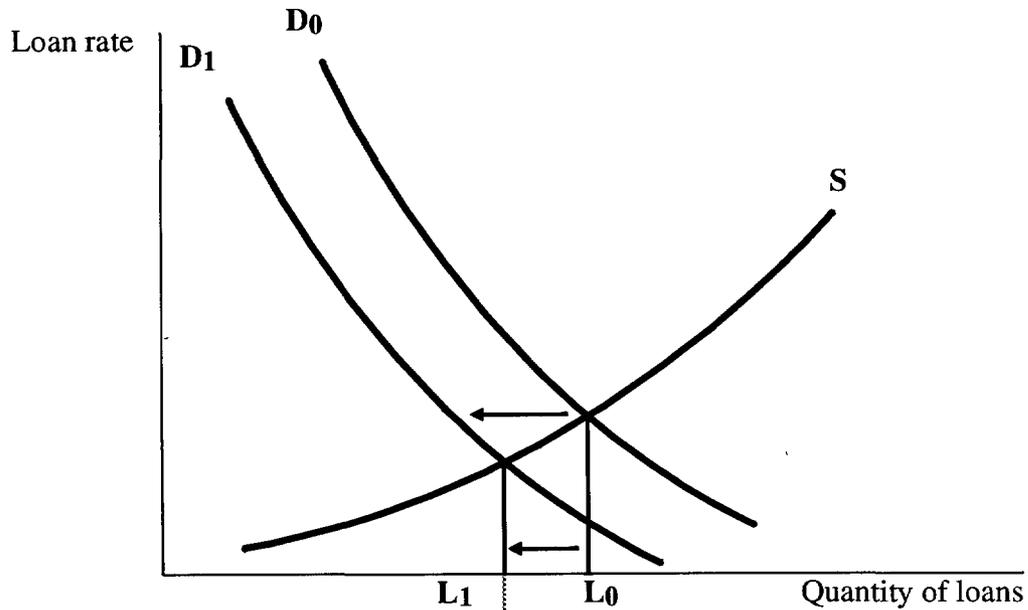


Figure 3
Change in Demand for Loans



have become more available in recent years, changes in factors that shift the loan demand curve cause smaller changes in the quantity of loans than in the past.¹¹

In summary, due to problems in measuring loan rates, an indirect approach must be used to determine whether substitutes for bank loans have become more available. If substitutes are more available than before, the loan demand curve is flatter. A flatter loan demand curve implies two things: (1) factors that shift the supply of bank loans have a larger effect on the quantity of loans than before, and (2) factors that shift the demand for bank loans have a smaller effect on the quantity of loans than before.¹²

Empirical results

To see whether substitutes for bank loans have become more available in recent years, the effects of supply and demand shifts on the quantity of loans are estimated for two separate periods. The effects of supply and demand shifts are estimated by regressing quarterly observations of bank loans to nonfinancial corporations on several of the factors that shift demand and supply.¹³ Two identical regressions are estimated—the first covering 1959 through 1976, the second covering 1977 through 1991. The estimated impacts of supply and demand shifts in the two subperiods are then compared.

Three demand factors are included in the regressions: investment, inventories, and internal cash flow at nonfinancial corporations. Increases in investment and inventories generate increases in loan demand. In contrast, an increase in internal cash flow reduces the need for external finance and thus the demand for bank loans. Therefore, investment and inventories should have a positive effect on loans, while cash flow should have a negative effect.

Only one factor—the stance of monetary policy—is used to measure supply shifts. While many other factors also affect loan supply, these other factors are difficult or impossible to observe.

Table 1

The Changing Sensitivity of Bank Loans

	1959-76	1977-91
Federal funds rate	-.96	-1.24**
Investment	.67*	.52*
Inventories	.83	.08
Cash flow	-.41*	-.34*
<i>Summary statistics</i>		
R ²	.74	.61
Adjusted R ²	.64	.37
Root mean squared error (percent)	6.99	8.56
Coefficient of variation	.85	.94

Note: This table presents regression estimates of the change in the growth of outstanding bank loans to nonfinancial corporations in response to a permanent, one-percentage-point change in each of the variables listed in the table. All estimates are adjusted for inflation. Thus, on average, from 1977 through 1991, a permanent, one-percentage-point increase in the federal funds rate decreased the growth rate of bank loans 1.24 percentage points. Similarly, on average, from 1977 through 1991, a permanent, one-percentage-point increase in the growth rate of business fixed investment increased the growth rate of bank loans 0.52 percentage points. All figures are from the authors' calculations.

* Statistically different from zero at the 10 percent level.

** Statistically different from zero at the 5 percent level.

For example, the strictness of regulatory oversight cannot be measured, while measures of bank capital are not available over long enough time spans.¹⁴ The stance of monetary policy is measured by the federal funds rate.¹⁵ An increase in the federal funds rate, which reflects a tighter policy, reduces the supply of loans, while a decrease in the federal funds rate increases the supply of loans. Thus, the federal funds rate should have a negative impact on the quantity of bank loans.¹⁶

The choice of the date for dividing the sample depends on when the demand curve becomes flatter. But because the introduction of substitutes does not occur overnight, the shift from a steep demand curve to a flat one takes place gradually. As a result, no matter where the sample is split, estimates of the impacts of demand and supply shifts can only be averages of those impacts over the subperiod.

Estimates were calculated using a number of different breakpoints, but the estimates were not particularly sensitive to the choice of the breakpoint. The results reported in this article use the fourth quarter of 1976 as the end of the first subperiod. This was the first year in which the joint market share of commercial paper and finance company loans exceeded 20 percent, an indication that these substitutes had become more important.

The regression results are presented in Table 1. The estimated effects of demand and supply shifts are as predicted. Increases in investment and inventories increase bank loans. Increases in firms' internal cash flow reduce bank loans. Tighter monetary policy, measured by increases in the federal funds rate, also reduces bank loans. In both subperiods, the effects of investment and of cash flow on bank loans are statistically significant. The federal funds rate is significant only in the later subperiod. Inventories never have a statistically significant effect on bank loans.¹⁷

The estimates in Table 1 are consistent with the view that the loan demand curve has become flatter in recent years. The regression coefficients across the two subperiods are statistically different at the 10 percent level.¹⁸ Moreover, the coefficients change in the predicted direction—bank loans react more to changes in the federal funds rate and less to changes in investment, inventories, and cash flow. For example, before 1977, a one-percentage-point increase in the federal funds rate decreased the growth rate of bank loans 0.96 percentage points on average. From 1977 through 1991, a one-percentage-point increase in the federal funds rate decreased the growth rate of loans 1.24

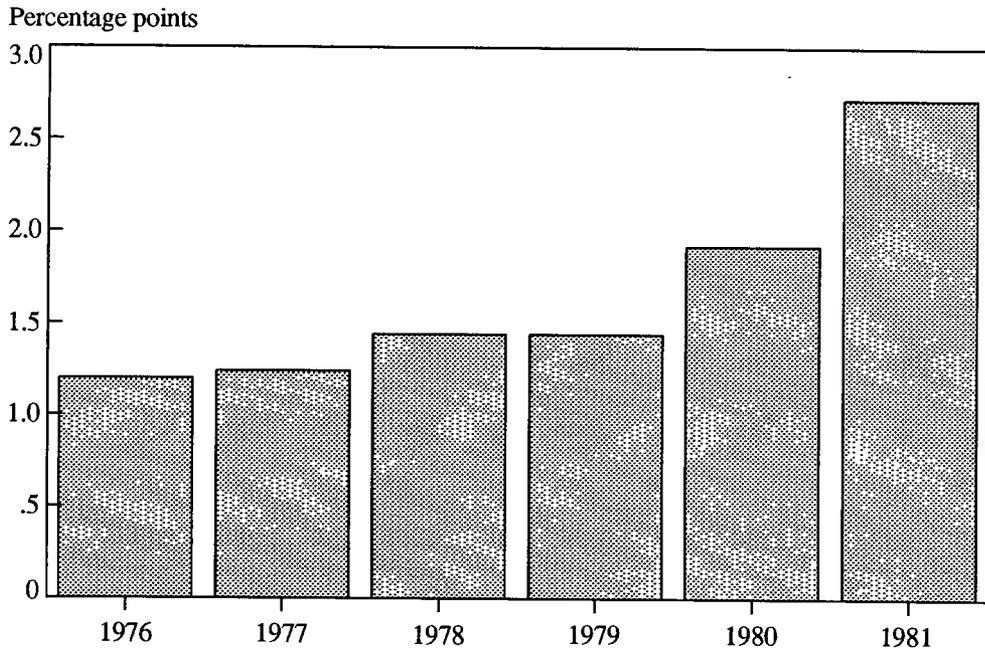
percentage points. In contrast, the effect of a one-percentage-point increase in the growth rate of cash flow on the growth rate of loans fell—from 0.41 percentage points before 1977 to 0.34 percentage points afterward. The estimates for investment and inventories display the same pattern.¹⁹

These estimates, however, should be interpreted cautiously. Although the changes in the impacts of demand and supply shifts are consistent with the view that substitutes for bank loans have become more available, the changes are generally quite small: 75 basis points for inventories, 28 basis points for the federal funds rate, 15 basis points for investment, and 7 basis points for cash flow.

One reason it may be difficult to detect a significant flattening of the demand curve is that substitutes may have become more available only very recently. As noted above, the estimates in Table 1 reflect the average impact of changes in the supply and demand factors on the quantity of loans. Thus, if the later subperiod includes many observations where the demand curve is still quite steep, it would be difficult to detect a flattening of the demand curve.

One way around this difficulty is to estimate the impact of, say, supply shifts for a sequence of samples that contain fewer and fewer observations from earlier years. The impact of supply shifts should increase when estimates are based on data that exclude the more distant past, that is, when the sample is split closer to the present. Chart 3 shows such a sequence of estimates. This chart displays the estimates of the impact of a permanent, one-percentage-point decrease in the federal funds rate for different sample periods. The first point plotted shows the estimate for the 1976-91 period, the second point shows the estimate for the 1977-91 period, and so on. For example, as reported in Table 1, the second bar indicates a one-percentage-point decrease in the federal funds rate increased the growth of bank loans 1.24 percentage points in the 1977-91 period. Note that a decrease in the federal funds rate increases the growth of loans by larger and larger amounts as the sample period

Chart 3
The Changing Sensitivity of Bank Loans to Supply Shifts



Notes: Each bar shows a regression estimate of the increase in the growth of outstanding bank loans to nonfinancial corporations in response to a permanent, one-percentage-point decrease in the federal funds rate. The date below each bar is the first year of the sample period for the regression. Each sample period begins in the first quarter of the year shown under the bar and ends in the third quarter of 1991.

Source: Authors' calculations.

excludes more of the earlier data—precisely the change that would occur if the demand curve flattened over time.

CONCLUSION

Are bank loans still special? Clearly they are. Despite significant growth in the market share of commercial paper, only a small fraction of business firms can tap this market. And for small and

medium-sized firms, banks are still the predominant source of credit.

Just as clearly, however, bank loans are less special than they used to be. The market shares of commercial paper and of finance companies have grown. And, while the evidence must be interpreted with some caution, the results of the analysis reported in this article provide preliminary support for the view that good substitutes for bank loans have become more available.

ENDNOTES

¹ Several financial institutions often lend to a single borrower when the loan is very large. Nevertheless, the number of financial institutions involved in the loan is extremely small compared to the number of individual investors that are involved.

² Investors do not have to gather information about and monitor some firms that are large and well known. Such firms become well known because they pay credit rating agencies, such as Moody's and Standard and Poor's, to gather information, to monitor, and to distribute the information to the public. For these borrowers, it is apparently cheaper to pay someone to provide the information gathering and monitoring services and to use debt financing than to use bank loans.

³ Of course, as long as individual investors bear the cost when a financial institution fails, investors must gather information about and monitor the financial institution. Because financial institutions are diversified, however, they are much less likely to fail than other types of firms. As a result, the costs of gathering information about and monitoring financial institutions are small. For a formal treatment of this issue, see Diamond and Williamson.

⁴ Banks have often paid implicit interest on demand deposits by giving away "gifts," such as toasters, or by not charging for certain services. However, because demand deposits serve as a means of payment and are more liquid than virtually any other investment, the implicit interest paid by banks is probably lower than the interest rate paid by nonbank lenders for their funds. Thus, even if banks were allowed to pay interest on demand deposits, they would still be able to attract funds at a lower cost than nonbank lenders.

⁵ Businesses are still prohibited from holding interest-bearing transactions accounts.

⁶ While it is difficult to quantify the burden of complying with regulations, one indicator is the length of the reports of condition and income that insured banks are required to file quarterly. The length of these reports more than tripled in recent years, from eight pages in September 1983 to 26 pages in March 1992.

⁷ If there were perfect substitutes for bank loans, the demand for bank loans would be a horizontal line. In other words, borrowers would abandon bank loans completely if the bank loan rate increased at all.

⁸ A number of attempts have been made to estimate the demand for bank loans. Harris presents one such attempt and surveys a number of other prominent models. None of these attempts has been completely successful, and preliminary research indicated none of them was well adapted to the purposes of this article.

⁹ The best available measure of loan rates is the prime rate, the rate banks, in theory, charge their best customers. The

prime rate, however, is an inaccurate measure of the true cost of bank loans. Most business borrowers pay some premium over the prime rate, and the premium varies with the creditworthiness of the borrower. Indeed, in recent years, some borrowers have been able to pay less than the prime rate. In addition, the prime rate does not reflect all the costs of a loan even after the premium is included. Borrowers frequently pay up-front fees to obtain or renew loans, and they may be required to hold balances in non-interest-bearing accounts as a condition of the loan. Moreover, loan contracts often contain clauses that restrict firms' actions. These clauses help banks monitor customer behavior and guard against certain types of risk-taking, but, to the extent these clauses actually restrict firm behavior, they can be regarded as a cost of obtaining a bank loan.

In addition to the problem of measuring the effective rate on bank loans, there is the problem of measuring the effective rate on substitutes for bank loans. A formal model of the demand curve in Figure 1 would measure not the bank loan rate on the vertical axis, but rather the spread between the bank rate and the rate on such substitutes as commercial paper. There are data on commercial paper rates, but no data are available on finance company loan rates.

¹⁰ Under certain circumstances, higher capital standards may lead banks to reduce their holdings of safe, but relatively low-yielding, securities and increase their holdings of riskier, but relatively high-yielding, loans. See Keeton (forthcoming) for a discussion of this point.

¹¹ There is no predictable change in the impact of a factor that shifts both the supply curve and the demand curve.

¹² These effects would also occur if there were no change in the slope of the demand curve, but the supply curve became steeper. However, the supply curve is likely to have become flatter, not steeper, since deposit rates were deregulated (Keeton 1986).

¹³ All estimates in this article are computed from data on nonfinancial corporate businesses to ensure that the data reflect business borrowing behavior and not the behavior of other types of organizations. The data on nonfinancial corporate businesses come from the Federal Reserve's Flow of Funds.

¹⁴ Bermanke and Lown use state data to show that bank capital helps explain the recent decline in bank loans.

¹⁵ From the fourth quarter of 1979 through the third quarter of 1982, the Federal Reserve used a nonborrowed reserves target in conducting monetary policy. For that period, the stance of monetary policy is measured by the growth rate of nonborrowed reserves.

Changes in monetary policy are assumed to shift the supply curve directly but to shift the demand curve only indirectly.

Changes in monetary policy affect the demand for loans only through factors such as investment and inventories. Because these demand factors are included in the regressions, the estimates of the impact of monetary policy measure shifts in the supply curve.

¹⁶ In addition to the demand and supply factors listed in the text, each regression included: a constant, quarterly dummy variables, a dummy variable for the credit controls in the second quarter of 1980, lagged values of bank loans, nonborrowed reserves from the fourth quarter of 1979 through the third quarter of 1982, and the GDP deflator. All variables except the federal funds rate were entered as growth rates (log first differences). The federal funds rate was entered in levels. This specification was chosen because all the variables, aside from the federal funds rate, are nonstationary. Moreover, bank loans were found not to be cointegrated with any of the explanatory variables, thus an error correction term was not included. The current and two lagged values of each variable were included. Current values of nonborrowed reserves and of the federal funds rate were excluded because they are likely to be correlated with the error term. This specification produced normal residuals in both regressions and no strong evidence of serially correlated residuals.

¹⁷ The reported significance levels are the levels from a traditional, two-tailed test. Since theory predicts the signs of these effects, a one-tailed test is appropriate. For a one-tailed test, the significance levels are cut in half. For example, effects reported significant at the 10 percent level in the two-tailed test are significant at the 5 percent level in the one-tailed test. One effect reported as not significant—the effect of inventories in the first subperiod—is significant at

the 10 percent level in the one-tailed test.

¹⁸ This test is a joint test of the hypothesis that none of the regression coefficients changes between subperiods, that is, a so-called Chow test. A joint test is appropriate because all the reduced form coefficients should change if the demand curve flattens across subperiods. None of the tests for a change in the impact of individual demand and supply shift factors, however, is statistically significant.

¹⁹ This discussion assumes that a given change in a supply or demand factor shifts the supply or demand curve by the same amount in each subperiod. However, in addition to causing the demand curve to flatten, greater substitution possibilities might cause demand factors to shift the demand curve by a smaller amount. Nevertheless, this would not alter any of the conclusions because, like a flattening of the demand curve, such a change would also cause demand factors to have a smaller impact on bank loans in the second subperiod.

On the supply side, such events as a reduction in the effectiveness of monetary policy might reduce the amount by which changes in the factors measuring monetary policy, such as the federal funds rate, shift the supply curve. If so, changes in the federal funds rate would not have as large an impact on bank loans in the second subperiod. In other words, a reduction in the effectiveness of monetary policy could offset the effects of a flattening of the demand curve, masking the impact of changes in the federal funds rate. Because the results indicate that the federal funds rate has had a larger impact on loans in the second subperiod, the flattening of the demand curve apparently was large enough to outweigh this masking.

REFERENCES

- Black, Fischer. 1975. "Bank Funds Management in an Efficient Market," *Journal of Financial Economics*, pp. 323-39.
- Compton, Eric N. 1987. *The New World of Commercial Banking*. Lexington, Mass.: Lexington Books.
- Diamond, Douglas W. 1984. "Financial Intermediation and Delegated Monitoring," *Review of Economic Studies*, July, pp. 393-414.
- Diamond, D. W., and P. H. Dybvig. 1983. "Bank Runs, Deposit Insurance and Liquidity," *Journal of Political Economy*, June, pp. 401-19.
- Fama, Eugene F. 1985. "What's Different About Banks?" *Journal of Monetary Economics*, January, pp. 29-39.
- Harris, M. 1976. "An Econometric Examination of Business Loan Behavior," Federal Reserve Bank of New York, Research Paper no. 7615, April.
- Keeton, William R. Forthcoming. "Substitutes and Complements in Bank Risk-Taking and the Effectiveness of Regulation," Federal Reserve Bank of Kansas City, working paper.
- _____ 1986. "Deposit Deregulation, Credit Availability, and Monetary Policy," Federal Reserve Bank of Kansas City, *Economic Review*, June, pp. 26-42.
- National Commercial Finance Association. Undated. "Money That Works," New York.
- Williamson, Stephen D. 1986. "Costly Monitoring, Financial Intermediation, and Equilibrium Credit Rationing," *Journal of Monetary Economics*, September, pp. 159-79.

Economic Review

President

Thomas M. Hoenig

Senior Vice President and Director of Research

Thomas E. Davis

Economic Research Department

Mark Drabenstott, Vice President and Economist
Bryon Higgins, Vice President and Associate Director of Research
Glenn H. Miller, Jr., Vice President and Economic Advisor
Craig S. Hakkio, Assistant Vice President and Economist
Charles Morris, Assistant Vice President and Economist
Gordon H. Sellon, Jr., Assistant Vice President and Economist
Stuart E. Weiner, Assistant Vice President and Economist
Alan Barkema, Senior Economist
Sean Beckett, Senior Economist
C. Alan Garner, Senior Economist
George A. Kahn, Senior Economist
William R. Keeton, Senior Economist
Tim R. Smith, Senior Economist
Todd Clark, Economist
Andrew J. Filardo, Economist
John E. Golob, Economist
Donald P. Morgan, Economist

Visiting Scholars

Robert S. Chirinko, University of Chicago
Charles Engel, University of Washington
Keith E. Maskus, University of Colorado
Anne C. Sibert, University of Kansas

Third Quarter 1992, Vol. 77, No. 3

The *Economic Review* (ISSN0161-2387) is published quarterly by the Federal Reserve Bank of Kansas City, 925 Grand Avenue, Kansas City, Missouri 64198-0001. Subscriptions and additional copies are available without charge. Send requests to the Public Affairs Department, Federal Reserve Bank of Kansas City, 925 Grand Avenue, Kansas City, Missouri 64198-0001. Second-class postage paid at Kansas City, Missouri.

POSTMASTER: Send address changes to *Economic Review*, Public Affairs Department, Federal Reserve Bank of Kansas City, 925 Grand Avenue, Kansas City, Missouri 64198-0001.

The views expressed are those of the authors and do not necessarily reflect the positions of the Federal Reserve Bank of Kansas City or the Federal Reserve System. If any material is reproduced from this publication, please credit the source.

Economic Review
Federal Reserve Bank of Kansas City
Kansas City, Missouri 64198-0001
Third Quarter 1992, Vol. 77, No. 3