

Interdependence, Exchange Rate Flexibility, And National Economies

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Over the past 20 years, economic relations among countries have been marked by an increasing degree of interdependence. A rapid expansion has occurred in the quantity of goods and financial assets traded across international borders and these trade and capital flows have become quite sensitive to differences in price and interest rate levels. As a result of the growth of international transactions, countries have benefited greatly in the form of larger output through more efficient use of productive inputs.

The rise in interdependence, however, has made it increasingly difficult for a national economy to follow a path that is not consistent with worldwide economic conditions. That is, the costs of greater international trade and interdependence have been increased vulnerability to disturbances arising in other countries and a possible reduction of national autonomy in deciding on levels of domestic prices and economic activity. As a reaction, governments have increasingly accepted greater flexibility in their exchange rates in the hope that they might obtain better control of internal economic targets.

The growth of interdependence and exchange rate flexibility has important implications for the performance of a national economy. For one, the effectiveness of traditional monetary and fiscal tools in an open economy is greatly influenced by the type of exchange rate system in operation. Even the channels

through which these policies affect aggregate demand may be different when foreign trade and capital flows are important. Greater interdependence and exchange rate flexibility also affect how an economy will react to an economic event in another country.

This article explores some of the more important conceptual implications of the growth in interdependence and the move to flexible exchange rates. Monetary and fiscal policy actions are examined both for their effects in the country initiating such actions and for their **impact** on other countries of the world. Also **examined** is the impact that an abrupt shrinkage in the supply of an important commodity will have on countries importing that commodity. The consequences of these events will be compared under systems of fixed and flexible exchange rates. Throughout, it will be assumed that the markets for goods and services and credit are highly integrated. In such an environment, small deviations from the world levels of prices or interest rates will elicit very large flows of goods or capital moving from an area of low yield or price to one in which high yield or price prevails.¹

¹/This does not imply that price and interest rate levels cannot be changed by the actions of a large country which purchases a significant portion of world output, only that eventually the same prices or interest rates—at whatever level—will prevail throughout the world. No explicit distinction is made between stock and flow adjustments to price or yield changes. It is assumed that the stock adjustment is so large and persists for so long that in the intermediate term considered by this article it can be treated as a flow adjustment.

MONETARY DISTURBANCE

Fixed Exchange Rates

When exchange rates are fixed, a monetary policy disturbance involving a change in the money stock at home or abroad tends to have little effect on income in its country of origin.² This is especially true of small countries with limited foreign exchange reserves. If the monetary authorities in such a country were to attempt to increase its money stock, they would first purchase securities so as to provide more bank reserves. The security purchase and money stock increase would put downward pressure on interest rates and cause capital to leave the country.³ To prevent the exchange rate from falling below its fixed rate, the government of the expanding country must then meet the resulting new demand for foreign exchange with sales of its international reserves. This action, however, would reduce the reserves of the banking system and cause the money stock to contract. Hence, the initial increase in the money stock would tend to be offset by its subsequent decline. The monetary authorities might try to maintain a higher money stock level by continuously injecting new reserves into the banking system. They would find, though, that their ability to sterilize the external deficit in this manner would be limited by their holdings of international reserves—for these reserves would continue to fall as long as the money stock and interest rates deviated from their initial levels.

²The same type of analysis would hold for other monetary disturbances such as a change in people's desire to hold money.

Parts of this section follow the general outlines of the monetary theory of the balance of payments. See Harry G. Johnson, "The Monetary Approach to Balance of Payments Theory," *Journal of Financial and Quantitative Analysis*, March 1972, pp. 1555-72.

A summary of much of the research done on monetary and fiscal policy under fixed and flexible exchange rates can be found in Robert M. Stern, *The Balance of Payments* (Aldine: Chicago, 1973), especially Chapter 10.

³This ignores the possibility that the forward rate on the country's currency may adjust so as to allow it to maintain a different interest rate. The more exchange rates are really considered to be fixed and immutable, the more remote is this possibility.

If it took some time for capital flows to respond to lower interest rate levels, then the country might temporarily increase its demands for goods and services. In an open economy, at least part of that new demand would find an outlet in purchases from overseas. This would put additional downward pressure on the exchange rate, result in a further drop in international reserves, and speed the return of the money stock to its initial level. Monetary policy, therefore, changes the level of international reserves but has no more than a temporary impact on domestic money supply, prices, and incomes.⁴

If a large country increased its money supply, the results might be somewhat different. An increase in the money supply by a large country, i.e., one which purchases a significant amount of the world's output, would lead to an increase in demand for foreign goods and services and may raise the level of prices throughout the world. Similarly, an increase in that country's money stock would lower interest rates worldwide.⁵ Consequently, the country would not be subject to the capital and product flows of the magnitude necessary to bring its income and interest rates back to their pre-expansion levels. Nonetheless, even a large country is likely to experience reserve outflows in response to a monetary expansion. The impact of the reserve outflow may be temporarily delayed if the country's foreign reserves are very large or if other countries hold the large country's currency as international reserves. In either event, the central bank could temporarily sterilize the reserve outflow and allow the money stock to remain higher for a considerable time period. In this interim period, the large country would then experi-

⁴For a country attempting to contract its money supply, the process would be a mirror image. A trade and capital account surplus would give rise to reserve inflows which would reexpand money. The central bank's ability to offset or sterilize this inflow would be limited by its holdings of domestic assets.

⁵If the money stock increase were continuous and inflationary, interest rates would eventually have to rise to incorporate revised inflationary expectations.

ence increased income and, if it is near full employment, increased prices. Eventually, the country would begin to run out of reserves and would be forced to reduce its money stock. But because of higher world prices and lower interest rates, reserve outflows would tend to cease when the money stock, income, and prices were above their previous levels. For the large reserve currency country, therefore, monetary policy can have a considerable **short-run** impact on income and some smaller **long-run** effects, too.

When a large country acts to increase its money supply, smaller countries may be subject to some irresistible consequences of that action when exchange rates are fixed. The increase in demand by a large country would be felt by the rest of the world as a rising demand for exports, which would cause rising pressures on prices and incomes worldwide. In addition, the reserve outflows of the large country would swell the reserves and money supplies in the rest of the world. Businesses and consumers would find that the initiating country's external deficits would provide them with the cash balances necessary to finance rising levels of expenditures. If a small country tried to resist these inflationary pressures by sterilizing the reserve inflows and keeping interest rates high, it would simply attract even more reserves. In brief, control over the money stock or inflation rate in the rest of the world could be greatly impaired. The inflation rate would be identical everywhere, tied to the monetary expansion of the large country.

These relationships were quite evident in the events of the mid-1960's through 1971. During that time, the United States was the dominant reserve currency country and, consequently, was in a position to incur large external deficits. In the late 1960's, many European countries complained that excessive monetary expansion and inflation in the United States were causing, through capital outflows and trade deficits, monetary expansion and

demand pressures in the rest of the world. Foreign countries also found that their attempts to dampen internal demand to resist inflationary pressures only elicited larger reserve inflows. One response to this problem was the proliferation of controls on capital movements into European countries. These attempts to gain policy maneuverability by decreasing interdependence proved only temporarily successful, however, because the means of avoiding controls grew as quickly as the controls themselves.

The problem became more acute in 1970 and 1971, as the Europeans attempted to tighten their monetary policy while U.S. monetary policy was loosened in response to the U.S. recession. The Eurodollar market became a turntable on which dollar outflows from the United States were borrowed by European companies and converted into their own currencies for domestic use. Thus, integrated capital markets and fixed exchange rates meant that the European countries had largely lost control of internal monetary conditions and the ability to use monetary policy to achieve domestic income and inflation targets.

The United States, despite its large size and the special status of the dollar, found that it too was vulnerable to foreign capital flows that weakened monetary policy. In 1969, the Federal Reserve was trying to dampen inflation in the United States by reducing credit granted to American borrowers. The high interest rates and slow monetary growth in the United States, however, attracted capital from abroad, especially through the mechanism of U.S. bank borrowing in the Eurodollar market. For a time, therefore, U.S. banks were able to lessen the effects of the restrictive Federal Reserve policy by borrowing abroad and re-lending in the United States.

Flexible Rates

With flexible exchange rates, just as under fixed rates, a small country that increased its

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money stock would have a tendency toward lower interest rates and would incur capital outflows. Also, an increase in its money stock would cause its residents to demand more of all goods, including imports. Under fixed exchange rates, as described earlier, the deficit in trade and capital accounts would give rise to a reserve outflow that would tend to reverse the money supply increase. With flexible rates, however, the monetary authorities would not purchase or sell international reserves to keep the exchange rate within a prescribed fixed range. Consequently, the deficit would not lead to an offsetting reduction in bank reserves and the money stock. Rather, the country's increased demand for foreign currency would cause its own currency to depreciate, or decline, in price. As its currency depreciates, the country's exports become less expensive to foreigners and imports cost its own residents more. As a result, both residents and foreigners demand more of the economy's output and nominal income rises. This is what the monetary authorities intended when they increased the money stock. Therefore, even though the traditional channels of monetary influence through interest rates would be eliminated by integrated capital markets, monetary policy can be quite effective by affecting import and export demand through changes in the exchange rate.

When exchange rates are flexible, monetary policy works in large countries in the same way it does in small countries. An increase in the money stock of the large country will result through trade and capital flows in the depreciation of its currency. This depreciation will stimulate production through its effects on internal demand. In the case of the large country, however, the capital outflow may be large enough to lower interest rates worldwide.

By allowing its exchange rate to fluctuate, a small country need not accept the effects of a monetary expansion transmitted from the

larger country. The depreciation of the large country's currency and coincident appreciation of the small country's currency will prevent additional domestic demand in the large country from being translated into new demands for the small country's exports. Domestic producers in the large country will feel the entire impact of the monetary expansion. As a result, the large country may find that money stock increases produce greater inflation under flexible than fixed rates. For the small country, the exchange rate might appreciate so much that its income was **reduced**.⁶ Under flexible exchange rates, however, the small country can increase its money stock to offset the effects of the excessive appreciation and retain control over its income level.

EXPENDITURE DISTURBANCE

Fixed Rates

An expenditure disturbance is a change in spending plans which is independent of a change in the money stock. One example of an expenditure disturbance would be a change in fiscal policy—the taxing and spending decisions of government. Under fixed exchange rates, an increase in expenditures in a small country can be a very effective means of increasing income. As with an increase in the money supply, part of the increase in spending will be deflected to foreign commodities and result in higher imports. This will create a balance of payments deficit that will drain reserves, reduce the money stock, and counteract the expansive fiscal policy. But the increased spending will also put pressure on domestic credit markets and tend to raise interest rates above the worldwide level. This

⁶/Appreciation beyond the level necessary to protect small country income from large country expansion may be made necessary by the new lower world interest rate which increases the demand for money at every income level. Sales of financial assets by small country residents to obtain higher money balances put upward pressure on interest rates which attracts capital and drives up the exchange rate thus reducing income.

will promote an inward flow of foreign capital and a gain in international reserves. The latter reserve inflow will more than offset any tendency for reserves to decline due to the trade account deficit. That is because, if imports are a reasonably stable proportion of income, the trade deficit would be limited by the size of the rise in income. On the other hand, when capital markets are fully integrated, the tendency toward higher interest rates will call forth a flood of incoming capital. The net increase in international reserves—unless neutralized by the central bank through sales of domestic assets—will enable the money stock to increase, thereby validating and reinforcing the expansive thrust of fiscal policy. In brief, while monetary policy by itself is ineffective under fixed rates, an increase in the money stock which accompanies an expenditure shift can be quite powerful since it will not be subsequently offset by a reserve outflow.⁷

If a large country adopted an expansionary fiscal policy under fixed exchange rates, the same processes would work in the same directions as they do for a small country but the end result may differ. That is because the increased demand and subsequent net reserve inflow may have important effects on the rest of the world which, in turn, would feed back into the large country. As demand by large country residents for the products of other countries grows, total demand in other countries would also tend to expand. This would raise price and interest rate levels everywhere, but the impact would be greatest in the initiating country. Capital

⁷/This scenario and much of the ensuing discussion of expenditure disturbances assume that the government demands domestic, rather than foreign, output and that the existence of unemployed resources means that increases in domestic output can take place at a constant price level. See Robert Mundell, "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates," reprinted as Chapter 18 of Robert Mundell, *International Economics* (New York: The Macmillan Company, 1968), p. 251. If there were any tendency for government purchases to raise prices, perhaps because the economy was near full employment, then imports would increase and the effect on income of the increase in government spending would be nullified by a larger trade deficit.

would flow into the large countries until its interest rates were reduced to the world level—now somewhat higher than they were initially. Because of the raised world interest rate level, the money stock and income increase in the large country would not be as great as it would have been had the country left the rest of the world unaffected.

The country facing an expenditure shift in a large country, especially an important trading partner, may experience important effects on its own economy. As pointed out earlier, interest rates in the smaller country would definitely be higher. Also, income in the smaller country would have two opposing forces working on it: the expansionary impact of demand from the country initiating the expenditure increase, and the contractionary effects of a lower money supply due to a reserve outflow to the larger country. Whether income in the smaller country will be higher or lower after the first expenditure change depends on the relative strength of these two forces.

Flexible Rates

Far different results would be obtained if a small country tried an expansionary fiscal policy under flexible exchange rates. The tendency toward balance of payments surplus under fixed rates would be translated into an appreciating exchange rate. This would dampen internal demand by reducing exports and increasing imports. Since no reserves can be gained or lost when governments do not intervene in the exchange market, the increased expenditures cannot be validated by increases in the money stock. The currency would continue to appreciate as long as expenditure demands were in excess of their old level. The process would stop when the currency appreciation had decreased demand by exactly the amount it had increased originally. When there are fluctuating exchange rates and integrated capital markets, fiscal policy tends to have no effect.

A large country would find its fiscal policy effectiveness reduced under flexible rates, but not eliminated. The initial increase in income in the large country increases demand in the rest of the world. Under flexible rates, however, the capital inflow would tend to appreciate the large country's currency. While the appreciation reduces demand on the large country's resources, it adds to the upward pressures on demand in the rest of the world by increasing their exports and decreasing their imports. Some of this foreign demand will return again to the large country as demand for its exports. If the countries are close to full employment, worldwide inflation will result. If unused capacity exists, real incomes will rise.

From the viewpoint of the small country facing a fiscal expansion in a large country, flexible rates would greatly increase its vulnerability to an unwanted rise in nominal income. Under fixed rates, the increase in demand in the small country was offset by a declining money supply. No such cushion exists with flexible rates. The large country's disturbance would have a considerable impact on the rest of the world.

This kind of business cycle transmission may have been operating at the end of 1974 and into 1975. The U.S. economy was declining more rapidly than that of most of the rest of the world. The decline was marked in part by slow monetary growth but even more importantly by downward expenditure adjustments in housing and durable goods purchases. The fall in demand resulted in lower interest rates and an outflow of capital from the United States. With exchange rates under a system of managed floating, the dollar began to depreciate against the currencies of most other industrialized countries. This development was beneficial to the United States as it tended to deflect foreign and domestic demand to U.S. products and so cushioned the fall in U.S. income. In other countries, the in-

creased imports and decreased exports resulting from dollar depreciation tended to reduce income and output at a time when their economies were already weak. Consequently, they moved to support the dollar and control the appreciation of their own currencies.

SUPPLY DISTURBANCE

A supply disturbance is a sizable and unanticipated reduction in the supply, or an increase in the price, of an important international commodity. With the growth of interdependence, the potential for serious disturbances of this type has increased sharply. Important examples of supply disturbances have occurred recently in both food and petroleum products. Since food demand declines very little as its price rises, very large price increases were necessary to ration the shortfalls in supply. In the case of petroleum, the supply reductions occurred from a deliberate decision by many petroleum producing countries to band together to increase their profits. As with food, petroleum demand is not very responsive to price changes over the short run, so the producers found they could temporarily raise the price of oil substantially with only minor cutbacks in production.

From the viewpoint of the importing country, the effects of a supply disturbance in a commodity facing inelastic demands are many faceted and mostly bad. Given the short-run unresponsiveness of demand, the importing country will spend relatively more of its income on imports and domestic demand for internally produced goods will fall. As domestic demand falls, so will domestic incomes, unless the fall in demand is cushioned by the exporter spending its new export receipts in the importing country. This effect on income is analogous to a decline in planned expenditures or a tighter fiscal policy. There is also a monetary effect analogous to a reduction in the money supply. The monetary effect arises because the higher import prices cause an in-

crease in the country's average price level.⁸ At higher prices, there will be an increase in the demand for money balances to purchase the same level of real output. People desiring to increase their money balances will, in turn, tend to sell other financial assets and drive up interest rates. This increase in the demand for money caused by higher prices will have the same impact on the economy as a reduction in the supply of money.

For the importing countries, the supply disturbance can be viewed as a reduction in expenditure occurring simultaneously with a fall in the money stock. Under fixed rates, if the recessionary tendencies of the expenditure shift dominate—perhaps because the country spends a high proportion of its income on the particular product—the fall in domestic income will cause interest rates to fall, capital to flow out, and an ensuing decline in the money stock that will further reduce income. If the monetary effects dominate, lower domestic income will be accompanied by higher interest rates, capital inflows, and an expanding money stock. In this case, the capital inflows and expanding money stock with fixed rates will ameliorate the fall in internal demand.

When exchange rates are flexible, countries that would have been made worse off under fixed rates are helped by exchange rate movements. If the expenditure shift dominates, the fall in income will cause interest rates to fall, capital to flow out, and the exchange rate to decline. The ensuing increased demand for exports and import substitutes will then cushion the fall in internal demand. In this case, the country is better off under floating rates. When the monetary effect dominates; however, the fall in income will be accompanied by higher interest rates, capital inflows, and an appreciating exchange rate that will

serve to further reduce income. In this case, the country is worse off under floating rates.

Whatever the exchange rate regime, a country facing a supply reduction is likely to experience a reduced level of real income and output for some time, especially when domestic prices and wages adjust slowly to changing demand conditions. To a lesser extent, it is also true over a longer term. Eventually, the pressure of falling domestic demand will tend to reduce domestic prices relative to import prices. Also, the investment of any capital inflows will reduce interest rates and stimulate interest sensitive spending. As a result, internal demand will rise. Even after full employment is attained, however, the importing country will be worse off than it was before foreign prices increased in that it would take a higher proportion of its production to purchase the same level of imports.

The behavior of income and trade balances in the wake of the petroleum price increases of 1973 and 1974 combine elements of adjustment under both fixed and flexible exchange rates. Petroleum producers accept payment in dollars, which are rarely converted into their own currencies. Consequently, the petroleum deficit cannot be offset by changing exchange rates. The petroleum exporters have little choice but to save much of their new income by investing their surpluses in the importing countries. The industrialized world as a whole has a petroleum deficit matched by a capital **reflow** of "petrodollars." This deficit is fixed in terms of dollars and is based on the price and quantity of oil purchased.

Exchange rates among oil consuming nations do fluctuate and will rise or fall in part depending on a country's ability to attract capital to offset its trade account deficits. Countries with small capital inflows will find their currencies depreciating. Their oil imports will be offset by a rise in exports to other countries, and their short-run income adjustment may be relatively mild. Countries which

⁸/It is assumed that the fall in domestic demand is unlikely to cause much, if any, decline in domestic prices in the short run.

attract a large inflow of petrodollars will have appreciating currencies. As a result, their trade deficits will tend to swell beyond that which can be attributed to oil imports. Floating rates in this hybrid system therefore serve to allocate the given petroleum deficit among consuming nations.

CONCLUSION

The integration of world markets for goods and credit has led to a heightened degree of economic interdependence among nations. Sensitive trade and capital flows govern the impact of economic events in their country of origin and facilitate their transmission to other countries of the world. The exact way in which countries interact in response to economic events depends, in part, on the exchange rate system under which they operate. A corollary notion is that countries might wish to choose their policy of exchange market intervention with an eye to the type of economic disturbances they expect to be most important at home and abroad.

If a country intended to rely on monetary policy to achieve its income, employment, and price targets, or felt it was subject to unwanted monetary influences from the actions of large and important trading partners, then it should choose to allow its exchange rate to fluctuate. Under flexible exchange rates, its own monetary policy gains effectiveness by inducing changes in exchange rates that push foreign and domestic demands on its resources in the desired direction. The country avoids importing monetary inflation or deflation by not letting its international reserves be changed and by allowing the exchange rate to neutralize potential changes in demand coming from abroad.

On the other hand, a country which felt it wanted to run an effective fiscal policy or

felt most threatened by shifts in expenditure flows abroad might opt for a fixed exchange rate system. Fiscal policy in an integrated world is most effective under fixed rates because it will be accompanied by capital flows which validate and reinforce the initial fiscal policy impulse. When there are expenditure shifts in other countries, fixed rates will tend to minimize their effects at home because the capital and trade accounts will move in opposite directions.

No exchange rate system will protect a country against the effects of a sudden cut-back in the supply of an important import. Countries that would tend to attract a lot of capital under these circumstances would find that fixed exchange rates will minimize the effect on income. Countries in which the trade deficit would dominate a capital inflow should choose fluctuating exchange rates.

In the 1970's, there has been a pronounced movement toward increased flexibility in exchange rates. This is implicitly a concession that, at least over the long run, monetary disturbances and monetary policy dominate the determination of income. Within a shorter period, however, there may be some justification for exchange market intervention, if it is believed that expenditure shifts are pulling exchange rates away from levels consistent with long-run monetary equilibrium. Of course, no country can unilaterally decide its own exchange rate regime. The nature of the transactions in which one currency is traded for another requires at least implicit agreement by those on the other side of the trades. Countries must agree among themselves on the importance of various types of policies and disturbances and formulate an exchange rate system to maximize national decisionmaking power, while retaining the fruits of an interdependent world economy.