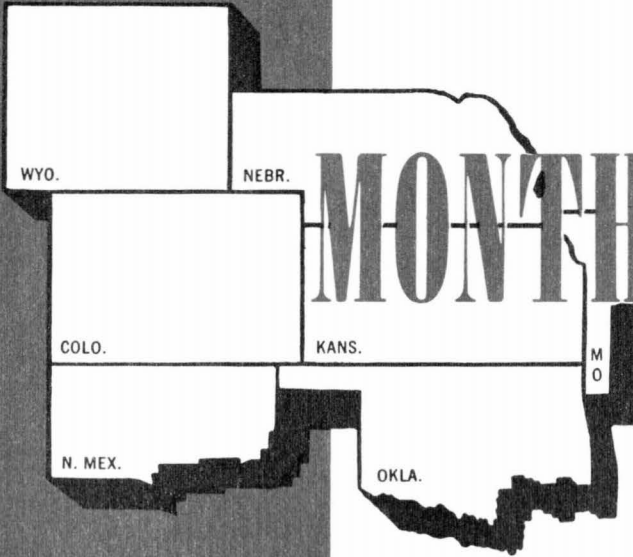


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*Toward an Understanding of the Dialogue on*

# International Monetary Reform

By *Sheldon W. Stahl*

THE INTERNATIONAL monetary system is a major element in our everyday life, operating as it does to enhance the commercial and financial interdependence of the free world's community of nations. Increasingly, however, this payments mechanism has come under criticism from many quarters. In the United States, and in other major industrial and financial centers of the free world, a great deal of effort has been devoted to formulating proposals for reforming the international payments mechanism so that it will do a better job of meeting the requirements of a growing level of world commerce and exchange. In view of the interest in this topic, then, this article examines the international monetary payments system in an effort to provide the fundamental background necessary for a meaningful understanding of the issues involved in any proposed reform of the system.

## **FUNCTIONS AND MECHANICS OF INTERNATIONAL PAYMENTS**

Probably one of the more familiar functions of the international monetary payments mechanism is that of enabling trade and exchange to take place across national boundaries, in much the same way as our domestic monetary system enables us to conduct trade and exchange freely among ourselves in the United States. While this aspect probably is taken for

granted by most of us, there are certain other requirements which must be satisfied by the international payments mechanism to make it acceptable to the community of trading nations.

In addition to facilitating trade and exchange among nations, an international monetary system must provide for some means of financing temporary imbalances which may arise between international receipts and expenditures. This function may be described as providing international liquidity—a term open to many interpretations. Finally, the international financial mechanism should operate in harmony with the goals of total public policy. That is, the goal of attainment or maintenance of equilibrium in a country's international balance of payments ought to be regarded as one of several goals of national policy. Other goals, such as the optimal utilization of a country's economic resources or maintaining its national security, should be afforded priority as well. The task of an acceptable international payments mechanism, therefore, is to enable these goals to be pursued simultaneously without undue strain, or without resorting to an unsatisfactory compromise that sacrifices one or more of these goals in order to attain the others.

Although the manner of financing international transactions is not as simple in actual operation as the description which follows, nonetheless this will help the reader to grasp

the fundamentals involved in the payments process. The overriding principle rests upon the fact that, where international trade takes place, international payments are required. In the case of domestic trade, the discharge of debts between the traders involves only an exchange of domestic currency, or a check drawn on the debtor's bank and given to the creditor. In the case of foreign trade, however, since the debtor and creditor reside in different countries with different units of exchange, the matter of payment is not as simple. Dollars do not ordinarily circulate freely abroad, nor does foreign exchange generally circulate in the United States. Thus, in the case of the purchase of a foreign good by an American, dollars may not be an acceptable means of payment. Conversely, in the case of a foreign purchase of U.S. merchandise, the foreigner's currency may not be acceptable to the U.S. creditor. As a consequence, there must be some device to enable traders to convert their domestic currencies into foreign currencies.

It may now be asked how the international monetary payments mechanism operates to convert domestic money into foreign money. As an example, let us suppose that an American purchases a British good. This necessitates payment in pounds sterling to the British exporter. Although there are various types of credit instruments used in conducting international trade, it is not necessary to take account of them here. To secure the needed foreign exchange, the American importer pays dollars—writes a check—to his bank. Let us assume that the bank is located in New York, one of the major U.S. financial centers. The New York bank would then pay to the London bank of the British exporter the required amount in either U. S. dollars or United Kingdom pounds sterling. Finally, the pounds sterling are paid to the British exporter by the London bank. It is important to note that the entire process was carried out by the banks in both countries acting as intermediaries with-

out any dollars or pounds actually crossing the ocean, yet its effect was to increase the amount of pounds held by England and to reduce the amount of dollars held by the United States.

Just as smaller city banks or country banks in the United States have correspondent arrangements with banks in the larger financial centers, the major banks of the different countries maintain a correspondent relationship with each other by holding accounts in the banks of the various financial centers. By building up or drawing down these accounts, international financial payments are transacted. That is, banks may build up their foreign balances by purchasing such credit instruments as commercial bills of exchange from exporters; conversely, these foreign balances are reduced when banks sell credit instruments to importers. Thus, imports create a demand for foreign exchange, while exports create a supply of foreign exchange.

Although the major part of foreign exchange transactions stems from the import and export of goods or merchandise, there are many other kinds of international transactions involving the payments mechanism. In the U. S. balance of payments, which records the total amounts of U.S. international transactions, merchandise imports and exports are referred to as "visibles" and are handled for accounting purposes in a broad grouping called "current account." The current account also records transactions involving "invisibles." These consist of such items as income on investments made abroad, tourist expenditures for services, transportation expenditures on foreign carriers, and certain other miscellaneous services. Another major group of accounts in the balance of payments is "unilateral transfers," which record the flow of gifts. These transfers are further classified as either private remittances or Government grants. The "capital account" involves another major category of international financial transactions. This major account records the vast lending and borrowing activities which take place be-

tween the United States and the rest of the world and may be classified as either "private" or "Government" in terms of origin, as well as either "short-term" or "long-term" in terms of maturity. The final major account in the balance of payments is the "gold" account which records the purchase or sale of gold. The reason for treating gold separately should become clearer when the question of international reserves is discussed. Thus, it can be seen that the payments mechanism plays a larger role than merely facilitating the movement of real goods between nations.

Turning to a closer consideration of the liquidity function of the payments mechanism, it should be noted that primary concern in this article is directed at the liquidity position of central banks or governments, rather than the "private" liquidity position of parties or firms engaged in international commerce. Consequently, "official" liquidity may be broadly defined as all the resources which the monetary authorities of a country may have at their disposal for settling its international accounts. Liquidity so defined includes a country's international reserves of foreign exchange and gold, as well as its ability to borrow reserves when the need arises.

It should be recognized that it would be very difficult to define, unambiguously, what "sufficient" liquidity really is, since, as the current debate on the subject has revealed, the matter of just how much is sufficient is subject to a wide range of interpretations, depending upon whether a country is either a net debtor or a net creditor on its international financial accounts. Nonetheless, one generalization may be advanced. Just as our domestic monetary system regulates the supply of money and credit in an attempt to avoid either inflationary or deflationary dislocations, the international monetary system must function in such a way as to allow the world community to operate at the most optimal levels of resource utilization without erratic gyrations. Similarly, in pro-

viding this desired level of liquidity to the world community, the payments mechanism should operate so as to:

. . . offset increases and decreases in the desire of people to hoard liquid assets at given levels of interest rates and should be able to prevent shifts in the form in which liquid assets are held from altering the total amount of the assets.<sup>1</sup>

That is, the level of international liquidity should be independent of the form in which international reserves are held by different countries:

Just as a domestic monetary system should be able to offset the effects on domestic money supply of conversions between currency and bank deposits, the international system should be able to offset the effects on international reserves of conversions between gold and foreign exchange reserves and among foreign exchange reserves denominated in different currencies.<sup>2</sup>

Having generally spelled out the functions and mechanics of the international monetary payments system, we may now turn to a closer look at the actual underlying arrangements of the present system. Only by understanding these basic arrangements as they have evolved since World War II can one grasp the key role played by the dollar in the free world's monetary system, and the issues involved in the continuing dialogue on monetary reform.

#### THE PRESENT ARRANGEMENTS

The present international monetary system generally is referred to as a "gold-exchange" standard. In contrast with the "pure-gold" standard, which fell into disuse following

<sup>1</sup>Walter S. Salant, "Does the International Monetary System Need Reform?" (The Brookings Institution, Reprint 82 [Washington, D. C., 1964]), pp. 5-6.

<sup>2</sup>*Ibid.*

World War I, the international reserves of central banks or national monetary authorities now include liquid claims against certain reserve currency countries as well as holdings of gold by the monetary authorities. As this system has evolved since World War II, it has been aided by the growth of such international financial institutions as the International Monetary Fund (IMF), along with the development of imaginative innovations and increased cooperation by the leaders of the free world's financial community.

Tracing these developments in more detail, one should recall that, at the close of World War II, the United States, almost alone, emerged relatively unscathed in terms of physical damage to its economy. This contrasted with the war-torn economies of Continental Europe, England, and the major powers of the Far East, notably Japan. The immediate task at hand was to restore these nations to a state where their material survival could be assured. Only the United States possessed adequate physical and financial resources to markedly accelerate restoration of these economies. During the postwar period, U.S. dollars and goods flowed abroad to help accomplish the task, and, by the mid-1950's, an observable change had taken place. The productive capacity of these countries had been largely reestablished; the normalization of former trade patterns was well underway; and their increased competitive viability was reflected in their improved balance-of-payments position with respect to the United States. By the end of 1958, currency convertibility had been reestablished in Western Europe. The IMF, which had come into being as a result of the Bretton Woods Conference in 1944, had been firmly established as an international lender of short-term reserves to cope with temporary imbalances which might crop up between trading nations. In short, by the end of the 1950's, the world community had been visibly strengthened and largely was able to stand on its own.

Beginning with 1958, the recovery clearly had entered a new phase. The balance-of-payments deficits of the United States assumed greater magnitudes than in earlier years, with the result that dollars began to accumulate in central banks abroad in the form of increased reserve balances. The deficits which the United States had incurred almost continuously since 1950 were beginning to be regarded with increasing concern—a concern which was manifested by a stepped-up conversion of dollars into gold by foreign central banks. The resulting large U.S. gold outflows served to raise serious questions about the stability of, and confidence in, the dollar. Because of the crucial position of the U.S. dollar in world monetary affairs, these developments have resulted in a critical reexamination of the international payments mechanism whose recent performance has, in the view of many observers, become unsatisfactory in terms of its ability to carry out its varied functions in a substantially changed world economic climate.

Under the present system, the United States is committed to buy gold at \$35 per ounce and, upon request, to sell it to central banks of foreign nations at that price, plus a small transportation and handling charge. The dollar, then, is firmly committed internationally to gold and the Government is obliged to honor all requests for gold from foreign central banks at the fixed rate of \$35 per ounce. For the most part, the exchange values of other major currencies are linked to the dollar by fixing their values in terms of dollar equivalents. To support these exchange rates—which are fixed within a very narrow range of fluctuation—the respective countries either sell or purchase their own currencies, as the case may be, if and when the demand for their own currencies, in terms of some foreign currency, becomes excessive, or, conversely, if the demand for foreign currencies, in terms of their own currency, becomes excessive. For example, if the demand by U.S. importers for British pounds

sterling were to rise as a result of increased British exports to the United States, this would act to bid up the dollar price of pounds. In this instance, the British monetary authorities—in order to prevent the exchange rate from rising outside its fixed upper limit—would sell pounds sterling on the exchange market and thereby would increase the supply of pounds. This would serve to lower its price. In the case of an increase in the demand for U.S. dollars by United Kingdom importers as a result of increased U.S. exports to Great Britain, the procedure on the part of British monetary authorities would be reversed. However, in order to purchase their own currency for support purposes, countries must offer in exchange some highly acceptable international liquid resource; and, when selling their currency, they will expect payment in this same medium. The resources which have found such international acceptance for this purpose include gold and “key” currencies—notably U.S. dollars and, to a lesser extent, British pounds sterling.

However, gold and reserve currencies do not provide the sole basis of international liquidity to buttress exchange rates or finance a payments imbalance. As mentioned earlier, another significant element in the international liquidity spectrum—though quantitatively less important than owned reserves—consists of “borrowed” reserves and includes the borrowing rights of the 102 members of the IMF. In addition to the subscribed quotas of the Fund, the potential resources of the Fund were expanded in 1961 by a General Borrowing Arrangement executed between the Fund and 10 major industrial countries.<sup>3</sup> Under this arrangement, these countries agreed to lend their currencies to the Fund for its use in advancing loans to any of them incurring a deficit, if, based upon subscribed quota levels, the Fund was unable

to supply the necessary currency or currencies required by the deficit member. Superimposed on this base is the more recent increase in Fund quotas resulting from the review and adjustment of the members’ quotas which takes place at 5-year intervals as provided for in the Fund’s Articles of Agreement.

Holdings of convertible currencies have been increased further in the past 4 to 5 years, as a result of the creation of a network of bilateral currency exchange agreements between the Federal Reserve System and the central banks of a number of the more highly industrialized countries of the world. These are the so-called “swap” agreements which serve to provide short-term credit up to agreed amounts to the swap partners for periods of from 3 to 9 months. Under these arrangements, the Federal Reserve Bank of New York is authorized to conduct transactions for the System Open Market Account in such foreign currencies and within certain limits as may be specified by the Federal Open Market Committee. Still another element in international liquidity, and a quite recent innovation, is the issuance of special U.S. Government securities which are non-marketable, and of either short-term or medium-term maturities. These bonds are, for the most part, denominated in the currency of the holder and may be converted on short notice by the holder into cash. The incentive to hold these bonds stems from the fact that not only do they earn interest but, by being denominated in terms of the currency of the holder, they insure the holder against the exchange risk of devaluation. These bonds are commonly known as “Roosa” bonds, since, in his former capacity as Under Secretary of the Treasury for Monetary Affairs, Robert V. Roosa was credited with their innovation.

As of June 30, 1965, the free world’s official monetary reserves were reported to equal approximately \$69 billion. Of this amount, gold accounted for \$41 billion, while total holdings of foreign exchange (assets denominated in

<sup>3</sup>These countries are referred to as the “Group of Ten,” and include Belgium, Canada, Germany, France, Italy, Netherlands, Sweden, United Kingdom, Japan, and the United States.

convertible currencies) comprised approximately \$21 billion. An additional \$5 billion represented the IMF position of various countries. The balance consisted of about \$1 billion of Roosa bonds, and about \$700 million in foreign currencies obtained under swap arrangements. It should be clear, from these figures, that gold is the single most important reserve asset and the basic source of international liquidity. Equally apparent is the fact that currency holdings account for nearly one third of official monetary reserves, and, therefore, constitute the second most important source of international liquidity. Since the major share of official monetary reserves is in the form of either gold or reserve currencies—primarily dollars and lesser quantities of pounds sterling—and since these assets are the primary source of international liquidity, one may ask what determines the total amount of these official reserve components as well as the changes which take place in them.

Newly mined gold and sales by the Soviet Union to the free world provide the basis for additions to free world official gold stocks. To the extent that gold supplied from these sources exceeds the amount of gold used for industrial purposes or added to private hoards,<sup>4</sup> the monetary gold stock will grow. From the end of 1959 through mid-1965, \$3.2 billion of gold was added to the official monetary reserves of the free world. This accounted for a little more than one fourth of the total growth of official monetary reserves during that period.

The magnitude of the other major components of official monetary reserves—the reserve currencies, i.e., dollars and sterling—is a function of the amount of these currencies (or assets denominated in terms of these currencies) held by central banks of countries

other than the respective reserve currency countries. Thus, it can be seen that this element of international liquidity can grow only to the extent that the reserve currency countries incur deficits with the rest of the free world. Conversely, when the reserve currency countries have surpluses in their balance of payments, the volume of international reserves—hence, international liquidity—declines. Of the approximately \$11.5 billion increase in official monetary reserves which took place between December 31, 1959, and June 30, 1965, \$4.5 billion—nearly 40 per cent—of the total expansion was accounted for by increased holdings of foreign exchange. The remainder of the increase in monetary reserves during this period—other than the \$3.2 billion in gold previously mentioned—was accounted for by reserve positions in the IMF, currency-swap arrangements, and Roosa bonds. The sizable additions to international reserves, in the form of increased holdings of foreign exchange by the nonreserve currency countries, was effected primarily as a consequence of the large and protracted balance-of-payments deficits of the United States. During this period, the United States experienced a loss in reserves of more than 25 per cent, a loss which stemmed directly from its persistent balance-of-payments deficits and subsequent conversion of dollars into gold by foreign central banks. It should be pointed out, however, that sizable additions to the dollar holdings of foreign central banks during the period served to hold down the actual gold loss of the United States compared with what it might have been. One also might note that the expansive influence of the U. S. deficit is offset when central banks convert dollars to gold. Thus, international reserves and international liquidity are diminished when reserve currency holders reduce their stocks of foreign exchange assets in favor of gold. A critical observation of an international payments system operating largely through vehicle or key currencies is succinctly made by Salant:

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<sup>4</sup>It is unlawful for U. S. citizens to hold gold, although the existence of free markets for the purchase and sale of gold is countenanced by a number of countries, with the result that a considerable portion of the world's gold stocks finds its way into private hoards.



The timing and size of their deficits have no rational relationship to the needed expansion in international reserves. Moreover, expansion in these reserves increases the liquid liabilities of the reserve currency countries in relation to their liquid assets. Such increases in liabilities create growing danger—or fear on the part of the holders—that the reserve currency countries will be unable to pay off those who wish to convert their holdings into gold or other currencies, and this, in turn, increases the likelihood that the holders will actually want to convert. The reserve currency countries are in the position of banks in a system with no central bank; they face a growth of deposit liabilities payable on demand and have no means of increasing their reserves correspondingly except by bidding reserve assets away from others. This situation increases the likelihood that depositors will create a run on the bank. Thus, the holding of reserves in national currencies not only fails to provide for a rational way of increasing this component of international reserves, but renders the system increasingly unstable.<sup>5</sup>

#### SOME FINAL OBSERVATIONS

The record of the present international financial payments mechanism through the postwar period is mixed. Although the more recent years have revealed certain stresses and strains present in the system, these should be weighed against the high degree of international financial cooperation and inventiveness demonstrated by the world financial community which permitted the system to function in spite of its shortcomings. Viewed from the wider perspective of the entire postwar period, rather than the last 6 or 7 years, the achievements of the

international payments mechanism are highly impressive. The renaissance of Western Europe and Japan, the return to currency convertibility, the tremendous increase in the volume of world trade and exchange, and the provision of adequate liquidity to accommodate these developments all attest to the performance of the payments mechanism.

This impressive performance, however, must not detract from the responsibility of looking toward the future. The current dialogue revolving about the reform of the international payments mechanism is well grounded in terms of the implications which might be drawn from the record of the past. The growth in world imports in the past 6 years has far outpaced the growth in total monetary reserves and the ratio of monetary reserves to imports has fallen sharply. Recognizing the substantial contribution of the U. S. balance-of-payments deficits to the over-all increase in foreign exchange holdings and, consequently, to the level of international reserves during the past 6 years, it can be seen that any future success of the United States in restoring equilibrium to its balance of payments will serve to curtail the primary source of the increase in total monetary reserves. The resolve of the Administration to restore balance in the U. S. international accounts should provide a continuing and potent stimulant to the search for acceptable monetary reforms.

While there is an apparent international consensus among the major industrial nations of the free world that there is no shortage of liquidity at present, their view is less hopeful about the adequacy of future liquidity given existing international financial arrangements. Thus, a continuing effort toward reform of the international payments system may be assured. In light of this, it is important to have some fundamental understanding of the issues involved.

<sup>5</sup>Salant, *op. cit.*, pp. 12-13.

# CURRENT DEBATE ON THE TERM STRUCTURE OF INTEREST RATES

*By Frederick M. Struble*

CAN THE MONETARY authorities—the Federal Reserve System and the U.S. Treasury—alter the relationship among maturity yields on Government securities by changing the maturity composition of Government securities outstanding? For many years, two different theories—the expectations theory and the segmented markets theory—have been used as a basis for answering this question.

The expectations theory contends that a change in relative supplies of securities with different maturities will not affect maturity yield relationships unless, in the process, it brings about a change in market expectations of future interest rates. On the other hand, the segmented markets theory argues that maturity yield differentials are caused by an imbalance between the maturity composition of debt demanded by lenders and supplied by borrowers. From this it follows that a shift in the maturity composition of supply will affect relative yields. The segmented markets theory acknowledges that market expectations of future interest rates may be changed as relative supplies in the various maturity sectors are altered, thus augmenting the change in yield differentials brought about by this operation. In general, however, most discussions of the segmented markets theory have emphasized the direct effects that changes in relative supplies will have on relative yields apart from any possible changes which might occur in expectations of

future interest rates. Discussions of the expectations theory similarly have played down the possible effects that changes in the maturity composition of debt might have on interest rate expectations. As a result, the theoretical controversy has been clearly defined.

Although each of these theoretical positions has a long history, it seems a safe judgment that the segmented markets theory has been and continues to be the theory most generally accepted by market analysts. However, the degree of consensus on this question has been reduced considerably as a result of recent research. Older statements of the expectations theory have been reinterpreted incorporating more plausible behavioral assumptions and the more rigorous modern formulations have added clarity to the meaning of the expectations hypothesis. On an empirical plane, several of the more sophisticated tests have provided strong support for the expectations theory.

This article reviews the current state of this controversy. To simplify the discussion, references to specific studies have been avoided. The reader interested in pursuing the topic further is referred to the brief bibliography of the major works on this question at the end of this article.

## **THE SEGMENTED MARKETS THEORY**

Although the term, segmented markets, is used here to identify one theory of the term

structure of interest rates, in other discussions this theory has been identified by several other terms, including institutional, imperfect substitutes, and hedging. Each refers to a type of balance sheet decisionmaking complicated by legal restrictions and traditional practices such as the matching of the maturity structure of one's assets with the maturity structure of one's liabilities—presumably in order to avoid risk. It is argued that because major groups of borrowers and lenders prefer to match assets and liabilities in this way, the market for credit instruments is partly compartmentalized, or segmented, according to the maturity of debt instruments. As a result, loans with different maturities are imperfect substitutes in the aggregate as well as for individual investor and borrower groups in the sense that different rates of return are required to hold securities with different maturities, and also, the size of the difference in rates of return varies with changes in the maturity composition of asset portfolios. This means that maturity yield differentials are determined by an imbalance between the maturity structure of debt demanded by investors and the maturity structure of debt supplied by borrowers.

Since the alternative theoretical position to be discussed in the next section of this article stresses the importance of interest rate expectations, it is worthwhile to note that discussions of the segmented markets theory generally have limited the influence of interest rate expectations to possible effects that *changes* in expectations of future interest rates can have on *current* interest rate relationships. This is quite different from the primary role assigned to expectations in the expectations theory. For, briefly, the expectations theory asserts that *current* differences in the maturity yields exist because the market expects interest rates to change over future periods of time. Moreover, it contends that it is possible to determine from a given yield relationship the pattern of future interest rates predicted by

the market. Discussions of the segmented markets theory have either ignored this issue or have asserted that a current yield structure is not affected by interest rate expectations in this manner.

Several facts appear to provide strong support for the segmented markets theory. In particular, the behavior of many institutional lenders accords with the assumptions about investor behavior made by this theory. For example, commercial bank portfolios are heavily weighted with assets of short maturity while assets held in the portfolios of insurance companies and savings and loan institutions are predominantly long term. Many examples of borrower behavior also may be cited which conform to the assumptions underlying the segmented markets theory. Consumers usually finance purchases of houses with long-term mortgages and purchases of less durable consumer goods with shorter-term debt agreements. In a similar manner, business firms generally attempt to match the maturity of their liabilities with the durability of their assets—inventories are financed by short-term loans while plant and equipment investments are financed by longer-term loans. These examples clearly are far from exhaustive. Presumably, it is the pervasiveness of such practices that makes the segmented markets theory so compelling to many analysts, particularly those involved in the day-to-day operations of credit markets.

Against this evidence supporting the segmented markets theory, the results of recent empirical studies have been surprising. One study after another designed to measure the effects of the maturity composition of debt on maturity yield differentials was unable to discern a substantial relationship between these variables. Consequently, these findings have cast doubt on the segmented markets theory.

These empirical studies have not been entirely convincing, however. In attempting to estimate the implications of changing supply

conditions, all but one study ignored the possible consequences of simultaneous shifts in demand. Most studies assumed that the demand for loans with different maturities remains relatively stable over time. If this is the case, then changes in maturity yield differentials can be attributed to changes in relative supply. If, however, conditions of demand change concurrently with changes in relative supplies, this would reduce the correlation between relative supplies and relative yields. The failure of most studies to consider this problem reduces their significance. The fact that the one study which did consider this problem came to essentially the same conclusions as the others, however, suggests that failure to consider this contingency may not have been an important deficiency. In addition, on an *a priori* basis, it seems unlikely that changes in demand would vary inversely with changes in supply so consistently that an actual relationship between relative supplies and relative yields would be entirely obscured.

#### THE EXPECTATIONS THEORY

The consistent findings that changes in relative supplies of securities with different maturities have only small effects on maturity yield differentials not only cast doubt on the segmented markets theory, they also provide indirect support for an alternative theoretical explanation of the term structure of interest rates. Both the pure expectations theory and the version of this theory which contends that liquidity preference is partly responsible for the establishment of maturity yield differentials, agree on one vital point: that the maturity structure of outstanding debt does not affect the maturity structure of yields.

The basic assertion of the pure expectations theory is that loans with different maturities, that are similar in all other respects, are perfect substitutes to investors in the aggregate. This means that the relationship among current prices and yields on securities with differ-

ing maturities are adjusted so that the rates of return on this debt—calculated to include capital gains and losses where applicable—are expected to be equal for any given period of time; and that the maturity composition of outstanding debt does not affect maturity yield differentials. From these assertions it follows that maturity yield differentials exist because the market is expecting interest rates to change over the future—to change in such a way that apparent differences in return which might be inferred from yield differentials are wiped out in the process—rather than because it expects the rates of return on loans with different maturities to differ. Moreover, any process which alters the maturity composition of investor portfolios, but does not change expectations of future interest rates, will not affect the existing structure of yields on loans with different maturities.

It should be emphasized that loans with different maturities may be perfect substitutes in the aggregate even though not every investor views them as such. Credit markets may be dominated by a relatively small but well-financed group of traders who treat loans of different maturities as perfect substitutes. If this is the case, the investors, whose actions are offset by these traders, would have no influence on security prices and yields. Security prices and yields would be established by traders willing to adjust their holdings of securities with different maturities until they expect the realized rates of return on the securities to be equal over any given period.

Still another possibility exists for rationalizing that certain securities in the aggregate are perfect substitutes. The preferences of different investor groups may overlap so that all securities within one maturity range may be perfect substitutes for one investor group, while securities in another maturity range may be perfect substitutes for another investor group. For example, banks may consider debt instruments over a certain range of short-term securities to

be perfect substitutes while savings and loan associations, insurance companies, and other investors may view longer maturity dates as perfect substitutes. If the maturity ranges of different investor groups overlap sufficiently, the structure of yields would be adjusted as if each investor believed all securities to be perfect substitutes.

However one views the process which leads to loans with differing maturities being perfect substitutes in the aggregate, the essential point is that the yields and prices are determined by investors who expect the rates of return on these securities to be the same over any given period of time. It is necessary to qualify this statement moderately, since most presentations of the expectations theory do recognize that such factors as market impediments and transactions costs may result in some inequality in expected rates of return and may cause some distortion between actually established yield structures and those which would be established if these factors did not exist. In general analysis, however, it seems a valid practice to ignore these factors, for yield differentials change rather substantially over time, and it is highly unlikely that this behavior could be attributed in any significant way to changes in transactions costs or other market impediments.

There are two compatible ways to look at the equality of expected rates of return. An existing long-term rate can be considered equal, roughly speaking, to an average of a current short-term rate and the short-term rates which are expected to be established over time until the long-term loan matures. On the other hand, a current long-term rate can be viewed as standing in a specific relationship to a current short-term rate such that its price is expected to change just sufficiently so that its rate of return will equal the short-term rate over the period required for the short-term loan to mature.

In either case, any yield differential represents a market prediction that interest rates will change over the future. For example, con-

sider two loans with 1 and 2 years to maturity that are selling to yield 2 per cent and 3 per cent, respectively. According to the pure expectations theory, this interest rate relationship indicates a market prediction that the price of the 2-year loan will fall by roughly 1 per cent over the year. Or, it indicates that the market is expecting the yield on a 1-year loan to be roughly 4 per cent 1 year in the future. This prediction is implied because the average of the current 1-year yield of 2 per cent and the expected 1-year yield of 4 per cent is roughly equal to the current 2-year maturity yield of 3 per cent. In short, the expectations theory contends that differences in yields on loans with different maturities are established not because the market expects to receive a higher return on one security than on another, but instead, because the market expects the rates of return on the two securities to be the same over an equal period of time.

To view this conception from a broader perspective, consider the relationship among a whole range of yields on loans with differing maturities. This relationship is usually depicted by a yield curve, a curve which provides a general picture of the relationship among all maturity yields on a particular date. Three prevalent types of yield curves have been established during this century. The first is an upsloping curve with yields rising as maturity lengthens and then generally becoming flat in the range of longest maturity dates. The second is a downsloping curve with yields declining as maturity lengthens and then generally becoming flat in the range of longest maturity dates. The third is a flat yield curve with all maturity yields equal.

According to the expectations theory, the upsloping curve indicates that the market is expecting all yields to rise over future periods of time, with the greatest increases expected among short-term yields. The downsloping curve reflects market expectations that all yields will fall over future periods of time, with the

greatest declines expected in shorter-term yields. The flat curve reflects market expectations that all yields will remain unchanged.

As might be expected, yield curves tend to vary over the business cycle and the types associated with the various phases of the business cycle lend plausibility to the expectations theory. For example, upsloping yield curves are usually observed during recessions and throughout the early part of a business expansion. It seems quite plausible that borrowers and lenders would be expecting interest rates to increase at such times. Conversely, downsloping yield curves generally have been established at or near the peaks of business expansion. With interest rates generally high historically, it is at least plausible that investors would be expecting to see yields decline in the future.

#### **THE LIQUIDITY PREFERENCE VERSION OF THE EXPECTATIONS THEORY**

Several discussions of the expectations theory have concluded that expected changes in yield relationships provide only part of the explanation for the existence of yield differentials. They have argued that lenders generally prefer to hold short-term loans as assets because the price of these assets tends to vary minimally. This preference is reflected in the willingness of investors to forego some expected return in order to hold short-term assets. As a result, longer-term assets generally provide a liquidity premium and their expected rate of return tends to be higher. To put this another way, it is asserted that the level of longer-term yields is always higher than it would be if the structure of yields was determined solely by market expectations. The fact that yield curves have sloped upward considerably more often than they have sloped downward since World War II often is cited as evidence of the existence of a liquidity premium on longer-term securities. It should be noted, however, that the predominance of upsloping yield curves is not

necessarily inconsistent with the pure expectations theory. If the market generally had expected yields to rise over this period—and yields did rise—the larger proportion of yield curves would have had an upward slope. It will be remembered that at the outset of the postwar period interest rates were at historically low levels.

Although the liquidity preference variant of the expectations theory contends that rates of return on loans with different maturities are expected to differ, it does not view credit markets as being segmented. Instead, the size of the presumed liquidity premium is held to be unrelated, or essentially unrelated, to the maturity composition of outstanding debt. Thus, the position of the liquidity preference approach is the same as the pure expectations approach on this vital point. In addition, the liquidity preference theory asserts that, in general, changes in yield differentials imply that the market has changed its expectations about the future course of interest rates. Here, again, the liquidity preference approach is in accord with the pure expectations approach and in conflict with the segmented markets approach. For these reasons, it is possible to consider this position as a variant of the expectations theory.

#### **IMPLICATIONS OF EMPIRICAL EVIDENCE**

The expectations theory has never been widely accepted outside of academic circles. Until recently, one reason was the inability of analysts to develop a test which supported this theory. In fact, early studies which purported to test this theory concluded that it had no empirical validity. This conclusion was based upon the demonstration that yield predictions derived from a structure of yields in accordance with logic of the expectations theory were usually wrong. Recent presentations of this theory have made it clear, however, that this is not a valid test. A test of the market's ability to form accurate forecasts of future

interest rates does not constitute a test of whether an existing yield structure depends upon market expectations of future interest rates. All that is asserted by the expectations theory is that yield differentials exist because the market expects interest rates to change. It is not claimed that the predictions of the market necessarily will be accurate. In addition to this clarification, recent studies have generated new evidence in support of the expectations approach. And, although these findings taken individually are not overwhelmingly compelling, as a group they do serve to increase the degree of acceptance of the expectations theory.

It is impossible in the short space available to describe these tests in detail, but their general approach may be outlined. First, hypotheses about how interest rate expectations are formulated at one point in time or how they are altered with the passage of time are developed. Maturity yield relationships established at various points in time and the subsequent changes in these relationships with the passage of time are then compared with this independent evidence of market expectations. A high degree of correlation has been found between these variables.

Another approach has been to draw inferences about the validity of the expectations approach by comparing actual interest rates established over a certain period of time with forecasted interest rates as implied by yield structures established in the past. The criterion used for judging the results was not whether market predictions always turned out to be correct, however, as it was in earlier tests of this kind. Rather, it was one of determining whether actual rates turned out *on the average* to be above or below forecasted rates. The presumption has been that if, on the average, actual rates were equal to forecasted rates, this suggested that the pure expectations theory was correct. The findings in several studies that forecasted rates generally exceeded actual rates has been the principal source of support for

the assertion that a liquidity premium on long-term debt must be recognized as a factor in determining maturity yield relationships.

Although most recent empirical studies of the expectations theory have proceeded along the lines described above, it should be noted that some investigations have approached the problem from a different perspective and have found evidence which casts doubt on this theory. One piece of evidence of this kind has been the inability to identify a group of balance sheet units that behave like the hypothetical speculators assumed in some presentations of the expectations theory. Moreover, objections have been raised as to the possibility of the type of speculative activity ascribed to traders because of technical deficiencies in the market with regard to short-selling. Additional evidence, which would appear to be particularly damaging to the overlapping markets version of this theory, was the finding in one recent study that interest rate expectations were not uniform among different market observers. This conflicts with one of the assumptions usually made in presenting the expectations theory which is that interest rate expectations of all investors tend to be uniform.

#### SUMMARY AND CONCLUSIONS

The problem of explaining maturity yield relationships remains unresolved. The implications of recent empirical findings, although far from being one-sided, have shifted opinion away from the segmented markets theory and toward either the pure expectations theory or this theory modified to include the existence of a liquidity premium on long-term debt. Perhaps the most compelling evidence produced by these studies was the consistent finding that changes in the maturity composition of debt have little, if any, effect on the maturity structure of yields. This, of course, constitutes not only a direct challenge to the segmented markets approach but, in addition, provides indirect support for the alternative theory. Other direct

tests of the expectations hypothesis have added further support for this theory. In fact, on the basis of the results of these two groups of tests, a strong argument has been made for rejecting the segmented markets theory and accepting the expectations theory. However, all the evidence does not point in one direction. The generally acknowledged fact that major groups of borrowers and lenders are constrained either by legal restrictions or personal preferences from viewing securities with different maturities as perfect substitutes, the inability to identify economic units performing as speculators, and the evidence of diverse interest rate expectations all serve to temper any inclination to discard the segmented markets approach and accept the expectations theory. Perhaps the best appraisal at this time is that, as a result of recent research, the expectations approach has won an important skirmish, but the outcome of the war remains in doubt.

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