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Interest Rate Swaps: Risk and Regulation

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Interest Rate Swaps: Risk and Regulation 3

By J. Gregg Whittaker

Bank regulators have become concerned that interest rate swaps are giving rise to new risks for banks. Regulatory agencies propose to limit such risks by ensuring that banks active in the swap market hold adequate capital.

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Policy coordination among the industrial economies has emerged as an issue in discussions of U.S. monetary policy. Though countries can work together to form mutually beneficial policies, substantial obstacles to coordination reduce the likely benefits.

Interest Rate Swaps: Risk and Regulation

By J. Gregg Whittaker

The rapid growth of “off-balance sheet” activities by banks in recent years has given rise to a number of concerns. These activities create commitments for banks that are not reflected on their balance sheets as either assets or liabilities. As a result, it is often difficult for investors, regulators, and even bank managers to determine the risk exposure of banks engaging in such activities. One of the most rapidly growing of these activities is the interest rate swap.

While enhancing financial market efficiency in many respects, interest rate swaps give rise to new risks for banks. Bank regulators are concerned that the role played by banks in the swap market may lead banks to incur too much risk or risk for which they are not adequately compensated. Current regulatory capital requirements for banks apply only to risks arising from a bank’s assets. And since swaps are not considered an asset and

do not affect the balance sheet, they can lead to increased risk exposure without requiring the bank to hold additional amounts of capital. Therefore, the potential may exist for excessive risk-taking and underpricing of this highly leveraged instrument. Bank regulators have recently proposed revising capital guidelines to help control these risks.

The first section of the article explains how interest rate swaps work and documents the recent growth of the swap market. The second section explores the risks of swaps and risk management techniques. The third section discusses proposed regulatory changes and other possible improvements for limiting the risks for banks involved in interest rate swaps.

What are interest rate swaps?

An interest rate swap is a financial transaction in which fixed interest is exchanged for floating interest of the same currency. Swaps were originally liability based exchanges of interest payment streams on debt obligations. More recently, however, asset based swaps have been

J. Gregg Whittaker is an assistant economist at the Federal Reserve Bank of Kansas City. Bryon Higgins, a vice president and economist at the bank, supervised the preparation of the article

arranged as well, exchanges of interest income streams on assets. Swaps are among the most versatile of all financial instruments. They can be used to obtain cheaper funds or to manage interest rate risks. All swaps are based on one central principle: one participant exchanging an advantage in one credit market for an advantage available to another participant in a different credit market. The advantage can be reduced costs or greater availability of funds. Swaps enable borrowers to tap markets where they can obtain the best relative terms and then swap obligations to obtain the desired interest rate structure.

Reasons for swaps

Some interest rate swaps are arranged to reduce borrowing costs through financial arbitrage. There are opportunities for financial arbitrage when borrowing costs for the same borrowers differ across various credit markets. For instance, bond market investors are very concerned about credit quality because they are lending for long periods at a fixed interest rate. Because there is no opportunity to adjust the lending rate to reflect changes in the financial condition of the bond issuer, the yield on fixed-rate bonds typically includes a large risk premium for bonds issued by firms that are perceived as having a relatively high risk of default. The risk premium for such firms is much smaller in floating-rate banking markets where lenders can adjust the lending rate in line with the financial condition of the borrower. Therefore, while a firm with a lower credit rating has a comparative advantage in raising short-term floating-rate debt, a firm with a high credit rating has a comparative advantage in raising long-term fixed-rate debt. As a result, a bond issue in conjunction with an interest rate swap can lower the cost of floating-rate funds for a highly creditworthy company. The lower rated firm that must pay a relatively large premium for borrowing in the bond market can use a swap to

lower its costs by borrowing short-term floating-rate funds and swapping for the fixed-rate payments of the more creditworthy firm.¹

Interest rate swaps can also be used to reduce interest rate risk. For example, savings and loan institutions (S&L's) have traditionally funded fixed-rate mortgage loans with short-term deposits. The danger of this kind of maturity mismatch was demonstrated in the late 1970s and early 1980s by the heavy losses S&L's sustained as a result of the rise in interest rates. An S&L can now swap its floating-rate interest payments on short-term deposits for fixed interest payments, or it could swap its fixed-rate interest income on mortgage loans for floating-rate interest income. By doing so, it better matches the income stream on its assets to the payment stream on its liabilities, thereby reducing the risk of a capital loss due to an unexpected increase in interest rates.

Participants in swap markets

There are two classes of participants in the swap market: end-users and intermediaries. End-users are those who want to swap their interest payment stream for a different type of payment stream. Intermediaries help arrange the swaps, collect and disburse the payments that are swapped, and assume the risk of default by end-users.

A variety of end-users participate in the swap market. International lending agencies were among the first to engage in swaps. Sovereign governments and their agencies also were early participants. Most recently, nonfinancial corpora-

¹ The lower rated firm does, however, incur rollover risk—the risk that its financial condition will deteriorate to the point that short-term financing is either unavailable or available only at higher rates. Even if the firm could continue to borrow, the floating-rate interest it receives in the swap could be insufficient to cover the higher costs of its floating-rate debt.

tions and many financial institutions have begun participating in the swap market as well.

The role of large commercial banks and securities firms as intermediaries has increased in recent years. When the swap market began in the early 1980s, intermediaries served merely as brokers. In arranging swaps between end-users, intermediaries had the obvious disadvantage of having to find end-users with equal but opposite needs. Recognizing the limitation of arranging swaps that required a "double coincidence of wants," intermediaries began playing a larger role.

Intermediaries now maintain inventories of standardized swaps and some even quote prices at which they will buy and sell swaps from qualified end-users. Instead of just arranging swaps between end-users, intermediaries themselves now enter into swaps with end-users even before finding offsetting swaps with other end-users. What may appear to be a single swap between two end-users is actually two swaps in which the intermediary itself has a contractual obligation to each of the end-users. Intermediaries have thus come to play the role of dealers, increasing the liquidity of the swap market and making it more convenient for end-users to arrange swaps.

Intermediaries earn fees for arranging and servicing swaps. The fees depend on the complexity of the swap agreement and, therefore, on the amount of services the intermediary provides. Fees on a standard interest rate swap usually range from 7 to 12 basis points a year but can be higher for more complex swaps, especially those tailored specifically to the needs of the customer. Since swaps are frequently arranged in conjunction with the initial borrowing of funds, the intermediary may cut fees on the swap to get other business from the customer. For example, a bank may charge a lower fee on a swap in exchange for the lead underwriter position in an accompanying Eurobond issue.²

How swaps work

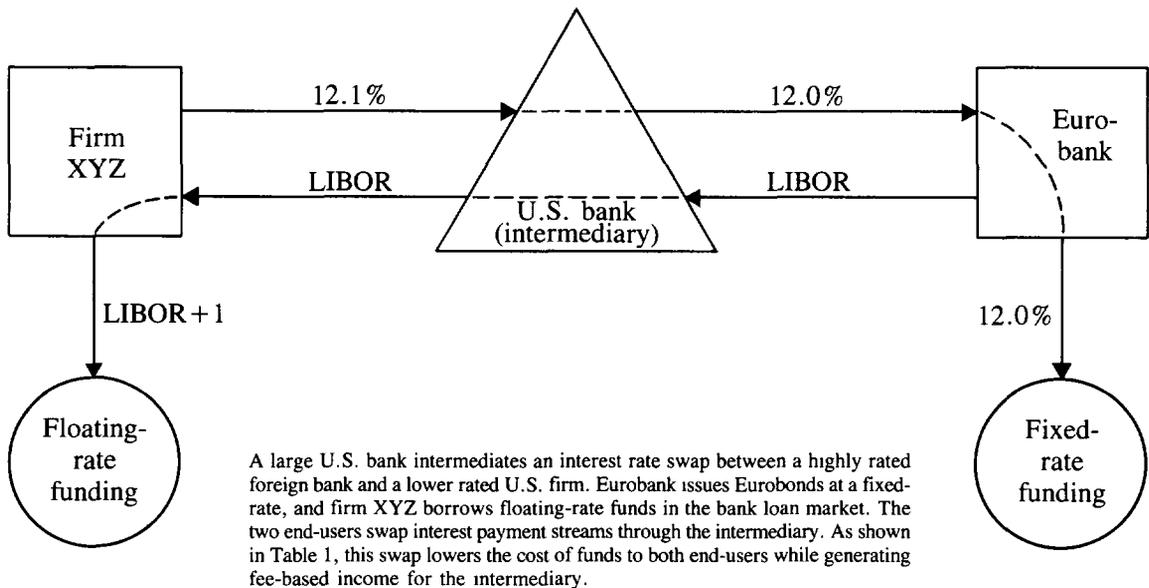
An intermediary can arrange a swap that allows the end-users to reduce their borrowing costs or better match their interest payments with their expected income streams. The interest payments to be swapped are based on a "notional" amount of principal—notional in that the principal is not actually exchanged but merely serves as the basis for calculating the amount each end-user pays. Only the interest payments are swapped.

An example shows how both end-users can benefit from an interest rate swap. Suppose company XYZ, a nonfinancial firm with a low credit rating, seeks fixed-rate dollar funds for a long-term investment project, while Eurobank, a bank that has a high credit rating, seeks floating-rate dollar funds to finance its short-term loan portfolio. Since Eurobank has a higher credit rating than XYZ, it can borrow funds of any type at lower rates than those available to XYZ. Assume company XYZ can borrow floating-rate funds at 1 percent over LIBOR (the London Interbank Offering Rate) while Eurobank can borrow at 0.5 percent over LIBOR. Further assume that Eurobank can borrow at 12 percent in the bond market while XYZ can borrow at a 14 percent fixed rate. While Eurobank has an advantage in both credit markets, it has a greater advantage in one market than in the other. Compared with Eurobank, XYZ must pay a two percentage point premium for fixed-rate funds but only a 0.5 percentage point premium for floating-rate funds. This difference creates a borrowing wedge that can be exploited through an interest rate swap.

Chart 1 shows the mechanics of an interest rate swap. Eurobank issues seven-year fixed-rate Eurobonds at 12 percent, and XYZ takes out a

² A Eurobond is a bond issued outside the confines of any national capital market and may or may not be denominated in the currency of the issuer

CHART 1
Interest rate swap



floating-rate bank loan on which it pays LIBOR plus 1 percent. Eurobank and XYZ then swap interest payments through the intermediary. XYZ pays Eurobank's fixed-rate obligation of 12 percent, plus an intermediation fee of 0.1 percent to the large U.S. bank. Eurobank pays the LIBOR part of XYZ's floating-rate interest payment, leaving XYZ to pay the remaining 1 percent. Thus, Eurobank has a floating-rate obligation to pay the LIBOR rate, while XYZ has a total or "all-in" fixed-rate obligation of 13.1 percent (12 percent + 0.1 percent + 1 percent).

As a result of the swap, both Eurobank and XYZ are able to obtain the interest rate structures they desire and to reduce their borrowing costs. Eurobank is financing its floating-rate loan portfolio with floating-rate funds, while XYZ has locked in the borrowing cost to finance its long-term investment project by swapping for fixed-rate funds. And, as shown in Table 1, both have

done so at reduced costs. The swap enables Eurobank to reduce its cost of floating-rate debt by 50 basis points from LIBOR + 0.5 percent to LIBOR. XYZ's cost of fixed-rate debt has fallen from 14.0 percent without the swap to 13.1 percent with the swap, a savings of 90 basis points.

The intermediary earns an intermediation fee based on the spread between the fixed rate paid and the fixed rate received. Swap prices are quoted as a spread over a fixed-rate index versus a floating-rate index, such as the seven-year Treasury bond rate plus 60 basis points versus the six-month LIBOR rate. The bank gives a bid price to the floating-rate payer and an offer price to the fixed-rate payer. The bid is the fixed rate that the bank pays in a swap and the offer is the fixed rate it receives. In Chart 1, the bid is 12 percent and the offer is 12.1 percent. The intermediary's profit is the offer minus the bid, or ten

TABLE 1
Analysis of swap payments

<u>XYZ's cost</u>		<u>Intermediary's fees</u>		<u>Eurobank's costs</u>	
Payment on debt: LIBOR + 1.0%		Receipt from XYZ: 12.1%		Payment on debt: 12.0%	
+ Payment to intermediary: 12.1%		- Payment to XYZ: LIBOR		+ Payment to intermediary: LIBOR	
- Receipt from intermediary: LIBOR		+ Receipt from Eurobank: LIBOR		- Receipt from intermediary: 12.0%	
= All-in-cost: 13.1%		- Payment to Eurobank: 12.0%		= All-in-costs: LIBOR	
		= Total Fees: 0.1%			
<u>XYZ's saving</u>				<u>Eurobank's saving</u>	
Best fixed-rate alternative: 14.0%				Best floating-rate alternative: LIBOR + 0.5%	
- Cost with swap: 13.1%				- Cost with swap: LIBOR	
= Total saving: 0.9%				= Total saving: 0.5%	

basis points in this example. Thus, the intermediary earns a profit by arranging a swap while both of the end-users obtain funds at a lower cost.

Growth of swaps

The swap market has grown rapidly in recent years. Virtually nonexistent as late as 1981, the interest rate swap market worldwide grew to about \$170 billion of notional principal outstanding by the end of 1985 and to between \$350 and \$400 billion by the end of 1986.³ Thus, interest rate swaps have become an important part of the global capital market.

This rapid growth has been due to several factors. A major cause of the dramatic growth has been the increased demand for protection against interest rate risk. Heightened interest rate volatility has caused bank customers to try new techniques for matching the interest rate exposures of their assets and their liabilities. Increased com-

³ Data for 1985 were taken from the International Swap Dealers Association (ISDA) 1985 annual survey. Preliminary data for 1986 were kindly provided by Kenneth McCormick, cochairman of the ISDA. Since the 1986 annual survey has not been completed, the 1986 data are based on quarterly statistical data gathered throughout the year by the ISDA.

petition also has stimulated innovation. Worldwide deregulation in the banking industry has increased the competition banks face on all sides, at home and abroad. Competition has been further stimulated by technological advances in telecommunications and computer systems that have increased international financial mobility. As a result, banks have tried to find new ways of generating income, while borrowers have sought lower borrowing costs and protection from interest rate risk.

Risks and risk management

The role of banks as intermediaries in swap transactions has exposed them to new and varied risks. The risks arise because, under certain circumstances, swaps can cause banks to suffer capital losses. There is also concern that banks may be underpricing their services and are not being adequately compensated for the risks they bear. However, banks have developed methods for limiting the risks involved in intermediating swaps.

Intermediation of a swap requires that the bank enter into a financial contract with each of the end-users. In the example above, the U.S. bank that arranges the swap between company XYZ and Eurobank has a contractual obligation to each. Instead of the two end-users agreeing to exchange interest payments with one another directly, they each enter into separate contracts with the U.S. bank acting as the intermediary. Firm XYZ agrees to pay the U.S. bank a fixed-rate stream of payments in exchange for the floating-rate stream from the bank, and Eurobank agrees to pay the U.S. bank a floating-rate stream of payments in exchange for the fixed-rate stream from the U.S. bank. Neither end-user has any obligation to the other. They may not even know the other's identity. The intermediary, in effect, enters into two separate contracts that are offsetting except for the fee earned for serving as the intermediary.

Their role as intermediaries between end-users in interest rate swaps exposes banks to two types of risk, price risk and credit risk.

Price risk

Price risk occurs from banks "warehousing" swaps—from arranging a swap contract with one end-user without having arranged an offsetting swap with another end-user. Until an offsetting swap is arranged, the bank has an open swap position and is vulnerable to an adverse change in swap prices.

The most common reason for a change in swap prices is a change in interest rates—a change that could cause the bank to suffer a loss on its swap. For example, if the bank has an open swap in which it pays XYZ a variable interest rate in exchange for a fixed interest rate, an increase in market interest rates would lead to an increase in the payments the bank makes but no change in the payments it receives. In this case, the bank incurs a capital loss just as it would if it were funding long-term fixed-rate loans with floating-rate deposits. Banks warehouse only a small amount of swaps relative to the total amount of swaps outstanding, however. As a result, only a small portion of a bank's total swap portfolio is subject to price risk.

Banks hedge to limit the price risk of an open swap. The predominant means of hedging is to offset an open swap position through the purchase or sale of Treasury securities. A bank that is a fixed-rate payer in an open interest rate swap can limit the interest rate risk of that position by buying a Treasury security whose price will change by the same amount as the price of the swap, but in the opposite direction. With this hedge, an unexpected change in interest rates will not affect the market value of the banks' overall portfolio because the resulting change in the price of the swap will be offset by a corresponding change in the price of the Treasury security. Because buy-

ing Treasury securities outright requires the bank to commit capital, however, banks often use the futures market rather than the cash market to hedge their open swap positions with maturities short enough to be offset with a futures contract.⁴

Although hedging through use of Treasury securities is widespread, it is difficult to entirely offset the risk of an open swap position in this way. It is difficult to design a position in Treasury securities—cash or futures—that exactly offsets the interest rate risk of a swap. In practice, banks can offset only a portion of the price risk of a swap through hedging in the Treasury securities market. For this reason, banks are usually reluctant to have substantial open swap positions on their books for long periods.

Credit risk

Credit risk is the main concern of regulators and banks. Banks' credit risk exists on all swaps in which the bank is the intermediary between two end-users. Suppose a bank enters into two perfectly matched, offsetting swaps with XYZ and Eurobank. If interest rates change, the value of one swap will fall while the value of the other rises by an equal amount, providing the bank with a hedge against price risk. But if one of the end-users defaults, the bank loses the hedging value of the offsetting swap and may suffer a capital loss.

Consider again the previous example where the bank pays fixed-rate interest to Eurobank in exchange for floating-rate interest, while the bank pays floating-rate interest to XYZ in exchange for fixed-rate interest. If interest rates fall and XYZ subsequently defaults, the bank is left with an obligation to continue making the agreed upon fixed-rate payments to Eurobank, but is now

receiving less in floating-rate payments. On the other hand, suppose that Eurobank, the floating-rate payer, defaults after interest rates have risen. The bank is now left with an obligation to pay XYZ the higher floating rate, but continues to receive the same fixed rate. In both cases, the bank serving as intermediary would incur a capital loss. Changes in interest rates, therefore, can cause losses on banks' swap activities even if the bank immediately offsets one swap with another. Because losses can be incurred in this case only if one of the end-users defaults, this type of risk is called credit risk.

Two of the most critical aspects of managing credit risk in the swap market are the banks' pricing procedures and the degree of portfolio diversification. Banks must make sure that the price of the service they provide adequately reflects the risk inherent in the arrangement. Just as investors demand a higher yield on bonds issued by a firm with a Baa credit rating than on commercial paper issued by a firm with a Aaa credit rating, banks must charge more for long-term swaps with end-users that have a low credit rating than for short-term swaps with end-users that have a high credit rating. In both cases, the risk of entering into a financial contract varies directly with the length of the contract and the creditworthiness of the other party to the contract. An individual risky swap need not endanger the financial position of the bank as long as the bank is adequately compensated for the risk and has diversified its swap portfolio so that default by any one customer or group of customers does not substantially impair the bank's earnings or capital position.

The credit risk of interest rate swaps can also be limited by the enforcement of strict credit standards. Perhaps the most important means of limiting risk is to enter into swaps only with credit-worthy customers. Typically, the credit department of a bank must agree to the swap before the contract is made. Moreover, banks ordinarily monitor the customer's financial position through-

⁴ See *Recent Innovations in International Banking*, Bank for International Settlements, April 1986, p. 48.

out the life of the swap. Banks may require less creditworthy customers to post collateral or use other credit enhancements that further reduce the risk to the bank in case of a default. The amount of protection collateralization provides is uncertain, however, because the legal status of collateral posted against swaps has not been tested in court. And as the swap market continues to grow, regulators are concerned that credit standards may deteriorate as banks try to accommodate more and often less creditworthy customers.

Regulation of swaps

Regulators are concerned about the risks involved in swap intermediation. However, prohibiting bank participation in the swap market could reduce financial market efficiency. To strike a balance, regulators are studying ways to impose capital requirements on banks' swap activities.

Reasons for concern

Even though banks have developed methods of limiting the risks of swaps, concerns have been expressed about the effect swaps have on the safety of banks and the soundness of the financial system. Some of these concerns result from the rapid growth of swaps. The \$400 billion increase in interest rate swaps over the past six years raises questions about whether end-users, financial regulators, and the banks themselves fully understand the risks inherent in swaps. The questions are even more troublesome because nearly all the growth has occurred during a period of declining interest rates. The risk characteristics of interest rate swaps may change when interest rates increase. Moreover, a recession could cause financial stresses that could lead to defaults on swaps with a cumulative effect on the financial position of intermediaries. Although such issues cannot be resolved now, planning for such adverse circumstances seems wise.

Another concern is that banks, possibly unfamiliar with the full range of risks that could be encountered, may be too aggressive in pricing interest rate swaps. Only if the financial institutions offering new financial instruments fully understand the risks inherent in those instruments can the pricing fully reflect the risks. However, given the disagreements among the banks themselves regarding the appropriate means of measuring risk and pricing swaps, regulators are concerned that banks may be underpricing their services. The interest rate swap market has become so competitive in recent years that the margins for banks acting as intermediaries have been substantially reduced. There is a fear that to gain market share in interest rate swaps, intermediaries may be underpricing the services they provide—that the return for intermediating interest rate swaps may not be commensurate with the risks.

This concern is exacerbated by existing strains on the banking system caused by losses from loans to less developed countries, energy firms, and the agricultural and real estate sectors. Losses incurred in traditional banking business may make some banks overzealous in trying to earn fees from off-balance sheet activities. The temptation to do so is more acute because the deposit insurance system, which bases insurance fees on total assets rather than on the risk of the activities, can encourage excessive risk-taking by banks.⁵ Although there is no evidence that banks engaging in swaps have suffered substantial losses as a result of these activities, there is a danger that new entrants into the swap market or existing participants in adverse financial circumstances might be too aggressive in seeking out new swap business to compensate for losses in traditional lending activities.

⁵ For a detailed discussion of the moral hazard problem, see William R. Keeton, "Deposit Insurance and the Deregulation of Deposit Rates," *Economic Review*, Federal Reserve Bank of Kansas City, April 1984.

A further concern arises from the nature of swaps themselves. Interest rate swaps can change the risk exposure of end-users or intermediaries. This capability can be used to reduce interest rate risk by hedging existing assets or liabilities. But the same capability also could be used to speculate on future movements in interest rates. A bank that had a "view" on the direction of interest rate movements could use the highly leveraged method of entering into unmatched interest rate swaps to bet the money of shareholders, uninsured depositors, and the deposit insurance system in the hope of earning large profits. But the counterpart of the chance for making large profits is the risk of incurring large losses. For example, a bank that believes that interest rates will rise could easily take an open position in which it is the fixed-rate payer on a substantial amount of swaps. If interest rates were to subsequently fall, however, the bank would suffer a significant capital loss.

Financial market safety and efficiency

One possible response to such concerns about the effect of interest rate swaps on the safety and soundness of the banking system could be for regulators to prohibit bank participation in the swap market altogether. However, such an outright prohibition would place banks at a disadvantage relative to securities firms in competing for the business of corporate customers with increasingly complex needs to raise funds in capital markets. Large bank holding companies are engaging increasingly in a wide range of capital market activities, both in the domestic credit markets and in foreign markets. Inability to offer interest rate swaps in conjunction with borrowing in Eurodollar markets, for example, could erode banks' earnings from capital market services for their customers. Moreover, inability to provide a full range of services could impair long-standing customer relationships between banks and corporate customers.

Prohibiting banks from participating in interest rate swaps could also reduce the safety of financial markets. Interest rate swaps can contribute to the safety of financial markets by providing a means of hedging interest rate risk. Financial futures contracts do not ordinarily extend beyond two years. Therefore, interest rate swaps provide the most efficient method for both financial and nonfinancial businesses to guard against the adverse effects of interest rate volatility.

Swaps can also enhance the efficiency of financial markets by allowing banks to "unbundle" risks that have traditionally been inseparable, allowing risks to be redistributed to those best able to bear them. For instance, end-users can use swaps to manage the interest rate risk of their portfolios and transfer the credit risk of the swap itself to the intermediary, who may be in a better position to manage the credit risk.⁶ More generally, swaps can be used to improve the efficiency of financial markets by reducing borrowing costs. Borrowers can use swaps to improve the terms of loans and increase the availability of funds by tapping a wider range of credit markets.⁷

Proposed regulation

To strike a balance between concern over the risk of interest rate swaps and recognition of the valuable functions swaps serve, the bank regu-

⁶ While swaps may improve the efficiency of financial markets, they may also increase the risk borne by the banking system by transferring credit risk from the end-users to the banks as discussed in the preceding section.

⁷ Moreover, several studies suggest that long-term fixed-rate financing may create incentives for low-rated firms to underinvest and shift from low-risk to high-risk investments. Short-term floating-rate financing eliminates these adverse tendencies but exposes firms to interest rate risk. Interest rate swaps eliminate both problems. See Larry D. Wall, "Interest Rate Swaps in an Agency Theoretic Model with Uncertain Interest Rates," Federal Reserve Bank of Atlanta Working Paper 86-6.

latory agencies have proposed regulatory changes to help control the risks from swaps. The Board of Governors of the Federal Reserve System has requested public comment on a proposed risk-based capital framework for banks and bank holding companies.⁸ The proposal is the result of an agreement between the U.S. bank regulatory agencies and the Bank of England. Goals of the proposal include making regulatory capital requirements more sensitive to differences in the risk of banking institutions and assessing capital requirements on certain off-balance sheet activities, such as interest rate swaps.

Under the proposal, banks will be required to hold capital against assets and certain off-balance sheet commitments in proportion to each item's credit risk. The proposed measure, which will supplement existing capital adequacy ratios, imposes a minimum ratio of adjusted primary capital to total risk-weighted assets. The face amount of off-balance sheet items is multiplied by a "credit conversion factor." The resulting amount, along with on-balance sheet assets, is assigned to one of five risk categories according to the relative risk of each asset. A designated percentage of each asset, depending on the risk category to which it is assigned, will be included in calculating risk-weighted assets, which in turn will be used to help determine the capital requirements of the bank.

Regulators are currently evaluating ways of incorporating the risk from swap activities into the proposed measure. Among the issues being considered is how best to convert the credit risk of a swap into an on-balance sheet credit equivalent that can be incorporated into the proposed framework for setting minimum capital requirements for banks.⁹

⁸ Federal Reserve Board proposal, Docket No. R-0567.

⁹ Assessing the degree of risk to banks from their swap activities is difficult, though. The amount of exposure is certainly much

Additional means of limiting risk

Cooperation among the banking regulatory agencies and the Securities and Exchange Commission, which regulates securities firms, regarding new capital guidelines is desirable for controlling the risk of swaps. In addition to commercial banks, large securities firms also play a major role in the swap market. The recent risk-based capital proposal does not apply to securities firms, however, even though the interrelationships among major swap dealers ties the safety of individual swap portfolios to one another. Consequently, regulatory changes for commercial banks alone may not be adequate to ensure that risk in the swap market is properly controlled. Moreover, more stringent requirements for banks than for securities firms raise questions about how level the playing field is for providing financial services.

More complete and more uniform disclosure of risk from swaps would also be desirable. The rules pertaining to the disclosure of banks' swap activities do not ensure adequate reporting of the risks involved. Any activity that may have a "material effect" on the financial condition of the bank should in principle be disclosed in the footnotes of the bank's financial statements. But many accountants in the United States apparently

less than the amount of notional principal involved in swaps. Swaps do not involve the risk of the loss of principal but only the risk of being obligated to pay a higher interest rate than is received. Moreover, most swaps are offsetting so that no risk is involved if interest rates change unless one of the end-users defaults. And banks can use interest rate swaps as a hedge against other interest-sensitive assets or liabilities. Furthermore, credit risk in the swap market may not be as extensive as some fear. Unlike default on a conventional loan, the default of an end-user may have no adverse effects on a bank at all. The default of an end-user does not generally lead to a loss for the bank if interest rates do not change, since the bank could enter into another swap on the same terms and restore the lost payment flows. And if interest rates do change, the default of an end-user is just as likely to benefit the bank—by allowing the bank to enter into a new swap on better terms—as to cause a loss.

do not consider swaps to be material and do not include them in the financial statements accessible to the general public. As a result, disclosure of the magnitude of swap activities and of the resulting risk exposure is currently lacking.¹⁰

Heightened reporting standards would help ensure that swaps do not cause undue risks. The Financial Accounting Standards Board's emerging issues task force is currently considering the problems posed by off-balance sheet activities, including swaps, and is expected to propose accounting modifications. Modifying standards to require that the effect of swaps on a bank's interest rate sensitivity, liquidity, and credit exposure could also help regulators and investors assess a bank's strength.¹¹ U.S. banks since 1983 have been required to disclose the amount of off-balance sheet activities, including swaps, in their financial statements filed quarterly with bank regulatory agencies, and many banks have voluntarily increased disclosures of swaps and other off-balance sheet activities in their annual reports. But disclosing the amount of swap activity is not in itself sufficient to determine the degree of risk associated with that activity.

Uniformity of reporting standards is, therefore, also necessary. Unless banks adhere to uniform reporting standards, increased disclosures alone may be insufficient to end the confusion regarding off-balance sheet risk. Bankers and bank regulators should agree on a set of disclosure and exposure measurement standards for swaps. An industry-sponsored dictionary of off-balance sheet risk analysis has been suggested by some. One obvious measure to be used uniformly for

disclosure of swap-related exposure is the exposure measurement that will ultimately be used by bank regulatory agencies for capital adequacy purposes. Such actions would serve to reduce confusion and enhance market safety.

Self-regulation in the swap market is another complementary way of dealing with risk. The commercial banks and securities firms most actively engaged in the swap market have formed an organization to standardize the terms of swap contracts and ensure good business practices in the swap market.¹² This organization is the International Swaps Dealers Association (ISDA). While the ISDA has made substantial progress, the methods of measuring and pricing risk still vary widely among swap market participants. Moreover, internal controls, such as prompt completion of swap documentation, are inadequate at times. Continued progress by the ISDA in resolving these and other problems would further reduce the risks in the swap market and reaffirm the commitment of swap market participants to the safety of financial markets.

Conclusion

Swaps are now an integral and generally beneficial part of the financial system. These activities are the result of a number of factors, including increased competition in banking and increased demands for protection from interest rate risk. Swaps offer banks an attractive array of fee-generating and portfolio management techniques, but also expose banks to new and varied risks. The leverage capacity of swaps—and other concerns—has caused bank regulatory agencies to consider these activities for inclusion in a risk-based capital adequacy proposal.

¹⁰ For a further discussion of accounting for interest rate swaps, see *Recent Innovations in International Banking*, Bank for International Settlements, April 1986, pp. 57-59.

¹¹ See Kenneth F. Cooper, "Coming to Grips with Off-Balance Sheet Risks," *The Bankers Magazine*, November-December 1985.

¹² International Swap Dealers Association, Inc., *Code of Standard Wording, Assumptions and Provisions for Swaps*, 1985.

International Policy Coordination In an Interdependent World

By *George A. Kahn*

A new issue has entered discussions of U.S. monetary policy. The issue is whether any particular policy action by the Federal Reserve will be part of a coordinated effort by the major industrial countries or whether the Federal Reserve will act alone. This issue has surfaced with the ballooning U.S. trade deficit, increased concerns over the exchange value of the dollar, and the realization that the policy actions of one country can affect economic outcomes in other countries. For example, a unilateral easing of monetary policy in the United States might cause the foreign exchange value of the dollar to fall and lead to an increase in U.S. inflation. On the other hand, coordinated reductions in U.S. and foreign interest rates might preserve the exchange value of the dollar and stimulate both U.S. and foreign production.

This article examines the advantages and difficulties of macroeconomic policy coordination

among the large industrial countries. Policy coordination can be roughly defined as the process by which two or more countries establish mutually beneficial macroeconomic policies. The types of policies considered are monetary and fiscal policies that affect aggregate demand under floating exchange rates.¹ The overall stance of demand management policy and the mix of fiscal and monetary policy affect domestic economic performance, exchange rates, and foreign economic performance. Through international policy coordination, the foreign effects of domestic policy might be orchestrated to improve economic performance in all participating countries.

The first section of the article describes efforts at policy coordination since the breakdown of the Bretton Woods era of fixed exchange rates. The second section analyzes the channels of macroeconomic policy interdependence and discusses

George A. Kahn is a senior economist at the Federal Reserve Bank of Kansas City.

¹ Other policies, such as trade, regulatory, and exchange market intervention policy may, nevertheless, serve as bargaining chips for desired macroeconomic policy actions.

the benefits of policy coordination. It examines the circumstances under which international policy coordination can improve the economic performance of participating countries. The third section describes the difficulties of coordinating policies. If policy coordination is mutually beneficial, why have the policies of the United States and its allies not been better coordinated? The article concludes that while there are potential gains from coordination, there are so many obstacles to coordination that full exploitation of these gains is unlikely.

Recent policy coordination efforts

During the Bretton Woods era of fixed exchange rates, from 1944 to 1971, the interaction of national macroeconomic policies was guided by a rule. Each country conducted its monetary policy so that the exchange value of its currency remained fixed relative to the U.S. dollar. Aside from occasional exchange rate realignments, the primary policymaking discretion held by countries other than the United States was over fiscal policy. Policy coordination, therefore, took the form of U.S. stabilization leadership. Foreign monetary authorities responded to U.S. policy actions by defending the value of their currency against the U.S. dollar.²

With the introduction of floating exchange rates in 1973, the coordination of national monetary policies was no longer governed by the rule that countries fix the exchange value of their currencies in terms of the dollar. Rather, coordination became more a matter of discretion and negotiation. Because floating exchange rates freed monetary policy to pursue domestic economic

objectives, international policy coordination was advocated to ensure that the disparate policies of many countries led to desired outcomes. The result has been more frequent demands for policy coordination and more frequent meetings by policymakers to negotiate the coordination of national macroeconomic policies.

Efforts at policy coordination resulting from the economic turbulence of the 1970s and early 1980s have been at best only partially successful. Immediately after the oil shock of 1973, for example, the main industrial countries committed themselves to avoiding restrictive policies that would cut each other's imports. In particular, the Rome communique on Reform of the International Monetary System and Related Issues (the Committee of Twenty) in January 1974, "stressed the importance of avoiding competitive depreciation and the escalation of restrictions on trade and payments."³ These restrictive policies would have had the effect of transmitting trade deficits to partner countries and, if pursued by all partners, exacerbating the world recession. Though the coordinated effort was fairly successful in preventing deflation and depreciation, as well as import restrictions, it did not keep most major industrial countries from switching to more restrictive monetary and fiscal policies. Nor did it prevent the worldwide recession that followed the 1973-74 oil price shock.⁴

Later, in response to the recession of 1974-75, the Carter administration advocated the "locomotive approach" to international macroeconomic policy. This call for international cooperation, formalized in an agreement at the Bonn

² For a discussion of this issue, see Roland Vaubel, "Coordination or Competition Among National Macro-economic Policies?" in *Reflections on a Troubled World Economy*, Fritz Machlup and others, eds., Macmillan, London, 1983, pp. 3-28.

³ John Williamson, "The International Financial System," in *Higher Oil Prices and the World Economy: The Adjustment Problem*, Edward Fried and Charles Schultze, eds., Brookings, Washington, D.C., 1975, p. 210.

⁴ Edward Fried and Charles Schultze, eds., *Higher Oil Prices*, pp. 22-24.

summit of 1978, required the major countries to stimulate their domestic economies to spur worldwide recovery. In particular, Japan and West Germany agreed to fiscal expansion of their economies in return for deregulation of U.S. oil markets.⁵ While the Bonn agreement has been called “the principal example of a macroeconomic policy package adopted by the major economies,” the cooperation it fostered was short lived.⁶

Another oil price shock in 1979 caused inflation and unemployment to rise in most countries. With rising inflation, as well as rising internal and external deficits, governments adjusted policies to counter inflationary pressures. Toward the end of the resulting world recession in late 1982, many economists and policymakers proposed a coordinated stimulation of the major world economies. Helmut Schmidt, for example, argued for close coordination of monetary, fiscal, and incomes policies to prevent a further contraction of the world economy and provide stimulus for recovery.⁷ His and other calls for coordination, however, were rejected.⁸ Martin Feldstein stated the U.S. position as follows: “. . . a shift toward more expansionary policies in the current context could be counter-productive, adding to

inflation in the short term and undermining the sustainability of the recoveries that are now getting under way.”⁹

Efforts to coordinate policy intensified in the mid-1980s. The record of these more recent efforts also has been mixed.¹⁰ Since September 1985, representatives of the United States and other major industrial countries have held a series of discussions on policy coordination. These discussions have focused mainly on interest rates and the exchange value of the U.S. dollar. Although exchange market intervention falls outside the scope of policy options analyzed in this article, recent discussions on exchange rate realignment set the stage for later monetary policy discussions and, therefore, were important in the recent evolution of policy coordination.¹¹ In some instances, the discussions directly resulted in lower interest rates and declines in the value of the dollar. In other instances, international discussions yielded few concrete results.

In September 1985, the finance ministers and central bankers from the G-5 countries—France, Japan, the United States, the United Kingdom, and West Germany—met at New York’s Plaza Hotel against the backdrop of a strong U.S. dollar and a spate of protectionist trade bills circulating in Congress. The result of the Plaza meeting was an announcement of multilateral support for a reduction in the foreign exchange value of the

⁵ Robert Putnam and C. Randall Henning, “The Bonn Summit of 1978: How Does International Economic Policy Coordination Actually Work?” *Brookings Discussion Papers in International Economics*, No. 53, October 1986.

⁶ Gilles Oudiz and Jeffrey Sachs, “Macroeconomic Policy Coordination Among the Industrial Economies,” *Brookings Papers on Economic Activity*, 1984:1, pp. 1-2.

⁷ Helmut Schmidt, “The Inevitable Need for American Leadership,” *The Economist*, February 26, 1983, pp. 19-30.

⁸ See, for example, Valery Giscard D’Estaing, “For a Useful Summit,” *The Economist*, May 21, 1983, pp. 15-18, and C. Fred Bergsten and Lawrence R. Klein, “The Need for a Global Strategy,” *The Economist*, April 23, 1983, pp. 18-20.

⁹ Martin Feldstein, “Signs of Recovery,” *The Economist*, June 11, 1983, p. 43.

¹⁰ For a summary of recent policy coordination efforts, see Reuven Glick, “International Policy Coordination,” *FRBSF Weekly Letter*, Federal Reserve Bank of San Francisco, June 13, 1986.

¹¹ Excess exchange rate volatility may be symptomatic of a lack of macroeconomic policy coordination. If so, exchange market intervention treats only the symptoms and not the cause of improperly aligned national macroeconomic policies.

dollar. Foreign exchange markets reacted immediately. Although the dollar was already depreciating against most major currencies, the fall in the value of the dollar was temporarily accelerated. Evidence suggests, nevertheless, that the dollar fell no faster in the nine months after the Plaza meeting than it had in the preceding six months.¹²

The G-5 countries met again in January 1986. With the value of the dollar down some 20 percent since the Plaza accord, high interest rates and sluggish economic growth became the prime concerns. Although the meeting produced agreement on the desirability of lower interest rates, there was no immediate concerted response. In March, however, the United States, Japan, West Germany, and some other European countries simultaneously cut their discount rates by one-half a percentage point. To avoid the risk of exchange rate depreciations, France and the United Kingdom chose not to participate. Later, in April, the United States and Japan again lowered their discount rates by another half percentage point. This time, fearful of putting upward pressure on inflation, Germany did not participate. Thus, while some coordination has been achieved recently, domestic concerns have sometimes prevented full cooperation. Concerted action seems possible only when national economic priorities do not outweigh international concerns.

The next significant effort at policy coordination was undertaken at the widely heralded Tokyo summit of May 1986. At this meeting, the G-7 countries—the G-5 countries plus Canada and Italy—agreed on the desirability of continued coordination of national economic policies.

Among the objectives cited at the summit were noninflationary economic growth and job creation. To achieve these goals, participants agreed “that there should be close and continuous coordination of policy among the seven summit countries.” Furthermore, the participants expressed approval for previous efforts by the G-5 countries to realign exchange rates and lower interest rates. They also agreed that “additional measures should be taken to ensure that procedures for effective coordination of international economic policy are strengthened further.”¹³

Participants at the Tokyo summit stopped short of specific policy recommendations. Instead, they agreed “to review their economic objectives and forecasts at least once a year . . . to ensure their mutual compatibility . . . taking into account indicators such as GNP growth rates, inflation rates, interest rates” and other economic variables.¹⁴

After the Tokyo summit and up until late October, little evidence existed to suggest an atmosphere of increased international cooperation. While the Federal Reserve lowered its discount rate twice, other countries—Japan and West Germany most notably—declined to follow suit. Substantial jawboning by Federal Reserve and Treasury officials failed to lead to concerted policy actions. Only in late October did an atmosphere of cooperation reemerge when the United States and Japan announced a joint policy package. Japan agreed to stimulate its economy by, among other actions, a one-half percentage point cut in its discount rate. For its part, the United States agreed that the dollar had fallen against the yen to a level “broadly consistent with present

¹² Martin Feldstein, “New Evidence on the Effects of Exchange Rate Intervention,” National Bureau of Economic Research Working Paper No. 2052, October 1986.

¹³ *Tokyo Economic Declaration*, as quoted by Gottfried Haberler in “The International Monetary System,” *The AEI Economist*, July 1986, p. 6.

¹⁴ Haberler, p. 6.

underlying fundamentals.”¹⁵ Both countries agreed to cooperate in dealing with several global economic issues, including exchange market efficiency, world economic growth, and trade imbalances.

While the United States has had some recent success in coordinating its economic policy with Japanese policy, U.S. and West German views on economic policy remain somewhat divergent.¹⁶ Why has policy coordination been so widely advocated but so rarely practiced? The next two sections discuss the benefits and difficulties of achieving internationally coordinated macroeconomic policy.

Channels of macroeconomic interdependence and the scope for policy coordination

Foreign trade in both goods and capital exposes the U.S. economy to international disturbances. This exposure constrains policy choices and influences the way policy actions affect the U.S. economy. It implies that policy actions and economic disturbances in the U.S. economy have international repercussions and that foreign economic policy and disturbances have domestic effects. To examine the channels of policy interdependence, this section first analyzes the foreign effects of domestic policy actions. Specifically, the foreign effects of a fiscal expansion are compared with

the foreign effects of a monetary expansion. Then, the domestic effects of foreign fiscal and monetary policy actions are examined through the implications of a change in the foreign interest rate.¹⁷ The appendix more formally explains the assumptions and mechanisms needed to derive the results.

Foreign effects of domestic policy

The two broad categories of demand management—fiscal and monetary policy—differ in their influence on foreign economies. A purely fiscal expansion causes the exchange value of the domestic currency to appreciate and, thereby, reduces net exports. When domestic net exports fall, foreign net exports rise. Thus, expansionary fiscal policy stimulates both foreign and domestic production. A purely monetary expansion, on the other hand, causes the exchange value of the domestic currency to depreciate and, thereby, increases net exports. When domestic net exports rise, foreign net exports fall. Thus, expansionary monetary policy stimulates domestic production but depresses foreign production.

A fiscal expansion raises domestic income directly and indirectly raises foreign income. An increase in government spending or a decrease in taxes increases domestic aggregate demand and interest rates. It also increases the capital account balance and tends to generate a balance of payments surplus as higher domestic interest rates attract foreign capital. Although higher income induces more imports, the higher interest rate induces relatively more capital inflows. Thus, there is an excess supply of foreign exchange as

¹⁵ “U.S. and Japanese Vow to Cooperate in Economic Moves,” *New York Times*, November 1, 1986.

¹⁶ This article was written before the February 1987 meeting of the finance ministers of the United States, West Germany, Japan, France, the United Kingdom, and Canada. Participants at the meeting agreed “to cooperate closely to foster stability of exchange rates around current levels.” West Germany agreed to increase a tax cut scheduled for January 1, 1988. And Japan promised to prepare “a comprehensive economic program... to stimulate domestic demand.”

¹⁷ The effect of one country’s economic policy on another country depends partly on the size of the two economies. Because the United States is large relative to other countries, the influence of any one particular country on the U.S. economy may be empirically small. However, the influence of a group of countries may be more significant. Note that the United States can be viewed from the perspective of either the domestic or foreign economy.

economic agents attempt to sell more foreign currency than is being willingly bought at the original exchange rate. The excess supply of foreign exchange causes the exchange value of the domestic currency to appreciate. The price of imports, therefore, falls, and the price of exports rises. As consumers and producers substitute away from domestic goods into less expensive foreign goods, net exports fall. This reduction in net exports offsets part of the initial increase in income and interest rates.

Because of the openness of the economy, part of the increase in income generated by a stimulative fiscal policy is "crowded out" by a reduction in net exports. Thus, the domestic output effect of fiscal expansion is less stimulative in an open economy than in a closed economy. The government sector gains in the distribution of domestic output at the expense of the export, import-competing, and interest-sensitive sectors. With the domestic interest rate rising relative to the foreign interest rate, capital is attracted from foreign countries, the capital account surplus widens, and interest-sensitive domestic spending falls. At the same time, foreign production increases to satisfy increased domestic demand for imports. Thus, a purely fiscal expansion raises income at home and abroad. The domestic fiscal stimulus generates a "locomotive effect" that pulls foreign income up along with domestic income. This locomotive effect lay behind the Carter administration's call for foreign fiscal expansion in the 1970s and underlies the Reagan administration's recent calls for fiscal reform in West Germany and Japan.

A monetary expansion, in contrast, raises domestic income directly but indirectly lowers foreign income. An increase in the money supply increases domestic aggregate demand and lowers domestic interest rates. It also decreases the capital account balance which tends to generate a balance of payments deficit. Although higher income induces more imports, a lower

interest rate induces greater capital outflows, causing an excess demand for foreign exchange. The excess demand for foreign exchange results in a depreciation of the exchange value of the domestic currency. Therefore, the price of imports rises, and the price of exports falls. As consumers and producers substitute away from imported goods into less expensive domestically produced goods, net exports rise. This increase in net exports further increases domestic aggregate demand and causes the interest rate to rise, partially offsetting its initial decline.¹⁸

Because of the openness of the economy, the increase in income caused by stimulative monetary policy is augmented by an exchange rate-induced increase in net exports. This increase in domestic net exports causes the net exports of foreign countries to drop and leads to a contraction of foreign income. The lower domestic interest rates also generated by monetary expansion stimulate interest-sensitive spending, primarily investment. Lower domestic interest rates relative to foreign interest rates cause an outflow of capital from the domestic economy to foreign economies and a worsening of the capital account balance. Thus, a purely monetary expansion raises income at home but reduces income abroad. The domestic income effect is magnified, however, by the induced increase in net exports.

Domestic effects of foreign policy

Foreign monetary and fiscal policy actions affect domestic economic performance in an open economy. For example, an easing of foreign monetary policy, brought about by an increase

¹⁸ Under the assumptions of marginal propensities to consume and import between zero and one and a marginal tax rate between zero and one, the final equilibrium interest rate will necessarily be lower than the initial equilibrium interest rate. For other details, see the Appendix.

in the foreign money supply, reduces the foreign interest rate. A tightening of foreign fiscal policy also reduces the foreign interest rate. Either way, the reduction in foreign interest rates increases the attractiveness of domestic assets relative to foreign assets, and capital flows into the domestic economy. The capital inflow increases the capital account balance and tends to generate a balance of payments surplus that causes the exchange rate to appreciate. As the price of imports falls relative to the price of exports, domestic net exports and production decline. Thus, an easing of monetary policy or a tightening of fiscal policy in foreign economies causes domestic income to fall. Similarly, a tightening of foreign monetary policy or loosening of foreign fiscal policy raises foreign interest rates and raises domestic income.

Scope for policy coordination

By taking the foreign effects of domestic macroeconomic policy actions into account, policy coordination can potentially result in better macroeconomic outcomes. In the context of this article, policy coordination occurs when countries take discretionary policy actions that would not otherwise be taken to achieve goals that are not purely domestic. Two types of policy coordination can be distinguished, depending on whether coordination is necessary to achieve domestic goals. Coordination is necessary if domestic policymakers have more economic goals than instruments. If, on the other hand, policymakers have more instruments than goals, coordination can improve foreign economic performance without impinging on domestic objectives. For example, if full employment is the only goal and monetary and fiscal policy are the only two instruments, domestic policy alone can achieve the domestic goal. But if the number of goals is increased or the number of instruments is reduced, international policy coordination may be needed to achieve domestic goals.

Coordination with more instruments than goals.

When there are more instruments than goals, exclusive use of domestic fiscal and monetary policy can achieve domestic objectives and offset foreign disturbances.¹⁹ Coordination may still be called for, however, if other countries are constrained from achieving their objectives by having too few instruments or if adjusting policy instruments becomes increasingly costly as adjustments get larger. Examples of policy changes that might involve increasing costs include changes in tax rates, the money supply, and government spending. Such changes tend to impose legislative, administrative, transactions, and uncertainty costs that may increase at increasing rates. With increasing costs of adjustment, even a country with more instruments than goals can be made better off if coordination can be used to make smaller adjustments to its policy instruments. Thus, by enabling domestic policymakers to make smaller, less costly, changes in economic policy or by directly contributing to foreign economic performance, policy coordination can make foreign economies better off and the domestic economy no worse off.

To understand how domestic policy can improve foreign performance, consider a simplified model where the United States represents one country and the “Rest of the World” represents the only other “country.” Suppose that full employment is the goal of both countries. If both the United States and the Rest of the World undertake policy actions that point toward full employment abroad, as well as at home, U.S. and foreign economic policy will work together in the same direction. Each country will be able to move closer toward its domestic goal with smaller

¹⁹ This assumes an activist’s paradise with no uncertainty about lags and other factors in the transmission of policy actions to the economy.

adjustments to policy instruments than if it had acted unilaterally. Furthermore, if one country is constrained by a lack of policy instruments, the other country can contribute toward attaining the goals of the instrument-constrained country. The particular policy package adopted will depend on the state of employment in the two countries.

If the United States and the Rest of the World are in recession, fiscal expansion in both is an appropriate cooperative policy. If the United States pursues expansionary fiscal policy to increase domestic income and employment, it does so to the benefit of the Rest of the World. Net exports by the United States will fall and net exports by the Rest of the World will rise as expansionary U.S. fiscal policy causes the U.S. dollar to appreciate. Unemployment abroad will fall as the recession in the Rest of the World is eased. Thus, part of the gain in U.S. income goes to foreign countries. Expansionary U.S. fiscal policy not only increases income in the United States but also helps pull the Rest of the World out of recession.

Expansionary monetary policy, on the other hand, is an inappropriate policy. If the United States pursues expansionary monetary policy in the face of worldwide recession, U.S. income is stimulated at the expense of foreign economies. In this case, the resulting depreciation of the U.S. dollar increases U.S. net exports and decreases the Rest of the World's net exports. The decrease in foreign net exports causes a contraction of foreign income and production. Thus, part of the gain in U.S. income comes at the expense of the Rest of the World—an effect appropriately called a “beggar thy neighbor” policy. To offset this internationally transmitted policy shock, as well as to combat the pre-existing recession, foreign policymakers must provide a larger, more costly, policy stimulus than otherwise.

Other combinations of policy are required for cooperative outcomes when starting from dif-

ferent economic conditions. For example, if the United States is in an over-full employment equilibrium—a boom—but the Rest of the World remains in recession, contractionary monetary policy in the United States will restrain U.S. production while, at the same time, stimulating foreign production. This result follows from contractionary monetary policy causing an appreciation of the U.S. dollar and an increase in U.S. imports. Alternatively, if the United States starts from a position of recession and the Rest of the World starts from a position of boom, an appropriate, cooperative policy would be for the United States to engage in expansionary monetary policy and the Rest of the World to engage in restrictive monetary policy.

Coordination with more goals than instruments. When policymakers have more goals than instruments, they may not be able to achieve their goals without the cooperation of other countries. Policy coordination represents a way to increase indirectly the number of instruments and, thereby, to achieve goals that are otherwise unattainable.

Suppose, for example, that the United States is in an under-full employment equilibrium and that the real interest rate and federal budget deficit are high. Because of the high level of interest rates, investment is weak and the capital account is in surplus. The capital account surplus, in turn, implies a current account, or trade, deficit. If policymakers want to stimulate investment and reduce the trade deficit, they must lower domestic interest rates. To lower interest rates to the desired level and attain full employment income might normally require a relatively large increase in the money supply and a relatively small decrease in the government budget deficit. But because of an unwillingness to raise taxes or significantly cut government spending, even a slightly tighter fiscal policy is considered unavailable. What can be done?

Because policymakers have two goals—income and interest rates—and only one instrument—the

money supply—policy coordination is required. Domestic monetary policy can generate an increase in the money supply broadly consistent with the desired interest rate and full employment income. However, it cannot ensure that nonmonetary factors are similarly consistent with desired income and interest rates. At best, monetary policy, acting alone, can achieve only one goal. With domestic policy constrained, policymakers must seek foreign cooperation to achieve domestic goals. If the United States can convince other countries to lower their interest rates through, say, stimulative monetary policies, both goals of U.S. economic policy can potentially be attained. Only through international coordination can policymakers determine a level of aggregate spending that, together with domestic monetary policy, generates the desired combination of interest rates and income. The likelihood of foreign cooperation clearly increases if the foreign economy benefits from the joint policy action.

The situation just described is similar to the current state of the U.S. economy. Persistent large budget deficits, caused by an unwillingness to increase taxes or cut spending, constrain fiscal policy. At the same time, domestic production is sluggish and the trade deficit is at a record high. Expansionary monetary policy is needed to stimulate production and reduce the trade deficit. If U.S. policymakers unilaterally ease monetary policy, however, the U.S. economy could overheat as the reduction in domestic interest rates relative to foreign interest rates depreciates the dollar. On the other hand, if foreign policymakers reduce their interest rates partially in line with U.S. interest rates, the tendency for the dollar to depreciate can be partially offset and an overheating of the U.S. economy can be prevented.²⁰

²⁰ This coordinated policy might also be appropriate if depreciation-induced inflation is a concern.

Thus, at least in a simple model, partner countries can design policies that work together to achieve better economic performance.

Difficulties of policy coordination

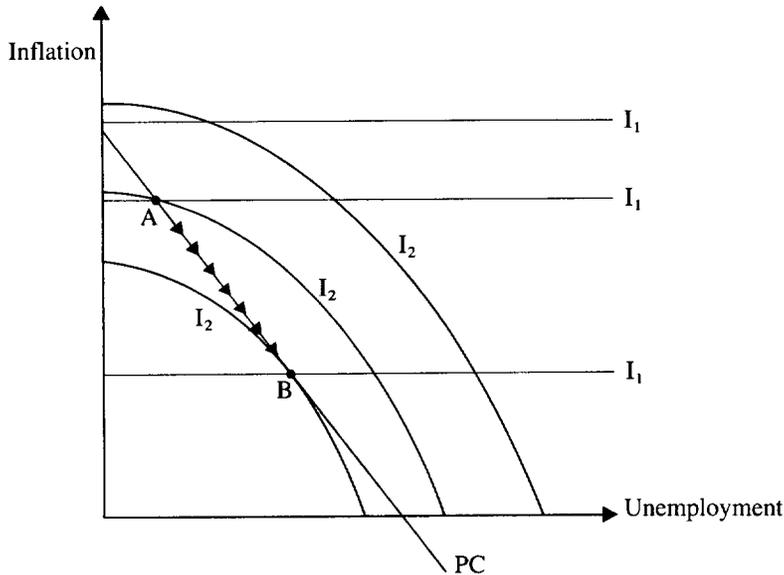
Because the world is more complicated than the model underlying the previous analysis, policy coordination is easier to advocate than to implement. Understanding why policy coordination is difficult requires going beyond the simplifying assumptions of the underlying model and analyzing other issues. For example, relaxing the assumption of a fixed price level creates an additional policy objective and presents a complicated policy dilemma. In particular, the objective of low inflation may conflict with the objective of lower unemployment, at least in the short run. Dealing with this and other problems requires going beyond the analytical framework of the previous section.

There are at least four reasons why policy coordination may be difficult or inadvisable. First, different countries may have different preferences regarding economic goals. Second, economic structures may differ across countries so that policies that work for one country do not work for another country. Third, because economists' understanding of the relationships between economic performance and policy tools is weak, economic models may differ across countries. Fourth, strategic interplay between central banks and economic agents may impart an inflationary bias to an economy under internationally coordinated policy.

Differing preferences

If countries differ in their preferences for economic outcomes, the scope for policy coordination narrows. It is often claimed, for example, that West Germany has a greater distaste for inflation than some other countries. If so, Ger-

FIGURE 1
Differing preferences



many might be reluctant to participate in any coordinated policy that carried a risk of greater inflation. Moreover, this reluctance could persist even if Germany's economy is structurally identical to the economies of less inflation-disliking countries. Thus, even if Germany is no more (or less) inflation prone than any other country, its distaste for inflation might limit its willingness to engage in policy coordination.

Figure 1 illustrates the problem that differences in preferences pose for international coordination. Inflation is represented on the vertical axis, and unemployment is represented on the horizontal axis. The line PC represents a tradeoff between inflation and unemployment available in the short run to policymakers.²¹ The line is negatively sloped under the assumption that any short-run reduction in unemployment achieved through macroeconomic policy carries the cost of higher inflation. Each of two countries is assumed to

have the same tradeoff between inflation and unemployment and, to isolate the effects of differing preferences, the same response to coordinated policy actions.

The lines labeled I_1 and the curves labeled I_2 represent indifference curves between inflation and unemployment for the two countries. The horizontal lines, I_1 , indicate that while the first country is indifferent to unemployment, it dislikes inflation. Thus, lower lines represent higher social welfare for the first country. The concave curves, I_2 , for the second country indicate that the second country dislikes both inflation and unemployment and that it is willing to accept higher unem-

²¹ PC stands for "Phillips Curve"—a short-run inverse relationship between inflation and unemployment.

ployment only in return for a reduction in inflation. Again, lower curves are associated with higher social welfare since they generally imply lower inflation and unemployment.

Starting from the same position, A, both countries would be made better off by moving down the PC line toward point B. As inflation falls, country 1 is made better off because it prefers lower inflation. The concomitant increase in unemployment does not matter since country 1 is indifferent to unemployment. As inflation falls, country 2 is also made better off since it is willing to tolerate some higher unemployment for a decrease in inflation. Country 2's willingness to trade unemployment for inflation, however, stops at point B. At that point, country 2 is unwilling to move in either direction along the PC line. Thus, both countries will accept a coordinated policy that takes them from point A toward point B. Once at point B, however, no further coordinated actions can take place since they would make one country worse off. Although country 1 would like to see still lower inflation and would agree to moves further down the PC line, country 2 will not participate. Differing preferences for inflation and unemployment prevent further policy coordination.

Differing economic structures

Even with identical preferences for economic outcomes, policy coordination may be difficult if countries have differing economic structures. One structural difference that might limit the scope for policy coordination is the extent to which countries exhibit short-run tradeoffs between inflation and unemployment. It has been often hypothesized that the U.S. economy exhibits a short-run inflation-unemployment tradeoff, such as that shown in Figure 1, while most European economies and Japan do not.²² One explanation for an inflation-unemployment tradeoff in the United States is that long-term U.S. labor con-

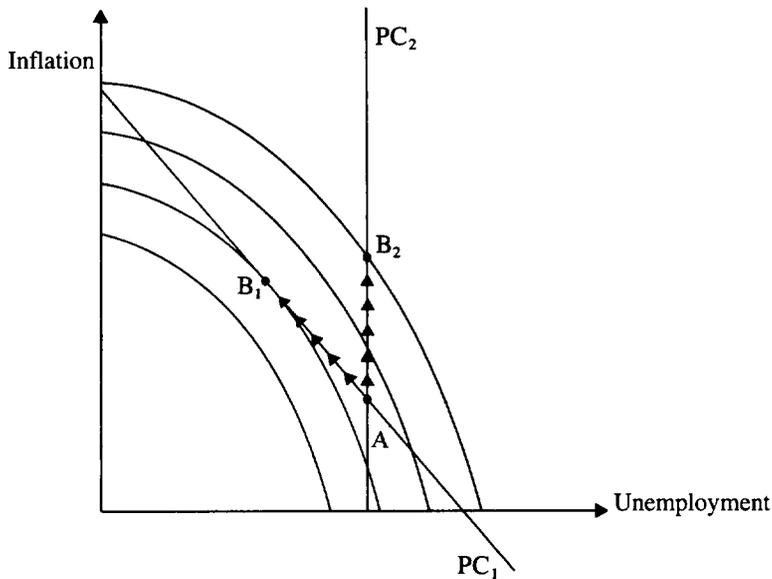
tracts keep wages from fully adjusting to inflation. Because of resulting real wage fluctuations, unemployment tends to fall in the short run in response to an increase in inflation. In Europe and Japan, however, shorter contracts allow real wages and unemployment to remain fairly constant. Thus, no matter what the inflation rate, unemployment in those countries remains largely unchanged.

Figure 2 shows how structural differences interfere with policy coordination. Lines PC_1 and PC_2 represent two possible inflation-unemployment tradeoff lines for two hypothetical countries. Line PC_1 shows a structural relationship that allows lower inflation only at the expense of higher unemployment. Such a tradeoff line might characterize the United States. Line PC_2 shows a structural relationship in which the rate of inflation is independent of the rate of unemployment. A vertical line such as PC_2 might characterize the economies of West Germany or Japan, where lower inflation can potentially be bought without higher unemployment. The curved lines represent the two countries' identical preferences for inflation and unemployment. Preferences are assumed identical to isolate the effect of differing economic structures on the feasibility of policy coordination. As drawn, the indifference curves reflect a distaste for both inflation and unemployment. Therefore, lower curves represent higher levels of social welfare.

Starting from point A, consider a coordinated policy that increases aggregate demand and moves each country up to point B on its PC line. From

²² For a discussion of this hypothesis, see George A. Kahn, "Wage Behavior in the United States: 1907-80," *Economic Review*, Federal Reserve Bank of Kansas City, April 1983, pp. 16-26, and George A. Kahn, "International Differences in Wage Behavior: Real, Nominal, or Exaggerated?" *American Economic Review Papers and Proceedings*, May 1984, pp. 155-159, and the references cited therein.

FIGURE 2
Differing structures



country 1's perspective, such a move would be desirable since point B₁ is on a lower indifference curve than point A. However, country 2 would not agree to such a move since point B₂ on PC₂ is a less desirable inflation-unemployment combination. For country 2, increased aggregate demand generates higher inflation with no reduction in unemployment and places the economy on a higher (less preferred) indifference curve. Thus, policy coordination affects countries with different economic structures very differently. Structural differences may make it difficult for countries to agree on coordinated policy.

Differing economic models

Even with similar preferences and economic structures, policy coordination will have limited scope if policymakers in different countries use different theoretical or econometric models in

forecasting and policy analysis. Because of an incomplete and imperfect understanding of economic structures, economists and policymakers have developed many alternative models of the world economy. No model is perfect, and some models are inevitably wrong. Regardless of which model is best, however, divergent models lead to differences in economic forecasts.²³ Therefore, they increase the cost of reaching consensus in any effort to coordinate policy. Higher costs of coordination reduce the net benefits and likelihood of coordination.

Not only do diverging economic models increase the cost of negotiation, they also limit the benefits of negotiation. If policymakers in dif-

²³ Alan Blinder makes this point in the context of domestic monetary and fiscal policy coordination in "Issues in the Coordination of Monetary and Fiscal Policy," *Monetary Policy Issues in the 1980s*, Federal Reserve Bank of Kansas City, 1982, pp. 17-18.

ferent countries each use different and inaccurate economic models, policy coordination may actually worsen economic performance.²⁴ In other words, when policymakers hold differing economic theories, they may be better off not cooperating. The superiority of noncooperation in this instance comes from the idea of checks and balances. If many alternative models exist and no one can be certain which is the “best” model, actions by countries with the better models might offset the ill-advised actions of countries with less accurate models. On these grounds, a case can be made for noncooperation.

Strategic considerations

Even if policymakers have similar preferences, face similar economic structures, and use reliable economic models, policy coordination may not improve economic performance. Because policy coordination can impart an inflationary bias to monetary policy, international coordination may increase inflation without reducing unemployment.

The inflationary potential of coordinated policy follows from the strategic interplay of central banks and economic agents.²⁵ For example, when economic agents commit themselves to fixed nominal wage contracts, it becomes possible for monetary authorities to lower real wages and unemployment temporarily by unexpectedly increasing the inflation rate. Once economic agents catch on to this “game,” however, they

²⁴ Jeffrey Frankel, “The Sources of Disagreement Among the International Macro Models and Implications for Policy Coordination,” National Bureau of Economic Research Working Paper No. 1925, May 1986. See also Blinder, “Issues in the Coordination of Monetary and Fiscal Policy.”

²⁵ Kenneth Rogoff, “Can International Monetary Policy Coordination be Counterproductive?” *Journal of International Economics*, May 1985, pp. 199-218.

build inflation premiums into their wage contracts. The economy can experience higher inflation without any long-run reduction in unemployment. Surprisingly, international coordination enhances the likelihood of such an outcome.

If policy is not coordinated, flexible exchange rates limit the ability of central banks to exploit short-run inflation-unemployment tradeoffs. Expansionary monetary policy that increases inflation causes the exchange value of the domestic currency to depreciate. A depreciation of the exchange rate increases inflation and unemployment, however, if wages are indexed to inflation or if imported goods are inputs to domestic products. Wage-setters realize the inflation and output effects of depreciation and moderate demands for higher nominal wages.

Under cooperative monetary policy, however, an increase in money growth by one country generally compels other countries to increase their money growth. If national monetary policies are eased simultaneously, currency depreciation will not occur. “Cooperation thus forces wage setters to set a higher rate of nominal wage growth in order to ensure that the central banks will ratify their target real wage.”²⁶ The result is higher inflation with no reduction in unemployment. Thus, in some circumstances, coordination can lead to inferior outcomes.

Summary and conclusions

Policy coordination can be beneficial, but for a variety of reasons, it can also be difficult to implement. In the current economic environment, the major world economies could benefit from lower interest rates, but there are substantial risks to using monetary policy, coordinated or not, to obtain interest rate reductions. If, for example,

²⁶ Rogoff, p. 204.

the United States acts unilaterally, it runs the risk of a sharp depreciation of the dollar and an increase in inflation. If it acts in concert with the other major economies, policymakers run the risk of losing their anti-inflation credibility. Nevertheless, in the current low-inflation environment, joint interest rate reductions might increase world

production without setting off an inflationary spiral. The trick, of course, will be to overcome the substantial obstacles to coordination. Because of such obstacles as different economic preferences, structures, forecasts, and models, fully exploiting potential gains from coordination may, in practice, prove difficult.

Appendix

This appendix develops a standard open economy macro model that illustrates channels of international interdependence and establishes the potential scope for policy coordination. By developing a model, it is possible to highlight a set of assumptions and mechanisms that lead to the international transmission of domestic policies. The model can then be used to show how national macroeconomic policies can potentially be coordinated to improve world economic performance. In particular, the model summarizes the assumptions and transmission mechanisms used to obtain the results in the article.

Open economy IS-LM model

The theoretical framework employed is an open economy version of the IS-LM model.²⁷ In developing the model, familiarity with the closed economy IS-LM model is assumed, and the standard IS-LM model is extended to the open economy. In this extended model, the economy is represented by three markets and three equilibrium conditions. The first market is the real goods and services sector. Equilibrium in this

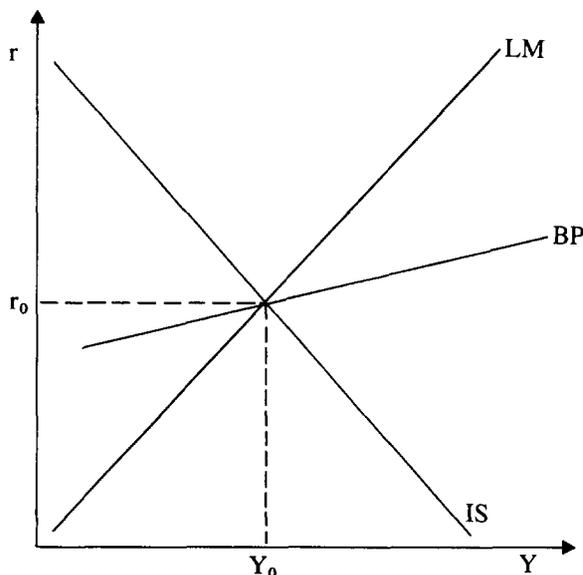
market is attained when savings plus the government budget surplus equals planned domestic investment plus net exports. The second market is the money market. Equilibrium in the money market occurs when money demand equals the given level of money supplied. The third market is the international sector. Equilibrium in this market obtains when the current account balance offsets the capital account balance so that the overall balance of payments is zero. Each of these equilibrium conditions can be represented as a relationship between real national income and the real interest rate.²⁸

Goods and services sector. The goods and services, or commodity, sector is characterized by the IS curve. As in the closed economy IS-LM model, the open economy IS curve represents combinations of real income and interest rates that satisfy equilibrium in the commodity market. The open economy IS curve, however, is less negatively sloped than the closed economy IS curve. In an open economy, lower interest rates not only stimulate interest-sensitive spending but also lead to an exchange rate depreciation. A depreciation of the exchange rate, in turn, stimulates net

²⁷ For a textbook treatment of this model, see Rudiger Dornbusch, Stanley Fischer, and Gordon Sparks, *Macroeconomics*, 2nd Canadian edition, McGraw-Hill, Toronto, 1985, chapter 6, pp. 197-220.

²⁸ The price level is held fixed in the open economy IS-LM model. This assumption, while unrealistic, simplifies the analysis and may be relevant for the short run.

FIGURE A.1
Overall equilibrium



exports. And because net exports are a component of real GNP, real income rises. Thus, while a negative relationship between income and the interest rate characterizes both the open and closed economy IS curves, the open economy IS curve, shown in Figure A.1, is flatter than its closed economy counterpart.

The position of the open economy IS curve depends not only on factors that determine the position of the closed economy IS curve but also on exchange rates, exports, and autonomous imports—imports not dependent on income. Any change in exchange rates or autonomous spending, therefore, shifts the IS curve. For example, by increasing the price of imports relative to exports, a depreciation of the exchange rate leads to an increase in net exports and a rightward shift of the IS curve. By reducing the price of imports relative to exports, an exchange rate appreciation leads to a reduction in net exports and a leftward

shift in the IS curve. Increases in autonomous net exports shift the IS curve to the right, while decreases in autonomous net exports shift the IS curve to the left.

Monetary sector. The monetary sector is summarized by the LM curve, which represents combinations of real income and interest rates consistent with financial market equilibrium. Under the assumption of flexible exchange rates, the open economy LM curve, as shown in Figure A.1, is identical to the closed economy LM curve. Equilibrium in the money market implies that high interest rates are associated with high income. Furthermore, as in the closed economy model, changes in the supply of money shift the LM curve.

International sector. The final equilibrium condition is international balance of payments. The balance of payments equals the current account balance plus the capital account balance. The cur-

rent account measures the value of net exports, while the capital account measures the net flow of financial assets into the economy from foreign countries. A balance of payments surplus (or deficit) must equal the sum of the current and capital account surpluses (or deficits). When the balance of payments is zero, any current account surplus (deficit) must be exactly offset by a capital account deficit (surplus). In equilibrium, the balance of payments is zero.

The equilibrium condition for the balance of payments is summarized by the BP curve, which represents combinations of real income and interest rates that give rise to a zero balance of payments. It slopes upward because as income rises, imports rise, leading to a worsening of the current account deficit. To maintain a zero balance of payments, capital must be attracted from foreign countries to offset the increase in the current account deficit. For capital to be attracted, however, the domestic interest rate must rise relative to the given foreign interest rate. Thus, higher real income is associated with higher domestic interest rates. As in Figure A.1, the BP curve slopes upward.²⁹

The BP curve is drawn for a given level of autonomous net exports and the exchange rate. Any change in exports, autonomous imports, or the exchange rate causes the BP curve to shift. An increase in exports at any particular level of income, for example, tends to improve the current account. To maintain a zero balance of payments requires an offsetting capital outflow and, therefore, a decline in the domestic interest rate. Thus, at any income level, balance of payments equilibrium is associated with a lower interest rate, and the BP curve shifts downward. The BP

curve also shifts downward as a result of a decline in autonomous imports. It shifts upward with a decline in exports or an increase in autonomous imports.

Changes in the exchange rate affect the position of the BP curve through their influence on net exports. By lowering the price of imports relative to the price of exports, an appreciation of the exchange rate causes net exports to fall. As a result, the BP curve shifts upward. On the other hand, by raising the price of imports relative to the price of exports, a depreciation of the exchange rate causes net exports to rise and the BP curve to shift downward.³⁰

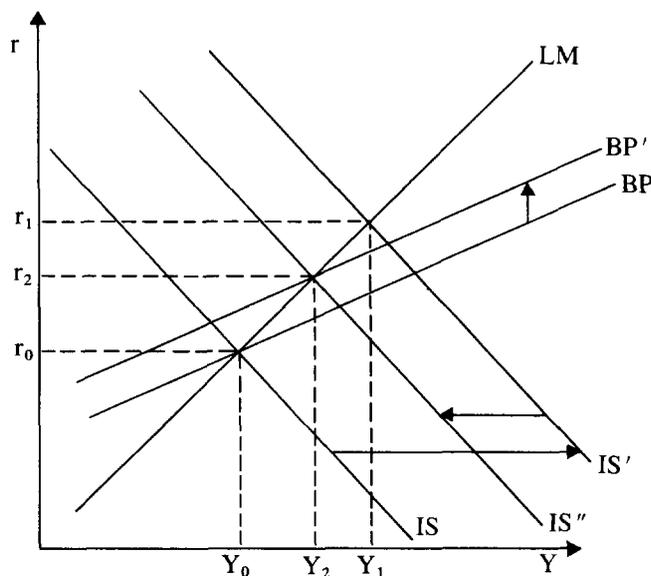
The position of the BP curve also depends on the given level of foreign interest rates. If the foreign rate of interest rises, then at every point along the initial BP curve, there will be an associated balance of payments deficit. This is because domestic assets will become less attractive at every level of income. To achieve balance of payments equilibrium, the domestic interest rate must rise at every level of income and, therefore, the BP curve must shift upward. Similarly, a decline in the foreign rate of interest causes the BP curve to shift downward.

Overall equilibrium. The overall equilibrium of the economy can be determined by combining the IS, LM, and BP curves. In Figure A.1, this equilibrium is represented by the intersection of IS, LM, and BP at income level Y_0 and interest rate r_0 . If the economy is not operating initially at the intersection of the three curves, conditions of excess supply or demand in one or more markets will move income, interest rates, and exchange rates in the direction that equilibrates the economy. While exchange rate flexibility ensures an eventual balance of payments

²⁹ The slope of the LM curve is assumed to be steeper than the slope of the BP curve. This assumption is valid if the marginal propensity to import is relatively low and there is a relatively high degree of capital mobility.

³⁰ The analysis is static and abstracts from response lags. Thus, it ignores the "J-curve" phenomenon that has been important in recent policy discussions.

FIGURE A.2
Pure fiscal expansion



equilibrium, there is no guarantee in the model that equilibrium will produce a full employment level of income.³¹

Policy analysis

When the economy is away from full employment—when the IS, LM, and BP curves intersect at an income level that does not correspond to full employment—fiscal and monetary policy can be used to bring the economy back toward full employment. The domestic effects of purely fiscal and monetary expansions are illustrated in Figures A.2 and A.3. The domestic effects of foreign fiscal and monetary policy are examined in Figure A.4.

³¹ Balance of payments disequilibrium can be maintained temporarily if the central bank defends the exchange value of the domestic currency.

Figure A.2 illustrates the case of a purely fiscal expansion. Initial equilibrium occurs at income level Y_0 and interest rate r_0 . An increase in the government budget deficit causes the IS curve to shift rightward to IS' . Income initially rises to Y_1 , and the interest rate rises to r_1 . The increase in the budget deficit, however, creates a balance of payments surplus. The resulting excess supply of foreign exchange causes the exchange value of the domestic currency to appreciate and net exports to fall. This reduction in net exports is associated with a leftward shift in the IS curve, from IS' to IS'' . At the same time, the reduction in net exports causes the BP curve to shift upward and leftward to BP' . Final equilibrium occurs at income level Y_2 and interest rate r_2 .

Figure A.3 illustrates the effect of a purely monetary expansion. Initial equilibrium occurs at income level Y_0 and interest rate r_0 . An increase in the money supply causes the LM curve to shift

FIGURE A.3
Pure monetary expansion

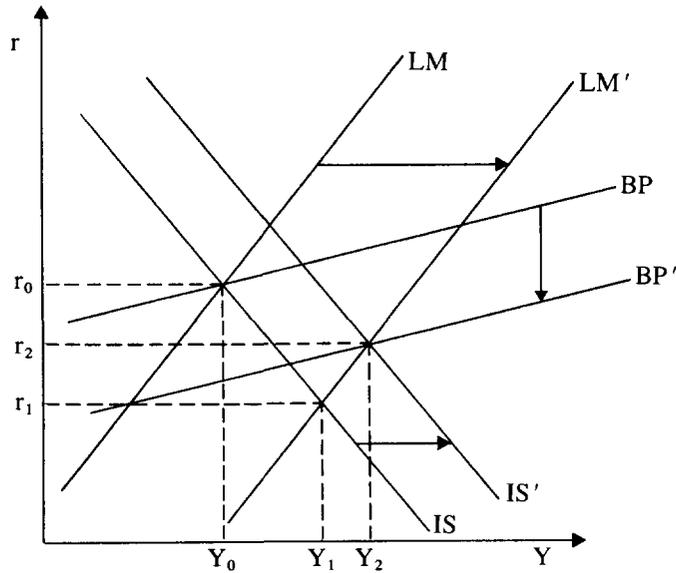
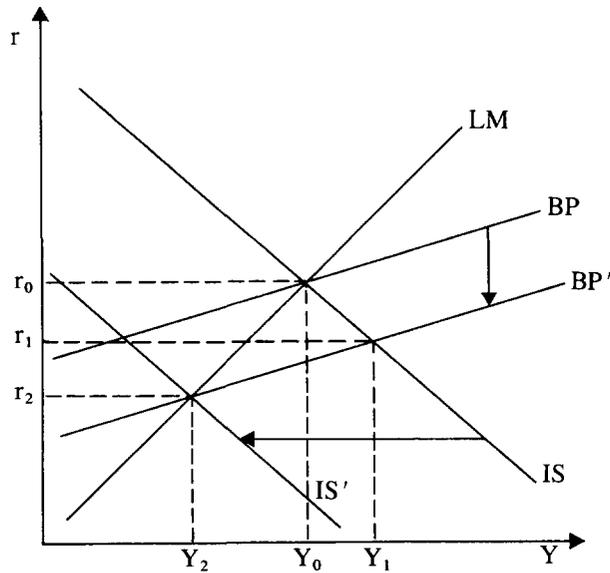


FIGURE A.4
Decline in the foreign interest rate



to the right from LM to LM'. Income initially rises to Y_1 , and the interest rate falls to r_1 . The increase in the money supply, however, creates a balance of payments deficit. The resulting excess demand for foreign exchange causes the exchange value of the domestic currency to depreciate and net exports to rise. This increase in net exports is associated with a rightward shift in the IS curve, from IS to IS'. At the same time, the increase in net exports causes the BP curve to shift downward and to the right to BP'. Final equilibrium occurs at income level Y_2 and interest rate r_2 .

In the open economy IS-LM model, foreign economic policy affects domestic economic performance. Figure A.4 illustrates the effect of a reduction in the foreign interest rate on the domestic economy. Because the position of the BP curve depends on the foreign interest rate, a change in the foreign interest rate causes the BP curve to shift. In particular, a decline in the foreign rate of interest—caused by either an easing of foreign monetary policy or a tightening of foreign fiscal policy—creates a balance of payments surplus at every point along the original BP curve and, therefore, causes the BP curve to shift downward to BP'. But because the IS and LM curves now intersect at a point above the new BP curve, an excess supply of foreign exchange exists. The resulting appreciation of the exchange rate causes domestic net exports to fall and the

IS curve to shift leftward to IS'. Final equilibrium occurs at the intersection of IS', LM, and BP', that is, at income level Y_2 and interest rate r_2 . Domestic income and interest rates are now lower than they were originally even though domestic policy remains unchanged.

Policy coordination

Policy coordination is necessary when the number of economic goals exceeds the number of instruments. If, for example, the money supply is the only instrument available to policymakers and income and interest rates are both goals, policy coordination will be required. Given a desire to raise income and reduce interest rates at home, domestic policymakers may have to convince foreign policymakers to lower foreign interest rates if the domestic goals are to be attained. An increase in the domestic money supply can generate an LM curve that passes through the point associated with the desired interest rate and full employment income. Foreign economic policy can then be exploited to position the IS and BP curves to intersect the new LM curve at the desired level of income and interest rates. In this way, international policy coordination can be used to achieve domestic goals that are otherwise unattainable. The likelihood of foreign cooperation increases, of course, if the foreign economy benefits from the joint policy action.

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