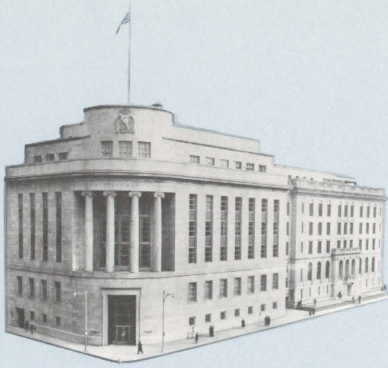


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# NEW ENGLAND ECONOMIC REVIEW

## **Exchange-Rate Flexibility and the Forward-Exchange Markets: Some Evidence from the Recent Experience with the German Mark**

One common objection to more flexible exchange rates is that they would overburden the forward-exchange markets and disrupt international trade. However, the experience of 167 U.S. firms last year shows that flexibility of the mark-dollar exchange rate did not produce this result.

## **The Path to Full Employment**

To attain "full employment," the U.S. economy must sustain a high rate of growth beyond this year due to continuing rapid growth of the labor force.

# Exchange-Rate Flexibility and the Forward-Exchange Markets: Some Evidence from the Recent Experience with the German Mark

by Norman S. Fieleke

IT IS WIDELY acknowledged that national governments will generally be freer to adapt monetary and fiscal policies to domestic needs if those policies are not constrained by a requirement to maintain fixed rates of exchange between national currencies. Nevertheless, governments typically undertake to fix these rates of exchange, allowing them to vary only within narrow limits. One reason for this rate-fixing is a fear that international commerce would be disrupted by exchange rates that could shift around with relative freedom. The evidence examined in this article suggests that this fear has little basis in fact.

## The Role of the Forward-Exchange Markets in International Trade

The contention that exchange-rate flexibility would disrupt international trade is customarily based on one or more of three different assumptions, none of which has been substantiated. The first assumption is that if exchange rates were allowed to fluctuate (or float), they would fluctuate wildly; there is little in economic theory or experience to support such an extravagant claim.<sup>1</sup> The second assumption is that in the absence of fixed rates international traders would be unnerved by uncertainty over what future exchange rates would be (even if exchange rates did not fluctuate wildly); thus, they would do much less

business, for to avoid struggling with uncertain exchange rates each trader would insist on consummating transactions in his own currency. This second assumption is vulnerable on two counts. First, over the long run, "fixed" rates are not really certain but are adjusted by sizable amounts. Second, in the short run, if forward-exchange markets are working properly they can substantially diminish business uncertainty stemming from short-run fluctuations in exchange rates.

How the forward-exchange markets are utilized to reduce uncertainty can readily be illustrated. Suppose that a U.S. importer signs a contract to purchase merchandise from Germany, and that the German supplier is to be paid in German marks soon after the merchandise is delivered 3 months hence. Because the rate of exchange between dollars and marks may change over the coming months, the U.S. importer cannot be sure what the merchandise will cost him in terms of *dollars* if he waits 3 months or more to buy the marks he has agreed to deliver. One way he can avoid this uncertainty is to buy marks for future delivery in the forward-exchange market. More specifically, his bank will agree to deliver, say, 3 months from now,

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<sup>1</sup> It is true, of course, that an exchange-rate which has been fixed by a government at a highly unrealistic level will change radically if it is allowed to move freely; this, however, is a different matter.

the marks he will need at that time, and will tell him *today* the rate of exchange (or dollar price) that he will have to pay for the marks at that time. By entering this contract, that is, by purchasing "forward cover," the importer can eliminate any uncertainty about the dollar price that he will have to pay for his imported merchandise. This service is made possible by the existence of the forward-exchange market.

This leads to the third assumption underlying the fear that exchange-rate flexibility would cripple international commerce. This assumption is that the forward-exchange markets would be unable to meet the demands placed upon them by a system of flexible exchange rates. With flexible rates, it is argued, the demand for forward cover would rise sharply, the facilities of the forward-exchange market would be overtaxed, and international trade would suffer. To return to the illustration, if the importer could not buy marks for future delivery without paying an exorbitant commission, he would not be willing to order the German merchandise.

Whether this third assumption is valid is a very important question. Fortunately, the question need not be debated in the abstract, since there is some recent experience to draw upon. In particular, the Canadian dollar has been floating since June 1, 1970, and nearly all the other major currencies also were allowed to float for a while last year after it became widely recognized that their rates of exchange against the dollar were being held at levels notably different from what market forces would dictate.

## Two Case Studies

In order to tap this experience with floating rates, we mailed questionnaires to selected U.S. firms which dealt with parties in Germany during the flotation of the mark, and also to firms which dealt with parties in Canada during the flotation of the Canadian dollar. Follow-up interviews were held with many of the firms that replied. The

purpose of these two surveys was to discover whether efficient forward-exchange market facilities were available for "covering" commercial transactions during the recent experiments with flexibility.

The results of the survey of firms doing business with Canadians have been published elsewhere.<sup>2</sup> Those results were very encouraging; the flotation of the Canadian dollar apparently did not impair the ability of the forward-exchange market to provide forward cover for transactions between U.S. and Canadian firms. However, because "one swallow does not make a summer," we subsequently investigated the functioning of the mark-dollar forward market during the flotation of the German mark, and it is the primary purpose of this article to report the results of that investigation.

## Firms Participating in the Survey

As noted, the investigation took the form of a questionnaire survey with follow-up interviews. Questionnaires were mailed to nonbanking firms in New York City which might have been expected to transact business with parties in Germany during the period the mark was floating (from early May through mid-December).<sup>3</sup> The questionnaire, which is reproduced at the end of this article, was designed to discover whether firms had experienced difficulties in obtaining forward cover during the flotation of the German mark. Completed or partially completed questionnaires were returned by 167 firms.

Recognizing the possibility that some lines of business might be troubled more than others by

<sup>2</sup> See *Canadian-United States Financial Relationships*, Conference Series No. 6, Federal Reserve Bank of Boston, available upon request.

<sup>3</sup> Firms to which the questionnaire was mailed were selected from Paul G. Baudler's *Directory of American Business in Germany* (4th ed.; Munich, Germany: Seibt Publications, 1971). Questionnaires were mailed to 890 firms.

difficulties in the forward-exchange market, we asked recipients of the questionnaire to identify the nature of their business and, in particular, to indicate whether they had acted as purchasers or sellers in their dealings with German residents during the flotation of the mark. This question, like others in the questionnaire, was not answered by all of the 167 firms. Of the firms which did answer the question, 35 had acted as purchasers, 54 had acted as sellers, and 31 had both bought and sold. A variety of lines of business were represented; 48 firms were manufacturers, 29 were distributors, wholesalers, or retailers, 25 merely exported or imported, 10 were publishers, and the remainder comprised a miscellany representing activities as diverse as mining and advertising.

It is also possible that smaller firms might not be accommodated so readily in the forward-exchange market as larger firms, and for this reason recipients of the questionnaire were asked to report their total assets and sales in 1971. The table shows how the responding firms are distributed in terms of their assets and sales; a few

gargantuan firms are included, but smaller businesses are well represented.

### The Performance of the Forward-Exchange Market

The questionnaire included two classes of questions relating to the performance of the mark-dollar forward-exchange market. The first class sought information on the general adequacy of the market, the second on specific characteristics of the market.

#### The General Adequacy of the Market

The most important finding can be stated in a single sentence. During the flotation of the mark, not one of the responding firms decided to forgo a transaction with a German resident because of difficulties in the forward market, and no firm was unable to buy or sell marks in the forward market. This is strong testimony that forward-exchange markets can function well during periods when exchange rates are undergoing significant change.

One hundred twenty-five of the firms partici-

NUMBER OF RESPONDING FIRMS SPECIFYING SIZE OF ASSETS AND SALES IN 1971, BY SIZE

<i>Size of assets or sales (in millions of dollars)</i>	<i>Number of firms with asset size indicated</i>	<i>Number of firms with sales volume indicated</i>
Less than 5	33	23
5 and under 50	16	24
50 and under 200	17	18
200 and under 500	9	12
500 and under 1,000	10	15
1,000 and under 2,000	13	12
2,000 and under 5,000	7	6
5,000 and over	4	3
Total	109	113

pating in the survey had entered into or completed a transaction with a German resident during the flotation of the mark. Seventy-three of these firms had agreed to make or accept payment in German marks in some of these transactions, and, other things being equal, these firms were faced with a foreign-exchange risk of the sort which confronted the importer in our illustration. Those which had contracted to pay marks in the future could, of course, have dealt with this exchange-risk by buying marks forward, while those expecting to receive marks in the future could have sold forward the marks they expected to receive.

However, 54 of the 73 firms dealing in marks stated that they did not buy or sell forward the marks involved in their transactions. It was not difficulties with the forward market which led these 54 firms to avoid the market, but other considerations. Eleven of the 54 thought that the mark amounts involved were too small to worry about, and a few others did not understand the logic of covering their mark transactions in the forward market. But the great majority of the 54 chose either (1) to protect themselves from exchange-risk by means *other than* buying or selling forward or (2) to gamble that they would do well enough without protection.

The means other than buying or selling forward which were employed by these firms to secure "protection" are discussed in a following section of this article. As for the "gambling" that went on, one example should suffice. Suppose that a firm is obligated to make a payment in German marks in the future, but that the management believes the rate it would have to pay for forward marks is unrealistically high; therefore, rather than buying the marks forward the management decides to wait and buy them at the time the payment must be made. In this example, the firm is "short" of the marks it needs to meet its obligations. Actually, the gamble represented by being "short" was not so common among the participating firms as the reverse gamble of having claims in marks that were greater than needed to meet the firm's

obligations.

The evidence presented thus far suggests that U.S. firms did not encounter any major inadequacies in the mark-dollar forward market during the period when the mark was allowed to float. However, it is possible that firms in Germany might not have been so fortunate; German firms making or receiving payments in dollars might have faced difficulties in covering their exchange risks by buying or selling dollars forward. If so, they might have asked their U.S. customers or suppliers to denominate the transactions in marks rather than in dollars.

The firms participating in our survey were questioned about this matter, and 23 of them stated that they had indeed been asked by German firms to start making or accepting payment in marks on transactions of a kind which previously had been denominated in U.S. dollars. However, none of the 23 firms indicated that it was difficulty with the forward-exchange market that had led the German businessmen to make this request. The truth probably is that the German businessmen did not want to be bothered with the bookkeeping and other administrative burdens associated with transactions in the forward-exchange market; if transactions were denominated in marks, it would be the U.S. firms, not the German firms, that would be faced with the exchange-risk and the decision of whether to enter the forward-exchange market. To be sure, these German firms had been willing to deal in dollars before the flotation of the mark; but at that time they probably thought that the exchange-rate would be stable enough to obviate the need for forward cover.

Nearly all of the 23 U.S. firms agreed to begin making or accepting payments in marks. Interviews with these firms revealed that the practice was continuing after the flotation of the mark was terminated. The continuation of the practice is no doubt partly attributable to inertia; but it is mainly attributable to a loss of confidence in Germany about the future worth of the dollar,

since 20 of the 23 U.S. firms reported that German suppliers had requested payment in marks out of fear that any dollars due them would decline in value.

To conclude this section, we were not able to discover any major deficiencies in the mark-dollar forward market during the flotation of the mark. In the next section, specific aspects of the market's performance are considered.

### Specific Characteristics of the Market

Even though the mark-dollar forward market seems to have been generally adequate during the mark's flotation, there might have been discontent with particular features of the market's performance. Consequently, our questionnaire included a few questions designed to reveal any such discontent.

As noted near the beginning of this article, it is conceivable that large firms with large forward transactions would be given much better service by the banks than small firms with small transactions. However, the questionnaire responses contained no evidence or allegations of discrimination against small firms or small transactions. In fact, in response to a question on the subject, three small firms each claimed to have entered the forward market during the flotation for a transaction of only 10,000 marks (the equivalent of about \$3,000). While such small transactions are hardly typical, it is encouraging that they did take place.

To obtain additional evidence on the treatment of small transactions, we asked the participating firms whether the forward-exchange rates quoted by banks are generally less favorable for small transactions than for large transactions. There were three affirmative and 10 negative responses. While the participating firms are therefore generally content with the treatment accorded their smaller transactions, it still is probably true that very small transactions are accommodated at rates less favorable to the firm; as one firm noted, "if the transaction were quite small the rate would be

less favorable to cope with the nuisance value."

Another important feature of the market is whether it can accommodate long-term contracts. To illustrate, a U.S. firm might agree to buy from a German firm a specialized machine which will require, say, 2 years to produce. If payment is to be made in marks, the U.S. firm might enter the forward market, seeking a contract to have the marks delivered 2 years hence at a price agreed upon today. It is sometimes alleged that such long-term contracts are very difficult to obtain, and that firms which could not obtain them would be discouraged from trading internationally if exchange rates became more flexible.

The evidence of the questionnaire survey is clear on this matter. No participating firm was unable to obtain forward-exchange contracts of the duration desired. However, the longest term to maturity that any firm contracted for was 1 year and 10 months, indicating that long-term contracts were not in great demand.

Finally, the questionnaire sought a little information on the nature of competition among banks active in the forward market, since it is sometimes argued that the banks follow monopolistic practices. The firms receiving the questionnaire were asked if they generally shopped around among the banks for the most favorable exchange rate when buying or selling marks forward. Those which did not shop around were asked why they did not, and those which did shop around were asked whether they encountered variations in the rates quoted by the banks.

Of the 24 firms answering this question, 12 customarily shopped around, and they reported minor variations in quoted rates. As for the 12 non-shoppers, the great majority either expressed confidence that their banks would not overcharge them or declared that the amounts involved in their transactions were too small to warrant the effort of shopping around. No firm complained of monopolistic behavior by U.S. banks.

The questionnaire also asked for suggestions on how to improve the mark-dollar forward market.

The only response relating to the functioning of the market was a suggestion that up-to-the-minute information on exchange rates should be obtainable without having to "bother the foreign-exchange traders all day." Twenty-five firms explicitly stated their satisfaction with the market.

In sum, the evidence examined in this section reinforces the conclusion that the mark-dollar forward market did not malfunction so as to disrupt international trade during the flotation of the mark.

### Commercial Hedging Practices

In the illustration given near the beginning of this article, it was noted that the importer could eliminate his exchange risk by purchasing marks forward. In fact, entering the forward-exchange market is only one of several methods by which a firm can cope with exchange risk. The purpose of this section is to describe the various methods that were employed by the firms which participated in the questionnaire survey.

#### Measurement of Gain or Loss from Exchange-Rate Changes

Once his merchandise had arrived, the importer in our illustration would have a debt to pay in marks, even though he had no marks on hand and none coming due him; he would then be "short" on marks. By contrast, an exporter to Germany might be entitled to receive payment in marks, even though he had no mark debts; he would be "long" on marks. Suppose that, before these payments were made, the dollar price of the mark went up in the foreign-exchange market, as happened last year. Then the exporter could obtain more dollars when he received and sold the marks than he could have obtained if the exchange-rate had remained stable; the importer, on the other hand, would have to spend more dollars to acquire the needed marks. Consequently, under the customary concepts the importer or other firm which had been short on marks would experience a loss

in terms of dollars, while a firm which had been long on marks would experience a gain in terms of dollars. If the dollar price of marks had fallen, the firm which had been long would have suffered a loss, while the other firm would have experienced a gain.

Measuring a firm's long or short position and the associated gain or loss from exchange-rate changes becomes more complicated if the firm has a number of different kinds of assets and liabilities denominated in the foreign currency, as firms commonly do if they have subsidiaries abroad. Knowing how firms measure their long or short position is necessary for understanding how they "hedge," or protect themselves, against avoidable losses from exchange-rate changes.

The accounting profession sanctions two general approaches, each with its variants, for measuring a firm's foreign-exchange position: the net financial assets approach and the net current assets approach. Under the net financial assets approach, the firm compares its financial assets (including cash and accounts receivable) which are denominated in a foreign currency with its financial liabilities (including both short- and long-term debt) which are denominated in that currency. Unless these foreign-currency assets and liabilities are of equal magnitude, the firm is considered to have a foreign-exchange position and to be exposed to the risk of loss from movements in the exchange rate. Physical assets, such as inventory and equipment, are excluded from the computation on the following grounds: (1) unlike cash and other financial assets, physical assets do not represent a fixed number of foreign currency units; (2) if a country's currency is losing value in the foreign-exchange markets, it is generally because of relative inflation in that country; and the price of physical assets in such a country generally rises with inflation, offsetting the depreciation of the country's currency and obviating any foreign-exchange loss on the physical assets.

Under the net current assets approach, the firm compares its current foreign assets (more pre-

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cisely, its current financial assets denominated in the foreign currency plus inventories held in the foreign country) with its current foreign liabilities (short-term debt payable in the foreign currency). Again, unless these assets and liabilities are of equal size, the firm is deemed to have a foreign-exchange position. The logic underlying this approach is not clear.

In response to our questionnaire, 75 firms indicated the approaches they used in determining whether they had a foreign-exchange position. Thirty-three firms used one of the traditional accounting approaches which have just been described, or used some minor variant of these approaches; more specifically, 16 relied upon the net current assets approach, six relied upon the net financial assets approach, and the remaining 11 employed variants or hybrids of these approaches. All but 7 of these 33 firms apparently had subsidiaries in Germany.

The remaining 32 firms made no reference to a traditional accounting approach, and only one of these firms had a German subsidiary. In other words, as might be expected, firms tend to ignore the traditional accounting concepts if they do not have German subsidiaries and are not faced with the task of periodically translating a complete set of German mark accounts into dollars. Nevertheless, these firms showed awareness that changes in the mark-dollar rate made a difference in the profitability of their dealings with parties in Germany; exporters to Germany knew that last year's rise in the dollar value of the mark would tend to raise their dollar revenues, while importers from Germany could hardly ignore the accompanying increase in the dollar cost of their imports.

### Measures Taken to Avoid Loss

The 75 firms which explicitly recognized that exchange-rate variations affected their businesses generally took steps either to protect themselves

or to profit from last year's appreciation of the mark. In particular, 25 of the 33 firms which employed a traditional accounting concept, or some variant thereof, managed to avoid having net liabilities, or to avoid being "short," under that concept. As for the 32 firms which did not espouse a traditional concept, the great majority of these also took steps to protect themselves. In fact, only eight firms explicitly declared themselves to be without protection, and all of them were importers.

The firms which took protective or profit-seeking measures named a variety of devices. Fourteen of them purchased marks forward; six purchased marks with borrowed dollars; 10 requested payment in marks for German goods they were reselling or for U.S. goods they were selling to German purchasers, while one started paying a German supplier in dollars instead of marks; two made estimates of how the exchange rate would change and planned their purchases from Germany on the basis of those estimates; two employed "currency clauses" in their contracts with German suppliers, under the terms of which their mark payments to the German suppliers were to be adjusted downward to offset any increase in the dollar price of the mark; and 11 engaged in "leading" or "lagging," which consists of changing the timing of foreign-exchange transactions in order to take advantage of anticipated changes in the exchange rate.

Leading and lagging, which was an important protective device, was accomplished in the following ways: deferral of dividends from German subsidiaries; delay in payment by German subsidiaries to non-German creditors; prepayment of German creditors; early placement of orders for German goods; and delay in repatriating export proceeds collected in Germany. In general, such activities allowed firms to delay the conversion of marks into dollars and to accelerate the conversion of dollars into marks, so that the firms would experience greater profits, or smaller losses, from the rise in value of the mark.



## Conclusion

The purpose of this article was to present additional evidence on the question of whether exchange-rate flexibility disrupts international trade by overtaxing the forward-exchange markets. The conclusion from the evidence now in hand is unambiguous. The 167 firms participating in our survey made no major, and virtually no minor, complaints about the functioning of the mark-dollar forward market during the flotation of the mark. This finding is all the more impressive in view of (1) the radical change in the mark-dollar exchange rate during the flotation and (2) the prolonged uncertainty over what the new fixed rate would be. Moreover, it is a finding which is very similar to that obtained from our earlier survey of experience under the flotation of the Canadian dollar. In brief, the claim that flexibility would overburden the forward markets is a bogeyman, whose exorcism is now in order, if not long overdue.

Of course, it is true that some forward-exchange markets did not perform well during the period of exchange-rate revisions last year; the

forward market for the Japanese yen is a case in point. However, the failings of such markets were caused by government restrictions over the institutions which serve the markets, not by basic inadequacies in the institutions themselves. These restrictions operated to reduce the degree of exchange-rate flexibility, but this reduction in flexibility impaired, rather than strengthened, the markets where it occurred.

Another important discovery from our survey is that a significant proportion of importers have started paying their German suppliers in marks instead of dollars. Foreign-exchange traders report that other continental West European currencies have similarly replaced the dollar to a significant degree in U.S. transactions with the countries concerned. This diminished role of the dollar as a transactions currency may have adverse implications for the U.S. balance of payments. In particular, if U.S. importers or other firms augment the foreign currency balances and reduce the dollar balances which they hold for transactions purposes, there will tend to be an excess supply of dollars in the foreign-exchange markets.

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## QUESTIONS FOR FIRMS TRANSACTING BUSINESS WITH GERMAN RESIDENTS

**Note:** For purposes of this questionnaire, "German resident" means any party in Germany, including individuals or firms or other organizations. "The flotation" refers to the period from May 10 through December 17, 1971.

1. During the flotation of the German mark, did you at any time decide against entering into a transaction with a German resident on the grounds that it would be too expensive or difficult to buy or sell German marks forward (for future delivery)?\_\_\_\_\_. If so, please explain.
2. Did you enter into or complete a commercial or financial transaction with a German resident at any time during the flotation?\_\_\_\_\_. If so, please proceed to the next question. If not, please return this questionnaire without answering any of the remaining questions *except numbers 12 through 18*.
3. What was the *general* nature of your business with German residents during the flotation? (In your answer, please note whether you acted as a purchaser or seller, or both, and what general classes of items were involved.)

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4. a. During the flotation were you asked by a resident of Germany to make or accept payment in marks on transactions of a kind which previously had been executed in U.S. dollars?\_\_\_\_\_. If so, can you explain why?  
b. If you did not agree to a request to make or accept payment in marks, would you explain why?
  5. During the flotation did you enter into or complete transactions with German residents involving your payment or your receipt of German marks?\_\_\_\_\_. If so, please proceed to the next question. If not, please return this questionnaire without answering any additional questions *except numbers 12 through 18*.
  6. Did you generally try to sell or buy forward the marks involved in the transactions mentioned in question 5?\_\_\_\_\_. If not, why not?
  7. During the flotation were any of your requests to buy or sell marks forward denied by a bank?\_\_\_\_\_. If so, why?
- Note:** If you have never bought or sold marks forward, please return this questionnaire without answering any additional questions *except numbers 12 through 18*.
8. During the flotation what is the smallest volume of marks which you bought or sold forward in a single transaction?\_\_\_\_\_. (An approximate figure will do.)
  9. In buying or selling marks forward *during the flotation*, what is the longest term to maturity that you contracted for?\_\_\_\_\_. Did you find it impossible to obtain desired maturities?\_\_\_\_\_. If so, please explain.
  10. a. Do you generally shop around among the banks for the most favorable exchange rate when buying or selling marks forward?\_\_\_\_\_. If not, why not?  
b. If you do shop around, do you frequently encounter variations in the forward exchange rates quoted by different banks?\_\_\_\_\_. Could you illustrate the variation encountered?
  11. Are the forward exchange rates quoted by banks generally less favorable for small transactions than for large transactions?\_\_\_\_\_. If so, could you illustrate?
  12. What improvements, if any, would you like to see made in the market for forward German marks?
  13. How would you go about computing the total loss or gain that your firm might have experienced as a result of the rise in the dollar value of the mark last year?
  14. Would you describe what measures, if any, you took to avoid suffering a loss from the widely anticipated appreciation of the mark last year?
  15. Please add here any other comments you may care to make.
  16. The following questions (16a and 16b) are asked merely for the purpose of classifying responses to this questionnaire. Your answers will be held in strict confidence.
    - a. What is the nature of your business?
    - b. What were your total assets in 1971?\_\_\_\_\_.  
Total sales?\_\_\_\_\_.
  17. Would you please state the name of your firm:
  18. Date you completed this questionnaire: \_\_\_\_\_.
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# THE PATH TO FULL EMPLOYMENT

by Stephen K. McNees

AFTER 2 YEARS of no growth, civilian employment began to rise in mid-1971. Since then employment, as measured by the household survey, has been expanding at the rate of 2.5 million new jobs a year.<sup>1</sup> Despite these impressive employment gains, the unemployment rate has been virtually stationary. Some observers, apparently seeking a single statistic to serve as the "true" indicator of labor market trends, have viewed these facts as a paradox. Others have "explained" the matter by suggesting that there has been a temporary, abnormally rapid rate of labor force growth.<sup>2</sup> There is some danger that the long-run implications of these recent events will be misinterpreted. While recent employment gains have been encouraging, returning to the full employment range is likely to be a nagging problem a year, or even 2 years, from now, unless an extremely high rate of output growth can be sustained.

## I. Definitional Framework

It may be helpful to present the definitional framework which will identify the relevant factors. Since output is the product of productivity, average man-hours, and employment, it grows as rapidly as those three factors, taken together, grow. For example, the "official" estimate of the rate of growth of potential output is 4.3 percent. The 4.3 percent is composed of a 1.7 percent

annual rate of growth in employment, a 0.2 percent rate of decline in the average workweek, and a 2.8 percent growth in output per man-hour, or productivity.<sup>3</sup>

Employment can be defined as the product of the working age population (aged 16 years and over), the participation rate (the proportion of the population in the labor force), and the rate of employment (the proportion of the labor force employed). The unemployment rate depends upon all of these factors: output, productivity, hours worked, participation rate, and the working age population.<sup>4</sup> This article will focus on alternative future time paths of employment and output and their implications for achieving full employment.

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<sup>1</sup>This excludes the 301 thousand increase in household employment, registered in January, which is solely attributable to population revisions based on the 1970 census.

<sup>2</sup>See, for example, *Business Week*, April 15, 1972, p. 44.

<sup>3</sup>The figures cited are those adopted by the Council of Economic Advisers. The Bureau of Labor Statistics also projects a 4.3 percent rate of growth of potential output but with a 0.1 percent annual decline in the workweek, a 3 percent rate of growth in productivity, and a 1.7 percent rate of growth in employment. See "The U. S. Economy in 1970: A Preview of BLS Projections," *Monthly Labor Review*, April, 1970, pp. 3-34.

<sup>4</sup>Output and employment are defined algebraically by (1) and (2) respectively. Combining (1) and (2), it is clear that the unemployment rate, (3), is negatively related to the level of output alone and, for a given amount of output, positively related to productivity, man-hours, the

## II. Population Growth and Participation Rates

Between 1948 and 1959 the working age population (the noninstitutional population 16 years or older) grew at an annual rate of only 1.1 percent, because new entrants were born during the Great Depression when birth rates were quite low. Due to the post-World War II baby boom, the working age population growth accelerated in the early 1960's, reaching an annual rate of 1.7 percent between 1962 and 1971. The working age population is relatively easy to predict for at least 16 years, since all the new entrants have already been born and since death and immigration rates are relatively stable. Thus, it is now clear that the working age population will continue to grow at the high 1.7 percent pace through the decade of the 1970's because birth rates did not peak until the late 1950's. After 1980, the rate of growth of the working age population is bound to drop off, due to the decline in the birth rate which occurred in the mid-1960's.

On the basis of these relatively certain projections of population, there will be some important shifts in the future composition of the labor force. The baby boom which drove up the proportion of teenagers in the labor force in the 1960's has reached its peak. The proportion of the labor force under 25 will decline slightly over the next few years, and the proportion of prime-age workers will rise steadily throughout the 1970s. All of the rise between now and 1975 stems from a strong upward surge in the proportion of the labor force between 25 and 34. The proportion between 35 and 44 will continue to decline until 1975 but then will rise in the last half of the decade, as the baby boom population starts moving up the age structure.

Projections of participation rates, the percentage of the various age-sex groups who hold a job or are looking for work, are not so certain, however. The Bureau of Labor Statistics has projected participation rates through 1985.<sup>5</sup> The projections

hinge on four broad assumptions: (1) The participation rate for prime-age men, 25-54, will hold constant at the 1964-1968 level. (2) The labor force participation by men 55 and over, which has been declining since 1950, will continue to decline but at only half the rate of recent years. (3) The participation rate of students, which is lower than that of non-students but which has been rising, will continue to rise while the non-students' participation rate will hold at its 1965-1967 level. (4) Finally, for adult women, classified by age, marital status, and age of children, the participation rates which have held constant will continue to do so, while the participation rates which have been rising will continue to rise but at only half their former rate of increase.

While each of these assumptions appears reasonable enough, together they lead to a rather peculiar result: 94 percent of the labor force growth in the 1970s will come from population growth and only 6 percent from higher labor force participation. This would mark a sharp departure from the 1960s, when 26 percent of labor force growth resulted from the net increases in participation rates. With no changes in participation rates between 1960 and 1970, the labor force would have grown at only a 1.3 percent annual rate

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participation rate, and the working age population:

$$\begin{aligned} (1) \quad Q &= P \cdot MH \cdot E \\ (2) \quad E &= ER \cdot PR \cdot Pop \\ (3) \quad UR &= 1 - ER = 1 - \frac{0}{P \cdot MH \cdot PR \cdot Pop} \end{aligned}$$

Where

- Q = Output
- P = Productivity, or output per employee
- MH = Average man-hours
- ER = The proportion of the labor force which is employed.
- PR = The proportion of the working-age population which is employed or is seeking employment.
- Pop = Noninstitutional population 16 years or older.

<sup>5</sup>Sophia C. Travis, "The U. S. Labor Force: Projections to 1985," *Monthly Labor Review*, May, 1970, pp. 3-10.

rather than the actual 1.75. Since the participation rate for men actually declined over the last decade, clearly the main stimulus came from women. The number of women in the labor force *would have* grown at a 1.5 percent annual rate if the 1960 participation rates for women had prevailed in 1970, but, in fact, the number of women in the labor force grew more than twice as rapidly.

Not only do the BLS estimates contrast sharply with the changes which occurred in the 1960s, but they also appear too conservative when compared to the participation rate levels in the early 1970's. Table 1 gives the age-sex breakdown in participa-

tion rates both historically and as projected by the BLS. With only the single exception of women between the ages of 55 and 64, participation rates in the sluggish 1970-71 period *exceed* the rates projected for 1975. One would expect those participation rates which normally rise to increase more rapidly, or at least not decline, and those rates which typically fall to decline less rapidly, as the current economic recovery gains momentum. Thus, the conclusion seems inescapable that for the next few years participation rates, and therefore the labor force, will be higher than the BLS has projected them to be.

**Table 1**  
**PARTICIPATION RATES**  
**(Total Labor Force as a Percentage of**  
**Total Noninstitutional Population)**

	1960	1970	1971	1975*
Total	59.2	61.3	61.0	60.1
Male	82.4	80.6	80.0	79.1
16-19	58.6	58.4	58.0	56.8
20-24	88.9	86.6	85.7	83.4
25-54	95.8	96.0	95.6	95.4
55-64	85.2	83.0	82.2	81.1
65+	32.2	26.8	25.5	23.1
Female	37.1	43.4	43.4	42.5
16-19	39.1	44.0	43.5	41.2
20-24	46.1	57.8	57.8	56.9
25-54	42.6	50.1	50.3	49.3
55-64	36.7	43.0	42.9	44.3
65+	10.5	9.7	9.5	8.8

\*Bureau of Labor Statistics estimate. See *Monthly Labor Review*, May, 1970, Table 1, p. 4.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings*.

**Table 2**  
**EMPLOYMENT GAINS NECESSARY TO ACHIEVE "FULL EMPLOYMENT":**  
**LOW GROWTH ASSUMPTION**

<i>Unemployment</i>	<i>Date Target is Reached</i>		
	<i>Annual Growth Rate From 1971:4 To</i>		
	<i>1972:4</i>	<i>1973:4</i>	<i>1974:4</i>
4.0	4.3	3.3	2.9
4.5	3.7	3.0	2.7
5.0	3.2	2.7	2.6
	<i>Annual Increase (Thousands)</i>		
4.0	3422	2654	2401
4.5	2987	2432	2250
5.0	2553	2210	2098

SOURCE: T. Aldrich Finegan, "Labor Force Growth and the Return to Full Employment," *Monthly Labor Review*, February, 1972, pp. 29-39.

### III. Employment Growth

The question then becomes how much higher they will be. Professor Finegan has recently projected labor force growth using a fairly simple set of assumptions based on the growth of participation rates in the period 1965 to 1969.<sup>6</sup> For the groups which raised their participation rate, primarily women under 65 and teenage men, Finegan assumes that future growth will be at one half of the rate which prevailed between 1965 and 1969. For groups whose participation rate dropped, primarily men 55 and over, Finegan extrapolates the full rate of decline. These assumptions, which fared fairly well in predicting actual figures in 1970 and 1971, imply that the labor force will grow at a 2.2 percent annual rate between 1969 and 1974 – 2.2 percent is about 30 percent higher than the BLS estimate of 1.7.<sup>7</sup>

The Finegan results have two important, related implications: first, the 4.3 percent rate of growth

of potential output used by the Council of Economic Advisers, the Bureau of Labor Statistics, and other official agencies is distinctly too low (unless, of course, there is an offsetting error in the estimates of productivity growth or workhour changes); and, second, the employment gains required to reach a full employment target will be significantly higher than the gains implied by the BLS estimate.

Table 2 updates Finegan's approach to include

<sup>6</sup>This section relies heavily upon T. Aldrich Finegan's "Labor Force Growth and the Return to Full Employment," *Monthly Labor Review*, February, 1972, pp. 29-39.

<sup>7</sup>Strictly speaking 1970 and 1971 do not provide a test of Finegan's projections since he projected the "full-employment civilian labor force," the labor force which would occur if the economy were operating at an unemployment rate of 4.5 percent. Tables 2 and 3 are based on the assumption that the economy is operating at an unemployment rate of between 4 and 5 percent so that Finegan's projections are taken as estimates of what the actual, measured labor force would be.

actual data from 1971 and extends it to the end of 1974. Table 2 shows the gains in employment necessary to meet various unemployment rate targets by the end of 1972, 1973, and 1974. For example, to achieve an unemployment rate of 4.5 percent by the end of 1973, employment would have to grow at an annual rate of 3 percent throughout this year and next. The economy would have to add about 2.5 million jobs in each of those years. The President's Council of Economic Advisers has predicted that the unemployment rate will be in "the neighborhood of 5 percent" by the end of this year. Unless the neighborhood is fairly large, this would require more than 2.5 million jobs to be created this year, a growth in employment of 3.2 percent. The first quarter of 1972 was an admirable start in this direction — payroll employment grew by 4 percent and employment measured on the basis of the household survey grew by nearly 3 percent.

However, despite this strong performance over the last several months, there are some grounds for

pessimism. Most important, a high growth rate would have to be sustained for several more quarters in order to reach full employment. Moreover, the participation rate assumptions in Table 3 may well be too conservative. Table 2 is based upon what Finegan calls his "low growth" assumptions. Along with them, he presents some "high growth" assumptions. The pair are intended to bracket the actual outcome. The implications of the high growth assumptions are shown in Table 3. The high growth assumptions, a simple extrapolation of growth rates from 1967 to 1969, imply a 2.5 - 2.6 percent annual rate of growth in the labor force, so that even more employment gains would be needed to meet the unemployment rate targets. Under the high growth assumptions, the 1972 first quarter results will have to be improved in order to reach a 5 percent unemployment rate by the fourth quarter of 1974.

Table 4 gives some historical perspective on how difficult it will be to sustain an expansion of employment at an annual rate of 3 percent. Rates

**Table 3**  
**EMPLOYMENT GAINS NECESSARY TO ACHIEVE "FULL EMPLOYMENT":**  
**HIGH GROWTH ASSUMPTION**

<i>Unemployment Rate Target (%)</i>	<i>Date Target is Reached</i>		
	<i>Annual Growth Rate From 1971:4 To</i>		
	<i>1972:4</i>	<i>1973:4</i>	<i>1974:4</i>
4.0	5.5	4.0	3.5
4.5	5.0	3.7	3.3
5.0	4.4	3.5	3.2
	<i>Annual Increase (Thousands)</i>		
4.0	4410	3280	2911
4.5	3970	3055	2757
5.0	3510	2830	2603

SOURCE: Finegan, *op. cit.*

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exceeding 3 percent *were* achieved early in the first two post-World War II economic expansions, but these rapid rates lasted only about a year. Exceptionally high rates of real economic growth were necessary to achieve them. In the long, gradual expansion of the early 1960's, perhaps the most analogous to the present situation, employment grew at less than 2 percent per year. Even under the low growth assumptions, this rate would not reduce unemployment below 5 percent in the fourth quarter of 1974.

### IV. Output Growth

Up to this point, the approach has been to concentrate on how rapidly employment must grow to reach various unemployment rate goals.

The same problem can also be approached by asking a different, but closely related question: How fast must aggregate real output rise in order to reach the unemployment rate target? Historical data, as shown in Table 4, provide little insight into this question since the amount of real growth, in relation to employment growth, has varied widely – from a low of less than twice as great in the mid-1950's to a high of more than seven times in the early part of the 1960's.

It is obvious that a 1 percent increase in the employment of a given labor force could be achieved with about a 1 percent increase in real output if *everything else remained unchanged*. But of course things do change: employment gains are associated with increases in the size of the labor force, in average hours worked, and in produc-

**Table 4**  
**ANNUAL RATES OF GROWTH DURING POSTWAR EXPANSIONS**

<i>Expansion Period</i>	<i>Real GNP</i>	<i>Civilian Employment</i>	<i>Civilian Labor Force</i>	<i>Output Per Manhour (Private Nonfarm)</i>	<i>Average Annual Change in Unemployment Rate</i>
<i>First 5 Quarters</i>					
1949:IV to 1951:I	12.6	3.0	0.1	4.8	-2.8
1954:III to 1955:IV	8.6	4.5	3.0	2.8	-1.4
1958:II to 1959:III	6.4	2.7	0.9	2.9	-0.8
1961:I to 1962:II	7.4	1.0	-0.0	5.3	-1.0
1970:IV to 1972:I	5.1	1.9	2.0	4.0	0.0
<i>First 10 Quarters*</i>					
1949:IV to 1952:II	7.7	1.6	0	3.3	-1.6
1954:III to 1957:I	4.4	2.7	1.9	1.9	-0.8
1961:I to 1963:III	5.7	1.4	0.8	4.5	-0.5

\*The expansion starting in 1958 did not last 10 quarters.

SOURCE: Original data from U. S. Department of Commerce, Bureau of the Census and U. S. Department of Labor, Bureau of Labor Statistics.



**Table 5**  
**REAL GROWTH RATES NECESSARY TO ACHIEVE "FULL EMPLOYMENT"**

<i>Unemployment Target</i>	<i>Date Target is Reached</i>		
	<i>Annual Rate of Growth of Output From 1971:4 To:</i>		
A. Estimates Based on Original Version of "Okun's Law":			
	1972:4	1973:4	1974:4
4.0	10.7	7.4	6.3
4.5	9.0	6.5	5.7
5.0	7.2	5.6	5.1
B. Estimates Based on Gap Version of "Okun's Law":			
	1972:4	1973:4	1974:4
4.0	11.5	7.8	6.8
4.5	9.8	7.0	6.3
5.0	8.2	6.2	5.7

SOURCE: The gap version of "Okun's Law" is taken from the Data Resources, Inc. econometric model of the U. S. economy.

tivity. Expansion not only means the employed work longer hours and are more productive, but it also means more people seek employment. George Perry has estimated that a 1 percentage point drop in the unemployment rate brings 500,000 persons into the labor force.<sup>8</sup> The basic question of how much real growth reduces the unemployment rate is, in short, an exceedingly complex one to which several different approaches have been taken.

A decade ago, Arthur Okun provided a useful, simple rule of thumb, known as "Okun's Law," to answer this complex question. His approach is straightforward — he used historical data to relate changes in the unemployment rate to the rate of growth of real output. The relationship he developed implies that real GNP must grow at an annual rate of more than 4 percent to hold the unemployment rate constant; for each additional percentage point real GNP grows at annual rates, the unemployment rate will drop by about 0.3 percentage points per year.<sup>9</sup> The top part of Table 5 gives the answer to the question based upon the

original version of Okun's Law. For example, a 7.2 percent real growth rate would be required to reach a 5 percent unemployment rate by the end of the year.

Some have suggested that Okun's Law may overstate the output growth requirements in the 1970's. Most of the reasons center upon a predicted decline in the rate of growth of productivity due, for example, to the constraint of energy supplies or to the rise in the proportion of services (with presumably sub-normal productivity) in total output. A substantial decline in the workweek would also lower the output growth requirements for employment gains. On the other hand, there are several reasons why Okun's Law is likely to understate the growth requirements in the

<sup>8</sup>George Perry, "Labor Force Structure, Potential Output, and Productivity," *Brookings Papers on Economic Activity* (3:1971), pp. 533-565.

<sup>9</sup>Arthur Okun, *The Political Economy of Prosperity*, Norton, 1970, pp. 135-137.

1970's. The most important ones have already been mentioned – the working-age population and labor force participation rates will grow more rapidly than they did in the period Okun studied. Re-estimating Okun's equation, using more current data, indicates that unemployment has been slightly less responsive to output growth over the last decade. The difference, however, is not significant so that the numbers in Part A of Table 5 should perhaps be taken as only slight *underestimates*.<sup>10</sup>

Most estimates of the relationship between real growth and the unemployment rate have been based on "Okun's Law." For example, the econometric model of the U.S. economy developed by Data Resources, Inc. modifies Okun's approach to take account of the proportion of the working-age population who are teenagers, since teenagers suffer such high unemployment rates. The proportion of teenagers in the labor force rose dramatically during the 1960's. Part B of Table 5 shows the real growth rates which will be required to attain specified employment targets, based on the Data Resources approach. This estimate is clearly more pessimistic than the original Okun version since at least an additional half of 1 percent of real growth is required to reach each of the unemployment targets. Considerable support for these estimates of the high real growth rates necessary to reduce unemployment comes from the fact that they are very similar to those Perry arrives at in his more sophisticated, disaggregated analysis.<sup>11</sup>

Finally, it is useful to consider an approach to the output-unemployment rate relation which is not based on Okun's Law. The Fair forecasting model arrives at an estimate of the unemployment rate by producing separate explanations of employment and of the labor force. There are two important innovations in the Fair approach: (1) wages rates are used to help explain labor force participation rates,<sup>12</sup> and (2) employment depends not only on changes in real (non-farm) output but also on the amount of "excess labor"

in the economy.<sup>13</sup>

In the Fair model, separate participation rates are determined for primary workers (males aged 25 to 54) and all other workers. The participation rate for primary workers is taken as simply a function of time. For secondary workers, participation depends not only on a time trend but also positively upon the total employment rate and the money wage rate, and negatively upon the price level. While participation is related to current employment conditions, wages and prices enter with a seven quarter distributed lag. It is interesting to note that when employment conditions including wage rates are taken into account, the relationship explains the rise in the participation rate of secondary workers without relying upon a positive time trend. Other things held unchanged, the passage of time results in a gradual decline in the participation of secondary workers in Fair's equation.

"Excess labor" is an important determinant of changes in employment in Fair's approach. Excess labor can be looked upon either as the difference between the standard number of hours of work per worker and the actual number of hours worked per worker or as the difference between

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<sup>10</sup>In Okun's original version, a 1 percentage point increase in the quarterly rate of growth of real output lowers the unemployment rate by 0.3 percent each quarter. Virtually the same responsiveness is found when the 45 quarterly observations through 1972:1 are added to the sample. A regression based upon quarterly data for the period 1961:1 thru 1972:1, however, gives the result that each percentage point increase in real output lowers the unemployment rate by .24 percent per quarter. The difference is not significant, however, on the basis of the Chow test for a structural shift in the coefficients:  $F(2, 92) = 0.4$ .

<sup>11</sup>Perry, *op. cit.*, p. 561.

<sup>12</sup>Ray C. Fair, "Labor Force Participation, Wage Rates, and Money Illusion," *Review of Economics and Statistics*, May, 1971, pp. 164-68.

<sup>13</sup>Ray C. Fair, *A Short-Run Forecasting Model of the United States Economy*, Lexington: D. C. Heath and Company, 1971, chapter 9; and *The Short-Run Demand for Workers and Hours*, Amsterdam: North Holland Publishing Company, 1969, *passim*.

the number of workers employed and the desired number of workers to be employed in any given period. The desired level of employment is obtained by dividing total man-hour requirements, as determined from a production function for each level of output, by an estimate of the standard number of hours per worker. When the actual number of man-hours exceeds man-hour requirements, firms can decrease either employment or hours per worker or both. When the man-hour requirements exceed actual man-hours in the last period of time, requirements are met both by increasing employment and by paying for more costly overtime hours.

The real growth requirements necessary to achieve full employment in the employment sector of the Fair model differ significantly depending on the time horizon in which the target unemployment rate is met. The prospects for this year are exceedingly bleak, given the amount of "excess labor" which has built up in the economy during the recent years of sluggish growth. A real growth rate of over 9 percent would be necessary to reach an unemployment rate of 5 percent in the fourth quarter. However, in 1973, the impact of a sustained high growth rate would erode the amount of excess labor, enabling the unemployment rate to drop more rapidly. An unemployment rate of 4.0 percent by the end of next year is consistent with an average annual real growth rate of 6.6 percent sustained throughout 1972 and 1973. This result is, of course, considerably more optimistic than either version of Okun's Law.

## V. Conclusion

The task of reaching full employment is clearly both an important and demanding one. Each of the analyses presented suggests that full employment, even when defined as only 95 percent of the labor force, is not likely to be achieved this year. The outlook for attaining full employment in future years is, of course, less certain. If the rise in participation rates should prove to be transitory, an updated version of Okun's Law should provide a workable estimate of the necessary growth requirements. In that event a real growth rate of between 6 and 7 percent would bring the economy to full employment range by the end of next year. At the other extreme, if labor participation rates were to behave the way Finegan suggests they might, the official estimate of the rate of growth of potential output is about 0.5 percent too low. Unless there is an offsetting reduction in the growth of productivity or speedup in the decline of the workweek, real growth requirements to reach full employment at the end of 1973 could be as high as  $6\frac{1}{2}$  to  $8\frac{1}{4}$  percent. Only if the target date were extended to the end of 1974 would an unemployment rate much below 5 percent be attainable if current (first quarter 1972) real growth rates are sustained. Whichever target date and whichever full employment target one selects, the implication is clear — rapid rates of real economic growth must be sustained over an extended period of time in order to reach society's full employment objective.

