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This Quarterly Review is published by the Research and Statistics Function of the Federal Reserve Bank of New York. Remarks by PAUL A. VOLCKER, president of the bank, on the treatment of foreign banks in the United States begin on page 1. Among the members of the function who contributed to this issue are CARL J. PALASH (on how heavy is the burden of household debt, page 9); WILLIAM C. MELTON and DIANE L. HEIDT (on variable rate mortgages, page 23); MAURY HARRIS (on finance companies as business lenders, page 35); DOROTHY MEADOW SOBOL (on precedents and issues of a Substitution Account, page 40); and JOEL L. PRAKKEN (on the exchange rate and domestic inflation, page 49). An article by RICHARD G. DAVIS, senior economic adviser, on the broad credit measures as targets of monetary policy, starts on page 13.

An interim report of Treasury and Federal Reserve foreign exchange operations for the period February through April 1979 begins on page 56.

Remarks before the
International Monetary Conference
London, England, on
Tuesday, June 12, 1979

Treatment of Foreign Banks in the United States: Dilemmas and Opportunities

Paul A. Volcker
President, Federal Reserve Bank of
New York

I have been asked to concentrate today on the treatment of foreign banks in the United States. Our recent Federal legislation on the subject has settled some old issues. But it has also revealed more clearly some policy dilemmas where there is, as yet, no evident consensus.

In approaching the subject, it seems to me obvious that any consistent, stable policy toward foreign banking must be rooted in more general attitudes.

In broad principle, the United States accepts the market system. We like to see more, not fewer competitors. In general, we are content to see economic policy work its way through relatively impersonal market incentives. And we have long supported the free movement of capital internationally, alongside trade, as being in the national, as well as in the international, interest.

Consequently, when the United States in the 1970's finally got around to considering in a conscious way what national policy should be toward foreign banks, a law was adopted, the International Banking Act, that embedded "national treatment" as the guiding light—that is, foreign banks would be permitted to operate in the United States on substantially the same basis as

United States banks. The new legislation for the first time brought banking by foreigners in all its forms—agencies and branches as well as subsidiaries—fully within the ambit of Federal law. But, in doing so, it seems to me indisputable that it maintained an open, nondiscriminatory attitude. In fact, to this observer, one of the more significant aspects of the long debate that led to the International Banking Act was the care of the Congress in responding to the expressed concerns of foreign banks—even in a situation in which those banks were defending some important competitive advantages inherited from the days prior to Federal legislation.

To be sure, part of the motivation for the Federal legislation was the restiveness of some domestic banks feeling the pressure of foreign competition. But the intent and result of the legislation was to deal with that restiveness by removing most of the legitimate concerns that foreign banks were peculiarly *avored* by the absence of Federal law relating to foreign branches or agencies, not by discriminating against them.¹

If this all seems simple and straightforward in broad

These remarks are personal, and do not purport to reflect the views of the Federal Reserve generally.

¹ In fact, even apart from "grandfathered" securities operations and branching privileges, foreign banks operating in the United States retain some elements of flexibility, particularly in branching, denied United States banks.

philosophical terms, the process of moving from broad philosophy to practical policy always raises difficult and crucial questions. One set of policies and philosophies—national treatment and the free flow of capital—has to be reconciled to others, including the desire of any country to be able to conduct effective national economic policies. We have to deal with the peculiarities of the dual system of state-Federal regulation in the United States and the related restrictions on interstate banking. More concretely, supervisory approaches and practices in the United States, including those primarily aimed at safety and soundness of individual banks, were shaped with domestic, not international, institutions in mind.

The need to resolve these practical issues is apparent, for foreign banking in the United States can no longer be considered a minor appendage on the domestic system. Since the early 1970's, few weeks have passed without a foreign bank establishing an office in the United States or expanding the number of existing locations. Taking account of recent acquisitions, the total number of foreign banks has reached over three hundred, and their United States-domiciled assets have passed the \$140 billion mark, about 10

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percent of the assets booked at all banking offices in the United States. In the area of commercial lending, their portion of the market is more than 13 percent nationwide, roughly doubling in the past seven years.

Reflecting both state regulatory patterns and the concentration of business opportunities, the penetration of certain major money centers has been much larger than these national figures imply. More than two thirds of the total assets are in New York City, and almost 95 percent in New York, Los Angeles, and San Francisco, combined. In those three cities, foreign-owned institutions hold 32 percent or more of the commercial banking assets booked by banks operating in those areas and do 38 percent of the commercial lending.

Those data exaggerate the penetration of purely domestic markets, because foreign-owned banks no doubt rely on both foreign funding and foreign lending to a greater extent than the average United States

bank. Moreover, it could be noted that the figures are still smaller than those for foreign banks here in London. But I think it can also be said that the typical foreign bank in the United States, operating almost wholly in the domestic currency and free of exchange control or any regulatory restraint on domestic business, is more fully integrated into the United States banking system than is the Eurocurrency institution that accounts for the bulk of the foreign presence in European countries.

This growth—against the background of the new legislation—has brought at least four key issues to the forefront:

- (1) What kind of information should be obtained, and what supervisory control maintained, by United States authorities with respect to foreign owners of United States banking offices, paralleling requirements routinely placed on all United States banking organizations?
- (2) Is there some degree of penetration of the United States banking system, or of particular markets within that system, by foreign-owned institutions that should be a matter of legitimate concern, and what is the nature of that concern? In particular, do takeovers of large United States institutions raise a different question than *de novo* or foothold approaches to the market?
- (3) Are there implications in the growth of foreign banking in the United States for the way United States banking itself is structured, and particularly for the limitations on interstate banking?
- (4) Finally, should some concept of reciprocity in national treatment play a larger role in United States policy? More broadly, how should national banking and supervisory systems mesh together in an integrated financial world?

The first of these questions has already been dealt with in fairly specific terms earlier this year by the Federal Reserve as it was called upon to consider several applications by large foreign banks proposing to acquire substantial United States banks. As with purely domestic acquisitions, our basic supervisory considerations are that the United States subsidiary be operated safely and that the foreign parent be a source of strength and support to the subsidiary. The position naturally followed that the foreign owner of a United States institution should, in concept, be subject

to information and reporting requirements comparable to those of a United States owner to the extent required to judge its financial soundness, including its capitalization, and its ability to support its United States operation over time.

At the same time, in recognition of the practicalities of a situation in which jurisdiction over the foreign

Ironically, the laws of both the United States and of a number of major states permit entry of banks domiciled abroad, while excluding banks of sister states as "foreign". Among other things, the implication is that a sizable domestic bank seeking sale or merger (or perhaps a large injection of capital in a depressed stock market) may be almost forced to look abroad for a partner.

owner is removed, the Federal Reserve indicated that it intends to exercise particularly close surveillance over transactions involving a major United States subsidiary with its foreign owner to assure the independent soundness of the United States institution. To that end, it has insisted that the United States subsidiary be plainly capitalized adequately.²

I know these requirements can raise difficult practical questions in the minds of bankers contemplating an acquisition in the United States. But we have ample experience, with United States or foreign owners, to know how difficult it is to insulate the fortunes of a subsidiary from that of its owner. In the last analysis, when an important United States banking institution is foreign owned, I see no alternative to seeking a *modus vivendi* for satisfying those informational requirements that we feel essential to evaluating an acquisition or to our continuing surveillance responsibilities.

My second question about limits to the degree or manner of penetration of domestic markets by foreign banks is nowhere addressed specifically in the International Banking Act or other Federal legislation. But it would be too much for me to say that it is not an issue at all in the United States, as suggested by the apparent hesitancy of New York State authorities to approve the voting of the stock that would be acquired by the Hong Kong Shanghai Bank in the Marine Midland Bank, a major state-chartered institution. These concerns have, in fact, led to the calling of Congressional hearings later this summer. That process seems to me

potentially constructive in more clearly settling, from a national perspective, a potentially troublesome and emotional issue. In practice, if the Congress wishes to develop new legislative criteria, it would appear to have the opportunity to do so before the Federal Reserve, in the normal course of events, would be called upon to act on any new proposals for a sizable acquisition.

My own thinking at this stage is that concerns about the extent or manner of foreign penetration—to the degree they have substance—can be dealt with by means other than setting arbitrary limits or a blanket prohibition on major acquisitions. The points I just made about adequate information about the parent, and surveillance and control of relations between parent and subsidiary, are relevant in that connection. The extension of reserve requirements to foreign branches and agencies, the fact that their United States operations will be subject to laws and policies affecting United States banks generally (including, for retail operations, laws specifically directing attention to the needs of the local community), the requirements of state or Federal law for heavy United States representation on boards of directors of subsidiaries—all of these help deal with broader concerns of possible lack of responsiveness to United States policies and needs. I might add, in my own observation institutions owned by reputable foreign banks have in general displayed a sensitivity to the policies and requirements of United States authorities in their United States operations as close (and as appropriate!) as that of purely United States institutions. Perhaps most importantly,

Much of the concern expressed recently about foreign takeovers of large United States institutions in New York has turned upon the point that United States institutions do not have equivalent opportunities. . . . I believe a proposal for such a takeover, in practice forbidden to another United States bank and involving ownership removed from United States regulatory control, should reasonably be required to pass a test of identifiable positive benefits to the United States.

banks in the United States are operating in a competitive market that provides disciplines as well as opportunities for domestic and foreign-owned institutions alike. In this environment, neglect of service or credit needs of an area should rather quickly provide openings for other institutions.

There are some special areas that deserve exploration and debate. Should we be equally hospitable to institutions that may not be subject to usual market

² The reporting and surveillance requirements are reflected in a *Statement of Policy on Supervision and Regulation of Foreign Bank Holding Companies* by the Board of Governors issued on February 23, 1979.

disciplines such as foreign government-owned banks, particularly if there is a pattern of state direction? Is it desirable, in the interests of supervisory control and the ability of the United States operation to stand on its own feet, to encourage major banking operations in the United States heavily directed toward our domestic market to be operated as subsidiaries rather than branches? Should foreign nonbanking institutions be able to operate banks in the United States, a possibility not permitted United States companies? What are the competitive implications of funding of United States banking offices from a home abroad subject to lower capital requirements or lower (or even no) reserve requirements?

These questions are not easily separable from those of the United States banking structure itself. Indeed, much of the concern expressed recently about foreign takeovers of large United States institutions in New York has turned upon the point that United States institutions do not have equivalent opportunities. Under United States law, takeovers, domestic or foreign, must be judged on competitive grounds. In practice, large domestic institutions that wish to acquire another sizable bank within their home state must assume a heavy burden of proof that any significant adverse competitive consequences in relevant markets are outweighed by substantial public benefits. Such domestic banks cannot, by law, acquire a bank out of their own state. As a result, a major bank in, say, New York or California is practically forbidden the opportunity to expand either by acquisition of another major viable institution in its home state or by acquiring an institution in another state. But, ironically, the laws of both the United States and of a number of major states permit entry of banks domiciled abroad, while excluding banks of sister states as "foreign". Among other things, the implication is that a sizable domestic bank seeking sale or merger (or perhaps a large injection of capital in a depressed stock market) may be almost forced to look abroad for a partner.

We have here a clash between the idea of open entry for foreign banks and the traditional geographic insularity of the United States domestic banking system. That insularity is breaking down, particularly for international or wholesale banking, under economic and technological pressures. The fact that it is happening is in part due to the penetration of foreign banks themselves. But we are still a long way from freedom of entry for retail banking nationwide.

The resistance to interstate banking, and in some areas to large metropolitan banks expanding offices elsewhere within a state, is rooted in part in some of the same instincts that fear foreign takeovers draining local funds for use elsewhere. I have not seen con-

vincing evidence to support that instinct. Indeed, much of the force behind the resistance appears to lie in the natural inclination of some banks to resist a new source of competition.

In such circumstances, prohibiting foreign acquisitions simply because of the interstate restrictions of the MacFadden and the Bank Holding Company Acts would seem backward looking. As a simple forecast, sweeping elimination of those domestic restrictions at any time soon appears unlikely. But there are practicable means for easing the dilemma. For instance, Federal legislation has been urged by the Federal Reserve and others to permit out-of-state institutions to acquire a failing bank. More broadly, there seems to me a strong case on domestic grounds for the provision of reciprocal branching or holding company privileges between major states.

Even in the absence of progress in those directions, *de novo* entry or foothold acquisitions by foreign banks normally suggest competitive benefits that we as a nation should encourage. The pro-competitive presumption is not self-evident in the case of a really major takeover by a foreign bank—such as acquisition of a large money center institution. I believe a proposal for such a takeover, in practice forbidden to another United States bank and involving ownership removed from United States regulatory control, should reasonably be required to pass a test of identifiable positive benefits to the United States. Those benefits might take such forms as increased capital, stronger management, together with a full commitment to support of local banking and the local economy. As I emphasized earlier, a fundamental prerequisite should

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be a wholehearted commitment to compliance with United States law, regulations, and policy in its United States operations, a suitable degree of insulation of the operation of the United States subsidiary so that in event of need it could stand on its own feet, and responsiveness to informational requirements.

Finally, a brief word about reciprocity. National legislation, unlike that of some states, makes no such requirement for approval of foreign entry, although it does call for a report by the Secretary of the Treasury on treatment afforded United States banks abroad. I

personally question whether open entry on a basis of national treatment in instances where the home country does not provide reasonably equivalent access to American and other foreign banks is equitable to United States banking interests or fully responsive to the national policy of open markets. I recognize that many foreign banking systems are much more concentrated than in the United States, and they are much smaller markets in the aggregate. Takeover of one of a handful of leading banks in those countries would have quantitatively and qualitatively different implica-

In the long run, I suspect the continued hospitality of the United States to foreign banks will be dependent on a sense that United States and foreign banks alike are operating under comparable ground rules and that cooperation among national supervisory authorities is adequate to maintain a sense of both competitive equity and soundness. The policies of the United States toward foreign banking seem to me broadly consistent with those needs.

tion than a takeover in the United States—but the differences might not be so great if analysis were directed toward regional sectors of the United States markets.

I won't try to tread my way through the labyrinth this afternoon by suggesting more specific standards. But I would leave you with the thought that, as banking systems become more integrated across national borders, inconsistency among major nations in the ways they approach banking regulation and supervision is bound to pose more and more awkward problems.

I would quickly concede we have too much regulation in our national system. But, the answer cannot be found in retreat to no regulation at all, or even to the lowest common denominator. The national authorities of all leading countries should have a common interest in assuring that their banks operating abroad, or foreign banks operating in their jurisdiction, do their business with appropriate prudential surveillance of their worldwide operations. Useful work in developing complementary and integrated approaches by the leading national authorities has been going forward mainly under the auspices of Peter Cooke's Committee in the Bank for International Settlements.

There should also be a common interest in assuring equitable competitive conditions, with implications for reserve requirements and capital ratios, among other things. I know the subject is bound to be difficult and controversial, but in that connection I welcome the studies under way in the Bank for International Settlements and elsewhere to look afresh at approaches to the Euromarkets.

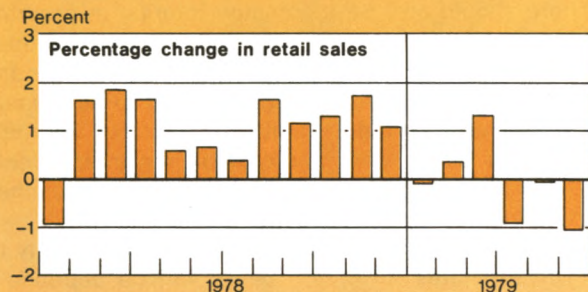
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The business situation

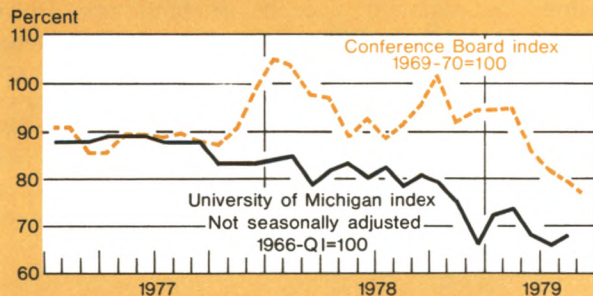
Current developments

Chart 1

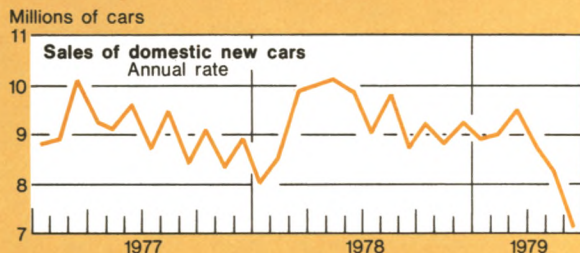
Consumer spending declined in the second quarter . . .



. . . as growing uncertainties eroded consumer confidence . . .



. . . and gasoline shortages accentuated the drop in new car buying.



All data seasonally adjusted, except where noted.

Sources: United States Department of Commerce, University of Michigan, The Conference Board, Inc., and Board of Governors of the Federal Reserve System.

With the slowdown in business activity in 1979, symptoms of an economic recession have begun to emerge. At the start of the year, harsh winter weather exaggerated the slowdown. In the second quarter, the sharp rise in fuel prices and sporadic shortages of gasoline accentuated the economic decline. In many respects, recent energy developments—the sharp rise in fuel prices and reduced availability of gasoline—are reminiscent of the 1973-74 oil embargo which tripped the United States economy into its worst recession in post-war history. Consumer confidence has been shaken by the growing uncertainties over energy, worsening inflation, and the economic outlook.

Manufacturing activity began the second quarter on a note of unexpected weakness. Industrial production declined sharply, employment growth faltered, and the workweek declined. Much of the weakness could be attributed to the effects of the teamsters' strike. In addition, a ready list of other factors—including the steel haulers' work stoppage and technical quirks of the business statistics (which captured the effects of religious holidays)—also helped explain the apparent weakness in the April data. While economic activity recovered in May and June, the rebound in production, employment, and the workweek failed to recoup the April declines.

In large measure, the slowdown in manufacturing activity reflected producers' response to the pronounced weakening in consumer expenditures, most notably new car purchases. Monthly retail spending declined from April through June (upper panel of Chart 1). After making adjustment for the effect of rising prices, the decline in real consumer spending in the second quarter was precipitous.

The weakness in consumer buying in recent months has been accentuated by declining real incomes,

shortages of gasoline, and growing uncertainties over the strength of the expansion. Led by the skyrocketing price of gasoline, the accelerating inflation outstripped the growth of earnings, eroding the real purchasing power of households' incomes. Reflecting these losses and heightening concerns over inflation, consumer confidence appears to have dropped sharply. Indeed, in recent months two widely followed measures of consumer confidence were close to their lowest levels in the past four years (middle panel of Chart 1).

The uncertainties over shortages of gasoline and higher prices of fuel led to an abrupt decline in purchases of domestic new cars, the main factor in the drop of household spending (bottom panel of Chart 1). Sales of domestic new cars weakened each month of the second quarter, closing the quarter at the lowest monthly rate since June 1975.

The fuel situation also led to a sharp shift in buyers' preferences for smaller, more fuel-efficient cars. Demand for large domestic cars and used cars, which tend to be less fuel-efficient, has fallen sharply. The trade-in value of used cars has dropped in recent months, and this drop in turn is depressing the demand for new cars still further.

While sales of standard-sized cars plummeted, sales of both imports and fuel-efficient domestically produced cars strengthened. Sales of imported cars in the second quarter averaged 2.5 million units at an annual rate, the highest quarterly sales pace ever posted.

The unexpected decline in the sales of standard-sized cars led to a backup in dealer inventories. As sales dropped, dealer inventories rose to the equivalent of 83 days of sales in June. The imbalance of auto inventories is underscored by trade reports of heavy price discounting of slow-selling large models, while some desirable subcompact models are in such short supply that waiting periods are up to a year.

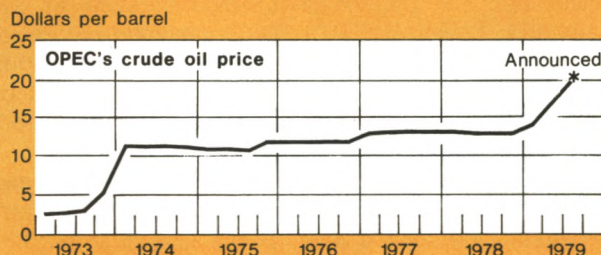
Outside the inventory accumulation in the automotive sector, the inventory buildup in manufacturing and trade appears, for the most part, to have matched the growth of shipments through the late spring. While there were undoubtedly some elements of involuntary accumulation of stocks in the second quarter, the extent of current inventory excesses is unclear. However, any correction is likely to be relatively small because of the cautious inventory policies followed earlier by businesses.

Sporadic shortages of gasoline played a role in curtailing consumer spending in recent months. From a longer term perspective, however, the run-up in crude oil prices is likely to be more important in paring demand because it has sharply reduced purchasing power. To be sure, the more than 60 percent increase in the average price of imported oil this year is

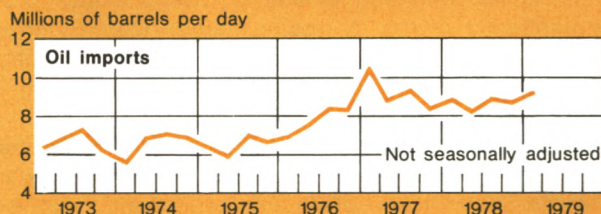
dwarfed by the fourfold increase in 1974. But, more importantly, in dollar terms the 1979 increase in oil prices is about the same as in 1974. Moreover, the United States has grown increasingly dependent on imported oil (Chart 2). In 1974, the United States imported about 6½ million barrels per day. So far this

Chart 2

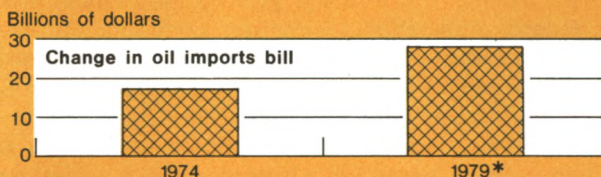
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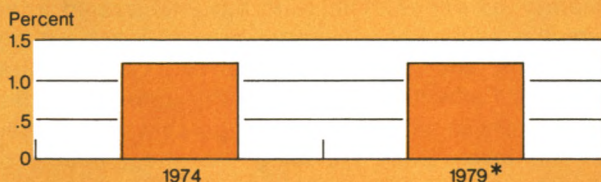
. . . but more oil is imported today . . .



. . . so that the increase in the United States oil import bill in 1979 will be larger than in 1974.



As a share of national income, the increase in 1979 is likely to be comparable to 1974.



*Federal Reserve Bank of New York estimates.

Sources: Central Intelligence Agency and United States Department of Commerce.

year, imports have been running about 9 million barrels per day. As a consequence of the higher level of oil prices and the greater dependence on imports, the increase in the United States oil imports bill in the fourth quarter of 1979 from the final quarter of last year is likely to be about \$28 billion, compared with the \$17 billion jump between the fourth quarter of 1973 and that of 1974. After taking into account the growth of national income over this period, it appears that the direct impact of oil import costs relative to gross national product is similar to 1974—about 1.2 percent of GNP. Of course, the final impact on economic growth depends on a host of factors, such as the spending behavior of the OPEC (Organization of Petroleum Exporting Countries) cartel, but this calculation is suggestive of the adverse consequences posed by this substantial transfer of purchasing power to the oil-exporting nations.

Amidst the decline in consumer spending, home-building activity in the second quarter recovered from the weather-depressed level of the first quarter. Still, the pace of housing starts remained below recent levels. Some continued weakening seems likely, given the tightening of the mortgage market. Deposit flows at thrift institutions have slowed sharply in recent months, and interest rates on new mortgage commitments have jumped.

Nonresidential construction activity also recovered in the spring. The latest readings as to prospects of business spending on plant and equipment, however, are mixed. Businessmen have raised plant and equipment spending plans slightly, and capital appropriations of major manufacturing corporations jumped sharply after the turn of the year to the highest level on record. Against this strength, contracts for new commercial and industrial construction, as well as new orders for capital goods, have fallen in recent months.

Price pressures remain intense. Over the five months ended in May, consumer prices have jumped at an annual rate of close to 13 percent—the worst experience since late 1974. In the early months of this year, surging food prices led the growing inflationary pressures. More recently, the upward spiral of consumers' food prices appears to have moderated a bit. Currently, skyrocketing energy prices—most notably for gasoline and fuel oil—have led the upward spiral of prices. Reflecting the run-up of world oil prices, gasoline prices in May were 20 percent above their year-end level. Even excluding the direct effects of higher food and energy prices, consumer prices have risen at a 10 percent annual rate in the first five months of 1979. Obviously, part of this inflation reflects the working through of higher food and energy prices.

In addition, the price increase continues to capture the lagged effects of the 1977-78 decline in the international value of the dollar (see article on page 49).

From a broad perspective, the decline in activity in the second quarter represents an interruption in a long pattern of business advance. The economy has come to operate near effective capacity, with the unemployment rate in June at its lowest level in several years. Indeed, because the economy has been working with so little spare room, some easing in upward demand pressures is not in itself alarming.

What would be alarming would be failure to take advantage of any pause in economic activity to work toward restoration of price stability and deal with other impediments to economic growth in the future—factors that only increase the vulnerability of the economy to a severe downturn at some point. Certainly, monetary policy has a key role to play in that process. In that connection, the Federal Open Market Committee recently reaffirmed the policy of gradually reducing the growth of the monetary aggregates in order to curb inflation (see the article on page 32).

Whether the projected monetary growth will provide enough money to finance early and sizable restoration of growth depends in large part on supply and cost pressures. The division of nominal growth between real output and inflation can be improved by removing impediments to price stability. Some of the difficulties arise from government itself. The point has often been made that many regulatory policies tend to add to the upward pressures on prices. Scheduled increases in payroll taxes need review. Similarly, the scheduled increases in the Federal minimum wage need to be re-examined. The effects fall hardest on those workers who are inexperienced and less skilled—teenagers and minorities. With the prices of many grains at high levels, the continuation of crop set-aside programs seems unnecessary. In addition to removing impediments, tax policy can be used to promote investment which reduces cost pressures by increasing productivity and raising supply.

Energy policies seem likely to raise prices in the short run, but in the long run conserving fuel and encouraging production will help contribute to the goals of price stability and economic growth. President Carter's energy proposals should serve as a springboard for the creation of a forceful energy program. While any solution to the energy problem is bound to be controversial, policies need to be forged that will reduce the vulnerability of the United States to the disruptive pricing and output decisions of the OPEC cartel.

Household debt burden: how heavy is it?

Households have borrowed at an unprecedented pace in the past two years. Total household debt—instalment, noninstalment, and mortgage—jumped by more than 35 percent or \$290 billion. With the heady growth of borrowing outpacing the advance of income, indebtedness relative to spendable income has risen to its highest level in the postwar period.

The borrowing binge in perspective

Consumer spending has played a key role in spurring the economic advance. In the past two years this spending has been financed by a step-up in consumer borrowing. Led by a surge in home mortgage borrowing in 1977, households have assumed debt at an exceptionally fast rate. During 1977 and 1978, mortgage indebtedness rose by about \$200 billion while instalment debt grew about \$80 billion and noninstalment debt increased by \$10 billion (upper panel of Chart 1). By the end of 1978, the ratio of debt outstanding to disposable personal income stood at an all-time high of 70.8 percent.

This higher level of indebtedness and higher interest rates have caused debt servicing requirements, *i.e.*, debt repayments for principal and interest, to advance also. To some extent, these increases have been moderated by the lengthening maturity on most kinds of debt. A notable example is the lengthened maturity of automobile loans. While in the past new-car financing was limited predominantly to three years, these loan maturities have been extended to four years and, in some cases, to as long as five years. As a consequence, the average maturity of automobile loans by finance companies has increased by close to 11 percent between 1976 and 1978, from thirty-nine months to forty-three months. Even with the longer loan maturities, however, repayments rose relative to income

during the past two years. In 1978, instalment and mortgage debt repayments reached a historic peak of 20.9 percent of disposable personal income (bottom panel of Chart 1).¹ While repayments slowed relative to disposable personal income in the closing months of 1978 and the first three months of 1979, the ratio of repayments to income remains high as compared with past levels.²

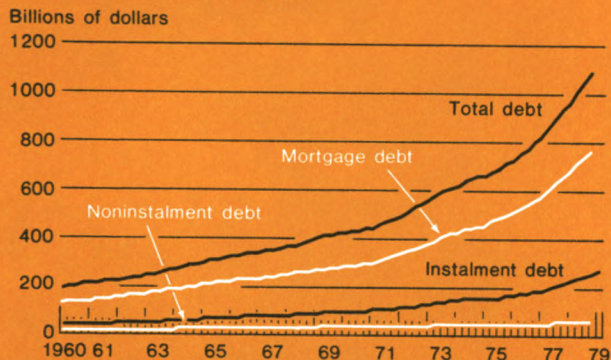
Despite the very high levels of debt and repayments, there is little direct evidence that households have had difficulty repaying loans. The delinquency rate—the percentage of instalment loans past due thirty days or more—on most categories of commercial bank loans was essentially flat in 1978 and remained well below the levels associated with the 1974-75 recession. The delinquency rate on bank credit card debt, which had climbed sharply from 1.8 percent in December 1977 to 2.6 percent at the end of 1978, fell back to a much lower 2 percent level by March of this year, substantially below the levels attained in prior years. Similarly, while the personal bankruptcy rate—the number of personal bankruptcies per 100,000 people of age 20 or more—rose during 1978, it eased a bit in the first quarter of 1979. In any event, in the past three years

¹ For purposes of historical comparison, the debt repayment figures used here do not incorporate the most recent revisions. The most important change was the reclassification of gasoline credit card debt from noninstalment to instalment debt. Data reflecting these revisions begin only in 1970. With the revised data, debt repayments attained a historic peak of 23 percent of disposable personal income in the third quarter of 1978.

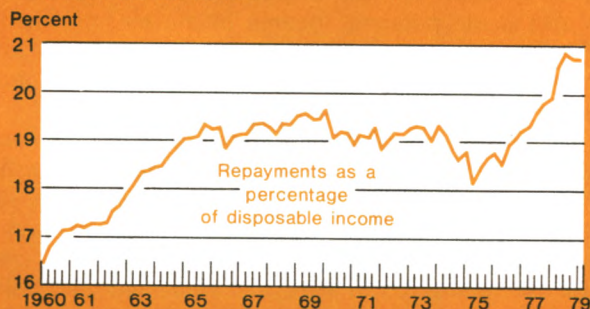
² Repayments may better indicate than debt itself whether households are overextended. The repayments represent the prior claim on income that borrowing eventually entails. The smaller the fraction of income that must be devoted periodically to paying back the loans, the greater the ability to carry a particular level of debt.

Chart 1

Household indebtedness has risen to an all-time high . . .



. . . propelling repayments to historically high levels relative to disposable personal income.



Sources: United States Department of Commerce and Board of Governors of the Federal Reserve System.

the bankruptcy rate has been comparable to its level in the early 1970's.

An important explanation why households have experienced little difficulty repaying debt obviously rests with the continued growth of income and employment. Another explanation is that consumers have sizable assets to fall back upon in the event their incomes are disrupted. While debt reached a historic peak in 1978 at close to 30 percent of financial assets, higher than its levels of about 20 percent in the 1960's, in recent years a substantial fraction of these assets have been held in highly "liquid" forms such as money market mutual funds or time deposits. The ease with which assets can be turned into cash is an important factor in assessing the ability of households to repay debt in the event of a disruption in income. Relative to

liquid assets, debt last year remained within the bounds attained in the 1960's.³

Why has indebtedness surged?

Part of the burgeoning growth of household indebtedness reflects the advanced stage of the business cycle. In periods of economic expansion, debt normally rises more rapidly than income. In the current expansion, the sharp acceleration in the inflation rate has played a direct role in encouraging households to assume debt. Debt repayments are fixed in dollar terms. During inflationary periods individuals expect these repayments to become easier to manage over time as their incomes rise with inflation. Moreover, in recent years interest rates on consumer loans have failed to rise as rapidly as inflation. Consequently, after taking into account the expected inflation rate, the cost of borrowing on many kinds of instalment and home mortgage debt has declined and, in some cases, turned negative.

During the current business expansion, the growth of indebtedness has been stimulated by several developments that facilitate the reliance of households on debt to finance purchases. A major factor contributing to this growth has been the continued aggressive marketing by commercial banks and other financial institutions to enlarge their shares of the consumer loan market. The expansion of preauthorized credit lines for consumers—through credit cards and overdraft facilities, etc.—has made it much more convenient for consumers to use credit. At the same time, the lengthening of loan maturities, by lowering the periodic debt servicing requirements, also has served to ease the assumption of debt. Another development that facilitated the use of credit was the introduction of six-month money market certificates in mid-1978. These instruments bolstered deposit flows at thrift institutions and commercial banks, increasing the availability of funds for home mortgages and other kinds of loans.

The introduction of the six-month certificates lent particular support to the growth of home mortgages. The upsurge in mortgages and their repayments reflected in part escalating home prices and higher mortgage interest rates. These greater purchasing costs have been reflected to a substantial extent in the outstanding stock of mortgages and their repayments because of the high level of new home construction and record sales of existing homes. Households have turned increasingly to home ownership as a hedge against inflation.

Whatever the complex factors encouraging consumer borrowing, the debt- and repayments-to-income ratios

³ Liquid assets are defined here as demand deposits and currency, time and savings accounts, and money market fund shares.

indicate that households apparently are heavily burdened with debt. At the same time, however, a host of other factors—including changes in the distribution of debt across the population—suggests that the indebtedness of households, while still a source of concern, is less ominous than appears at first glance.

The distribution of debt

The debt- and repayments-to-income ratios used to characterize the debt position of households cover all households. As a consequence, they fail to take account of the distribution of debt or debt repayments across households. Both mortgage and instalment indebtedness appears to be more broadly distributed among the population than in the past. In particular, the percentage of households holding home mortgages is estimated to have risen significantly between the 1960's and 1977 (upper panel of Chart 2). The distribution of instalment debt has also broadened, but to a lesser extent. Much of the wider ownership of indebtedness is the result of a greater fraction of households in most age categories assuming debt now than in the past. Only a small part of the increased ownership reflects a compositional shift in the population toward younger families, those which are likely to be more heavily in debt than other age households.

Weighting disposable income by the percentage of households with debt makes allowance for the broader ownership of indebtedness. After making this allowance, the ratio of *debt to income* in 1978 still is high but below its previous peak. When the *repayments-to-income* ratio is adjusted for the percentage of households with instalment and mortgage debt, the adjusted ratio in 1978 is at a historic peak although it is close to its level in the late 1960's and early 1970's. On a per household with debt basis, then, debt and repayments relative to income appear to be closer to historical experience than suggested by the aggregate ratios.

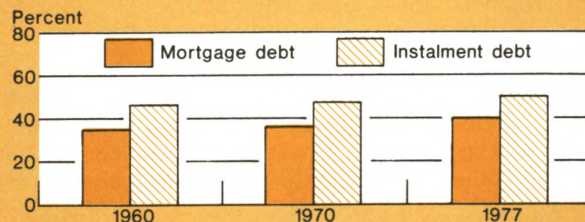
Another demographic development that bears on the increased indebtedness of households is the growing number of families with both spouses working. Two-worker families may find debt less risky to carry because both spouses are unlikely to experience work disruptions such as sickness or unemployment at the same time. In contrast, many of the second workers probably are new to the labor force and may be prone to layoffs in the event of an economic downturn.

The wider distribution of debt and other demographic developments help explain part of the increase in the debt and repayments ratios. Other factors point to a somewhat lighter burden than that implied by the aggregate ratios. Among these are the role of credit cards and the tax system.

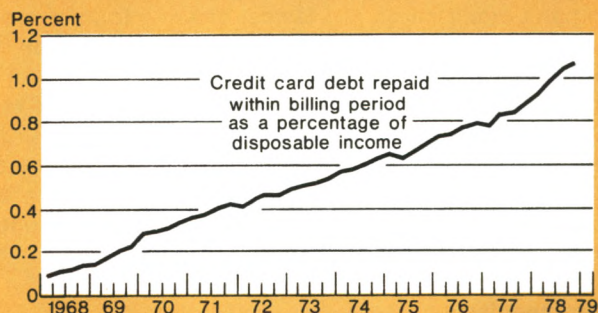
Chart 2

The burden of carrying the debt is not extraordinarily heavy . . .

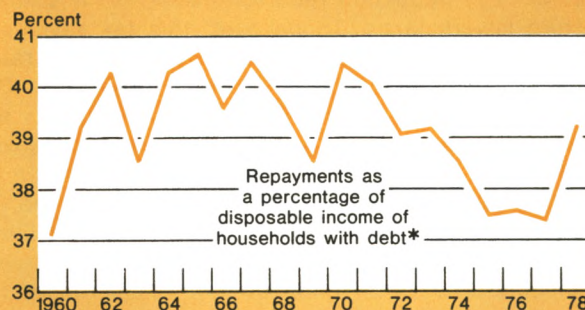
. . . as a higher percentage of households hold debt . . .



. . . and close to 40 percent of the credit card debt is repaid within the billing period.



Taking into account these and other factors, repayments relative to income are similar to earlier levels.



* Federal Reserve Bank of New York adjustments for "on time" credit card payments, the tax subsidy on mortgage interest payments, the percentage of households with debt, realized capital gains, and automobile lease payments.

Sources: United States Department of Commerce; Internal Revenue Service, *Statistics of Income*; Federal Budget; United States Census Bureau; Board of Governors of the Federal Reserve System; and Federal Reserve Bank of New York.

Credit cards

The increase in indebtedness and repayments has been exaggerated by the growing use of credit cards. For instance, by one estimate, between 1970 and 1978 the number of active bank credit card accounts more than tripled from 15 million to 47 million. All credit card purchases are counted as extensions of debt, and their repayments as debt liquidations. The expanded use of credit cards has contributed to the rise in the repayments ratio.

To the extent that consumers make purchases with credit cards and then pay for the purchases on an instalment basis, the outstanding balance on cards should be counted as indebtedness. However, for many consumers, credit cards serve only as a substitute for cash. For them, credit cards act as a convenient method of payment, where the outstanding credit card balance is paid in full during the billing period. With respect to bank credit cards, the fastest growing form of credit cards, such "on-time" payments are estimated on the basis of trade information to be about 40 percent of the repayments. Their inclusion in the repayments ratio biases this ratio upward as a measure of debt burden (middle panel of Chart 2). If these payments are excluded from the repayments-to-income ratio, the advance of the ratio during the past two years is pared by about a fifth.

Tax incentives

Debtors who itemize deductions in calculating income taxes receive a tax break because interest payments can be itemized as a deduction in arriving at taxable income. The deduction reduces taxable income which in turn lowers taxes. To be sure, this tax savings is reflected in the debt- and repayments-to-income ratios through disposable income, their denominators. Disposable income is personal income net of taxes and therefore is higher as a result of the tax savings realized on interest deductions. However, because the tax savings are small relative to disposable income, increases in the tax savings affect the ratios to a lesser extent than the corresponding increases in interest payments. Thus, the ratios do not reflect accurately the aftertax indebtedness burden. An accurate measurement of the burden requires that the tax savings be subtracted from the debt repayments. After this adjustment, the repayments-to-income ratio rises somewhat more slowly during this economic expansion.

Other factors

A complete picture of the indebtedness of households should include several factors not represented in the conventionally defined debt- and repayments-to-income ratios. One such factor is the availability of capital gains to repay debt. In particular, because the ratios emphasize a "cash flow" approach to representing income, "realized" capital gains—those gains which are converted into money—should be included in the ratios as a part of income. Another factor that should be represented in the ratios is leasing, which has become an increasingly popular method for individuals to acquire the use of an automobile. The contractual lease payments represent a prior claim on income in much the same way as do automobile loan repayments and thus should be added to debt repayments to get a better measure of consumers' obligations. The inclusion of lease payments and realized capital gains have small effects on the debt- and repayments-to-income ratios and tend to offset each other.

Conclusion

How heavy a burden is the indebtedness of households? The debt-to-income ratio remains high but below its previous peak when the factors discussed above are taken into account. Moreover, much of the indebtedness, particularly home mortgages, is offset by assets in the balance sheets of consumers. For such debt, households may be concerned more about the required repayments than the size of the outstanding indebtedness.

The burden of repaying debt is considerably less onerous than the standard ratios indicate. Adjusting the repayments-to-income ratio for the percentage of households with debt, "on time" credit card payments, and the other factors discussed here, the adjusted ratio in 1978 is within the range experienced in the 1960's and early 1970's (lower panel of Chart 2). This suggests that the financial position of households is less precarious than suggested by the conventional indebtedness measures. Nevertheless, in the event of an economic downturn the burden of indebtedness is likely to worsen as income and the value of assets decline. Indeed, in such circumstances the incidences of loan delinquencies and personal bankruptcies are likely to increase. As a consequence, the financial condition of households should continue to receive close attention.

Carl J. Palash

Broad Credit Measures as Targets for Monetary Policy

Over the last few years the use of targets for one or more financial aggregates has become a prominent feature of central bank policy in the industrial nations. In the United States, the Federal Reserve has made use of publicly announced targets since 1975 and has been using them internally since 1970. The kinds of financial measures central banks use for targeting purposes—often somewhat loosely referred to as the “monetary aggregates”—have included various narrow and broad measures of the money supply, measures of “central bank money” or the “monetary base” (roughly the sum of bank reserves and the public’s holdings of coin and currency), and measures of bank credit. In the United States, the Federal Reserve has used a system of multiple targets, announcing one-year growth rate ranges for three different definitions of the money supply and an associated range for a measure of commercial bank credit.

It has been suggested from time to time that the range of financial measures used by the Federal Reserve and other central banks for establishing targets is too narrowly focused on the commercial banking system and the “near” banks (such as the thrift institutions) and that the result has been insufficient attention to the overall volume of credit and too much concentration on the money supply. This article examines the case for the use of a broad measure of credit as a possible target for monetary policy in the United States. Such a broad credit measure need not necessarily be conceived as a substitute for measures of the money supply, but perhaps more plausibly as a *supplement* to the use of one or more such measures.

The choice among financial measures for targeting

purposes obviously depends on the underlying rationale for the use of such targets. Clearly, monetary policy is ultimately concerned with broad economic objectives such as the rate of inflation and the level of real output and employment. There is no intrinsic reason for policymakers or the public to prefer any particular rate of growth in any given financial measure over another except to the extent that such growth rates influence the performance of the economy itself. Since the influence of financial variables on the economy is generally believed to operate mainly through their influence on aggregate demand, the strength and stability of the relationship between various financial measures and aggregate demand is clearly a major issue in the choice among such measures for targeting purposes.

But it is not the only issue. The ability of the central bank to “control” or at least influence the behavior of the measure appears to be just as important. To take an obvious example, few doubt that the level of Federal spending is a significant determinant of aggregate demand, at least in the short run. But, since the Federal Reserve has no control over the level of Federal spending, Federal Reserve targets for such spending would clearly make no sense.

There may well be other considerations that should enter into the choice of a financial measure or measures. For example, if a particular financial measure comes to have widespread symbolic significance, it may acquire special importance simply because it may have a disproportionate impact on people’s expectations about future price and interest rate developments. Similarly, some might attach special significance to a

measure that includes major sources of funds for the housing industry. But the two broadest and most generally accepted criteria for choosing financial targets are influence over aggregate demand and controllability. These are the criteria used in this article to examine a possible role for broad credit aggregates as monetary policy targets.

Theoretical considerations in the use of credit measures as targets

Recent central bank emphasis on measures of the money supply, and the corresponding absence of emphasis on broad credit measures, probably reflects fairly accurately a general climate of opinion among economists and others that has existed to some extent throughout the postwar period and especially in recent years. Theoretical and statistical work in recent decades has tended to concentrate substantially more heavily on the market for monetary assets (*i.e.*, for currency and various types of bank and "near-bank" deposit liabilities) and on the market for bank reserves than on the market for credit. It is perhaps symptomatic, for example, that the "macroeconomic" model most widely taught in American colleges throughout the postwar period does not even treat explicitly the market for credit instruments, but instead focuses attention on the market for monetary assets. And of course the popular "monetarism" that became increasingly prominent during the 1960's also focused attention on money and, in some versions, specifically disavowed any corresponding interest in the behavior of credit. Thus, the rising interest in monetary targets over the past decade and the corresponding lack of interest in broad credit targets does seem at least partly to reflect a climate of ideas prevalent over the period.

But the existence of such a climate seems itself to need some explanation in view of the obvious importance of the credit markets. For one thing, the credit markets are clearly large relative to the market for money. In 1978, the volume of credit market instruments of nonfinancial sectors outstanding at the year-end amounted to \$3.4 trillion. This compared with a substantially smaller figure of \$1.6 trillion for the volume of "money" outstanding—even as very broadly defined to include all bank and thrift institution deposits (M_2). The corresponding figure for the narrow definition of money (M_1) was only about \$361 billion. In theoretical discussions, moreover, it is readily conceded that *all* markets must be in balance for the economy as a whole to be in "equilibrium", and thus a disturbance in the market for credit could just as well create a disturbance in the markets for goods, services, and jobs as could a disturbance in the "market" for currency and deposits. At a somewhat less abstract

level, no one really questions that the terms and conditions on which credit is extended can have a major impact on spending and real activity. Yet, despite these considerations, the credit market and the credit aggregates have generally tended to receive less attention than money. At least this is conspicuously true, as already noted, insofar as choosing intermediate financial objectives for monetary policy is concerned.

There are several possible explanations for the recent relatively greater emphasis on money than on credit both in economic analysis and in choosing financial aggregates for targeting purposes. First, even when there are no explicit policy targets for the behavior of the monetary aggregates, actions taken by treasuries and central banks often dominate developments in the supply of bank reserves and money. In looking for a major source of "outside" influences on the economy, it thus may be only natural to pay special attention to the supply of reserves and money.

To be sure, such "outside" or "exogenous" developments impinging on the economy can also originate in the credit market. While the very concept of "outside" or "exogenous" influences is certainly a bit vague, and at the least has to be regarded as relative to the particular economic model under consideration, examples of credit market developments that most people would regard as "exogenous" include financial innovations, the effects of changing financial regulations, and, indeed, perhaps any shifts in credit market psychology reflecting responses to new information bearing on economic prospects. But rightly or wrongly, such developments have in recent decades figured less importantly in most accounts of how the economy works and what sets it in motion than have "exogenous" influences operating through the government's impact on the money supply.

A closely related though slightly different reason for greater concentration on monetary aggregates is simply the assumption that these aggregates *can* be controlled by the authorities while total credit aggregates cannot, a subject to be discussed further below.

A third possible reason for emphasizing monetary aggregates over total credit aggregates may be that the latter seem to many to be far more heterogeneous than even the more broadly defined concepts of money. Thus, for example, any broad measure of total credit flows has to include all sorts of claims on a number of diverse nonfinancial sectors, such as corporate and municipal bonds, commercial paper, loans, and mortgages. By comparison, the items included in most definitions of money appear to be relatively homogeneous. To be sure, this situation could change to the extent that new nonbank, money-like instruments (such as shares in money market mutual funds against which

checks may be written) were to continue to expand and become accepted as components of at least some money stock measures.¹ But, under existing conditions, most economists and central bankers have tended to prefer to monitor the credit markets by looking at the terms and conditions prevailing in these markets—interest rates and nonrate lending terms—rather than at the *ex post* magnitude of the aggregate of claims generated in these markets.

It should perhaps be noted that, whatever the merits of these arguments for preferring monetary aggregates to credit aggregates as analytical tools and as policy objectives, these arguments do not seem to apply when the credit measures in question are defined more narrowly as measures of commercial bank credit alone. Obviously, the supply of bank credit is closely connected via the balance sheet of the banking system to the supply of money and reserves. To be sure, there may be some significant slippages between any particular measure of money and bank credit, reflecting, for example, the fact that banks have important “non-monetary” liabilities such as large certificates of deposit. But these qualifications aside, virtually everything that can be said about the relative importance to the economy of monetary shocks, about the importance of policy influences on the supply of money, and about its controllability can also be said about bank credit. Consequently, any theoretical preference for monetary over total credit aggregates would not seem to provide a corresponding basis for preferring monetary measures over bank credit measures.

Some alternative credit measures

There are probably at least as many plausible ways to measure the stock of outstanding credit and changes in it as there are ways to define “money”. One of the broadest credit measures that seems intuitively appealing is the total volume of outstanding credit extended to the domestic nonfinancial sectors.² For convenience this concept can be dubbed “total credit” even though the term is obviously not quite accurate. Thus the measure excludes credit extended to financial intermediaries because these institutions borrow only to relend to ultimate borrowers. To include credit extended to them as well as the credit they extend to ultimate borrowers would therefore represent a kind of “double counting”. The measure, however, also ex-

cludes two classes of ultimate borrowers, namely, the Federal Government and foreigners. The exclusion of Federal debt can be justified on the grounds that the Federal Government’s spending is not closely constrained by its ability to raise funds in the market. It can also be argued—though perhaps somewhat less forcefully—that the volume of funds raised by foreigners in the United States capital market has only a very limited relevance for United States gross national product (GNP). Given these exclusions, the “total credit” measure reflects the level of credit extended to domestic businesses, households, and state and local governments. Similarly, *changes* in total credit over a period of time represent the flow of new credit extended to these sectors net of repayments.

An alternative credit market measure that has been proposed³ focuses, not on the volume of credit extended to the private domestic nonfinancial sectors, but instead on a partial measure of the volume of financial *claims* held by these sectors. This alternative measure includes direct holdings by these sectors of securities (other than equities), mortgages, and loans, together with their holdings of bank deposits, thrift institution deposits, and coin and currency. The deposit items in this list represent a partial measure of indirect claims against final borrowers through claims against financial intermediaries, while coin and currency can be regarded as a noninterest-bearing claim against the Federal Government and the Federal Reserve. The resulting overall measure has been dubbed the “debt proxy”.⁴

Of these two credit market measures, the total credit measure is somewhat broader, amounting to \$2.6 trillion at the end of 1978 as against \$2.2 trillion for the debt proxy. Of the latter, about 70 percent consisted of deposit claims on banks and thrift institutions and claims against the Federal Government in the form of coin and currency (M_2). In addition to these two broad credit measures, total debt and the debt proxy, it is also interesting to consider a narrow credit measure covering only commercial banks (“bank credit”) and a measure of intermediate scope covering commercial bank credit along with credit extended by the thrift institutions (“bank and thrift credit”).

Cyclical behavior of credit and credit velocity

One way to approach the relationship of credit measures to aggregate demand is simply to examine growth rates of the various credit measures in relationship to the business cycle. To do this, growth rates, over four-quarter spans, in total credit and the debt proxy were

¹ For a discussion of this subject, see John Wenninger and Charles Sivesind, “Defining Money for a Changing Financial System”, this *Quarterly Review* (Spring 1979), pages 1-8.

² This is the “stock” analog to the flow concept of “net funds raised by the domestic nonfinancial sectors” as used in the flow-of-funds accounts.

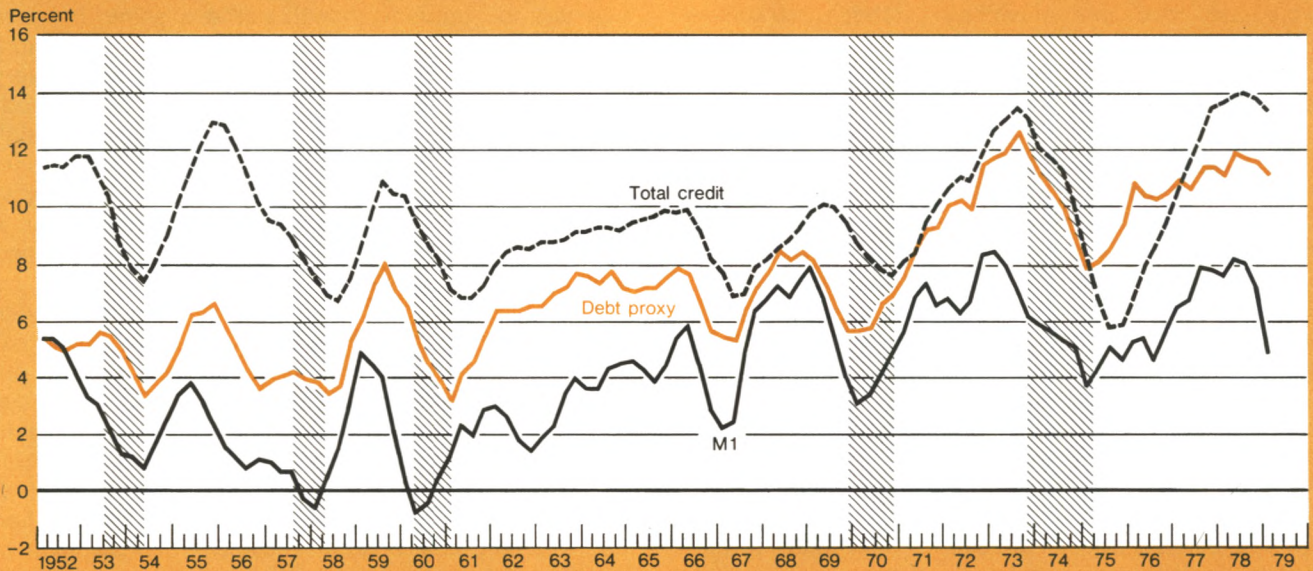
³ See testimony by Henry Kaufman before the House of Representatives Committee on the Budget (February 6, 1978).

⁴ The term is Kaufman’s.

Chart 1

Growth of Broad Credit Measures and M1

Percentage changes from four quarters earlier

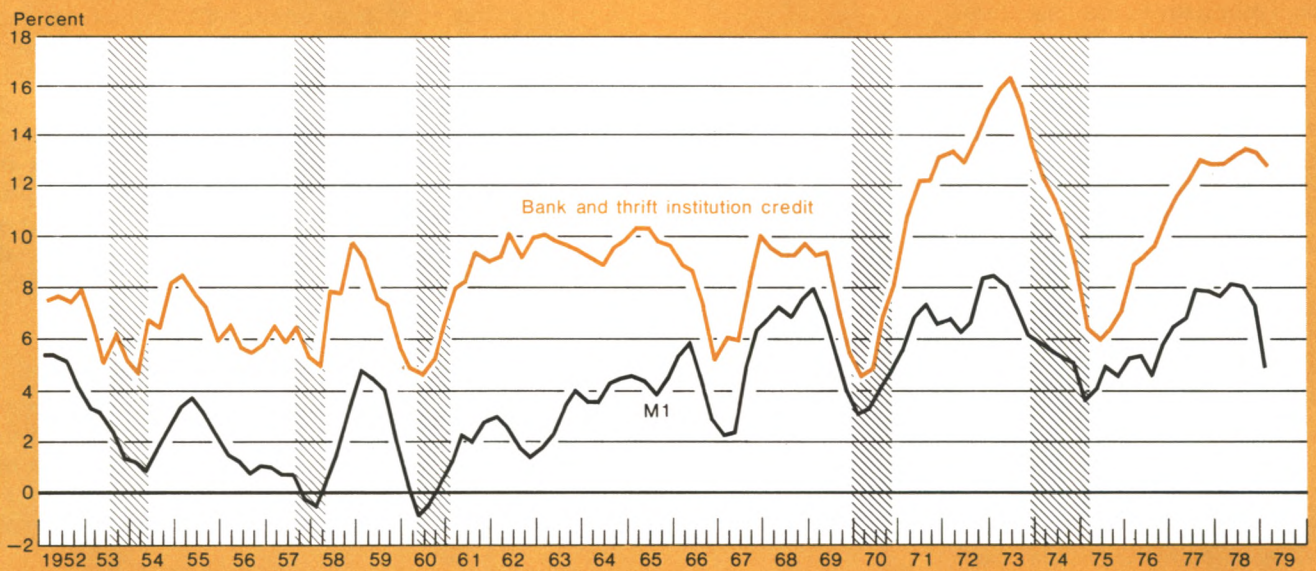


Shaded areas represent periods of recession, as defined by the National Bureau of Economic Research.

Chart 2

Growth of Bank and Thrift Institution Credit and M1

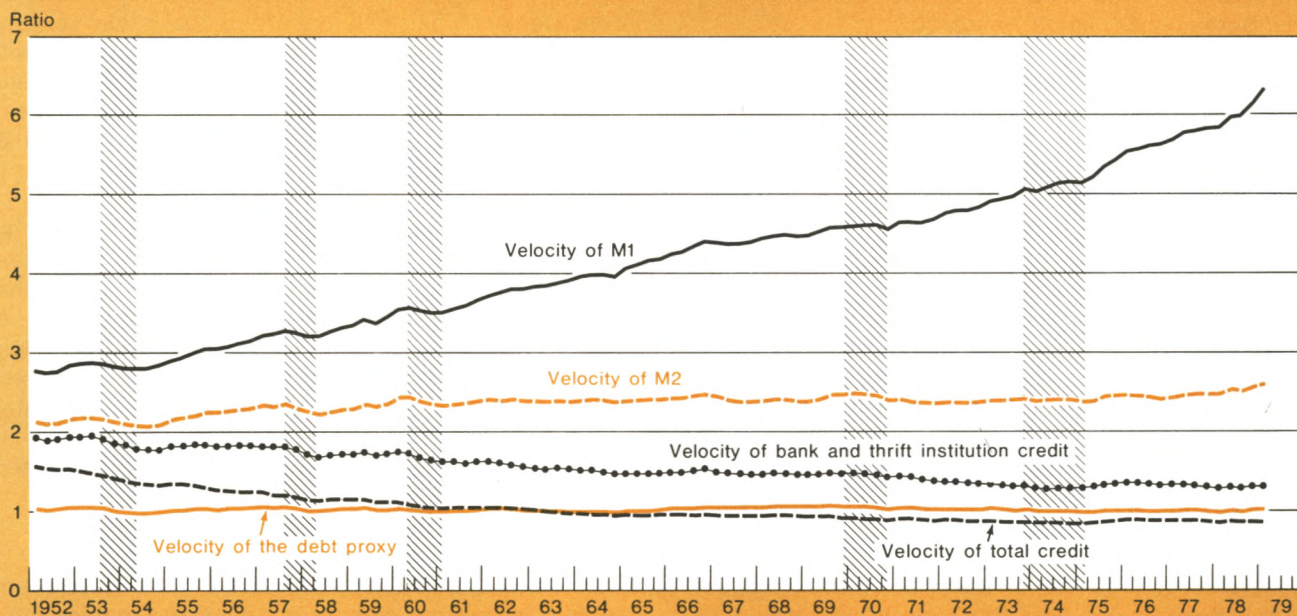
Percentage changes from four quarters earlier



Shaded areas represent periods of recession, as defined by the National Bureau of Economic Research.

Chart 3

Income Velocity of Money and Credit Measures

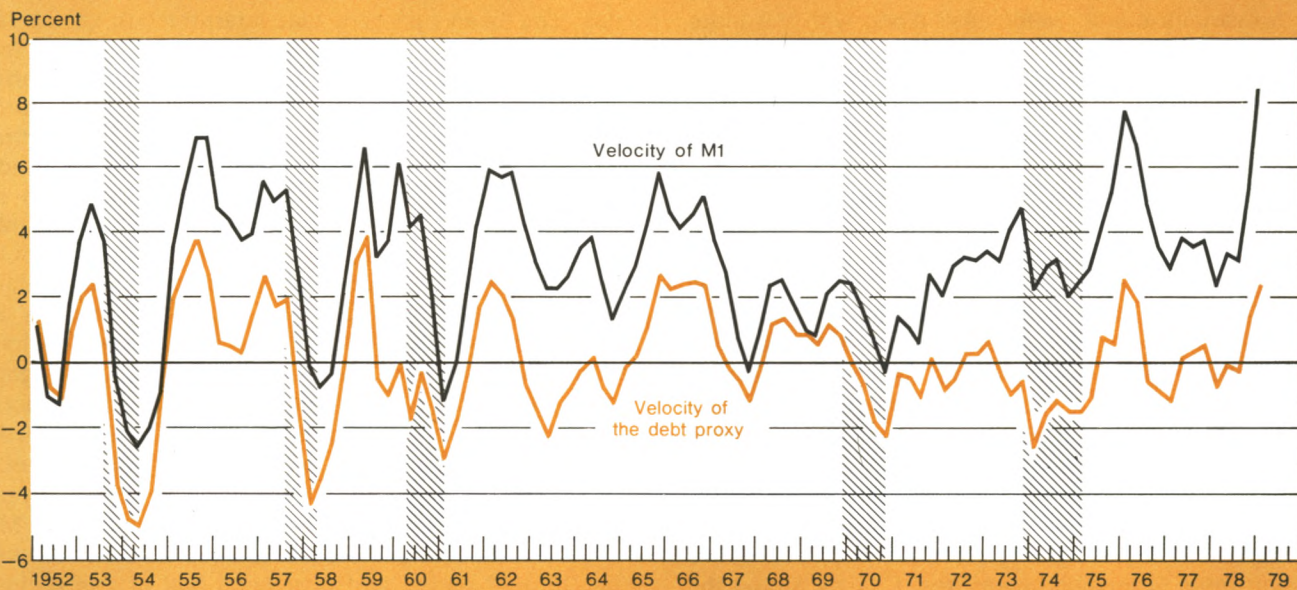


Shaded areas represent periods of recession, as defined by the National Bureau of Economic Research.

Chart 4

Velocity Growth Rates: M1 and the Debt Proxy

Percentage changes from four quarters earlier



Shaded areas represent periods of recession, as defined by the National Bureau of Economic Research.

computed for each quarter of the 1952-78 period. These growth rates are shown in Chart 1, along with the corresponding growth rate of M_1 . Shaded areas indicate periods of business recession as defined by the National Bureau of Economic Research.

Reflecting their more rapid trend rates of growth over the twenty-seven years covered, the two credit growth rates have consistently exceeded the corresponding growth rates for M_1 , but the cyclical patterns of growth of the three measures are very similar. All three series show clear cyclical peaks, peaks which have almost invariably led the corresponding peaks in the business cycle. The average lead time for the two credit series at cyclical peaks was about the same. In both cases, it was somewhat shorter than the average lead for M_1 . At cyclical troughs, both credit series have tended to bottom out at about the same time as the economy itself. M_1 , however, led the overall economic revival in three out of five instances. All three financial series peaked in advance of the 1967 mini-recession, and then showed a clear-cut dip through early 1967. In short, the cyclical performance of the broad credit measures has been rather similar to that of the money supply. The four-quarter growth rate of bank and thrift institution credit (Chart 2) parallels the cyclical pattern of M_1 growth even more closely, if anything, than do the total credit and debt proxy measures.

Another obvious way to look at the relationship of the credit measures to aggregate demand is in terms of the behavior of the ratio of GNP to the dollar volume of outstanding credit—in other words, the credit analog to the “income velocity” of money. Chart 3 plots the levels of the various credit “velocities” along with the more conventional M_1 and M_2 velocities for the 1952-78 period. Most of these various velocity measures have shown a greater or lesser tendency to drift up or down over the 27-year period—with the rather striking exception of the “velocity” of the debt proxy. Over this long period, a dollar’s worth of GNP has tended to be supported by about a dollar’s worth of the financial instruments included in the debt proxy measure.

While the tendency of the debt proxy to grow roughly dollar for dollar with GNP over the period is certainly visually impressive, the significance of this phenomenon for the value of the debt proxy measure as a policy target is questionable. The problem is that the apparent long-term stability of the level of velocity can conceal considerable cyclical variability in its growth rate. And it is the cyclical behavior of the rate of change in velocity that is important in trying to gauge the short- to medium-term impact on the economy of alternative growth rates in financial measures. Chart 4 shows the debt proxy velocity measure, computed as a four-quarter growth rate and compared with the correspond-

ing four-quarter growth rate in the velocity of M_1 . Given the long-term uptrend in the velocity of M_1 and the essentially trendless character of the debt proxy velocity, the growth rate of M_1 velocity of course tends to be consistently higher than that of the debt proxy velocity. But the volatility of the two measures has been about the same and, as the chart indicates, the cyclical and subcyclical movements in the two measures have been remarkably similar. The four-quarter growth rate of total credit velocity (not charted) is also quite similar in its cyclical behavior to that of M_1 velocity.

These crude comparisons suggest that, at least as a first approximation, the broad credit velocity measures must respond to about the same influences that affect M_1 velocity and in about the same way. This, in turn, suggests that the various credit velocities might present about the same prediction problems that exist for M_1 velocity. The same conclusions are suggested by the movement of the four-quarter growth rate in the bank and thrift credit velocity—also not charted.

Regression evidence on the relationship between credit measures and nominal GNP

As indicated, one major premise of the use of long-term targets is that movements in financial variables influence, probably with a lag, movements in nominal GNP and thus prices and output. One way to examine the influence of a financial variable on aggregate demand is simply to regress current growth rates in current dollar GNP on current and lagged growth rates in the financial variable. This procedure has come into very common use over the past ten years even though it has long been apparent that interpretation of the results is fraught with difficulties. Quite apart from the purely statistical problems, experience has shown that results tend to be sensitive to such matters as the form in which the data are expressed (whether as dollar first differences or as percentage changes), the time periods covered by the statistical equations, the inclusion of other variables, and so forth. The upshot of all this seems to be that the results of such equations should be treated with considerable caution and a healthy dose of skepticism. But at the least, such equations do provide a concise summary of the historical relationship between nominal GNP as a measure of aggregate demand and the past and current behavior of financial measures that has accompanied the behavior of GNP.

Table 1 shows the results of regressing quarterly percentage changes in current dollar GNP on current and lagged percentage changes in, separately, M_1 , M_2 , and the various credit measures described earlier over the 1961-77 period and over each half of this period. The results suggest that, for the period as a whole, current and past movements in the total credit measure

"account for" a bit less of the movement in quarterly GNP growth rates than do M_1 or M_2 and that the debt proxy "accounts for" somewhat more of these movements than do M_1 and M_2 .⁵ The other two credit measures perform noticeably worse than the monetary and broad credit measures. A glance at the highly divergent results for the two subperiods, however, reinforces the warning that these results should be treated with caution. For example, the total credit measure performs quite poorly in the first subperiod (1961 to mid-1969) and quite well in the latter half of the full period (mid-1969 to 1977). Bank credit, for which very favorable results have been reported in other studies, does as well as the two monetary measures in the first subperiod but performs poorly in the later years.

In any case, it does appear that the relationship of aggregate demand to broad credit measures, especially the debt proxy measure, is roughly comparable in closeness to its relationship to the monetary measures—again a result that should not be surprising in view of the evident similarity of the cyclical performances of the credit and monetary growth rates. But the question still remains of what to make of the statistical association between current GNP movements and current and past movements in these credit measures from a policy point of view?

Probably the kinds of statistical association between GNP and credit measures suggested by these regression results have significance for choosing policy target measures only if these results can be interpreted in a "causal" sense—i.e., so that one can say that, if the financial variable is made to behave in a certain way, GNP will behave in a certain way. As many econometricians have pointed out, interpretation of results such as are presented in the top half of Table 1 are loaded with potential ambiguities with respect to the existence and/or direction of "causation" of the financial and GNP movements. There are a number of possible reasons for questioning whether a correlation of current GNP movements with current and lagged movements in a financial variable implies causation

running from the financial variable to GNP. When such doubts exist, the ranking of different financial variables for targeting purposes according to their performance in such tests obviously becomes questionable.

Problems of interpretation as to "causation" could arise from a number of sources. For example, if the financial variable is used successfully by the central bank to offset other sources of change in GNP, measures of statistical association such as those presented in Table 1 would tend to be biased toward zero. Problems could also arise if the Federal Reserve tended to target interest rates and if these targets were adjusted to GNP only with a lag, thus leading to accommodative behavior of money and credit growth in the face of accelerations or decelerations of GNP growth. And, apart from central bank behavior, cyclical developments could tend to produce corresponding cyclical movements in money and credit, raising further problems for interpreting "causation" in the statistics.

This does not exhaust the list of possible complications in inferring "causation" from results such as those described in Table 1. In response to these potential problems of interpretation, a wide and increasingly sophisticated battery of econometric machinery has been unloosed in recent years—especially in the context of interpreting "causal" relationships from regressions of GNP on measures of the money supply. It is probably a fair generalization to say that, despite this effort and its growing sophistication, the results have not been conclusive. It would be impractical to attempt to repeat all the various possible tests in respect to the credit/GNP equations. Nevertheless, some of the more obvious checks are worth making.

One precaution is to look at the influence only of lagged values of the financial aggregates since the direction of causation in contemporaneous movements is ambiguous and since some of the "reverse causation" possibilities cited above seem likely to have important contemporaneous effects—e.g., the possibility that financial variables accommodate to changes in GNP as a result of Federal Reserve use of interest rate targets.⁶

In the bottom half of Table 1, the change in nominal GNP is made a function of *only* lagged values of the various financial measures. Predictably, dropping the current change in the financial measures noticeably reduces their explanatory power for GNP in all cases. Indeed, the explanatory value of the total credit measure drops to zero, obviously raising very serious questions about its value as a policy target measure. The debt proxy measure, however, continues to do

⁵ Two standard measures of the degree of association of GNP growth with the behavior of growth rates in the various financial measures are reported in Table 1 and in the subsequent table. One measure, R^2 , is the square of the "coefficient of multiple correlation" (adjusted for "degrees of freedom"). R^2 measures, on a scale of zero to one, the proportion of the variation in GNP growth that can be accounted for by the regression equation on the basis of variations in the current and lagged growth of the financial measures. The second measure, the "standard error of estimate", is the square root of the average squared error made by the equation in estimating GNP growth rates over the sample period on the basis of the current and lagged growth rates in the financial measure. As is apparent from these definitions, the association of movements in GNP growth rates with current and lagged movements in the growth rates of the financial measures is the closer, the larger is the R^2 and the smaller is the standard error of estimate.

⁶ The coefficient on the contemporaneous change was indeed larger and had a larger "t" value than any of the lagged changes for all the money and credit measures examined in Table 1.

Table 1

Regressions of GNP Growth Rate on Current and Lagged Growth Rates of Various Monetary and Credit Aggregates

Variable	1961-I through 1977-IV		1961-I through 1969-II		1969-III through 1977-IV	
	\bar{R}^2	SEE (percent)	\bar{R}^2	SEE (percent)	\bar{R}^2	SEE (percent)
Current and four lagged growth rates in financial measures						
M ₁ .....	.30	2.84	.21	2.29	.23	3.44
M ₂ .....	.29	2.86	.20	2.30	.20	3.52
Bank credit .....	.04	3.32	.20	2.31	.11	3.71
Bank and thrift credit .....	.12	3.18	.06	2.50	.24	3.41
Debt proxy .....	.35	2.74	.36	2.06	.36	3.13
Total credit .....	.23	2.98	.14	2.38	.39	3.07
Four lagged growth rates only						
M ₁ .....	.18	3.07	.15	2.37	.09	3.75
M ₂ .....	.23	2.97	.20	2.31	.12	3.67
Bank credit .....	.02	3.37	.22	2.27	.02	3.89
Bank and thrift credit .....	.06	3.29	.07	2.48	.01	3.92
Debt proxy .....	.21	3.02	.38	2.03	.07	3.78
Total credit	0	3.39	.13	2.41	-.03	3.98

See footnote 5 in text for definitions of \bar{R}^2 and SEE (standard error of estimate).

Regressions relate percentage changes at annual rates in seasonally adjusted quarterly values of gross national product to current and lagged values of percentage changes at annual rates in seasonally adjusted quarterly values of the various financial measures.

Table 2

Regressions of GNP Growth Rate on Lagged GNP Growth Rates and Lagged Growth Rates of Various Monetary and Credit Aggregates

Variable	1961-I through 1977-IV		1961-I through 1969-II		1969-III through 1977-IV	
	\bar{R}^2	SEE (percent)	\bar{R}^2	SEE (percent)	\bar{R}^2	SEE (percent)
One- and two-quarter lagged GNP only .....	.05	3.31	.09	2.45	-.03	3.99
Plus:						
Lagged M ₁* .....	.17†	3.09	.18	2.34	.06	3.81
Lagged M ₂* .....	.22‡	3.00	.16	2.35	.11†	3.71
Lagged total bank credit* .....	.04	3.33	.19	2.32	-.05	4.02
Lagged bank and thrift credit* .....	.06	3.30	.12	2.42	-.05	4.02
Lagged debt proxy* .....	.22‡	3.00	.36‡	2.06	.09†	3.75
Lagged total credit* .....	.00	3.39	.13	2.40	-.11	4.13

See footnote 5 in text for definitions of \bar{R}^2 and SEE (standard error of estimate) and footnote 8 for a discussion of the "F" test.

* Lagged four times.

F test for contribution of lagged financial measures significant as follows:

† 90-95 percent; ‡ 95-99 percent; § 99 plus percent.

All variables measured as percentage changes at annual rates in seasonally adjusted data.

about as good a job as M_1 and M_2 for the period as a whole—and again, better than the monetary measures in the earlier years and worse than in the later years.⁷

But confining the regressions to lagged values only of the financial variables still does not guarantee “causal” significance to the results. Thus, for example, income changes could generate financial changes in each period, and if income changes were auto-correlated, this could create a spurious relationship even between *current* income changes and *lagged* financial changes. Consequently, in Table 2, income growth rates were first regressed on their own lagged values (line 1) and then the lagged money and credit variables were added one at a time. As indicated by the results of a standard statistical test (the “F” test), only M_1 , M_2 , and the credit proxy continue to contribute to significant additional explanatory power for the 1961-77 period as a whole after allowing for past growth of GNP itself.⁸

Taken together, the results of these various tests suggest that at least one credit measure, the debt proxy, may do about as good a job of “explaining” aggregate demand as M_1 and M_2 and that there is at least no more reason to suspect that this explanatory power is spurious than there is in the case of the monetary measures. This is a rather weak conclusion, but it may be about all that is justified on the basis of these commonly used statistical tests. It suggests, as far as it goes, that the debt proxy measure might be considered as an *alternative* to M_1 and/or M_2 targets if in fact a mutually exclusive choice had to be made between a money measure and this particular credit measure.

Credit measures as a supplement to monetary measures for targeting purposes

But to pose the question of a credit aggregate measure as an *alternative* to monetary measures for targeting purposes is almost certainly to pose a false issue since past practice and the current legal framework for aggregate targeting⁹ suggests that at least *some* monetary measure will continue to be used as an aggregate

target. A more appropriate question may therefore be whether any of the credit measures appears likely to be a useful *supplement* to monetary targets.

Within the framework of the kind of regressions used in the preceding section, this question becomes one of whether credit measures appear to make an *additional* contribution to explaining movements in aggregate demand once the apparent influence of money has been taken into account. To test this proposition, lagged values of the various credit aggregates were added to regression equations already containing two lagged values of nominal GNP growth and lagged values of the growth rate of either M_1 , as in one set of equations, or M_2 in a second set of equations. The results of this final set of regression tests (not reproduced here) were completely negative insofar as the various credit aggregates are concerned. That is to say, in no case did the credit measures make a statistically significant additional contribution to explaining movements in GNP growth once either M_1 or M_2 had already been taken into account. The implications of this final set of tests thus seems to be that, if M_1 and/or M_2 is already being used as one of the variables selected for long-term targeting, there would be no particular value in adding a credit variable—at least insofar as targeting financial measures is regarded as a way of trying to produce a determinate result for aggregate money demand.

The controllability issue

As suggested earlier, even if a variable is highly “exogenous” and makes an important independent contribution to explaining aggregate demand, it makes little sense for the Federal Reserve to set “targets” for it if it is not at least potentially controllable.

The total credit measures would not in fact appear to be especially satisfactory targets from the point of view of controllability. There is, for one thing, a problem of timely data availability for these broad credit measures. Both the total credit and debt proxy measures are derived from the Federal Reserve’s flow-of-funds accounts and become available only once a quarter with a lag of five to six weeks. Data on M_1 and M_2 as currently defined become available once a week with a lag of a week. Both the infrequency and the delay of data availability for the credit measures could pose some problems for controllability. The relative infrequency with which the data become available means that there can be no feedback from incoming data, and therefore no plausible basis for readjusting the Federal Reserve’s short-term operating objectives in response to deviations of the credit measures from targets set for them, except once every three months. This is certainly a rather long interval. Similarly, the

⁷ It may be worth noting that when contemporaneous values are excluded, most of the explanatory power of the debt proxy measure lies in its M_2 component. Indeed, using the “F” test, the direct holdings of credit market instruments component of the debt proxy does not make a statistically significant contribution (at the 90 percent probability level) to explaining GNP movements over the period as a whole once the M_2 contribution has been taken into account.

⁸ The “F” test is a means of determining whether the apparent additional explanatory power (if any) achieved by adding new independent variables to a regression equation is larger than might be expected to arise from chance alone at some specified level of probability. In the text, the apparent additional explanatory power is said to be “significant” if the probability that it is due solely to chance is 10 percent or less.

⁹ The “Full Employment and Balanced Growth Act of 1978”, known as the Humphrey-Hawkins Act.

lag with which the credit data become available could be a problem for controllability by delaying the ability of the Federal Reserve to respond to actual performance in the previous quarter until several weeks of the new quarter had already passed. No comparable problem exists with respect to the present M_1 and M_2 concepts or with respect to bank credit.

In principle, the data problems posed by the broad credit measures might be mitigated by changes in collection procedures. Data problems apart, however, it seems clear that the aggregate credit measures could be expected to produce substantially greater control problems than do the various money supply measures. The Federal Reserve of course does not directly control even the narrowly defined money supply but must, instead, attempt to adjust its major policy instruments—especially open market operations—to bring about conditions of bank reserve availability and money market conditions that will, in turn, tend to generate the desired behavior of the money supply.

Fundamentally, there are two basic tactical approaches the Federal Reserve can use to attempt to control the behavior of the money supply or any other financial variable. One of these would be to attempt to project the path of bank reserves (or the monetary base) that seems most likely to be associated with the desired path of the aggregate. The success of this approach depends, in turn, on the stability and predictability of the “multiplier” relationship between reserves and the aggregate in question. Even in the case of monetary definitions involving only currency and commercial bank deposits, there are significant problems with regard to the stability and predictability of the relevant multipliers. It is obvious that such problems would be far more severe, if not overwhelming, where the multiplier in question connected the reserves of the banking system to some broad credit measure that involved the behavior not just of the banking system but of *all* potential lenders in the economy.

An alternative tactical approach open to the Federal Reserve in seeking to control the behavior of financial aggregates involves attempting to estimate the volume of the aggregate the public will want to hold under given conditions of aggregate demand and interest rates, then seeking to influence short-term money market rates accordingly. This approach also poses very real problems even in the case of a monetary aggregate because of difficulties in estimating what the public's demand for money will be under given conditions. But again, the problem appears likely to be far more serious for broad credit measures since there is no reason to expect any well-defined, stable

relationship between the demand for a broad credit aggregate and short-term interest rates. And indeed one econometric effort to estimate such a demand relationship for total credit and the debt proxy on quarterly data covering the 1969-77 period turned up a nonsignificant relationship to short-term interest rates in the case of the debt proxy and a “statistically significant” but nonsensical positive relationship in the case of total credit—“nonsensical”, that is, in that the total credit equation implied, if taken literally, that a tightening of money market conditions would tend to accelerate the growth rate of credit.

On the whole, it does not really seem necessary to belabor the point that a broad credit measure could be expected to be much less amenable to Federal Reserve control than money supply or credit measures relating primarily to the banks and near banks. And it seems equally obvious that the pragmatic value of setting target growth rates for a measure over which effective measures of control do not exist would be very doubtful indeed.

Conclusion

In summary, the case for adding a broad credit measure to the menu of financial measures targeted by the Federal Reserve appears rather weak. This does not mean that credit markets are unimportant, nor is it a recommendation that they be disregarded in making policy! Developments in credit markets are certainly likely to provide important clues as to the prospective behavior of the economy. But, in looking for such clues, the behavior of the various interest rate and nonrate terms in the credit markets and the behavior of credit flows in particular submarkets seems likely to prove more helpful than movements in the broad credit totals.

Perhaps the conclusion that the broad credit totals are unlikely to convey much useful additional information about the economy once monetary movements have been taken into account does need one qualification: It is based on evidence from the past. Recently a wave of innovations in the characteristics of deposits, of nondeposit transactions instruments, and of related money substitutes has complicated interpretation of the monetary measures. A continuation of this process of innovation could weaken the analytical value of these measures for some time to come. Under such circumstances, the relative usefulness of the broad credit measures as financial indicators of prospective aggregate demand might be enhanced. But, even in this case, problems of Federal Reserve control with respect to these credit measures would continue to limit their usefulness as policy targets.

Richard G. Davis

Variable Rate Mortgages

Recently, Federally chartered savings and loan associations were authorized to offer variable rate mortgages. Prior to that authorization, various forms of variable rate mortgage instruments were being offered in a number of states, and several states currently are considering introducing some form of them. This interest in variable rate mortgages is due to the difficulties which the standard fixed payment mortgage has created for many lenders in periods of volatile interest rates as well as the prospect that, as restrictions on deposit interest rates are relaxed, lenders' exposure to interest rate volatility is likely to increase.

As its name suggests, a variable rate mortgage (VRM) is a mortgage loan which provides for adjustment of its interest rate as market interest rates change. Often adjustments of VRM interest rates are linked to the movement of some reference market interest rate or index. As a result, the current interest rate on a VRM may differ from its origination rate, *i.e.*, the rate when the loan was made. This is the major difference between a VRM and the standard fixed payment mortgage (FPM), on which the interest rate and the monthly payment are constant throughout the term. Because VRM rates can increase over the term of the loan, VRM borrowers share with lenders the risk of rising interest rates.

Interest rate risk

The major mortgage lenders obtain funds primarily from relatively short-term deposits. The FPM, which generally has a term of twenty-five to thirty years, has significant

interest rate risk for them because the maturity imbalance between lenders' liabilities and their mortgage assets exposes them to the risk of short-term rates paid on deposits and borrowings rising above yields on outstanding mortgages.¹ In such a situation, the interest expense of lenders approaches their interest income, causing losses which, if great enough, could threaten their viability. As a result of the FPM's interest rate risk, lenders make mortgage credit available on less favorable terms than they otherwise would, and their large holdings of seasoned mortgages paying below-market interest rates have limited their ability to obtain funds by paying market rates on deposits.

During the 1950's and early 1960's, when the variability of interest rates was relatively mild and long-term rates consistently exceeded short-term rates, the maturity imbalance of the major mortgage lenders was of little importance. However, with the acceleration of inflation in the mid-1960's, the average level and variability of short-term interest rates rose much more than long-term rates. This increased the risk of borrowing short to lend long, and thrift institutions sought to reduce this risk by lengthening the maturities of their deposits. For example, in the period from 1969 to 1978, savings and loan associations (S&Ls) reduced the share of their total deposits accounted for by passbook accounts, which are effectively payable on demand, from 69 percent to 32 percent. Mutual savings

¹ Nondepository mortgage investors, such as life insurance companies and pension funds, typically have long-term liabilities, so that they are less exposed to interest rate risk through mortgage investments.

banks reduced their passbook share from 99 percent to 51 percent. Nevertheless, the average maturity of thrift institutions' assets still far exceeds that of their liabilities.

The constant interest rate on an FPM protects borrowers from increases in mortgage interest costs.² Borrowers can also prepay their mortgages in advance of maturity, although penalties typically must be paid if the loan is repaid within three years of its origination, and there generally will be other, possibly substantial, costs involved in originating a new mortgage, such as fees for appraisal, title search, etc. Prepayment may be attractive to the borrower if the original loan can be replaced by a new loan bearing a significantly lower interest rate. These advantages for borrowers are mirrored by disadvantages for lenders, whose return on a mortgage may decline but will not increase.³

The VRM changes the distribution of interest rate risk by allowing interest rates on outstanding loans to increase if current market rates rise. Should market rates decline, downward adjustment of VRM rates saves the borrower the transactions costs involved in prepayment of an FPM and refinancing. VRM contracts almost never provide for a minimum rate—which would be difficult to enforce when borrowers can prepay their loans without penalty.

VRM terms and rates

VRMs differ greatly in the extent to which they protect borrowers against increases in interest costs. For example, some VRMs provide a rate ceiling, while others do not. Obviously, the rate "cap" is advantageous to the borrower, since it places an upper bound on interest costs. However, it is important to realize that the major protection against interest rate increases may be current mortgage rates, not the rate cap. If lenders attempted to increase rates on outstanding VRMs above the current market rate, borrowers could prepay their VRMs and refinance the loans at current market rates. Thus, depending on the level of prepayment penalties and costs of originating a new mortgage, the current mortgage rate provides an effective

ceiling on VRM rate increases. In practice, when lenders in California and other states have been allowed to raise VRM rates, many have not done so in cases where the new rate would have been higher than, or close to, the prevailing rate on new mortgages.

Like FPM rates, VRM origination rates are affected by expected future interest rates. However, the expected pattern of interest rates in the near future may cause origination rates on FPMs and VRMs to diverge. If rates are expected to rise, the VRM rate should be lower than the FPM rate. But, if interest rates are relatively high and expected to decline in the near future, a lender might well feel that, other things being equal, VRM rate reductions could be more costly to him than the possible prepayment of an FPM, especially if subject to prepayment penalties. In such a case, the lender would require a higher origination rate on a VRM than on an FPM.

Other features of VRM contracts which affect their origination rates are prepayment and assumability provisions. For reasons explained earlier, the absence of prepayment penalties significantly increases the borrower's ability to take advantage of rate declines and avoid rate increases. Similarly, assumability is valuable in that it may allow the borrower to sell a house more easily or to realize a capital gain if the loan rate is below current rates and is not subject to adjustment when the loan is assumed. Other things being equal, a mortgage loan which incorporates liberal prepayment and assumability provisions will carry a higher rate than one which does not.

In addition, VRM origination rates are affected by the index (if any) used for adjusting the rate and the magnitude and frequency of permissible adjustments. If the index does not reflect movements in current market rates—or if index changes may be incorporated into rate adjustments only infrequently—VRMs may have little advantage to lenders over FPMs. If current mortgage rates decline to a level below the VRM rate, borrowers have an incentive to refinance their loans, just as if they had FPMs. Alternatively, VRM borrowers benefit if the loan carries a lower than market rate. Also, if restrictions on VRM rate increases reduce the likelihood of borrowers being unable to meet their payments, VRM default risk will be little different from that on FPMs, and VRM origination rates will not have to incorporate a special risk premium.

Default risk may also be reduced if borrowers have the option of keeping their monthly payments constant by extending the maturities of their loans to offset VRM rate increases. However, if borrowers use the option, lenders may find that the reduction of VRM amortization payments largely offsets the favorable effect on their cash flow of increases in VRM rates. The

² Moreover, if the loan is assumable—i.e., if it can be transferred from the original borrower to a buyer of the house without the terms of the loan being altered—then the borrower may realize a capital gain in the form of a higher price for his house if current rates rise above the original rate.

³ However, the lender still has an opportunity for returns on a portfolio of mortgages to increase to some extent at times of rising interest rates, even if the rates on the individual FPMs which comprise the portfolio are constant. One reason is that, in a market with substantial housing turnover, many loans will be prepaid well before maturity, so that they can be replaced with loans bearing current yields. Also, as outstanding loans are amortized, new loans can be made at current yields.

Canadian Rollover Mortgages

Rollover mortgages (ROMs) incorporate interest rate adjustments by structuring the loan as a series of relatively short-term loans, each one of which carries a constant interest rate. At the end of the term of the preceding loan, a new loan is originated at the current interest rate.¹ Since amortization is scheduled over a long period of years, a borrower may "roll over" a series of successively smaller loans before the debt is paid off.

ROMs currently account for almost all Canadian single-family residential mortgages. Although they were first introduced in Canada in the 1930's, ROMs have been widely used only since the 1960's. ROMs exist both as conventional mortgage loans and as government-guaranteed loans authorized under the Canadian National Housing Act (NHA). Both types typically have five-year terms.² Amortization is scheduled over a twenty- to thirty-year period for conventional ROMs and twenty-five to forty years for NHA ROMs. At the end of the term, the loan is renewed at the current mortgage market rate.

The government first began to guarantee five-year ROMs in 1969 and last year allowed three-year ROMs to be included in the NHA program. The interest rate on a government-guaranteed ROM is usually lower

than the rate on a conventional loan, and the amortization period is longer. Borrowers have the option to extend the maturity of NHA loans to a maximum of forty years to avoid higher monthly payments if the rate is increased when the loan is refinanced. Borrowers generally do not have this option with conventional ROMs.

During the first two years of the term, up to 10 percent of the principal balance of a NHA ROM may be prepaid with a three-month interest fee. Any amount may be prepaid after the two years with a fee equal to three months' interest. At the end of the term, the borrower may make a prepayment without incurring a fee simply by taking out a smaller loan. Prepayment penalties on conventional ROMs vary with the lender. Generally there is a charge of three months' interest for prepayment during the term, but any amount of the loan may be prepaid without penalty at the end of the term.

¹ Canadian law does not require the lender to guarantee to originate a new loan at the maturity of the preceding loan, but such commitments are the standard practice among mortgage lenders.

² ROMs with terms of from one to four years do exist but are less common.

small increase in cash flow would then do little to assist lenders to meet their rising cost of funds.⁴

VRM activity in the United States

In different forms variable rate lending has been for years a central feature of housing finance in many European countries.⁵ In addition, rollover mortgages (ROMs) have been the major mortgage instrument in Canada since the 1960's (see box). In contrast, VRM activity in the United States is of more recent origin. Substantial numbers of VRMs have been made in a number of states in the last several years, and the recent authorization of VRMs for Federally chartered S&Ls should spur such activity further. To date, the bulk of VRM activity has been concentrated in California, and California's VRM regulations served as a model for the VRM regulations recently issued by the

Federal Home Loan Bank Board (FHLBB).⁶ As a result, there is a tendency in popular discussion to identify VRMs with the specific version employed in California. As the accompanying box on pages 26 and 27 makes clear, the California VRM regulations are different for S&Ls and commercial banks and also differ in important ways from the FHLBB's regulations. Currently the most common kind of VRM originated by state-chartered S&Ls in California must incorporate a 2½ percentage point cap on cumulative rate increases, and rate adjustments are indexed to the average cost of funds index for California S&Ls published by the San Francisco Federal Home Loan Bank. Rate increases are at the option of the lender, while rate decreases are mandatory.

In contrast to the widespread usage of VRMs in California, VRM activity elsewhere in the country has been uneven. While few states have legislation which specifically forbids VRMs, the law in most states is silent on the matter, and the uncertain legal authority in these states probably has discouraged their introduction. Also usury ceilings in many states preclude meaningful VRM lending activity. Finally, until recently,

⁴ The seriousness of this possibility is illustrated by the response of California VRM borrowers to the August 1978 rate increase. About two thirds of the affected borrowers exercised their option to extend the maturities of their loans rather than allow their monthly payments to increase.

⁵ For example, variable rate mortgages of various types are used extensively in the United Kingdom, France, and Germany. In addition, rollover mortgages are common in Switzerland and the Netherlands.

⁶ Title 12, Code of Federal Regulations, Parts 545 and 555.

California Variable Rate Mortgages

VRM regulations

Regulations governing California VRMs are the product of legislation and of regulation by the California Commissioner of Savings and Loan. In addition, Federally chartered savings and loan associations (S&Ls) in California are subject to the VRM regulations of the Federal Home Loan Bank Board.

Prior to November 23, 1970, VRM lending in California was unregulated. On that date, legislation became effective which allows lenders the option of increasing the VRM interest rate only if the index to which it is tied increases, but a decrease in the rate is mandatory if the index decreases. The index itself is not specified. Semiannual adjustments of VRM rates are provided, with a maximum adjustment of $\frac{1}{4}$ percentage point. Prepayment without penalty is permitted up to ninety days following notification of a rate increase. Also, the terms of the variable interest rate provision are required to be fully disclosed to the borrower before closing the loan and to be described in both the mortgage (or trust deed) and the note. The legislation was amended in 1976 to provide additional protection to borrowers by requiring a $2\frac{1}{2}$ percentage point ceiling on the cumulative increase in the VRM interest rate. In addition, in the event of a rate increase, borrowers were given the option of extending the maturity of their loans to a maximum of forty years in order to keep monthly payments stable. In January 1978, lenders were also allowed to offer a VRM with rate adjustments every five years and a maximum rate increase of $2\frac{1}{2}$ percentage points.¹ These regulations apply to all lenders in California.

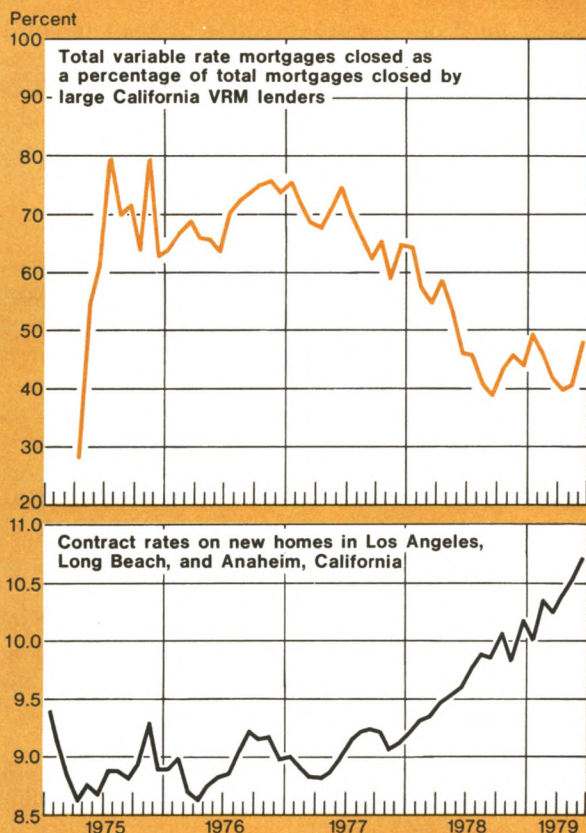
In addition, California S&Ls are subject to the more restrictive regulations of the State Commissioner of Savings and Loan.² VRMs providing for semiannual interest rate adjustments must be indexed to the weighted average cost-of-funds index for all California S&Ls published by the Federal Home Loan Bank of San Francisco.³ Effective June 23, 1979, VRMs providing for interest rate adjustments every five years must be indexed to the average yield on accepted bids for commitments to sell conventional mortgages to the Federal Home Loan Mortgage Corporation. Also, the minimum rate increase which can be implemented is $\frac{1}{10}$ percentage point, except that, for VRMs with semiannual rate adjustments, smaller increases may be implemented if the $\frac{1}{4}$ percentage point maximum prevented rates from being adjusted fully in the previous semiannual period. Index increases of less than $\frac{1}{10}$ percentage point may be accumulated until they total at least $\frac{1}{10}$ percentage point. Borrowers are also required to be notified at least thirty days in advance of any rate adjustments.

Effective January 1, 1979, the Federal Home Loan Bank Board (FHLBB) authorized VRM lending by Federally chartered S&Ls in areas where Federally chartered associations had faced a competitive disadvantage in the market. At the time, California was the only state which the FHLBB felt met this requirement. Most of the FHLBB's VRM regulations for Federally chartered S&Ls are essentially identical to those currently applicable to state-chartered S&Ls in California. However, Federally chartered S&Ls may make only annual rate adjustments no greater than $\frac{1}{2}$ percentage point. Also, in the event of a rate decrease, Federal associations must decrease the maturity of the loan first—but not to less than the original maturity of the loan—and then adjust the monthly payments. Other FHLBB regulations are significantly more restrictive. Federally chartered S&Ls must offer fixed payment mortgages (FPMs) as well as VRMs and must provide detailed information to facilitate the borrower's intelligent choice between them. To force Federally chartered S&Ls to continue to offer FPMs on reasonable terms, VRM acquisitions are restricted to 50 percent of their total mortgage originations and purchases. Also, effective July 1, Federally chartered S&Ls must index their VRMs to the national cost-of-funds index published by the FHLBB.

Growth of VRMs

VRMs had a very slow start in California. In the mid-1960's, one state-chartered savings and loan association attempted to incorporate provisions for variable interest rates in its mortgage loan contracts, but strongly negative consumer response discouraged the effort. Two S&Ls tried to promote VRMs in 1970 but met with only modest success. In 1971 another S&L began offering VRMs more successfully. In 1975 VRM activity finally picked up, as a significant number of large lenders began to offer them. Currently there are about twenty-seven state-chartered S&Ls, two national banks, and two state-chartered banks offering VRMs in California. Federally chartered S&Ls are beginning to offer them as well.

From mid-1975 through 1977, the volume of VRMs increased rapidly, as large California VRM lenders had about 60 to 80 percent of their new loan originations in VRMs (chart). However, during 1978, as mortgage interest rates rose sharply, the VRM percentage declined to about 40 to 50 percent, and VRM growth has slowed. The reason apparently is that lenders are offering VRMs on less attractive terms relative to FPMs in anticipation of declining interest rates. Other things being equal, an FPM with prepayment penalties is more attractive to the lender in these circumstances since it locks in high interest rates.



Sources: Federal Home Loan Bank of San Francisco and Federal Home Loan Bank Board.

After September 1978 the VRM percentage increased sharply, though it has resumed its decline since the beginning of this year. The resurgence was probably stimulated in part by the California Supreme Court's August 1978 decision in *Wellenkamp vs. Bank of America* that "due-on-sale" clauses in mortgage contracts cannot be exercised by lenders in order to increase interest rates on mortgages to current market levels.⁴ The decision severely reduces lenders' ability to increase interest rates on FPMs in the active California housing market. Unless the law is changed or the Court reverses itself, VRMs should be even more attractive to California lenders in the future than they were in the past.

VRM rate changes

Interest rates on VRMs have decreased only once since 1970 but have increased several times. Following a rate decrease of 15 basis points in October 1972, the only S&L actively lending through VRMs implemented 25 basis point rate increases in April and October 1974 and in April 1975. The first rate increase implemented by a significant number of large lenders occurred following the August 1978 announcement that the cost-of-funds index increased in the first half of 1978 by 12.9 basis points. This increase in the cost of funds, plus earlier small accumulated increases, allowed about a 20 to 22 basis point rise in VRM rates, and twenty S&Ls out of twenty-one implemented it for most of their VRMs. There was very little consumer reaction to the increases. According to a survey conducted by the California Commissioner of Savings and Loan, only 4 percent of the borrowers who received notice that their rates were being raised wrote inquiries to lenders, and only 5 percent of the inquiries were complaints. A large majority of VRM borrowers—67 percent—decided to extend the maturity of their loans to avoid any increase in monthly payments. Most recently, the San Francisco FHLB announced in February of this year that, in the second half of 1978, the cost-of-funds index increased 30.1 basis points. This increase allowed lenders to raise their rates on most VRMs by the maximum increase of 25 basis points, with a further 5 basis point increase possible six months later.

¹ To date this new variant does not seem to have attracted much attention.

² In practice, California commercial banks offering VRMs in most cases voluntarily adhere to the rulings and regulations of the Savings and Loan Commissioner.

³ Between June 24, 1971 and January 1, 1976, S&Ls were required to use an index of the cost of funds of all S&Ls in the Eleventh Federal Home Loan Bank District, which includes Arizona, California, and Nevada.

The index now used with California VRMs is calculated by dividing California S&Ls' total annualized funds cost by their average total funds:

$$2 \times \frac{\left[\begin{array}{l} \text{total interest or dividends paid on:} \\ \text{savings capital, FHLB advances, debentures, and} \\ \text{other borrowings} \end{array} \right]}{\left[\begin{array}{l} \text{averages of:} \\ \text{savings capital, advances, debentures, and other} \\ \text{borrowings outstanding} \end{array} \right]}$$

The index is released semiannually, usually in February and August, for the six-month periods ended December 31 and June 30.

⁴ A due-on-sale clause is a device commonly used in real property security transactions to provide, at the lender's option, for acceleration of the maturity of the loan upon the sale of the real property security.

Federally chartered S&Ls outside California were not authorized to offer VRMs.

Two states with considerable VRM activity are Ohio and Wisconsin. VRMs offered in Ohio are essentially similar to California VRMs, but the dominant form of VRM in Wisconsin differs from most others in that its rate is not tied to an index. Called the "escalator clause mortgage", it provides for a constant rate for three years, after which the rate may be adjusted once a year. The borrower is protected by restrictions on rate increases. The maximum initial rate increase is 1 percentage point, and a 0.5 percentage point maximum applies to successive increases. Borrowers are also protected to some extent by the option to prepay their loans without penalty within four months following a rate increase or anytime the rate is 2 percentage points or more above the original contract rate. For this kind of VRM, then, the current mortgage rate serves as an effective "index", since the virtual absence of prepayment penalties insures that lenders will not increase rates on outstanding VRMs above current mortgage rates.

Wisconsin lenders may offer a California-type VRM as well as the escalator clause mortgage. However, lenders strongly prefer the "escalator", and virtually all state-chartered S&Ls offer it, as do a number of Federally chartered S&Ls.⁷ In contrast, activity in the California-type VRM is negligible. Though there were some complaints from borrowers who had their interest rates increased in 1974, following 1975 legislation governing the frequency and size of increases, rate adjustments seem generally to have been accepted by borrowers.

There has also been substantial VRM activity in several New England states, most notably Massachusetts.⁸ VRMs in New England differ in a number of respects from those in California. Typically there is no cap on cumulative upward adjustments of VRM rates, and borrowers have either very limited options to extend maturities to offset rate increases or none at all. Indexes used also vary. In Maine and New Hampshire, VRM lenders generally have used as an index some measure of the cost of funds to lending institutions. In Massachusetts and Connecticut the norm is an index of current interest rates on new mortgages. Absence of a cap on rate increases and a

maturity-extension option, together with indexation to mortgage rates, means that VRM borrowers in New England share more interest rate risk than their California counterparts. As a result, VRM lenders in New England must offer more attractive "discounts" off the FPM lending rate than do California VRM lenders. In New England the norm seems to be about a ½ percentage point reduction of the VRM rate relative to the FPM rate—considerably greater than the typical reductions of ¼ percentage point or less in California.

VRMs as short-term mortgages

Borrowers seem to have responded to the substantial rate discounts offered in New England by favoring VRMs over FPMs when they expected to move, to sell their homes, and to prepay their mortgages in the near future. Although it is still too early to say so definitely, it appears that substantially lower initial rates on VRMs may lead to selection of borrowers preferring lower current interest rates in anticipation of prepaying their loans well before any substantial rate increases will have occurred. If this proves to be generally true, then VRMs, instead of functioning solely as a long-term variable-rate lending instrument, in effect would also be a device for making short-term mortgage loans. Indeed, at least one New England mortgage lender has specifically designed and marketed its VRM to appeal to "transient" homeowners who expect to move within a few years after originating their mortgages.

The major advantage to such a use of the VRM is that, under certain circumstances, it allows individuals who expect to be short-term borrowers to reduce their borrowing costs. In addition, borrowers avoid both the expense of writing a new loan upon maturity of a short-term loan and the risk that new finance might not be available then. Moreover, borrowers have flexibility in determining when to prepay or transfer their loans (if the loans are assumable). Thus, VRMs may provide a mechanism through which lenders, without attempting to screen short-term borrowers from long-term borrowers, may offer what are in effect short-term mortgage loans while retaining for borrowers many of the advantages of long-term financing.

Consumer protection

Consumer protection figures prominently in most discussions of VRMs. At the heart of the issue is disclosure of the terms of the mortgage contract. The FHLBB and a number of states have promulgated comprehensive regulations designed to insure that a borrower understands his potential mortgage costs with a VRM. By encouraging consumers to evaluate their borrowing options carefully and by insuring that lenders disclose to borrowers all information relevant for an

⁷ There is some uncertainty as to whether an escalator clause mortgage complies with FHLBB regulations, which in general prohibit loans with an increasing sequence of monthly payments. Some Federally chartered S&Ls avoid the appearance of a conflict by extending the term of the mortgage to offset the effect of a rate increase on monthly payments. Others have interpreted the regulation as allowing them to increase monthly payments.

⁸ A number of lenders in New England also offer ROMs similar to those used in Canada.

intelligent choice between different mortgage instruments, these regulations facilitate the sound development of VRMs.

In addition to disclosure regulations, consumer protection measures have taken several other forms. For example, for many lenders the FPM is, for all practical purposes, the only mortgage design permitted. As a means for implementing consumer protection, such a draconian approach has obvious drawbacks.

Another approach to consumer protection is incorporated in the regulations issued by the FHLBB in December of last year, which required that any Federally chartered S&L offering VRMs also offer FPMs to prospective borrowers to assure them "the freedom to choose". While there are some mortgage lenders which lend only through VRMs, the great majority of VRM lenders also offer FPMs. There are two main reasons. First, since many individuals continue to prefer fixed monthly payments, it can still be profitable for lenders to offer FPMs. Second, for reasons developed more fully below, the VRM is likely to gain less acceptance in the secondary mortgage market than the FPM, so that lenders desiring to originate and sell mortgages have a strong incentive to offer FPMs. In light of these factors, the FHLBB's regulation will probably have little overall effect, though it may constrain some individual lenders.

Another, more important, way in which regulators and legislators occasionally have sought to protect the interest of borrowers is through placing restrictions on the form of the mortgage contract. For example, California VRMs have a 2½ percentage point cap on cumulative rate increases, and lenders must permit borrowers to extend the maturity of their loans (subject to certain limitations) to prevent rate increases from adding to their monthly payments. Since these features make VRMs more similar to FPMs and thus lessen their attractiveness to lenders, they contribute to limiting the rate discounts offered on California VRMs.

Also contributing to the smallness of the discounts is the linkage of most VRM rates to a statewide S&L cost-of-funds index. The California requirement resulted from a view that VRMs should enable lenders only to recoup variations in their average cost of funds and should not reflect movements in mortgage rates unrelated to movements in the cost of funds. While this view has an intuitive appeal as a means of insulating lenders' profits from fluctuations in the cost of funds, the insulation provided is only partial. In a period of rising interest rates, lenders' average returns on VRMs will rise about in tandem with their average funds costs, and their profit rates will be relatively stable. However, in a period of declining interest rates, yields on new mortgages will probably fall more than average funds

costs, causing downward adjustments of VRM rates to lag behind the declining mortgage rates. Such a situation might lead to some consumer resentment until mortgage rates declined sufficiently to make it attractive for borrowers to prepay the VRMs and refinance them. As a result, returns on VRMs indexed to lenders' average cost of funds should rise roughly in tandem with average funds costs as rates rise, but probably will fall disproportionately as rates decline. This prospect clearly limits the magnitude of rate discounts which lenders can offer on VRMs.

Indexing VRM rates to funds costs also contributes to concerns that the progressive removal of deposit interest ceilings may raise funds costs and thus increase VRM rates, at least until the cap rates are encountered. The actual situation is more complex—and less threatening to borrowers—since they may prepay and refinance VRMs if their rates get out of line with market mortgage rates. No doubt some increases of mortgage rates will result from removal of deposit interest ceilings, but these will probably be substantially less than the increases in deposit interest rates.⁹ The probable result, then, is that current mortgage rates will constrain increases in VRM rates resulting from indexing the rates to lenders' funds costs.

Since California VRMs are less attractive to lenders than those indexed to mortgage rates without rate caps and maturity extension options, it is not surprising that VRM rate discounts in California are relatively small. Ironically, though California VRMs do incorporate protections for consumers, they may also prevent individuals who expect to remain in their homes for relatively short periods of time from obtaining more favorable mortgage rates than long-term borrowers. In a housing market with turnover as high as that in California, the generally small rate discounts available to short-term borrowers may represent a considerable cost to consumers.

VRMs in the secondary mortgage market

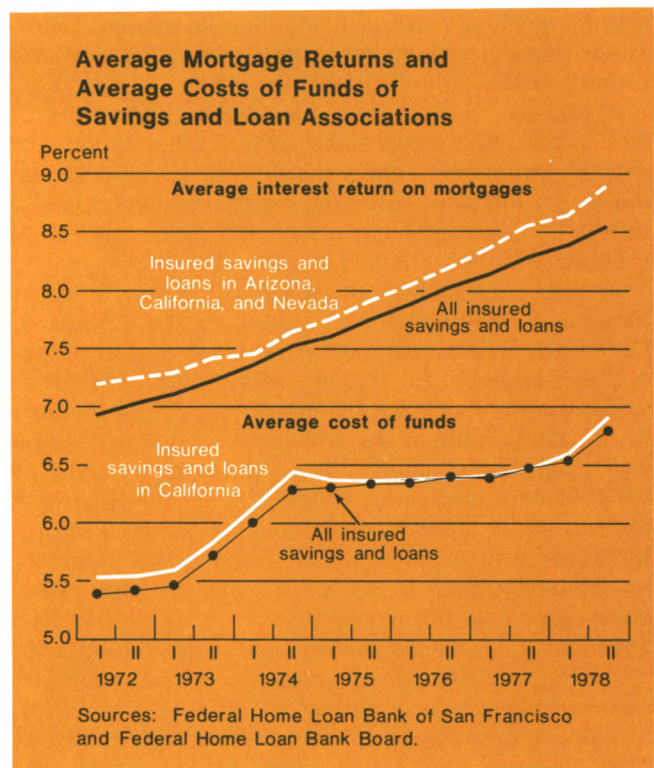
Because VRMs are a new mortgage instrument, sales of VRMs in the secondary mortgage market are a relatively new phenomenon. They are almost always arranged through negotiation between the originator and the investor—either directly or through a broker. However, in March 1978, the first public offering of VRM pass-through securities was made by the Home Savings and Loan Association of Los Angeles, the

⁹ Part of the reason is that as deposit interest ceilings are removed, lenders may initiate explicit charges for services heretofore provided free as a form of noninterest remuneration. In addition, many investors in the mortgage market—such as insurance companies and pension funds—are unaffected by deposit interest ceilings, and their demand for mortgages will dampen upward movements in mortgage rates relative to rates on alternative investments.

largest S&L in the country. The issue was well received by primarily institutional investors. A second issue in October met a somewhat poorer reception, and there have been no further public offerings of VRM pass-through securities since then. At this time, two main factors account for the relative unattractiveness of California VRMs in the secondary market. The California usury law limits the interest rate increases which out-of-state investors may expect.¹⁰ Also, prevailing expectations of future declines in interest rates make fixed-rate investments more attractive to investors. Should rates decline significantly, public offerings of VRM pass-through securities could become attractive once again.

Nevertheless, a number of obstacles currently prevent VRMs from becoming a standard fixture of the secondary market. Since some states prohibit VRMs, lenders in such states may not buy them—either as whole loans or as participation certificates in pools of VRMs—for inclusion in their portfolios.¹¹ Moreover, even in states where VRMs are legal, Federally chartered S&Ls cannot purchase VRMs originated, for example, by California lenders with terms different from those authorized by the FHLBB. Also, Federal housing agencies such as the Federal National Mortgage Association and the Federal Home Loan Mortgage Corporation currently do not purchase VRMs.

The fundamental obstacle to purchases by the housing agencies as well as to trading VRMs in the secondary market is their lack of uniformity. Non-homogeneous mortgage pass-through securities can be traded only after some detailed examination of the underlying mortgages. While newly issued Government National Mortgage Association pass-through securities bearing a given contract interest rate are uniform as to the contract rate and the original term, VRM pass-through securities, even if they have the same origination rate, may have different rate caps and different rate indexes. Moreover, although the indexes could be formally identical, different regional conditions affecting funds costs or current mortgage rates—especially state usury ceilings—might lead to variations in the pattern of implementation of VRM rate adjustments. Thus, with regional differences in deposit and mortgage markets, the origination rates as well as the course of rate adjustments will differ from one region to another. As a result, it will be difficult to trade VRM pass-through securities without some inspection of the



underlying mortgages. This situation clearly favors determination of the terms of secondary market transactions in VRMs through negotiation between the buyer and seller, either directly or through a broker. Where the offering is large enough and the seller is sufficiently well-known to investors, it may be feasible to arrange a public offering. But, due to the lack of uniformity of VRMs, it will be difficult for securities dealers to “make markets” for them by posting the prices at which they stand ready to buy and sell.

To avoid such “fragmentation” of the secondary market for VRMs, a single, nationwide index has been suggested in place of the various local or regional indexes currently being used. The FHLBB lent support to this view in its recent regulations which required that all Federally chartered S&Ls offering VRMs after July 1 use the same nationwide cost-of-funds index. While widespread adoption of a uniform index clearly would reduce the variety of VRMs, several problems would remain. First, not all lenders would be attracted to the uniform index. For example, lenders in California might prefer to continue to index their VRMs to their average cost of funds. As the chart shows, the California average cost of funds generally has tracked the national average very closely—the simple correlation coefficient between the two indexes is 0.99—

¹⁰ Out-of-state lenders are subject to a 10 percent usury ceiling which does not apply to California S&Ls and commercial banks.

¹¹ However, since FHLBB regulations authorizing VRMs take precedence over such state laws, Federally chartered S&Ls in such states may offer VRMs.

but discrepancies have emerged, especially during periods of rising interest rates. Another reason why lenders might prefer to avoid using the nationwide index is that they might want to use VRMs to make short-term mortgage loans as described earlier, in which case they probably would want to index them to current mortgage rates. Moreover, even if all VRMs were tied to the nationwide index, local mortgage market conditions, including usury ceilings, would affect the ability of lenders to implement the VRM rate adjustments allowed by the national index. As a result, some heterogeneity would remain. Thus, use of a national index, though it will increase the uniformity of VRMs, does not appear likely to eliminate the fragmentation of the secondary market for VRMs.

Outlook for VRMs

While it is difficult to predict the future growth and impact of VRMs, experience in California and elsewhere suggests that they should enjoy a ready market in states where they have not yet been introduced. In the near future VRMs are likely to spread more widely throughout the country. Effective July 1, the

FHLBB authorized Federally chartered S&Ls in all states to offer VRMs and, as pressure grows to raise or eliminate deposit interest ceilings, interest in expanding lending through VRMs should increase. As more lenders are able to use VRMs to reduce the risk of lending long and borrowing short, VRMs should have a favorable impact on the supply of mortgage credit throughout the business cycle.

Experience to date illustrates the variety of feasible VRM designs, including nonindexed VRMs like the Canadian ROM and the "escalator clause" mortgage popular in Wisconsin, VRMs indexed to current mortgage rates as in New England, and VRMs indexed to a measure of lenders' funds costs as in California. Some of these VRMs provide borrowers considerable protection against future rate increases, though not so much as an FPM. But such protection is generally obtained only at the cost of higher origination rates, which may prevent short-term borrowers from reducing their borrowing costs with a VRM. Thus, in the future development of VRMs, the cost of imposing restrictions on the form of VRMs should be weighed carefully against the expected benefits.

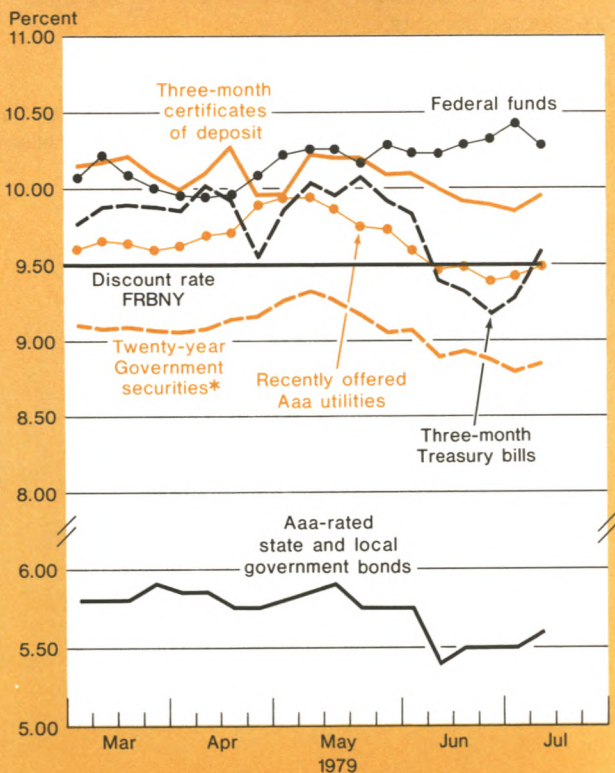
William C. Melton
Diane L. Heidt

The financial markets

Current developments

Chart 1

Recent Changes in Interest Rates



* This yield is adjusted to twenty-year maturities and excludes bonds with special estate tax privileges.

Sources: Federal Reserve Bank of New York, Board of Governors of the Federal Reserve System, and Moody's Investors Service, Inc.

Financial market developments in the spring and early summer reflected the unsettled conditions in the economy. Interest rates, particularly those on longer term securities, rose at first as concern over inflation intensified. However, as signs of a slowing in the pace of economic expansion accumulated, the earlier increases were reversed. The July 20 increase in the Federal Reserve discount rate to a record 10 percent was followed by an upward adjustment in short-term interest rates. The long-term debt markets, in contrast, rallied in response to the determination shown by the monetary authorities to strengthen the dollar.

During the spring, interest rates on most money market instruments extended the period of relative stability that had begun early in the year (Chart 1). Following an April surge in the growth of the monetary aggregates the Federal funds rate rose from around 10 percent or slightly higher to about 10¼ percent and then remained at that level through mid-July. Other short-term rates moved in a similarly narrow band but showed little net change for the entire period. For example, three-month certificates of deposit (CDs) were trading at around 10 percent in the secondary market in mid-July, essentially the same as their level in early April.

Yields on United States Treasury bills moved in line with those on other short-term securities for a while but then fell dramatically in early June. Professional demand was heavy, amid speculation of collateral shortages and strong reinvestment demand as outstanding cash management bills began to mature. Later in June a weakening of the dollar in the foreign exchange markets led to increased purchases of Treasury bills by foreign central banks, which helped maintain the relatively low yields on these securities. At times,

steep rate declines in the Treasury bill futures market added impetus to the downward pressure in the cash market, particularly for bills closely related to the June and September contracts.

Trading in the Treasury bill futures market was quite active over the period. Open interest in the June 21, 1979 futures contract remained high throughout the latter stages of its life. Indeed, on the last day of trading, the contract closed with a record high open interest of 706 contracts, resulting in the delivery of \$706 million of September 20 bills on the next day. This delivery represented a substantial fraction of the September 20 bills outstanding, after excluding those held by the Federal Reserve, those held in foreign official accounts, and awards to noncompetitive bidders. (The previous high delivery which occurred last December amounted to \$442 million of bills.)

In contrast to the short-term sector of the fixed income securities market, yields on long-term instruments fluctuated widely during the spring and early summer. Initially, concern over inflation as well as a pessimistic long-run outlook for interest rates weighed heavily on the market. Subsequently, large increases in the weekly money stock figures, together with a lack of retail follow-through demand for the Treasury's May refunding issues, also served to depress market sentiment. In this atmosphere, yields on long-term taxable bonds rose by up to 35 basis points, with the largest increases occurring in the corporate sector.

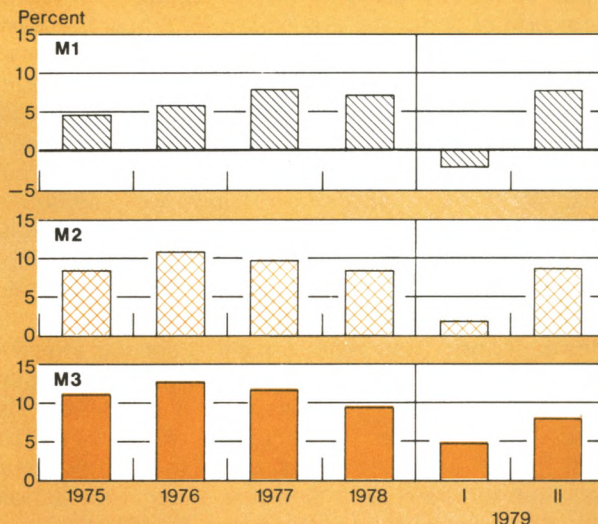
Toward the middle of May there was a major shift in sentiment. Government statistics released at the time presented a softer picture for business activity than had previously been anticipated. In particular, market participants were surprised by a small downward revision in first-quarter gross national product. A series of reports for April added to the view of a weakening economy and helped turn rates lower. In the changing investment climate a consensus began to take shape that bond yields might be near, or perhaps even beyond, a cyclical peak. As a result, the market rallied strongly. While yields backed up somewhat in early July, amid the weakening of the dollar in the foreign exchange markets and concern over energy policy, they remained below the early-April levels.

In the tax-exempt market, the net change in yields was similar to that for other long-term securities but the pattern of movement was different. Here, rates varied little through most of the spring but then dropped markedly in early June. The initial strength in this area was largely technical as new issue activity was light. The supply of new issues was curtailed further following the introduction in the Congress of legislation designed to end the tax-exempt status of home mortgage revenue bonds sold after April 24. While

Chart 2

Growth of Monetary Aggregates

Seasonally adjusted



The annual growth rates represent the percentage change from the fourth quarter of one year to the fourth quarter of the next. The quarterly growth rates represent the percentage change from the preceding quarter, expressed at annual rates.

Source: Board of Governors of the Federal Reserve System.

final action on the legislation is still pending, it forced postponement of virtually all such offerings, except for a few that were close to completion.

Some of the volatility in the capital markets reflected the sharp but irregular rebound in the growth of the monetary aggregates. The behavior of M_1 is particularly noteworthy. After remaining virtually unchanged since last summer this aggregate surged to a 7.5 percent rate of advance in the second quarter (Chart 2). Not only was the increase larger than those in the recent past but it was more uneven, with the entire change occurring in two months—April and June.

The second-quarter rise in M_1 more than offset a small first-quarter decline and brought the advance over the first half of the year to just below a 3 percent annual rate, which is at the middle of the 1½ to 4½ percent growth range specified by the Federal Open Market Committee (FOMC) for all of 1979. This range was originally set by the FOMC in February and was reaffirmed at its July meeting.

Growth of the broader monetary aggregates (M_2 and M_3) also recovered from its modest pace early in the year, but in these cases the acceleration was not so

sharp. A pickup in commercial bank time and savings deposits (other than large CDs), combined with the renewed strength in M_1 , raised the second-quarter growth rate of M_2 to approximately 8.5 percent. Although this is well above the advance during the winter, it leaves the growth of M_2 for the first half of 1979 near the lower end of the 5-8 percent range projected for the year as a whole. As in the case of M_1 , the FOMC voted at its July meeting to retain its original 1979 projections for the broader monetary aggregates and for bank credit.

Unlike time and savings deposits at commercial banks, thrift institution deposit inflows were weaker in the spring than in the winter. This turnabout in relative growth rates was due largely to the elimination of the higher ceiling interest rate that thrift institutions are allowed to pay on six-month money market certificates of deposit. (New regulations that became effective in mid-March reduce or eliminate the higher rate payable by thrift institutions whenever the rate on six-month United States Treasury bills is above certain levels.)¹ As a result, the recent uptick in M_3 growth was small, and for the year to date it remains at the bottom of the 6-9 percent range projected by the FOMC.

Total commercial bank credit expanded at about a 13 percent rate in the second quarter, bringing its growth for the first half of 1979 to a rapid 14 percent rate. In contrast to the experience with the monetary aggregates, the latter figure is well above the 7½ to 10½ percent growth range set by the FOMC for this year. As the pace of business activity weakened and inventories continued to mount, loans to commercial and industrial firms remained one of the strongest components of bank credit. After rising by 14 percent in 1978, the growth of business loans accelerated to nearly a 21 percent pace over the first half of this year.

At its July meeting the FOMC formulated preliminary growth ranges for the monetary aggregates and bank credit for 1980. The Committee tentatively decided that the ranges for 1980 should be the same as those for 1979, with the understanding that adjustments might be necessary in light of emerging economic conditions and in response to legal or legislative developments affect-

ing M_1 . (In April a United States Court of Appeals ruled that automatic transfer accounts—ATS—and certain other payments services are illegal under current laws and will be prohibited as of January 1, 1980 unless the Congress explicitly enacts new legislation authorizing these services.) In any event, the Committee noted that the current reexamination of the definitions of the monetary aggregates might in the near future lead to a new and improved set of money stock measures.

The second quarter witnessed a continuation of a number of ongoing changes in the balance sheets of financial market participants. Total investments in money market mutual funds rose by approximately \$9 billion, surpassing the previous record increase of \$7 billion set during the winter months. At the same time, while households added further to their stock of outstanding debt, there were indications of some moderation from the unprecedented borrowing pace of the previous two years. An analysis of household indebtedness is presented in the article beginning on page 9. As mentioned above, business firms placed strong credit demands on banks during the second quarter. An article beginning on page 35 looks at another important source of business credit that has grown over the past few years, namely, finance companies.

Commercial banks in the United States also made important changes in their portfolios in recent months. Specifically, they cut back on their domestic money market liabilities and instead drew heavily on the Euro-dollar market. Since early this year, United States banks have permitted a \$22 billion runoff in deposits with denominations of over \$100,000—\$17 billion in negotiable CDs and \$5 billion in other large time deposits. With total bank credit continuing to advance at a rapid pace, banks offset this decline by increasing the net balances due to their own foreign branches by \$16 billion and the net balances due to nonaffiliated foreign banks by an additional \$5 billion. The increase in indebtedness of United States banks to their own foreign branches during the first half of this year is exceptionally large. Indeed, over the preceding eighteen months, United States banks had maintained a virtually constant level of \$10 billion in net claims *against* their foreign branches. Among the factors contributing to this dramatic turnaround were a 2 percentage point increase in reserve requirements on large-denomination time deposits (effective November 1, 1978) and some narrowing in the differential between interest rates on Eurodollars and on CDs. An April 13 proposal by the Board of Governors of the Federal Reserve System to impose a 3 percent reserve requirement on certain domestic nondeposit bank liabilities also may have provided some inducement for banks to borrow in Euromarkets.

¹ Effective March 15, 1979, the Board of Governors of the Federal Reserve System, the Federal Home Loan Bank Board, and the Federal Deposit Insurance Corporation took joint action to eliminate the ¼ percentage point differential on money market certificates issued by thrift institutions and commercial banks when the rate on six-month United States Treasury bills is 9 percent or more. The full differential is in effect when the ceiling rate is 8¾ percent or less. When the six-month bill rate is between 8¾ and 9 percent, thrift institutions may pay a maximum 9 percent while commercial banks may pay up to the actual discount rate on the bills. Except for the last two weeks in June and the first week in July, the six-month bill rate has not fallen below 9 percent.

Finance companies as business lenders

Finance companies, which have been viewed traditionally as providers of consumer credit, have become important lenders to business as well. Today, business lending represents about half of all finance company credit. In 1978, finance companies accounted for \$1 out of every \$5 of short- and intermediate-term borrowing by nonfinancial businesses—a total of \$63 billion. This lending encompasses a broad spectrum of financial arrangements, including loans by finance subsidiaries of manufacturers to dealers and business customers and asset-based financing such as leasing and various types of accounts receivables financing. Most of this credit is to small- and medium-sized businesses. As financial intermediaries, finance companies fund much of this lending through financial markets that are reserved for the largest corporations, such as the commercial paper market.

Finance companies—function and profile

Finance companies have a long history as intermediaries that channel funds from the financial markets to business and household borrowers. Originally they served largely as lenders to consumers. In recent years, however, business lending has become increasingly important. In fact, by the end of 1978, business credit represented almost half of the accounts receivables of finance companies, compared with only one third in the early 1960's (Chart 1).

The change in the composition of finance company lending has been accompanied by important shifts in the structure of the industry. In its early history, the industry consisted mainly of independent companies. Beginning in the postwar period, a growing number of large corporations—mainly in durable goods industries and to a lesser degree in retail trade—followed the lead of major automobile companies and established

finance company subsidiaries. These so-called “captive” finance companies serve as a source of finance for the dealers and customers of the parent companies. While captive finance companies exist in a number of industries, the automotive sector accounts for most of their lending. In addition to large manufacturers and retailers, many bank holding companies now have finance company subsidiaries. As a result of these structural changes, at the close of 1978 the largest 100 finance companies consisted of 45 captive sales finance companies, 41 companies that were either independently owned or subsidiaries of nonbanking firms, and 14 subsidiaries of banking organizations.¹ These large firms account for the bulk of finance company lending to business and consumers. In mid-1975, 88 companies or only about 2½ percent of the approximately 3,400 companies in the industry extended about 90 percent of total finance company credit.²

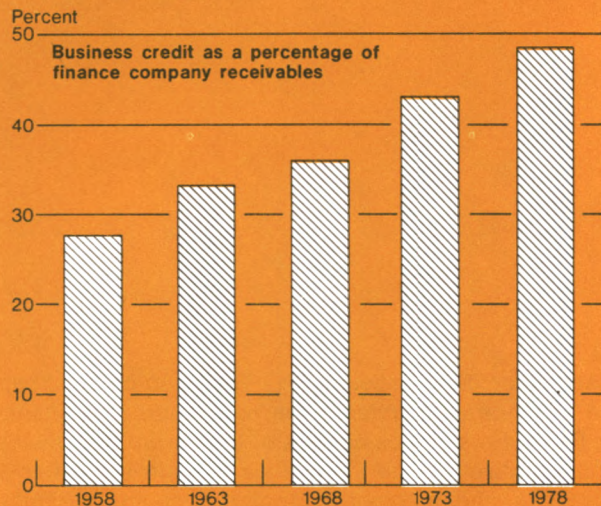
Finance companies depend mostly on nonbank credit, both short- and long-term, to fund their lending activities. As an example of this dependence, finance company borrowing accounts for almost 60 percent of total borrowing in the commercial paper market. This reliance on market debt highlights a key intermediary role played by finance companies. While traditionally the commercial paper and bond markets are viewed as credit sources for only the nation's largest firms,

¹ “100 Largest Finance Companies in the U.S.,” *American Banker* (June 11, 1979). In the survey, only companies whose main activities consist of financing sales of their parent firms' products or services are identified as captives. However, such financing is also among the activities of some firms listed in the survey as subsidiaries. The survey understates the role of bank holding companies since some large bank subsidiaries are excluded.

² “Survey of Finance Companies, 1975,” *Federal Reserve Bulletin* (March 1976).

Chart 1

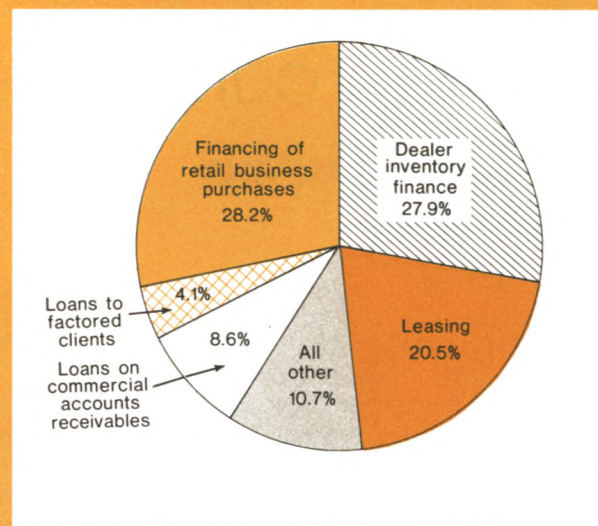
After many years of primarily serving household credit needs, finance companies now conduct about half of their lending with businesses.



Source: Board of Governors of the Federal Reserve System, Flow of Funds.

Chart 2

Components of Finance Company Business Credit



Source: "Survey of Finance Companies, 1975", Federal Reserve Bulletin (March 1976), page 205.

finance companies enable these markets to finance in effect many smaller businesses as well as consumers.

Types of finance company business lending

Finance companies perform their intermediary role in a variety of ways. Somewhat over half of finance company business lending represents financing of finished goods inventories in the trade sector and purchases of equipment by business (Chart 2). Such activities mainly reflect credit extension by captive finance companies of large manufacturers. The other major category of finance company business credit is often described as "asset-based" financing. This broad term includes leasing, loans secured by firms' accounts receivables, liquidation of instalment receivables, and loans to customers by factors, who buy and then usually collect short-term receivables. These forms of finance are based on asset values in contrast to lending which depends more upon net worth and cash flow.

Captive finance company lending

Captive finance companies offer financing for dealers and retail customers of parent companies. The manufacturer can better and less expensively obtain infor-

mation on its dealers, monitor the borrower, and liquidate repossessed collateral than banks or independent finance companies. Thus, captives may extend credit when other financial institutions might be unwilling to do so. Such financing is generally secured by the goods sold or dealers' inventories. At the retail level, credit may be extended via instalment sales contracts, which are often purchased from dealers, or leases. Seeking diversification as well as an attractive return on investment, some captive finance companies have expanded into various types of inventory, receivables, and equipment financing not directly related to sales of the parent.

While financing by some captive companies has become more diversified, the bulk of lending—some-what over 40 percent of total finance company business credit—is accounted for by the automotive industry. Propelled by the rapid expansion of auto-dealer inventories and business investment in automobiles and trucks, automobile financing grew at an annual rate of close to 18 percent in the 1974-78 period. Such strong gains are an important reason why business lending over recent years has grown more than twice as fast at finance companies compared with banks (Chart 3).

Asset-based financing

In addition to lending by captive finance companies, the other key component of finance company business lending is asset-based financing. With asset-based finance, the lender either owns a physical asset to be financed (as in leasing), buys the borrower's receivables and extends funds prior to their collection (as in credit extension by factors buying short-term receivables or sales of instalment contracts to finance companies), or has an explicit lien on specific and often closely monitored collateral (as in commercial finance). This wide assortment of financing techniques meets many varied needs of business borrowers.

Commercial finance

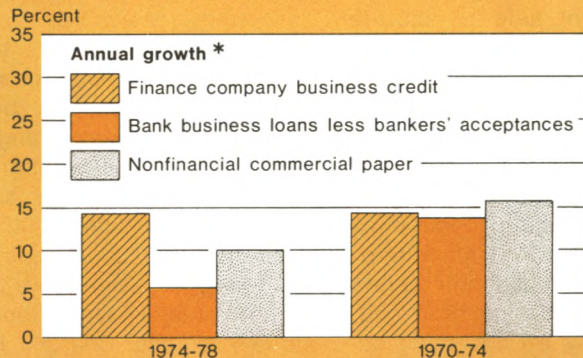
Commercial finance is a form of secured, revolving credit generally designed to meet the short-term working capital needs of a firm. In its most common form, a firm offers its accounts receivables as security, and this lending arrangement is sometimes called accounts receivables financing. Inventories or plant and equipment may also be used as collateral. In a typical financing arrangement, maximum credit is limited to around 75 to 85 percent of eligible receivables, with eligibility defined largely by the receivables' quality (e.g., delinquency status, creditworthiness of customers). The outstanding loan amount varies over time since extensions are tied to receivables and repayments are coordinated with receipts.

The variation in the loan amount under commercial financing is somewhat similar to a revolving credit agreement at a bank. However, the mechanics of commercial finance differ in some important respects. With a commercial financing arrangement the outstanding balance often varies daily, while it generally changes less frequently in the case of many revolving credit loans at banks. Also, commercial financing arrangements are sometimes characterized as "ever-green" loans which can grow continuously with eligible collateral, without the need of being periodically paid off or fully amortized. While conventional bank business loans often are secured, in commercial financing the lender generally monitors the collateral much more closely. Sometimes daily reports on inventories, receivables, and receipts are required, and field auditors may frequently visit the borrower's business.

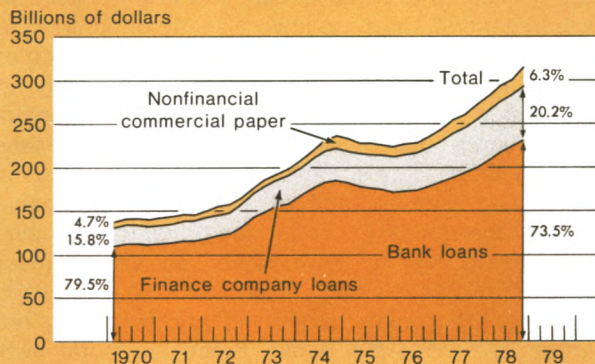
The monitoring and coordination of repayments with daily receipts under a commercial financing arrangement enable the lender to limit risks. Thus, commercial finance is used to accommodate new businesses, small- and medium-sized firms experiencing relatively fast growth, and companies having temporary business difficulties. The financial markets are usually unavailable to these borrowers and conventional bank credit

Chart 3

In recent years, finance companies have become a relatively fast-growing source of business credit . . .



. . . and account for an increasing portion of short- and intermediate-term business borrowing.†



* Compound growth rates computed from year-end levels.

† Shares of short- and intermediate-term business lending are shown for the beginning of 1970 and the end of 1978.

Source: Board of Governors of the Federal Reserve System.

can be inadequate relative to their needs.

The monitoring costs and the comparative riskiness of typical borrowers result in rates on commercial finance anywhere from 2 to 5 percentage points and more above the prime lending rate. However, this difference overstates the relative cost of funds for a borrower. First, the daily flexibility of outstanding borrowing means that the borrower pays interest only on funds required for immediate working capital purposes. Alternative lending forms, such as revolving credits at commercial banks, are generally less fine tuned to such needs. Also, commercial finance arrangements

generally exclude compensating balances or commitment fees sometimes required on bank business loans.

Factoring

In contrast to the lien on assets acquired by the lender under commercial finance, factoring involves the outright sale of short-term accounts receivables to a factor. It is the factor who usually then collects the receivables on a nonrecourse basis (*i.e.*, without recourse to the seller of the receivables for any bad debts). Depending on the particular factoring arrangement, the factored client receives funds either after a maturity period, which reflects stated due dates and average collection experience, or occasionally after collection. In addition to credit checking, bookkeeping, and collection services, factoring is also used for credit protection and cash flow stability since funds may be advanced on overdue accounts. Charges for these services generally range from $\frac{3}{4}$ to 2 percent of purchased receivables, with specific rates varying with the volume purchased, average size of the invoice, terms of sale, and credit quality of the purchased invoice. In general, rates are lowest on factoring arrangements in which clients collect their own receivables.

Factoring is used by some businesses simply for its collection and credit protection services. Financing also frequently occurs when factored clients receive advances prior to negotiated average maturity dates or collection dates. Credit can be advanced against existing receivables (discount factoring) or, in some arrangements, against anticipated receivables (over-advances). Rates on such financing are generally a few percentage points above the prime lending rate charged by commercial banks. Since the factor owns and often collects the receivables, borrowing on factored accounts receivables generally permits a higher maximum credit than with commercial finance.

Sales of longer term receivables to finance companies

In addition to financing short-term accounts receivables through factoring and commercial finance, businesses also receive funds on longer term instalment receivables by selling them to finance companies. These transactions are sometimes referred to as instalment or industrial sales finance. The mechanics of such sales vary with respect to who collects the receivables and the arrangements for recourse. In addition to the longer maturities of the receivables sold, there are a number of other differences among sales of instalment receivables, commercial finance, and factoring. Sales of instalment receivables generally require less monitoring by the finance company. Also, individual transactions can be larger than those typically associated with most factoring and accounts

receivables financing arrangements. While companies borrowing via commercial finance or factoring often have limited alternatives, industrial or instalment sales finance is selected by some borrowers from a variety of options.

Leasing

Aside from receivables and inventories, longer term fixed assets are also financed by finance companies via leasing. This financing technique has been growing rapidly at finance companies as well as at banks. For example, in the 1965-75 period the volume of leasing grew almost tenfold at finance companies and national banks. By way of comparison, over the same interval commercial bank business loans only about tripled.

The fast expansion of leasing reflects its appeal to a variety of borrowers. From the standpoint of the small borrower, leasing can be an attractive alternative to direct borrowing, in spite of the sometimes relatively high implied interest cost. For instance, capital and liquidity are conserved as a result of no compensating balances and little or no downpayments. Also, fixed monthly payments may be preferred to variable payments on a floating rate bank loan. Moreover, lessors may be less conservative than the commercial lending departments of some banks because their expert knowledge of used equipment markets raises the likely value of equipment in the event of default.

In contrast to the rates on leases of relatively small dollar volume, rates on big-ticket leasing—such as airplanes and computers—are more likely to be competitive with business lending rates at banks and in the financial markets. These big-ticket leases, which are generally motivated by tax considerations, were boosted in the 1960's by the introduction of the investment tax credit and accelerated depreciation. Some firms discovered that the added tax write-offs and credits associated with new investment more than offset their taxable income. Through the leasing mechanism, the tax benefits of ownership could be obtained by lessors who can use tax credits and deductions. Competition motivates the lessors to incorporate their lower aftertax ownership cost in the lease rate. Thus, the lessee effectively receives the benefits of the tax-based investment incentives.

When a firm's tax situation does not make leasing an attractive alternative, finance companies may also offer the option of financing equipment with longer term loans. Credit is also sometimes extended for plants and commercial real estate. Unlike users of big-ticket leasing, borrowers are less likely to have ready access to financial markets.

Finance company business lending and commercial banks

The wide variety of business lending by finance companies naturally leads to competition as well as to cooperation with banking institutions. Asset-based lending is an area of competition between independent finance companies and many commercial banks and their holding company affiliates.³ There are also areas of cooperation with business finance companies who participate in loans with some banks and utilize bank credit and bank lines of credit in raising funds through the commercial paper market.

Nonbank subsidiaries of bank holding companies have achieved a substantial presence in asset-based finance. In 1976, close to 500 bank holding company subsidiaries reported either commercial finance, factoring, or leasing as their primary activities. These subsidiaries had total assets of more than \$7 billion.⁴

Further perspective on the role of banking institutions in asset-based financing is provided by industry studies. One survey of the factoring industry reports that almost two thirds of the industry volume is now accounted for by bank-related factors.⁵ According to a survey by the American Association of Equipment Lessors, bank holding company subsidiaries and commercial bank divisions or subsidiaries now account for around 45 percent of lease financing. While the survey covered only part of the leasing industry, it does give some impression of the role of banks and bank holding company subsidiaries in leasing. In addition to factoring and leasing, commercial banks are also involved in commercial finance, although it is difficult to measure the extent of their involvement precisely.

Competition is only one facet of the interaction between finance companies and banking organizations, since there are also areas of cooperation. For example, commercial banks lend to finance companies. However, the importance of bank loans as a source of funds has been declining. At the time of the most recent comprehensive Federal Reserve survey of finance companies

in mid-1975, bank loans represented only around 10 percent of their liabilities and capital versus slightly over 20 percent in mid-1960. More recently this share has declined further, as bank loans to finance companies have been about unchanged over the past four years, while finance company lending has increased rapidly. Nevertheless, although direct loans to finance companies have not grown, banks also provide lines of credit to support the expanded borrowing by finance companies in the commercial paper market.

Bank lines and direct lending still give an incomplete view of banks' interaction with finance companies. For instance, some banks have become increasingly involved in loan participations with asset-based lenders. Under these arrangements a finance company or asset-based lending division of another commercial bank monitors the collateral, allowing a bank to participate in loans that it would not otherwise extend. From the standpoint of borrowers, this arrangement can result in a "blended rate" which is lower than the rate that would be charged by the asset-based lender. From the perspective of the bank, this allows the bank to maintain customer relationships that otherwise might have been terminated. In particular, this arrangement enables smaller banks without asset-based lending capabilities to compete for customers more effectively.

Summary and conclusions

In recent years there have been marked changes among the suppliers of business credit. At one time, asset-based financing was conducted primarily by independent finance companies. Today, commercial banks and subsidiaries of bank holding companies are also important suppliers. Business lending by the captive finance companies of the major automotive manufacturers has jumped to over 40 percent of finance company business lending. Their credit extension has been boosted by the relatively rapid increases in auto dealer inventories and business investment in automobiles and trucks. Such lending is a major reason for the faster growth of business credit at finance companies than at commercial banks in the 1974-78 period.

In addition to these changes within the ranks of suppliers, there is also somewhat more diversity among businesses utilizing finance company credit. The rapid growth of leasing suggests that finance companies are increasingly serving large companies. Still, most finance company lending is to small- and medium-sized firms. Thus, finance companies remain an important link between such borrowers and financial markets that are directly tapped only by large corporations.

Maury Harris

³ Asset-based lending by nonbank finance company subsidiaries of bank holding companies is included in the Federal Reserve data on finance company business loans. Credit extended by commercial banks or their majority-owned domestic subsidiaries via factoring or commercial finance is included in commercial bank commercial and industrial loan data. Leasing receivables of commercial banks is reported separately.

⁴ R. Michael Rice, "Financial Impact of Nonbank Activities on Bank Holding Companies", Board of Governors of the Federal Reserve System, unpublished staff paper, June 1978.

⁵ "Factors Hit Record in '78 Volume", *Daily News Record* (January 29, 1979).

A Substitution Account: Precedents and Issues

In March, the Interim Committee of the International Monetary Fund (IMF) instructed the IMF Executive Directors to present at the next Committee meeting on October 1 their conclusions regarding the establishment of a Substitution Account to be administered by the Fund. Such an account would accept deposits of foreign exchange, primarily United States dollars, from Fund members in exchange for an equivalent amount of claims denominated in special drawing rights (SDRs).¹ Broadly, the account could facilitate the evolution of a more smoothly functioning international monetary system. It might further serve to enhance the prospects for the SDR as the principal reserve asset in the international monetary system, a goal set forth in the recently amended IMF Articles of Agreement.²

The concept of a Substitution Account is not new. The idea has been discussed periodically in one form or another throughout the postwar years. Before focusing on the current discussion, therefore, this article reviews the historical precedents for creating a Substitution Account and the contexts in which the idea has been

explored. From that review, it is clear that creation of a Substitution Account raises important technical as well as economic and political questions. Perceived national interests and priorities are involved. In its final section, the article seeks to outline the major issues that might be considered in the current Fund discussion, without anticipating specific proposals or positions by any of the participants.

Historical precedents

A Substitution Account in the IMF would serve to increase the centralization of world monetary reserves in an international institution by increasing the SDR share of official reserves. The notion of reserve centralization traces its intellectual origins to the International Clearing Union proposed by Lord Keynes in 1943.³ Today, a modified version of the idea is embodied in the Fund itself.

Under the Keynes proposal, countries were to hold their reserves solely in the form of gold and a new international currency unit, called *bancor*. *Bancor* was to be convertible into gold at a fixed, although alterable, rate and created by the member countries either against deposits of gold in the Clearing Union or by using their overdraft facilities. *Bancor* was to be used only in transfers among the accounts of central banks. Quotas were to be set limiting a country's ability to make use of its overdraft facilities.

The majority of countries involved in the postwar planning, however, were reluctant to rely on such an

¹ The special drawing right (SDR) is an official international reserve asset which was created by the IMF and first distributed to participating member countries on January 1, 1970. The asset is held by central banks and governments and used by them much like foreign exchange holdings for the financing of balance-of-payments surpluses and deficits. When created, the value of the SDR was equivalent to 1/35 of an ounce of gold. Since July 1974, the value of the SDR has been tied to a basket of the sixteen most important currencies of the member countries of the Fund. The United States dollar currently accounts for approximately one third the value of the SDR.

² The revised amendments were approved by the Board of Governors of the IMF on April 30, 1976 and entered into force on April 1, 1978.

³ *Proposals for an International Clearing Union*. Presented by the Chancellor of the Exchequer to Parliament, April 1943 (London: H.M.'s Stationery Office, Cmd. 6437).

artificially created unit of account as *bancor* to meet their future reserve needs. Moreover, partnership in the Clearing Union would have obliged any one member to extend credit to all the others up to the total of their combined quotas. In effect, the United States could have been called upon to provide up to \$30 billion through an international institution whose policies it could not fully control. The United States proposed instead, and the Bretton Woods conference of 1944 accepted, a more limited IMF. Under the Fund agreement, no member was obliged to extend credit to the others beyond 75 percent of its own quota.

Throughout the ensuing years, the world community came to rely increasingly on the United States for financial resources that the Fund itself was unable to provide but that countries greatly needed to rebuild their war-torn economies. The notion of strengthening the resources and ability of the Fund to create liquidity was not seriously considered until the late 1950's and early 1960's. By this time, the United States was persistently building up such large official liabilities that the viability of the international monetary system, primarily dependent for its reserve growth on the more or less accidental by-product of continuing American balance-of-payments deficits, was called into question.

Perhaps the most notable critic was Robert Triffin of Yale University. If the United States attempted to balance its external accounts, Triffin reasoned, a contraction in the growth of world reserves and hence in world trade and payments would ensue. If, on the other hand, the United States continued to provide liquidity to the world community as it had, at the expense of its own net reserve position, other countries might lose confidence in the value of the dollar and seek to convert their dollar holdings into gold or other currencies. This could lead potentially to a collapse of the postwar payments system.

Triffin's proposed solution was to concentrate increasingly monetary reserves in the IMF, which would henceforth be able to control the expansion of world reserves. Under Triffin's scheme, all members of the Fund would substitute a portion of their existing official reserves for IMF deposits. In subsequent years, countries experiencing an increase in reserves would further substitute a portion of those additions for IMF deposits. The idea was for countries then to use their IMF deposits as international reserves. In addition, IMF deposits could be created through Fund operations in the open market and through borrowing by member countries. Such reserve-creating activity was to be subject to conditions intended to safeguard against inflationary effects and to promote balance-of-payments adjustment.

Essentially, Triffin wanted to find a way to increase

world liquidity over time that would be independent of the balance-of-payments position of the United States. In so doing, he hoped to remove short-term and long-term threats to the stability of the dollar and the international monetary system. Implicit in Triffin's plan to centralize monetary reserves in the Fund was a gradually reduced reserve role for gold and the dollar and an increased role for IMF deposits to meet the future liquidity needs of the world economy.⁴

In subsequent years, economists and officials alike came to accept Triffin's diagnosis of the dollar problem, although the majority of them were not prepared to accept his proposed solution. In part, they feared the potential inflationary consequences of increased balance-of-payments financing by the IMF. Nevertheless, as the issue of monetary reform became more widely discussed during the early 1960's, a number of prominent economists, some of whom had been officially involved in the working of the international monetary system, substantially endorsed the basic goal shared by both Triffin and Keynes, namely, to centralize monetary reserves in an international institution.⁵

The first official to support the notion of centralizing monetary reserves in the IMF was the British Chancellor of the Exchequer, Reginald Maudling. At the 1962 annual meeting of the Fund, Maudling endorsed a proposal—somewhat comparable to a Substitution Account—to enable surplus countries to deposit with the Fund unwanted balances of reserve currencies and receive in return gold-value guarantees against any subsequent losses from devaluation. His theoretical conception was to provide an alternative to any worldwide contraction in official reserves resulting from the conversion into gold of reserve currencies by the surplus countries.⁶

⁴ Robert Triffin, "Tomorrow's Convertibility: Aims and Means of International Policy", *Banca Nazionale del Lavoro Quarterly Review* 49 (June 1959), pages 131-200. See also his *Gold and the Dollar Crisis* (New Haven, Conn.: Yale University Press, 1960), pages 102-20.

⁵ Maxwell Stamp, "The Fund and the Future", *Lloyds Bank Review* (1958), pages 1-20. Also, see his "Changes in the World's Payments System", *Moorgate and Wall Street* (Spring 1961), pages 3-22. A. C. L. Day, "Memorandum of Evidence" (Radcliffe) *Committee on the Working of the Monetary System*, Principal Memoranda of Evidence, Vol. 3 (London: H. M.'s Stationery Office, 1960), page 75. James E. Angell, "The Reorganization of the International Monetary System: An Alternative Proposal", *Economic Journal* 71 (December 1961), pages 691-708. Sir Roy Harrod, *Alternative Methods for Increasing International Liquidity* (Brussels: European League for Economic Cooperation, 1961). Edward M. Bernstein, "Statement" in United States Congress, Joint Economic Committee, *Outlook for United States Balance of Payments*, Hearings before the Subcommittee on International Exchange and Payments, 87th Congress, Second Session, 12-14 December 1962, pages 205-18 and 221-40.

⁶ Address of Rt. Hon. Reginald Maudling at the Annual Meeting of the Board of Governors, International Monetary Fund, *Summary Proceedings of the Seventeenth Annual Meeting of the Board of Governors*, September 1962 (Washington, D.C.: International Monetary Fund, 1962), pages 61-68.

Although Maudling's proposal received no support from the official community, it was apparent to many analysts by the following year that the international monetary system was soon likely to face some serious liquidity problems. By this time, the position of the system's primary reserve currency—the United States dollar—was perceived by many to be under increasing strain. At the end of 1962, reserves of gold and foreign exchange held by countries other than the United States and the United Kingdom totaled \$40 billion, of which more than half was in foreign exchange, including \$12 billion in the American currency. Under the commitment of the United States to exchange dollars for gold at \$35 an ounce, conversions of these foreign-held dollars could have depleted most of the \$16 billion gold stock of the United States.

The problems raised by the progressive accumulation of dollars by foreign monetary authorities were compounded by the decline in offsetting postwar debts due to both the Fund and the United States by the major surplus countries of Europe. This meant that one of the means by which the gold stock of the United States had been protected from dollar conversions would no longer exist. It thus became clear that continued deficits of the United States would soon have to be absorbed entirely by additional increases in already swollen foreign dollar holdings, by borrowings from the Fund, or by depletion of the United States gold stock.⁷

The urgency, therefore, of restoring equilibrium in the payments position of the United States was recognized both here and abroad. At the same time, it was equally clear that adjustment of the United States balance of payments could result in serious dislocation to the world economy unless new measures were simultaneously taken to ensure that world reserves were not placed under pressure. In short, other means of liquidity creation had to be found. As the United States launched a major program in July 1963 to reduce its payments deficits, the delegates to the annual meeting of the Fund that autumn agreed to institute a high level study of future liquidity problems.

The negotiations which ensued led to a decision in 1968 to create within the Fund a new reserve asset, the special drawing right. A major impetus leading to this decision was the initiative of Secretary of the Treasury Henry Fowler in July 1965 committing the United States to such a potential reform of the international monetary system. The equivalent of \$3.5 billion in SDRs was distributed for the first time on January 1, 1970. A further

\$3 billion was distributed in each of the following two years. The creation of SDRs represented a step toward the centralization of monetary reserves in an international institution. The asset itself was intended to supplement the use of dollars and gold as official reserves and to reduce the dependence of the world community on continued United States deficits to meet future liquidity needs. The reform measure did not, however, provide for either any substitution of dollars or a Substitution Account.

The Substitution Account proposal

A proposal to establish a Substitution Account within the Fund, and thereby to strengthen further the basis for centralizing world monetary reserves in an international institution, was first put forth at the annual meeting of the Fund in the fall of 1971, following the decision of the United States in August to end the gold convertibility of the dollar. In the previous two years, official holdings of dollars had tripled. This led monetary authorities and academic economists alike to review more intensively the question of how the reserve role of the dollar might be modified in connection with reform of the international monetary system.

One suggestion was that central banks be allowed to deposit dollars and pounds in excess of anticipated needs for those currencies as working balances into the Fund in exchange for SDRs. That would involve a move away from the use of national currencies as reserves and the simultaneous development of the SDR.

The idea of creating such an account was supported the following year by the Fund's Executive Directors, who had been asked at the 1971 meeting to report to the Governors on the means by which the international monetary system might be reformed. Their study, *Reform of the International Monetary System* (September 1972), suggested a Substitution Account with two main features. First, the account was to enable countries to alter the composition of their reserves by allowing the Fund to sell to them, or stand ready to sell, newly created SDRs in exchange for reserve currencies. Second, it was to allow the reserve currency countries themselves to earn SDRs through their payments surpluses. This could be accomplished by allowing the Fund to buy their currencies from them in exchange for newly created SDRs to the extent that other countries' holdings of their currencies declined.

The study revealed, however, considerable disagreement, particularly between the United States and some major surplus countries, as to whether the United States should permit settlement of its deficits in gold and foreign exchange assets in the future and what role a Substitution Account should play in this setting. Traditionally, United States balance-of-payments defi-

⁷ Richard N. Cooper, *The Economics of Interdependence, Economic Policy in the Atlantic Community* (New York: McGraw Hill, 1968), page 47. Also, Robert Triffin, "The Latent Crisis of the Reserve Currencies", *The Banker* (August 1963), pages 527-35.

cits had been financed in considerable part through increases in liabilities to official institutions abroad. Those liabilities arose as the passive result of the intervention obligations under the Bretton Woods system of fixed but adjustable exchange rates. In this respect, the United States was in a position different from other countries with balance-of-payments deficits. Other countries had either to draw down owned reserves or to negotiate borrowing facilities to finance their deficits.

The major surplus countries wanted all countries, including the reserve centers, to adhere to the same rules in settling payments deficits. They supported this position largely because they believed that the United States would thereby be subjected to greater discipline than it then was in the adjustment of its balance-of-payments deficits.

To help resolve the issues discussed in the 1972 Fund report and to provide a forum in which the momentum toward monetary reform would be maintained, the Governors of the Fund appointed a ministerial committee in July 1972 composed of representatives of each of the twenty constituencies choosing an Executive Director for the Fund. This Committee on Reform of the International Monetary System and Related Issues, or C-20 as it subsequently became known, was instructed to report to the Governors on all aspects of monetary reform.

In the C-20 negotiations the United States was prepared to accept conditionally some form of convertibility. Its proposed conditions were that arrangements would also be adopted assuring both symmetrical balance-of-payments adjustment on the part of surplus and deficit countries alike as well as the avoidance of excessive reserve hoarding by particular countries. To these ends, the United States endorsed a reserve indicator system that would trigger timely remedial action. If a country's reserves increased or decreased disproportionately, reaching specific indicator points, that country would be expected to adopt policy measures to correct its surplus or deficit. The country could also be refused the right to convert any excessive accumulation of dollars. If the country failed to take adequate measures, it could ultimately be subjected under Fund surveillance to graduated pressures or sanctions.

The C-20 presented its *First Outline of Reform* a year later, at the fall 1973 meeting of the Fund. By this time, the dollar had been devalued for a second time (in February 1973) and the major currencies were freely floating. In this climate, there was some support for the Substitution Account proposal. It was viewed largely as a means of handling existing reserve currency balances once dollar convertibility was restored.

During the C-20 discussions, it is useful to note, substitution was widely viewed as a multilateral oper-

ation in which countries would replace short-term currency assets (primarily dollars) with liquid claims on the international community in the form of SDRs. The intended effect was to alter the composition but not the level of existing reserves. In contrast, funding of dollar balances was seen more as a bilateral operation in which countries would replace short-term currency assets (again, primarily dollars) with longer term and less liquid claims than SDRs. Unlike substitution, funding was not intended to involve the creation of additional SDRs but rather to reduce the volume and liquidity of existing reserves. Both substitution and funding were considered means to consolidate outstanding reserve currency balances by altering the composition, volume, or liquidity of international reserves.

All these issues were of concern to the C-20 when it resumed its discussions during 1973-74. It was clear by early 1974, however, that the committee would be unable to agree upon a definitive reform plan. The shocks to the world economy stemming from the widespread inflation and the quadrupling of oil prices during the winter of 1973 provided the incentive for discontinuing the reform effort. Once the member countries recognized the dimensions of their oil-financing requirements, none were willing to commit their currency to a par value or central rate or to claim that their dollar reserves were excessive and in need of consolidation. Moreover, with the delays in implementing other aspects of monetary reform, notably a return to convertibility, any sense of urgency in introducing a Substitution Account also diminished. Nevertheless, many countries continued to believe that the reserve currency component in official liquidity would remain unsatisfactorily high and that some corrective provisions would eventually be required.

In its final report to the Governors of the Fund in June 1974, entitled *Outline of Reform*, the C-20 listed the goals it sought for a reformed system, together with some possible means of reaching them. These goals included: (1) the achievement of symmetry in the obligations of all countries, debtors and creditors alike, (2) the better management of global liquidity, (3) the avoidance of uncontrolled growth of reserve currency balances, and (4) the allowance of as much freedom for countries to choose the composition of their reserves as would be consistent with the overall objectives of reform.

To these ends, the *Outline* proposed, among its other conclusions, that provision be made to consolidate existing reserve currency balances. This was viewed as a means to reduce strains on the international monetary system which might result if the convertibility of the dollar were restored. In addition,

the *Outline* proposed arrangements under which reserve currency countries would be able to acquire reserve assets when in surplus instead of having to reduce their outstanding official debts. To accomplish these goals, as well as to permit countries that wished to do so to exchange official currency holdings for SDRs, the *Outline* proposed that the Fund be provided with the authority to administer a Substitution Account.

Further, the *Outline* confirmed the view that the SDR should become the *numeraire* of the international monetary system in terms of which the Fund's members could express the value of their currency. To assist this process, the *Outline* specified that the Executive Directors would periodically set the interest rate on the SDR in such a way as to maintain an appropriate effective yield in light of changing market interest rates. In addition, the *Outline* proposed to value the SDR in such a way as to reduce fluctuations in its capital value resulting from exchange rate changes.⁸

The proposal to establish a Substitution Account failed to receive widespread support during the reform discussions, partly because many holders of reserve currencies were unwilling to exchange their reserve currencies for SDRs at a substantial reduction in interest rates. The proposal also failed because the United States and the major surplus countries could not agree on the obligations debtor and creditor countries would accept in the management of their external accounts. In these circumstances, the negotiations were never brought to the point where debtor and creditor countries could reach an agreement on the financial obligations they would undertake in the operation of a Substitution Account. More significantly, however, the proposal failed to be accepted because many of the concerns which had inspired the initiation of the reform discussions in 1971, such as the inconvertibility of the dollar and the desire for a more symmetrical payments system, receded in importance in view of the problems presented by the oil price increases, world inflation, and the emergence of floating exchange rates.

The notion of establishing a Substitution Account was not raised again on the official level until April 1978. At that time, the Managing Director of the Fund, H. Johannes Witteveen, felt that a second distribution of SDRs would be desirable in order to foster the SDR as the principal reserve asset in the international monetary system. To allay any fears that the increase in

liquidity would add to world inflationary pressures, Witteveen suggested that countries match all or part of the SDR allocation with deposits of reserves held in other forms in a Substitution Account in the Fund. In this way, the allocation of SDRs would not add to world liquidity but only affect its composition, increasing the share of the SDR.

At the fall meeting of the Fund in 1978, the Interim Committee, which succeeded the C-20, agreed to endorse the resumption of SDR allocations at an annual rate of SDR 4 billion during 1979-81 but declined to support the creation of a Substitution Account. Nevertheless, to enhance the attraction of the SDR as a reserve asset, it did favor increasing the interest rate on SDRs, from 60 to 80 percent of the weighted average of short-term rates prevailing in the markets of five major countries. These decisions were thus adopted by the Executive Directors of the Fund.

At this 1978 meeting, however, the Interim Committee did not entirely dismiss the proposal to create a Substitution Account, notwithstanding the differences of opinion about it. To the contrary, many on the Interim Committee seemed convinced that the creation of such an account might offer certain advantages. A Substitution Account could (1) promote further the reserve role of SDRs, (2) increase the centralization of monetary reserves in the IMF and, in so doing, lead to more effective control over international liquidity creation, and (3) provide the means for countries to diversify the composition of their reserve holdings without having a direct impact on the exchange markets. For these reasons, the Interim Committee instructed the Executive Directors to keep the question of the Substitution Account under review. Subsequently, at its meeting in March 1979, the Interim Committee expressed broad support for active consideration of a Substitution Account and asked the Executive Directors to present conclusions about the matter at the next Committee meeting.

Issues to be considered

In preparing their report on the Substitution Account for the October 1 meeting of the Interim Committee and the Board of Governors, the Executive Directors of the Fund will be confronting a variety of issues. These will range in dimension from broad questions about the fundamental purposes and objectives of a Substitution Account to detailed technical questions about how the account would work, including how the financial obligations would be distributed. The issues are not only complex but also overlap. This means that choices made with respect to some issues would necessarily constrain choices that can be made with respect to others. The result is an intellectual puzzle that is both

⁸ These steps were taken on July 1, 1974. At this time, the interest rate on the SDR was changed from a flat rate of 1½ percent initially to 60 percent of the weighted average of specified short-term interest rates in the markets of five major countries: the United States, the Federal Republic of Germany, the United Kingdom, France, and Japan. In addition, the value of 1 SDR was changed from 1/35 of an ounce of gold to a specified basket of the sixteen most important currencies of the Fund's member countries.

challenging and frustrating. To simplify the following discussion as much as possible, the issues will be grouped into four categories: (1) the potential objectives of an account, (2) its structure, (3) its functioning, and (4) the nature of the exchange risks involved.

Objectives

There are basically two types of objectives that a Substitution Account might be designed to achieve. They are not mutually exclusive, but they do entail somewhat different approaches to the issue.

The first and potentially the most far-reaching objective would be to promote the SDR as the principal reserve asset in the international monetary system. In general terms, that goal is already set forth in the amended Articles of Agreement. Development of the SDR as the principal reserve asset could help lay the groundwork in the long run for arrangements providing more effective international control over the growth of world liquidity than currently prevails. Eventually, that could be a step toward an improved functioning of the international monetary system. At the same time, there would be other implications for the monetary system. The relative reserve role of the dollar could diminish, since the dollar would be the primary currency deposited in a Substitution Account in exchange for SDR-denominated claims. In addition, the substitution process would tend to strengthen the position of the IMF as the international institution that manages and oversees the functioning of the SDR.

To achieve the objective of promoting the role of the SDR by means of creating a Substitution Account, it would be useful to encourage broad participation by many countries in the account and to ensure that the SDR-denominated claims in the account were roughly similar to the existing SDR. In other words, it would not be constructive for the account to create yet another international reserve asset. By contrast, the actual size of the account would be less of an issue, since even a relatively modest-sized Substitution Account could be a step in the direction of promoting the role of the SDR.

A second type of objective would be perhaps less visionary but more concrete: to contribute to exchange market stability by removing a source of uncertainty related to potential changes in the composition of official reserve holdings. In practical terms, the dollar is expected to remain the principal reserve asset in the international monetary system for the foreseeable future. But it may be increasingly supplemented in its reserve use by other national currencies. Under normal exchange market conditions, this kind of diversification of reserves would pose no special problems. Individual central banks, however, have occasionally sought to

shift a portion of their reserves out of dollar assets into other currencies during times of unsettled market conditions. The extent of actual diversification may easily be exaggerated by the market, and this perception may aggravate existing pressures against the dollar by private market participants.

A Substitution Account could help reduce or even eliminate this sequence of reactions by providing central banks with an alternative way outside the market to diversify the composition of their reserves. This could diminish destabilizing capital flows which may distort exchange rates among the major currencies. The account could therefore serve to reduce both the magnitude of potential exchange rate volatility and one of the motivations for diversification on the part of the official community. It would not, however, directly address problems stemming from diversification on the part of private market participants.

To recapitulate, the objectives of promoting the role of the SDR and internationalizing currency diversification are neither exclusive nor incompatible. The priority that each country attaches to a specific objective, however, may color choices regarding the technical features of the account. Moreover, because of their implications for achieving the basic objectives of the scheme, even seemingly specialized technical decisions deserve thorough exploration in the development phase of a Substitution Account proposal. These technical features are described in the next section.

Structuring the Substitution Account

Legal basis. There are a number of ways to establish the account legally. One way is already provided for in the amended Fund Articles. Under these terms, the account would be administered by the Fund acting in a fiduciary or trust capacity.⁹ An alternate way would be to establish the account as a separate legal entity by international agreement and appoint the Fund to act as administrator. A third possibility would be to allow the account to function as a separate legal entity in the form of a Fund affiliate, in much the same way as the International Development Association and the International Finance Corporation currently relate to the World Bank.

Participation. In designing a Substitution Account, countries will have to decide whether participation in the facility would be mandatory for all Fund members

⁹ Article V, section 2 (b) of the Fund's amended Articles states: "If requested, the Fund may decide to perform financial and technical services, including the administration of resources contributed by members, that are consistent with the purposes of the Fund. Operations involved in the performance of such financial services shall not be on the account of the Fund. Services under the subsection shall not impose any obligations on a member without its consent."

or voluntary. If the scheme were mandatory, changes would be needed in the Fund's Articles. Some countries might, however, reasonably judge that they do not possess sufficient amounts of reserve currency to make deposits in the account. Further, opinions might vary widely among countries as to the nature of their participation. These differences might be better accommodated by a voluntary rather than a mandatory scheme.

Yet, if participation were voluntary and either a majority of countries or some of the major reserve holding countries declined to join, the account might fail to achieve any of its objectives. It might not effectively constrain reserve diversification or promote the position of the SDR.

Size of the account. As noted above, the size of the account is an important issue bearing on the purposes envisaged for the account. A relatively large account to provide for substantial substitution would do more than a small account to reduce the likelihood of reserve diversification in the market. A large account would also promote the position of the SDR relatively more than a small account as well as allow countries to restructure the composition of their reserves more comprehensively. A large account, however, may be heavily dominated by the deposits of just a few major reserve-holding countries. Thus, the optimal size of the account is not obvious. In any case, countries will have to decide whether the total amount of dollars to be substituted should be specified in advance or whether decisions as to the account's magnitude should be left to each participant's choice. To avoid token participation, for example, it might be desirable to require minimum deposits, and to avoid domination by just a few countries it might be desirable to impose maximum deposits.

Frequency of substitution. How often substitution would be permitted is a related question. For example, participants might be allowed to substitute dollars for SDR-denominated claims on an ongoing basis, on a periodic basis, or only on a once-and-for-all basis. An ongoing facility would most fully accommodate desires to reduce reserve diversification in the market by allowing countries to substitute dollars for SDR claims at any time they wished. Substitution offered on a periodic basis (such as once a year) would be roughly similar in effect and might have certain advantages in terms of administrative simplicity. By contrast, a once-and-for-all substitution facility would be appropriate to the objective of enabling countries to achieve a major restructuring in their reserve holdings.

Termination and liquidation. This issue raises questions as to whether the account would have a fixed maturity or whether it would exist indefinitely. A fixed maturity for the account, and therefore for the SDR

claims in the account, might be seen as a means of assuring the ultimate liquidity of the SDR claims, irrespective of whatever conditions on transferability and usability might be agreed upon for the period in which the account is operating. However, there is a danger that, as the fixed maturity approached, the original problem of the currency composition of reserves that the Substitution Account was intended to address would simply recur.

An alternative possibility would be to allow the account to exist indefinitely. In this way, the dollar assets of participants deposited in the account would be permanently taken out of reserves and the SDR-denominated claims held in place of dollars would correspondingly occupy a greater proportion of official reserves. Under that alternative, arrangements would need to be agreed upon to maintain adequate liquidity for the SDR claims over time.

Functioning of the Substitution Account

How substitution would work. As already suggested, countries agreeing to participate in a substitution facility would deposit reserve currencies—mostly dollars—in the account. In return, they would receive SDR-denominated claims. They would hold these SDR-denominated claims in their official reserves together with dollars and other reserve currencies, the regular SDRs they already hold, and gold. They would receive interest from the account on their SDR assets.

There is a wide range of options on the central characteristic of the investment facility for the account's dollars—that is, the interest rate to be paid by the United States Government. For example, the account might receive an ordinary long-term interest rate much like any long-term bond, a floating interest rate based on market rates for short-term United States Government issues, a floating interest rate based on long-term United States Government securities, or even a floating rate based on interest rates prevailing for SDRs. The account could receive interest payments in dollars. Alternatively, it could receive interest in SDRs or some combination of dollars and SDRs based on prearranged conditions.

The manner in which the account would receive interest is important. If, for example, the United States were to pay interest in SDRs, it would have to have a means to acquire sufficient SDRs to meet its obligations to the account. It could do so either through SDR allocations from the Fund or through the maintenance of a balance-of-payments surplus that permitted purchases of SDRs from countries which needed dollars to cover their own balance-of-payments deficits. The magnitude of a United States surplus would have significant implications for the overall functioning of the interna-

tional monetary system. Under certain conditions, it could involve some contractionary effects on both the domestic and world economy.

The nature of the liabilities owed by the account. The liabilities owed by the account would consist of SDR-denominated claims. The characteristics of these claims might be like those of currently existing SDRs and subject to comparable conditions. Alternatively, the account might owe SDR-denominated claims to which might be attached conditions somewhat different from those currently applicable to existing SDRs.

The characteristics of the SDR claims offered by the account are important because they will influence countries in their decision to participate. For example, if the SDR-denominated claims owed by the account are inferior to existing SDRs, this would do little either to attract participants or to promote the SDR as a reserve asset. The more complicated the conditions attached to the account's SDR liabilities, the less workable the scheme might be and hence the less wide the participation it would attract.

A feature of considerable importance is the interest rate the account would pay on its SDR liabilities. One option would allow the account to apply the same interest rate as that currently applied to existing SDRs. This is a floating rate equivalent to 80 percent of the combined short-term rates prevailing in the markets of five major countries. There are other options, however. For example, the account might pay a slightly higher rate to compensate for potential restrictions on the usability and/or liquidity of the new SDR claims. Alternatively, the account might pay a fixed rate for a specified period of time, a long-term rate, a short-term rate, or a combination of these.

The higher the interest rate the account would pay, the more attractive the scheme to those considering participation. Yet, the argument could work in the opposite way. Thus, the attractiveness of the SDR as a reserve asset might be compromised if the interest rate the account were to pay on its SDR liabilities were substantially higher than that paid by the Fund on outstanding SDRs. Moreover, the higher the interest rate paid, the more difficult it might be to reach agreement on apportioning the financial obligations and ensuring that earnings on the account's assets were sufficient to cover its interest commitments.

The way in which the account would pay interest to participants is also of concern. One option would be to enable the account to increase each participant's account. This would be comparable to the way in which individuals receive interest on their savings deposits. Another possibility would be to allow the account to pay interest to participants periodically in the form of an outright payment.

The medium in which the account would pay interest is a related question. There are basically three options. First, interest could be paid in terms of currently existing SDRs. The account could also pay interest in the form of dollars at the prevailing dollar-SDR rate, using the dollars deposited with it. Finally, interest payments could take the form of new SDR-denominated claims.

Transferability and usability of SDR assets held by participants. Participants might be allowed to use their SDR-denominated claims in the Substitution Account subject to the same conditions that apply to existing SDRs. Currently, SDRs are used in exchange for national currency. In general, a country is expected to use its SDRs only if it has a need because of its balance-of-payments or reserve position, rather than solely to change the composition of its reserves. A country may use its SDRs either in direct agreement with another country or by going to the Fund and having the Fund designate another country to receive the SDRs in exchange for currency. Under current procedures, no country is designated to receive SDRs unless it is in a sufficiently strong balance-of-payments or reserve position.

In designing the Substitution Account, however, it might be desirable to vary the freedom of choice available to participants in the use and transfer of their SDR claims. More or less stringent conditions might be applied depending upon the type of transfer. For instance, voluntary transfers among participants might be permitted with minimal limitations. In contrast, transfers involving some form of designation might require demonstration of a balance-of-payments need by a participant wishing to use its SDR claims to acquire dollars from other participants. Still other conditions might be applied if a participant wished to acquire dollars directly from the account in exchange for its SDR claims.

More generally, provisions might be required to prevent participants from using their SDR claims solely as a means to speculate on foreign exchange rate changes. For example, a repurchase provision might be imposed. This would oblige participants using their SDR claims to reacquire and redeposit these claims in the account after some agreed period. Such an obligation would be analogous to the reconstitution requirement under the existing SDR provisions in the Articles of Agreement. Those provisions oblige member countries to hold on an average daily basis 15 percent of the SDRs allocated to them over any five-year period.

Finally, countries might decide to attach similar acceptance limits to the SDR claims created by the Substitution Account as those currently applied to the SDR. This provision is intended to ensure that

only a limited amount of SDRs need be accepted by any member. Under existing rules, no participant in the SDR facility need accept more SDRs in exchange for currency than twice its net cumulative allocation, although it may accept more if it wishes. Comparable provisions might be applied to the SDR claims created by a Substitution Account as a means of reducing the obligation of potential net creditors to hold more claims than they might wish.

Nature of the exchange risk

Exchange risk questions would arise in the event that the account were terminated and liquidated. At that time, the dollar assets of the account would revert to the participants. The dollar-SDR exchange rate would likely be different from that which prevailed at the time of the substitution. Whether this rate were favorable or unfavorable to the account would depend on the relationship between the cumulative interest paid by the account, the cumulative interest the account had earned, and the changes which had taken place in relative exchange rates.

One possibility is that relative interest rate differentials and changes in exchange rates may balance out over time. In that case, the difference between interest paid and received by the account would about offset the change in the capital value of the account's dollar assets resulting from the overall change in the dollar-SDR rate. Thus, the question of exchange risk would be effectively neutralized.

If, however, interest rate differentials and exchange rate changes do not balance out over time, countries must make choices as to how best to deal with the exchange rate risk involved. One approach to resolve this problem would be to arrange a form of risk sharing among the participants and the account at the outset of the agreement. At one extreme, the United States could assume all the potential exchange risk by agreeing to maintain the dollar value of the SDR liabilities held by the account. At the other extreme, the United States could assume no maintenance of value obligation and the exchange risk would reside with the participants in the account. Alternatively, some intermediate course might be selected which would oblige all participants in the account and the

United States to share whatever exchange rate cost might prevail at the time the account was liquidated and terminated. The way this question is resolved has to be considered in connection with all other issues bearing on the distribution of financial obligations among participants in the account and the United States—especially the interest rate to be paid and received on the account's assets and liabilities.

One point to underscore is that there can be no way to measure or to assess the magnitude of the exchange rate exposure ahead of time. Therefore, arrangements would have to be specified in advance as to the obligations participants in the account would assume at some future date.

Conclusion

As this review has shown, the concept of a Substitution Account has been considered in various forms in virtually all the discussions of international monetary reform, beginning with the Anglo-American negotiations during World War II as well as during the multilateral discussions of the 1960's and 1970's. Under the Keynes plan and also in the C-20's *Outline of Reform*, the proposals were presented as an integral part of comprehensive schemes to reshape the international monetary system. In that context, the fundamental problems involved in reforming the system could not be avoided. These problems concern the provision and control of international liquidity, the maintenance of convertibility between primary reserve assets (e.g., SDRs) and national currencies, and perhaps most important the adoption of such arrangements for economic adjustment among national economies that would assure the smooth functioning of the international monetary system.

Perhaps because of inability to resolve them on earlier occasions, these fundamental problems have not thus far been confronted directly in the current Substitution Account discussions. A piecemeal approach has the potential disadvantage of obscuring disagreement among countries on how to resolve the fundamental problems. The approach may have advantages, however. Namely, it may be preferable to deal with one problem at a time. By doing so, gradual improvement of the international monetary system might best be achieved.

Dorothy Meadow Sobol

The Exchange Rate and Domestic Inflation

The value of the American dollar, measured as a weighted average against the currencies of our major trading partners, fell 12 percent between the first quarter of 1977 and the last quarter of 1978. During the same span, the rate of change in consumer prices—measured by the percentage change in the consumption deflator from four quarters earlier—rose unevenly from just over 5 percent to over 8 percent per annum. The coincident fall of the dollar and surge of prices in the United States raise several important questions. How much has the depreciation contributed to the acceleration of domestic inflation? What has been the timing of the inflationary impact of the depreciation? What are the principal channels through which the depreciation has raised American prices?

The relationship between the exchange rate and domestic prices is influenced by a variety of factors, including economic conditions here and abroad, the response of policymakers to fluctuations in the exchange value of the dollar, and expectations of future economic and political events. These considerations greatly complicate efforts to measure the inflationary impact of a depreciation. For example, it is difficult to

estimate how much members of the Organization of Petroleum Exporting Countries (OPEC) raise prices in response to a depreciation, or to separate the inflationary impact of a depreciation from the depressing influence that expectations of United States inflation can have on the exchange rate. Statistical techniques, however, are useful in obtaining estimates of the approximate measurable contribution of the rise in domestic prices made by the decline of the dollar that occurred in 1977 and 1978. These estimates suggest that the 12 percent depreciation ultimately will raise consumer prices in the United States by about 2½ percent. Roughly two thirds of this increase had occurred by the second quarter of this year.

The dollar and domestic inflation during the recovery

Fluctuations of the dollar on the foreign exchange markets can be summarized in a composite index, representing a weighted average of the dollar's rate of exchange against selected major foreign currencies. The weight assigned the currency of any country typically reflects the relative importance of that country in international transactions.¹ The measure used here is a geometrically weighted average of indexes of the value of the dollar against the currencies of ten major industrial countries. The weights reflect each country's share of the total volume of bilateral capital

This article summarizes a recently completed study of the inflationary impacts of fluctuations in the exchange rate. The complete work is available from the author upon request. For an excellent survey of research done on this topic, see Peter Hooper and Barbara Lowrey, "Impact of the Dollar Depreciation on the U.S. Price Level: An Analytical Survey of Empirical Estimates", Board of Governors of the Federal Reserve System, International Finance Discussion Papers, No. 103 (April 1979). The author would like to thank Hooper and Lowrey for helpful comments made during the preparation of this article.

¹ Such summary measures can vary both in coverage and in weighting procedures, depending on the use for which the index is intended. A good discussion of these issues is presented by Peter Hooper and John Morton, "Summary Measures of the Dollar's Foreign Exchange Value", Federal Reserve *Bulletin* (October 1978), pages 783-89.

and trade flows between the ten countries and the United States.²

From early 1975 through the end of 1976, the dollar rose roughly 9 percent (Chart 1). This overall strengthening occurred despite some well-publicized losses of the dollar in 1976 against the Japanese yen, the West German mark, and the Swiss franc. These latter depreciations were more than offset by the appreciation of the dollar against the currencies of several of our other major trading partners, including Canada, the United Kingdom, France, and Italy.

The year 1977 marked a turning point for the dollar. While the dollar continued to fall against the yen, mark, and Swiss franc, these depreciations were no longer countered by appreciations against other currencies. With the exception of the Canadian dollar, nearly all major currencies gained against the American dollar in late 1977 and 1978. By October of last year, the dollar was down over 12 percent from its peak of 1976.

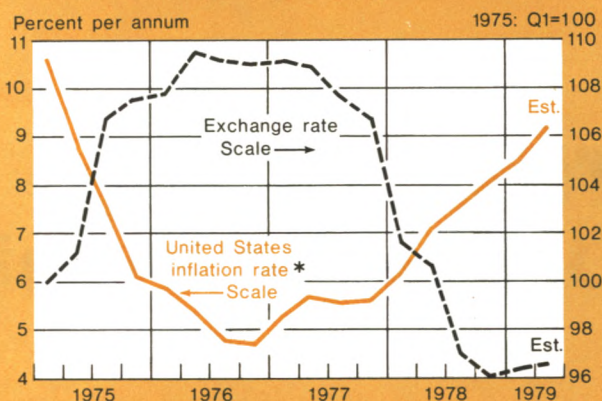
On November 1, 1978, President Carter announced a major new effort, in coordination with the authorities of several other industrial countries, to correct the decline of the dollar. The program featured a tightening of monetary policy and the mobilization of foreign currency resources totaling up to \$30 billion to finance the United States part in coordinated exchange market intervention. The initiatives were successful in halting the dollar's slide, and in the following months the weighted exchange rate rose significantly for the first time in two years.

While the dollar gained in 1975 and 1976, the rate of change in consumer prices—measured by the percentage change in the consumption deflator from four quarters earlier—fell rapidly from over 10 percent to just under 5 percent (Chart 1). Shortly after the dollar peaked in 1976, the inflation rate began moving upward, although unevenly, approaching 6 percent in late 1977. Then, as the depreciation quickened in 1978, the rate of increase in consumer prices jumped quickly

² The currencies (and weights) are: Belgium (.055), Canada (.251), France (.085), Italy (.068), Japan (.160), the Netherlands (.061), Sweden (.028), Switzerland (.028), the United Kingdom (.104), and West Germany (.160). This exchange rate, along with other data used in this study, is taken from the data base of the MIT-Pennsylvania-Social Science Research Council (MPS) quarterly econometric model of the United States economy. One advantage of this data source is its consistent construction of summary indexes of foreign economic activity that are useful in estimating linkages between the exchange rate and domestic prices. When evaluating the impact of a depreciation on domestic prices of goods and services, however, it may be conceptually inappropriate to use an exchange rate with weights based on trade and capital flows. Nevertheless, empirical experimentation with other aggregate measures of the exchange rate suggests that the choice of index fails to alter significantly the estimated impact on domestic prices of the dollar's recent depreciation.

Chart 1

Value of the Dollar and United States Inflation during the Recovery



* Percentage change in consumption deflator from four quarters earlier.

Sources: United States Department of Commerce and Board of Governors of the Federal Reserve System.

to over 8 percent and accelerated further during the first half of 1979.

The channels by which a depreciation affects domestic prices are numerous, and their importance varies with economic conditions here and abroad as well as with expectations of future economic and political developments. Therefore, before considering estimates of the inflationary impact of the depreciation, it is useful to discuss the major linkages between the exchange rate and the domestic price level.

Depreciation raises the price of imports

As the dollar depreciates, foreign costs of production rise when measured in terms of dollars. The resulting squeeze on earnings from goods sold to the United States tends to induce foreign producers to boost the dollar price of their exports. Viewed from an American perspective, the depreciation raises the price of our imports unless foreign suppliers absorb the cost of the depreciation through reduced profitability.

It is likely, however, that import prices will rise by less than the full amount of the depreciation. Buyers here may resist the higher priced imports by reducing their purchases of foreign products. If the American market for these products constitutes a major share of the worldwide market, the softening of demand in the United States could discourage foreign suppliers from posting proportionately higher prices. The inducement not to boost prices is heightened if foreign

producers already face slack demand. For example, although the United States economy expanded strongly following the last recession, other major industrial nations recovered sluggishly. The continued excess capacity abroad in 1977 and 1978 spurred foreign producers to extra efforts to supply goods at competitive prices to the American market despite the depreciation of the dollar.

Expectations of future movements in the exchange rate can also temper efforts by foreign exporters to pass through the cost of a depreciation. If the depreciation is considered temporary, foreign suppliers may prefer to hold prices constant and tolerate a period of reduced profitability rather than risk losing their market share and jeopardizing relationships with American importers by raising prices with each dip in the exchange rate. Indeed, many foreign suppliers contract with domestic firms to reduce the impacts on costs of short-term fluctuations in the dollar. An example is the contract between one American electronics corporation and its Japanese supplier. Each year, the parties set a "bench-mark" exchange rate of the dollar against the yen. If the market exchange rate fluctuates within 5 percent of the bench-mark value, the firms continue to conduct their transactions at the bench-mark rate. If fluctuations are in excess of 5 percent, the companies split losses (that otherwise would have been borne in full by one or the other) until the contract is renegotiated to reflect newly established expectations regarding the value of the dollar.³ This and other similar types of arrangements delay the full response of import prices to a prolonged depreciation, thus slowing the timing of the inflationary impact of the dollar's decline.

Such agreements are also common in the trade of raw materials, where procurement contracts often are written at fixed prices valid over extended periods. A special example is imported oil, most of which is produced by members of the Organization of Petroleum Exporting Countries (OPEC). The price of OPEC oil is an administered price set by the cartel in dollar terms. Consequently, the price of imported oil is not subject to immediate pressure arising from fluctuations in the exchange rate. In the long haul, however, OPEC nations raise oil prices at least in part to recoup purchasing power lost to the dollar's depreciation.

These caveats notwithstanding, import prices do climb following a depreciation, raising consumer prices here through two channels. First, increases in the prices of imported consumer goods are reflected directly in

consumer prices in the United States. For example, the prices of Japanese and European automobiles climbed steadily in 1977 and 1978 as the dollar depreciated. Second, American firms that rely on imported materials will attempt to pass through to prices the rising cost of supplies. Their ability to do so is, of course, limited by resistance of consumers to higher prices. It can also be weakened by the presence of slack demand. The latter consideration was of diminishing importance during the dollar's two-year decline, since by the end of 1978 the rate of capacity utilization in the United States was not far below the peaks experienced in 1973 and 1974.

Demand-induced increases in domestic prices

An additional major impact on the price of domestically produced goods is transmitted through the demand side of the economy. Many American goods and services compete with foreign products in the world's marketplaces. When the dollar depreciates, the dollar price of foreign goods rises relative to the price of domestically produced substitutes. Our imports tend to fall as Americans switch from the now more expensive foreign goods to American products; our exports tend to rise as foreign purchasers do the same. Consequently, the demand for domestically produced items increases.

In competitive sectors of the economy where prices are determined by the forces of supply and demand, the prices of domestically produced goods and services normally will be bid up as demand shifts toward United States markets. Such price increases may occur only with a lag because buyers here and abroad do not immediately switch to the relatively less expensive American goods. Many may be bound by previous contractual agreements to purchase foreign products; others may find it impractical to interchange foreign and domestic equipment in the short term. However, in sectors where American producers exercise some power in setting prices, price hikes may occur with little delay as firms here raise prices in anticipation of the shift in demand toward domestically produced goods and services. This apparently was the case in the auto industry where, in 1977 and 1978, the prices of small domestic models rose as the dollar declined and the prices of similarly sized imported cars climbed.

In addition, the extent of demand-induced increases in domestic prices depends on the ability of domestic producers to expand supplies. In some areas of manufacturing, production can be stepped up sufficiently to meet the increased demand at unchanged prices—although it does become increasingly difficult to do so as plant and equipment are more fully utilized. In

³ This example was reported in "Dollar's Long Decline Snarls Trade Patterns but Effect Isn't All Bad", *Wall Street Journal* (August 4, 1978), page 1.

other industries, such as agriculture and various raw materials, supplies often cannot be increased significantly in the short term. Consequently, prices of these commodities can prove sensitive to the exchange rate and may rise rapidly following a depreciation. In some instances the problem can be exacerbated by government policies designed to alleviate other difficulties. This apparently was true in agriculture. Acreage "set-aside" programs were activated in 1978 to boost farm incomes by restricting grain output just as the depreciation provided greater incentives for United States agricultural exports.

The effects of portfolio shifts on prices

One characteristic that distinguishes the dollar from other currencies is its continued use throughout the world both as a unit of account and as a store of value. A sizable part of all financial assets (and liabilities) is denominated in dollars, and the bulk of international reserves is still held in dollars by private individuals and foreign officials. Given the role of the dollar as the world's major currency, changes in the value of the dollar can have substantial wealth effects. Consequently, uncertainty over the dollar's future value may cause investors to prefer holding assets other than dollars.

One possible alternative is tangible goods such as raw materials and other commodities thought to be a safe store of value. If investors switch from dollar-denominated assets to tangibles, the prices of these commodities, which typically are determined in a world-wide market, are bid upward. Therefore, the shift by investors to tangibles imparts additional inflation to the United States economy.

The volume of dollar assets held by foreigners is large enough that even a small change in views on the desirability of holding dollars may have a substantial impact on commodities prices. This may have been the case in 1978. The uncertainty that characterized foreign exchange markets during the dollar's sharp depreciation increased the perceived risk of holding dollar-denominated assets. A resulting switch by investors from dollars to tangibles appears to have contributed to a new surge in the dollar price of commodities, particularly raw materials.

Wage effects

An additional impact of the depreciation occurs when the initial round of higher prices induces workers to attempt to recoup their lost purchasing power by demanding higher wages. In unionized sectors these forces are often institutionalized by the provision in labor agreements of cost-of-living escalators (COLAs) or "reopener" clauses.

Additional pressure on wages is also created in industries that compete with foreign producers. Following a depreciation, as our exports rise and our imports fall, domestic firms experiencing increased demand for their goods need additional manpower to expand production. If the unemployment rate is low and there is not a ready supply of qualified workers, employers in the expanding sectors may have to offer wage increases in excess of the general rise in prices to attract the requisite number of extra workers.

The response of wages to prices is not immediate. It may take considerable time for employers and employees to realize the full extent of the rise in prices following a depreciation. Many COLAs are subject only to annual reviews, and most do not compensate workers entirely for an increase in consumer prices. In these cases, full adjustment might not be completed until the existing contract expires and another can be negotiated to reflect the newly established price level.

These upward wage adjustments put additional upward pressure on prices as businesses attempt to recoup the rising costs of production by raising prices. Therefore, the depreciation can trigger several rounds of price increases that continue long after the exchange rate stabilizes. Furthermore, the series of wage and price increases may generate expectations of continued inflation that, by undermining confidence in the future value of dollar-denominated assets, can depress the exchange rate further and thereby augment the inflationary effects of the initial depreciation.

Factors offsetting the inflationary impact of the depreciation⁴

Several factors tend to offset the inflationary effects of a depreciation. For example, the magnitude of inflationary effects generated by a falling dollar also depends importantly on the response of the monetary authorities to the depreciation. As domestic prices rise following the dollar's decline, the demand for money increases since more balances are required to conduct transactions at the higher price level. If the Federal Reserve does not permit the money stock to grow rapidly enough to meet fully the additional demand, interest rates in the United States will rise. This tightening of monetary policy works to check the increase in aggregate demand for domestic goods that stems from the depreciation and, consequently, eases pressure on United States prices. Furthermore, if interest rates in the United States rise following the depreciation, investors are induced to reduce their holdings of assets denominated in foreign currencies and to in-

⁴ The following discussion draws heavily from Hooper and Lowrey, *loc. cit.*

crease their holdings of dollar-denominated claims. The resulting flow of capital toward the United States bids up the exchange rate and, through the channels outlined above, partly offsets the inflationary impact of the initial depreciation.

The dollar's decline has precisely the opposite effects abroad that it does in the United States. As American products become more competitive worldwide, demand for foreign products slackens and our exports become cheaper in terms of foreign currencies. As a result, foreign prices decline (or rise more slowly). This moderation in foreign prices affects domestic prices as would an appreciation of the dollar, and therefore can counter the inflationary impact of the initial depreciation. This offset depends, however, on the response of foreign governments to the appreciation of their currencies. If governments abroad attempt to insulate their economies from the retarding effects of the dollar's depreciation by pursuing expansionary policies, foreign prices may continue rising.

Limitations of the statistical analysis

Statistical techniques can be used to uncover the historical relationship between the exchange rate and domestic prices. However, the difficulty of capturing in a statistical model the entire complex of factors discussed above mandates several simplifying assumptions that, while rendering the following empirical analysis tractable, also subject estimates of the inflationary impact of the depreciation to a degree of uncertainty. For example, current techniques preclude accurate measurement of the response of producers and purchasers to uncertainty in the foreign exchange market. It is difficult to capture adequately the effects that changing expectations can have on commodities prices through shifts in the composition of investors' portfolios.

In addition, the statistical analysis abstracts from the moderating influence that the depreciation might have on foreign prices. This simplification tends to result in overestimates of the inflationary impact of the depreciation. On the other hand, the relatively short period of time over which OPEC nations have administered their oil prices makes it difficult statistically to relate OPEC pricing decisions to the exchange value of the dollar. Therefore, it was initially assumed that oil imports do not rise in price following a decline of the dollar. This simplification tends to result in underestimates of the inflationary impact of the depreciation, the extent of which is discussed below.

Another important problem is caused by the fact that, not only does a depreciation raise domestic prices, but domestic inflation—or, more properly, expectations of domestic inflation—can depress the exchange rate. Consider, for example, a jump in the expected rate

of inflation in the United States. To protect themselves from the anticipated decline in the purchasing power of dollar-denominated assets, investors will increase their holdings of assets denominated in foreign currencies and reduce their holdings of dollar-denominated claims. Therefore, the expected worsening of domestic inflation is reflected quickly in a decline of the dollar. If, however, inflation in the United States subsequently does increase as anticipated, the surge in domestic prices might mistakenly be attributed entirely to the earlier depreciation when in fact the causality runs in both directions. This type of error leads to an overestimate of the inflationary impact of a depreciation. Attempts were made to correct for this relationship, but such efforts are hindered by the inability to measure accurately inflationary expectations.

Estimated impacts of a once-and-for-all 12 percent depreciation

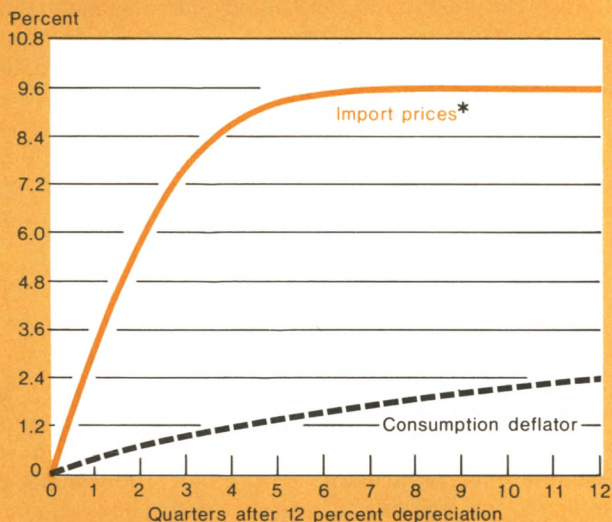
Despite their limitations, statistical techniques can be useful in estimating the importance of many of the linkages between the exchange rate and domestic prices. These estimates can then be used to investigate the approximate magnitude and timing of the impact on domestic prices of a dollar depreciation. Consider, for example, the estimated effects of a once-and-for-all 12 percent depreciation—a decline of the same magnitude actually undergone by the weighted exchange rate in 1977 and 1978. The findings, depicted graphically in Chart 2, assume that the response of domestic policymakers to the induced increase in the demand for money following the depreciation is typical of those in the past. That is, the Federal Reserve does not permit the money stock to grow rapidly enough to accommodate fully the heightened demand for money balances at existing interest rates. Hence, yields rise, choking off part of the increase in aggregate demand and easing upward pressure on prices.

Immediately following the 12 percent depreciation, the price of nonfuel imports starts rising and in just more than one year stabilizes at a level roughly 9½ percent higher than otherwise would have obtained. The less than proportionate increase is attributable mainly to the variety of moderating influences on import prices suggested in the earlier discussion.⁵

⁵ An additional technical reason is that the price index for imports covers imports not just from the countries included in the weighted exchange rate. Therefore, if currencies of some of our lesser trading partners do not appreciate against the dollar along with the major currencies, not all import prices are subject to upward pressure. Consequently, the aggregate index of import prices may rise by less than the dollar's decline even if the price of goods and services imported from our major trading partners do rise proportionately.

Chart 2

Following a 12 percent depreciation, import prices rise quickly by roughly 9.5 percent while consumer prices rise more slowly by about 2.4 percent.



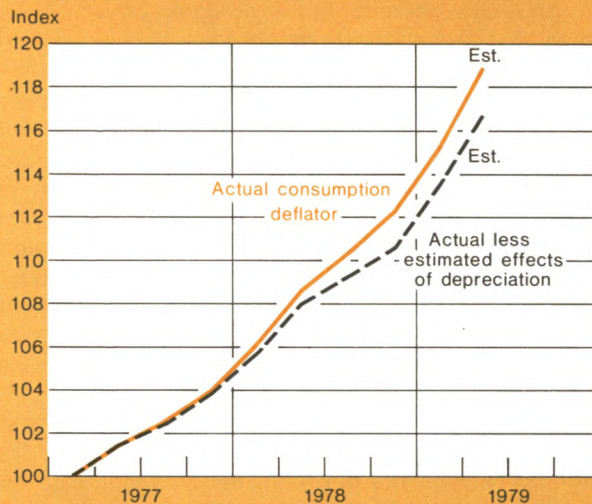
* Excludes petroleum imports.

Rapidly rising import prices help push the consumption deflator up by roughly 1.2 percent in the year following the depreciation. After import prices stabilize at higher levels, consumer prices keep climbing but at a slower pace because only the shift in demand toward American products and rising wages continue to exert upward pressure on domestic prices. In two years the cumulative impact on consumer prices reaches 1.7 percent; in three years it approaches 2.4 percent.

How do these results compare with the conclusions of other studies? In a recent study, Peter Hooper and Barbara Lowrey compared the findings of a large number of researchers.⁶ Standardizing the results of earlier papers where possible, they concluded that a 12 percent depreciation ultimately raises domestic consumer prices by 1.8 to 2.4 percent in two to three years. Therefore, the results presented here appear representative of findings generated both within the Federal Reserve System and elsewhere.

Chart 3

The dollar's slide in 1977 and 1978 has added roughly 1.7 percent to the level of consumer prices since the first quarter of 1977.



Source: Actual figures are from the United States Department of Commerce.

Inflationary impacts of the dollar's depreciation of 1977 and 1978

The dollar's 12 percent depreciation was actually distributed over two years. Nonetheless, the same statistical model employed to generate the results discussed above can be used to estimate the impact on consumer prices of the dollar's depreciation in 1977 and 1978. This is done by comparing the actual course of the consumption deflator after 1976 with an estimate of the path consumer prices would have followed had the weighted exchange rate remained at the level attained in the first quarter of 1977 (Chart 3). As expected, the level of consumer prices is higher than would have been the case in the absence of depreciation. By mid-1979, the dollar's cumulative 12 percent decline had raised the consumption deflator by 1.7 percent. However, since the depreciation was spread over two years, delayed inflationary effects could push domestic prices up another 7/10 percentage points over the next two years.

The estimated impact of the depreciation on the level of consumer prices may seem relatively unimportant, particularly because it is distributed over several

⁶ Hooper and Lowrey, *loc. cit.*

years. However, when presented in terms of the rate of change in consumer prices, the results are more striking. The above estimates suggest that in the last half of 1978, following the dollar's sharp losses against a broad spectrum of foreign countries, the impact of the cumulative depreciation on the annual rate of increase in the consumption deflator reached 1.4 percentage points. This differential began narrowing in 1979 as the dollar rebounded.

As noted earlier, these results are based on the assumption that any increases in OPEC oil prices after 1976 have not been in response to the dollar's depreciation. An alternative assumption is that OPEC matches the depreciation with a proportionate price increase. That is, part of past and scheduled rises in the price of OPEC oil reflects a 12 percent hike in response to the dollar's decline. Estimates suggest that a once-and-for-all 12 percent increase in the price of OPEC oil initially raises the consumption deflator by roughly $\frac{1}{4}$ percentage point. Subsequently induced wage increases put further upward pressure on consumer prices, bringing the total impact of the OPEC response to about $\frac{4}{10}$ percentage point. Under these assumptions, the estimated impact on domestic consumer prices of the dollar's 12 percent depreciation reaches 2.8 percent.

The outlook

What does the analysis tell us about the prospects for the coming year? One important result is that the inflationary impact of a depreciation is spread over several years. Thus, we will continue to feel in 1979 additional inflationary pressure generated by the prolonged slide in the dollar that occurred in 1977 and 1978. This delayed response, attributable in part to the continued shift in demand toward American goods, could boost consumer prices an additional $\frac{3}{4}$ percent this year, or even more if increases in OPEC prices are interpreted as a response to the depreciation.

On the other hand, since November 1978 the weighted exchange rate has climbed, mainly on the dollar's strength against the yen. This appreciation, by rendering foreign goods relatively less expensive, should diminish incentives to switch to American products and therefore, after a period of adjustment, contribute to the easing of demand pressures in the United States economy. Furthermore, although the appreciation may not lead to an outright decline in import prices, it should help forestall further increases by reducing the dollar costs of foreign exporters. Thus, the recent appreciation should help offset the lingering inflationary impact of the dollar's weak performance in 1977 and 1978.

Joel L. Prakken

Treasury and Federal Reserve Foreign Exchange Operations

During the February-April period under review, the dollar came into increasingly heavy demand against most major foreign currencies. This demand largely took the form of unwinding previously adverse leads and lags, covering of speculative positions, and the reversal of portfolio shifts out of the dollar which had built up last year.

At first, the reflux of funds mainly reflected growing confidence in the measures taken by United States and foreign authorities in late 1978 to correct what had become an excessive decline in the dollar. The measures had included a sharp tightening of Federal Reserve monetary policy, coordinated intervention in the exchange market by the United States, German, Swiss, and Japanese authorities, and provision for up to \$30 billion of foreign currency resources to finance United States participation in that intervention. The authorities had intervened in substantial amounts to blunt selling pressure on the dollar through the year-end. Although many market participants expected renewed downward pressure on the dollar in early 1979, such pressure failed to materialize. On occasions when the dollar came on offer in January and February, the authorities quickly met the pressures, helping restore a

sense of two-way risk to the market. Moreover, as part of the broad effort of the United States authorities to deal with the inflation and dollar problems, the Federal Reserve kept interest rates firm even as the growth of the monetary aggregates remained sluggish in February and March.

Once market participants no longer expected dollar rates to decline, traders began to respond to the relatively high interest rates in the United States, compared with rates in many other industrial countries. Substantial amounts of funds began to move out of Germany, Switzerland, and Japan. The central banks of those countries took the opportunity to mop up liquidity by purchasing their own currencies against dollars sold out of reserves, in effect unwinding part of their intervention of last year. The United States authorities also purchased German marks, Swiss francs, and Japanese yen to repay borrowings which had arisen out of previous operations and to restore depleted balances.

The flow into dollars slowed at times as market participants reacted to the political upheavals in Iran, the associated shortfall in world oil production, the sharp rise in the international prices of oil and other key commodities, and evidence of generally more rapid inflation in the United States. Adverse news for the United States occasionally sparked some selling of dollars, but the pressures did not cumulate. Moreover, many of these developments were seen as serious for other countries as well, particularly as inflation rates began to rise sharply abroad. Indeed, as oil supplies became short, leading to a scramble for spot crude around the world

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Table 1

Federal Reserve System Drawings and Repayments under Reciprocal Currency Arrangements

In millions of dollars equivalent;
drawings (+) or repayments (—)

Transactions with	System swap commitments January 31, 1979	February through April 30, 1979	System swap commitments April 30, 1979
German Federal Bank ..	4,168.2	{ + 145.5 — 4,355.2*	-0-
Swiss National Bank ...	446.7	{ + 40.4 — 487.1	-0-
Total	4,614.9	{ + 185.9 — 4,842.3*	-0-

Data are on a transaction-date basis.

* Repayments include revaluation adjustments from swap renewals, which amounted to \$41.5 million for drawings on the German Federal Bank renewed during the period.

Table 2

Federal Reserve System Repayments under Special Swap Arrangement with the Swiss National Bank

In millions of dollars equivalent

System swap commitments January 31, 1979	February through April 30, 1979	System swap commitments April 30, 1979
139.3	— 139.3	-0-

Data are on a value-date basis.

Table 3

United States Treasury Drawings and Repayments under Swap Arrangement with the German Federal Bank

In millions of dollars equivalent;
drawings (+) or repayments (—)

Amount of commitments January 31, 1979	February through April 30, 1979	Amount of commitments April 30, 1979
613.0	— 613.3*	-0-

Data are on a transaction-date basis.

* Repayments include revaluation adjustments from swap renewals, which amounted to \$0.3 million for drawings on the German Federal Bank renewed during the period.

and prompting OPEC (Organization of Petroleum Exporting Countries) members to jack up their prices, exchange market sentiment turned bearish for currencies of countries which were most heavily dependent on oil imports for their energy needs. These included Japan, especially, and several European countries. The United States was viewed as better able to cope with oil-supply and price problems, and the dollar was one of the currencies, along with the pound sterling and Canadian dollar, that came into demand as concerns heightened in March and April over the world energy outlook generally.

By that time, also, the market was responding to clear evidence of an improvement in current account positions. In particular, Japan's current account surplus virtually disappeared in the early months of the year. For our part, a rapid acceleration in United States exports and a slowing in import growth led to a further narrowing of the United States trade and current account deficits and bolstered expectations that further progress toward reducing those deficits was likely over the rest of the year. In view of concerns over the price outlook for the United States, indications that the United States economy was cooling down somewhat were taken positively by the market, as was the further firming of United States interest rates by the Federal Reserve when the monetary aggregates began to grow more sharply in April. By the end of the month, the dollar was very strongly bid in the exchange market and the authorities of the United States, Germany, Switzerland, and Japan intervened vigorously to contain the demand pressures. On balance, for the three-month period, the dollar advanced by about 1 percent against the German mark and Swiss franc and by 10 percent against the Japanese yen.

During the period the United States authorities intervened as a seller of foreign currencies only in February. That intervention amounted to some \$656 million equivalent of German marks, Swiss francs, and Japanese yen. The bulk of this intervention—\$535.0 million equivalent—was in marks, of which \$323.5 million equivalent was by the Treasury out of balances and \$211.5 million equivalent was by the Federal Reserve. The System operations in marks were financed partly out of balances and partly by drawings of \$145.5 million equivalent under the swap arrangement with the Bundesbank. The Federal Reserve sold \$45.8 million equivalent of Swiss francs financed by drawings on the swap line with the Swiss National Bank and from balances. For its part the Treasury sold \$24.8 million equivalent of francs from balances. In addition, the Federal Reserve and the Treasury, respectively, sold \$33.8 million equivalent and \$16.6 million equivalent of Japanese yen out of balances. In early March the

Table 4

United States Treasury Securities, Foreign Currency Denominated

In millions of dollars equivalent; issues (+) or redemptions (—)

Issues	Amount of commitments January 31, 1979	February through April 30, 1979	Amount of commitments April 30, 1979
Government series:			
Swiss National Bank	531.2	— 531.2	-0-
Public series:			
Switzerland	1,203.0	-0-	1,203.0
Germany	1,595.2	+1,351.5	2,946.7
Total	3,329.3	{ — 531.2 +1,351.5	4,149.7

Because of rounding, figures may not add to totals.

Data are on a value-date basis.

Table 5

**Net Profits (+) and Losses (—) on United States Treasury and Federal Reserve
Current Foreign Exchange Operations**

In millions of dollars

Period	Federal Reserve	United States Treasury	
		Exchange Stabilization Fund	General account
February 1, 1979 through April 30, 1979	+21.6	+ 4.6	+8.5
Valuation profits and losses on outstanding assets and liabilities as of April 30, 1979	—14.4	—285.3	—0.3

Data are on a value-date basis.

Table 6

**Net Profits (+) and Losses (—) on United States Treasury and Federal Reserve
Liquidations of Foreign Currency Debts Outstanding as of August 15, 1971**

In millions of dollars

Period	Federal Reserve	Exchange Stabilization Fund
February 1, 1979 through April 30, 1979	—123.5	—471.2

Data are on a value-date basis.

Treasury placed another \$1,351.5 million equivalent of mark-denominated notes, bringing the total amount of marks raised in the German capital market to \$2,946.7 million equivalent since December 1978. As with earlier such issues, the Treasury then warehoused the proceeds of this new borrowing with the Federal Reserve.

With the dollar strengthening in the exchanges, the United States authorities bought \$2,218.7 million equivalent of foreign currencies in the New York market. In addition, the United States authorities purchased \$4,972.8 million equivalent of currencies from correspondents, mainly from the Bundesbank and Swiss National Bank in connection with their own sales of dollars. These acquisitions were used by the Federal Reserve and the Treasury to repay all outstanding swap debt to foreign central banks. The Federal Reserve repaid \$4,355.2 million equivalent of mark debt to the Bundesbank, \$487.1 million equivalent of Swiss franc debt to the Swiss National Bank, and \$139.3 million equivalent of pre-August 1971 swap debt to the Swiss central bank. For its part, the Exchange Stabilization Fund (ESF) repaid \$613.3 million equivalent

of marks to the Bundesbank and liquidated \$531.2 million equivalent of pre-August 1971 Swiss franc-denominated obligations. The remaining foreign currency acquisitions were added to System and ESF balances, which rose by \$1,088 million equivalent to \$6,286 million equivalent as of April 30.

During the period under review, the Federal Reserve and the United States Treasury realized net profits from current operations. Table 5 presents these profit figures as well as figures on valuation profits and losses. The table presents the results of ESF operations separately from those of the Treasury general account which issued the foreign currency-denominated securities. The realized profits on current operations reflect liquidation of current swap debts and sales of currencies out of the balances held by the System, the ESF, and the Treasury general account. The valuation profits and losses reflect revaluation of System and Treasury foreign currency assets and liabilities as of April 30. Losses on the final liquidation of pre-August 1971 Swiss franc debts, undertaken to protect the United States gold stock, are shown in Table 6.

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