

July 1966

# FEDERAL RESERVE BANK OF ST. LOUIS

# Review

## *Total Demand and Inflation*

### Introduction

TOTAL DEMAND FOR GOODS AND SERVICES in the economy has expanded more rapidly in recent months than has supply. The rate of price increase has risen. Total demand has been augmented by stimulative monetary and fiscal factors and, in turn, has greatly expanded credit demands. Consequently, interest rates have moved up. Many of the salient developments in the current domestic economic situation also characterize most other developed countries.

In order to minimize inflationary pressures at a time of full use of resources, it is important that increases in total demand be kept in line with increases in the economy's capacity to produce goods and services. Real product has risen rapidly during the past year and a half, but with indication in 1966 that the rate of increase may be lessening. Real GNP rose at a 6 per cent rate in the first quarter of 1966, somewhat less than in the preceding year. In order to draw forth additional increments of real product, increasingly large changes in total demand have been necessary during the past year.

Government policies, past and present, are generally believed to have a great bearing on total demand. A major problem of the Government is to devise policies which keep the economy moving up at what has been termed a "sustainable" rate. Excessively stimulative Government policies lead to marked increases in the price level. Rapid monetary expansion is regarded by many as a means of stimulating total demand. Federal fiscal

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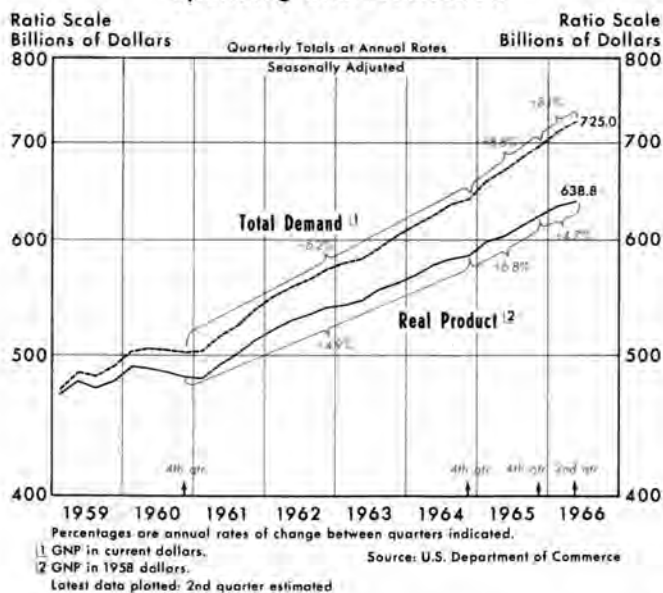
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policies are regarded as stimulative if the tax structure and spending programs are such that at high employment a relatively small surplus or a relatively large deficit is incurred.

### Growth in Real Product

How rapidly can demand grow without excessive price increases? At high employment the rate of increase of the growth "ceiling" is determined by the rate at which additional man-hours come into the work force and the rate at which productivity increases. This rate of growth of productive potential is indicative of the rate at which demand can grow without inordinately rapid price increases. From a point well below the ceiling the economy can bound up very rapidly. Once physical output has reached this ceiling, total demand can increase at no greater rate than the ceiling's upward slope without adding to inflationary pressures. If total demand does continue to grow more rapidly than the ceiling, real physical product may continue to grow by bringing marginal facilities into operation and by attracting into the labor force those who under current conditions do not choose to work, such as housewives, those on retirement, those in school, or those who already have one job. But gains in real product can be made only at the expense of sufficiently sharp price increases to attract these resources into production.

### Spending and Production



In making judgments about appropriate rates of increase in total demand that are sustainable, consideration must be given to the underlying supply factors, that is, to those factors that are independent of current economic conditions. On the supply side, growth in the number of man-hours available reflects

institutional practices concerning the length of the workweek, customary labor force participation rates, and the growth in population of working age. At the same time there are changes in technology and increases in capital goods which lead to greater productivity per man-hour worked.

The length of the normal workweek has remained near the 40-hour mark for more than a decade. The population of working age rose at a 1.1 per cent annual rate from 1960 to 1964. From 1964 to 1965 it rose 1.9 per cent and is estimated to be currently rising at a 1.6 per cent annual rate. Real output per man-hour rose at a 2.4 per cent annual rate from 1953 to 1957, a 2.5 per cent rate from 1957 to 1960, and a 3.5 per cent rate from 1960 to 1964.

Strong total demand has led to a more rapid growth in employment of resources in recent years than the long-run growth in supply. Such deviation from trend is not unusual in the early phases of cyclical recovery and may continue for some time. During 1965 total employment rose 3.5 per cent compared with a 1.6 per cent average annual rate of increase from 1960 to 1965. The workweek in manufacturing rose to about 41.4 hours at the end of 1965 compared with 40.7 hours in 1964 and 39.7 hours in 1960.

There is tentative evidence of a slowdown in the rate of increase in real product in the second quarter. Industrial production rose at an 8 per cent annual rate from February to May, after spurting at a 15 per cent rate from September 1965 to February. Payroll employment expanded at a 3.0 per cent annual rate from March to June, down sharply from the 7 per cent rate of increase in the preceding six months. Total employment, according to estimates which are subject to considerable statistical error, showed little net increase from January to June compared with a 3.5 per cent rate of increase during the preceding

### Status of the National Labor Force



year. Apparently there has been no net increase since late 1965 in the workweek in manufacturing.

### Recent Increases in Total Demand and Prices

Total demand has risen more sharply in recent quarters than real output. Price increases consequently have accelerated. From 1960 to 1964 the average level of prices was relatively stable. Consumer prices rose at a possibly overestimated average annual rate of 1.2 per cent; wholesale prices were virtually unchanged; and the GNP implicit price deflator, the broadest indicator of price changes, rose at a 1.3 per cent annual rate, a rate which also may have been overstated.

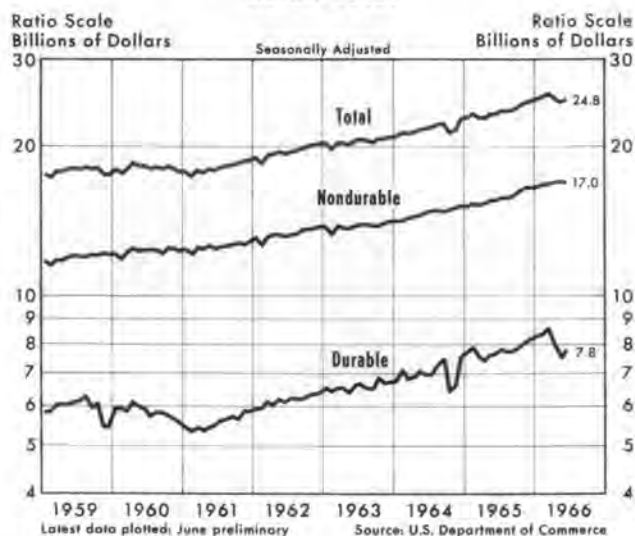
After mid-1964, prices began to rise noticeably. From June 1964 to October 1965 consumer prices rose at a 1.7 per cent rate, and wholesale prices increased at a 2.3 per cent rate. The implicit price deflator showed an average rise of 2.0 per cent from the third quarter of 1964 to the fourth quarter of 1965.



Since late 1965 the rate of price increase has moved up further. From October 1965 to May consumer prices rose at a 3.4 per cent annual rate. Wholesale prices increased at a 3.8 per cent rate from October 1965 to June. Since the fourth quarter of 1965 the implicit price deflator has shown a 3.6 per cent rate of increase. Changes in the trend of transactions prices may have been even greater, reflecting factors such as discount eliminations and quality reductions.

Some indicators suggest a lull in recent months in actual takings but do not necessarily reflect a moderating in demands. Total retail sales declined at a 10 per cent annual rate from March to June after expanding at a clearly unsustainable 16 per cent

### Retail Sales



annual rate from September 1965 to March. The decline was centered in sales of durables, largely reflecting downward adjustments in automobile sales. Expenditures on new construction, at \$76 billion in May, were about unchanged from the levels reached in late 1965.

Actual takings of durable goods and houses may moderate or decline even though basic demand for their services is growing or unchanged. The reimposition of excise taxes on such consumer goods as automobiles has increased their purchase cost. In addition, interest rates on mortgages have risen, and there has been a general stiffening in credit terms. These developments—that is, rising costs—may tend to moderate spending on durables and housing. It is not unusual that expenditures on housing or other durables bear the brunt either of policy measures or of the natural workings of the economy to limit spending. Because it is possible for the public to continue to consume the services of existing housing or other durables while postponing their replacement, social costs may be at a minimum when declines in spending center in capital investment areas such as these.

### Rising Interest Rates

As with other prices, the underlying trend in interest rates has been strongly upward. Since June of last year the rise has been marked, with the upward trend at least as strong in the first half of 1966 as in the last half of 1965. Interest rate increases have resulted from a strong demand for investment funds and have occurred despite an inordinately rapid expansion in bank reserves and money. Strong private demands for loan or investment funds derive in turn from excessive total demand for goods and services, buoyed by expectations of price increases. The public

policies which will effectively limit price increases, namely policies which restrict total demand, are in the main those which, after a brief lag, are also apt to limit interest rate increases.

In addition to the strong private demands for loan funds, a major factor in the interest rate increases has been the stimulative fiscal situation. The high-employment budget has been essentially in balance during the past 12 months compared with a \$7.2 billion surplus in the first half of 1965. Thus, whereas in the first



half of 1965 the Government was a substantial high-employment supplier of funds, in 1966 it has been a negligible supplier. With private high-employment investment and savings plans maintained or shifted toward even more investment, a rise in interest rates has been an inevitable result of a lessened high-employment supply of savings from the Federal Government sector. Higher tax rates or less Government expenditures might provide the chief means whereby interest rate increases could be limited. An alternative to the recent rise in interest rates might have been a yet more rapid monetary expansion, though there is a view that a more rapid monetary expansion, by further stimulating demands for goods, services, and investment funds, would, after a brief lag, have resulted in yet higher interest rates as well as higher prices in general.

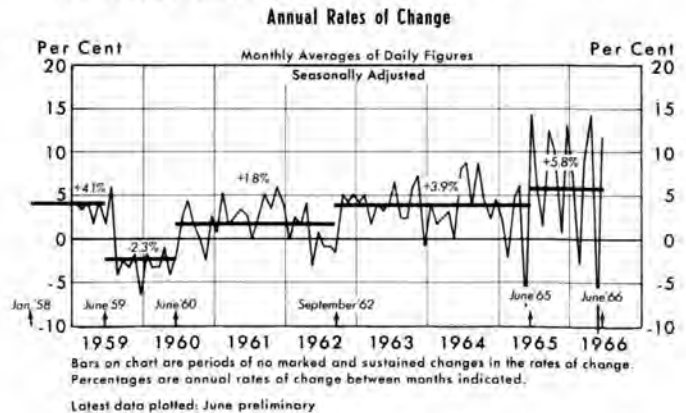
Even though domestic interest rates have risen markedly in the past year, there has been little change in relationships between interest rates in the United States and those in leading foreign countries. Those factors which have been responsible for rising do-

mestic interest rates—strong demands for goods and services, strong investment demands relative to savings flows, a stimulative fiscal situation, and rapid monetary expansion—have also pushed up prices and interest rates in many foreign countries.



### Rapid Monetary Expansion

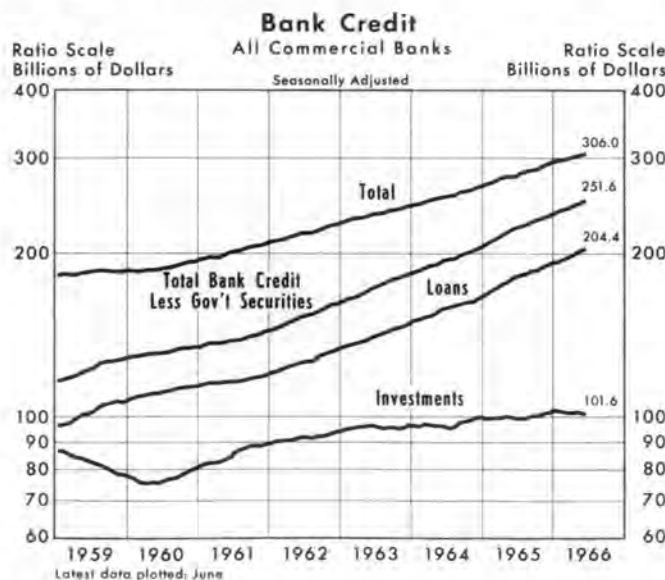
The money supply has continued to rise rapidly in recent months. According to standard seasonally



adjusted data, the money supply has risen at a 4.6 per cent annual rate since March, at a 5.6 per cent rate since September 1965, and 5.8 per cent since a year ago. These increases are substantially more rapid than trend rates of growth: from 1960 to 1964 money rose at a 2.6 per cent rate; from 1953 to 1960 the increase averaged an annual rate of 1.4 per cent.

In discussing the relation between the price level, total demand, and real output, it was pointed out that price increases occur if at high employment levels demands rise more rapidly than potential output. It was further observed that price increases may be avoided if productive capacity rises as rapidly as total demand. Similarly, monetary expansion is commonly regarded as an alternative to rising interest rates, at least in the short run. If monetary expansion is sufficiently rapid, credit demands can be met by debt monetization rather than curbed by stiffened terms. However, it may be misleading to view rising interest rates as a reflection of tightening on the part of the monetary authorities. If credit demands are sufficiently strong, it is possible to have both rapid monetary expansion and rising interest rates.

Bank credit has continued to expand rapidly. Since November total bank credit has risen at a 10 per cent rate, slightly more than since a year ago. Total bank earning assets other than U. S. Government securities have also expanded rather steadily, at an average 14 per cent rate per year since November, a little less than in the preceding year. Business loans at commercial banks have continued to grow at about a 20 per cent annual rate. In view of such continued rapid rates of increase, it is difficult to give credence to popular views that there has been a lessened availability of commercial bank credit.



Credit expansion has been facilitated by a sharp increase in total reserves of member banks. These reserves expanded at a 7 per cent annual rate from November to June. This rapid increase resulted chiefly from a \$1.5 billion rise in the Federal Reserve System's holdings of U. S. Government securities. Reserve System purchases of securities tend, at least in the short run, to place upward pressure on security prices and downward pressure on interest rates. From February to June interest rates on U. S. Government securities did not push upward like most other market rates.



Reserve requirements for member banks were increased from 4 per cent to 5 per cent against time deposits other than savings deposits in excess of \$5 million at any one bank. It is estimated that the change in regulation increased required reserves by more than \$400 million at about 950 member banks throughout the country, primarily those issuing savings certificates and other certificates of deposit (CD's) in large volume. The increase became effective July 14 at reserve city banks and July 21 at other member banks.

This action was taken to moderate further growth of bank credit and deposits. There are two chief effects of an increase in required reserves on time deposits. There is a once-and-for-all adjustment whereby the banking system obtains the additional required reserves (or reduces its required reserves). Second, additional time deposits available for lending are more costly thereafter than when the reserve requirement was lower. The once-and-for-all adjust-

ment can take several forms and combinations: temporarily, the additional reserves can be borrowed from the Federal Reserve; they may be obtained by asset purchases by the Federal Reserve (open market operations); or, the banking system may sell earning assets to the nonbank public and thereby bring about a reduction in required reserves. The last-mentioned adjustment, if used completely, would involve a substantial contraction in money and credit (about \$3.0 billion). In the past, reserve requirement increases have been largely accommodated in the short run by open market operations.

Borrowing from the Federal Reserve provided \$220 million of the \$840 million rise in total reserves from November to June. The discount rate, the interest charged banks borrowing from the Federal Reserve,

has been 4.5 per cent since early December. The yields on prime bankers' acceptances and commercial paper have increased to about 5.6 per cent, more than a basis point higher than the discount rate. The standard rate charged highest grade borrowers by commercial banks is now  $1\frac{1}{4}$  percentage points above the standard rate at which the Federal Reserve lends to banks.

Banks have made modest reductions in excess reserves since November, providing a minor factor in the increase of total bank credit, bank deposits, and the money supply. As market interest rates rise, there is a corresponding rise in the opportunity cost of holding assets in the nonearning form of excess reserves. Excess reserves averaged \$320 million in June, down \$50 million from November.



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# The Effect of Total Demand on Real Output

## *Introduction*

ONE ASPECT OF PUBLIC POLICY is concerned with establishing a rate of increase of total demand (spending on goods and services) which is conducive to achieving growth in real output (physical units of goods and services) with reasonable price stability. This article is concerned with the total demand experience of eight countries for the last 15 years with the hope that it may be helpful in understanding total demand policy in the United States.

In the past year public policy actions in the United States resulted in increased growth in total demand. In the period from June 1965 to June 1966 money supply grew about 6 per cent, the highest growth rate for any 12-month period in 20 years. At the same time, Government spending accelerated, largely because of the Viet Nam conflict. In the past four quarters (third quarter 1965 to second quarter 1966) the high-employment budget,<sup>1</sup> an indicator of the degree of stimulation the Federal Government is giving to the private sector, ran the smallest surplus since 1954. These pressures were reflected in the high rate of growth in total demand in the last half of 1965 and the first half of 1966, accompanied by increases of prices at the fastest rate since the Korean War.

The article is organized as follows: First, definitions are presented to clarify the conceptual relation between total demand, real output, and prices; then, the experience of eight industrial countries since the

end of World War II is considered for the short run and the long run; finally, some tentative generalizations are drawn from this experience and related to recent developments in the United States.<sup>2</sup>

## *Definitions and Concepts*

The monetary and fiscal policy tools of government affect total demand and real output independently. They affect total demand through changes in the size of the government deficit or surplus, changes in the rate of growth in the money supply, and changes in interest rates. It is generally believed that government policy can determine the level and rate of growth in total demand by appropriate use of these tools. How the growth in total demand will be distributed between changes in prices and real output depends upon the willingness of producers to supply goods at varying prices.

Government policy can also affect real output and capacity. A tax policy which directly increases after-tax profits on new investment, such as the 1962 tax credit in the United States, encourages investment and therefore growth in capacity of the economy. In addition, there is some evidence on the basis of European experience that steady growth in total demand leads to larger growth in real output than sharply fluctuating growth in total demand. This is because steadier growth in total demand improves business expectations about future sales and thus increases investment and capacity. But recognizing

<sup>1</sup>For explanation of the high-employment budget see Keith M. Carlson, "Budget Policy in a High-Employment Economy," this *Review*, April 1966, and Nancy H. Teeters, "Estimates of the Full-Employment Surplus, 1955-1964," *The Review of Economics and Statistics*, XLVII (August 1965), pp. 309-321.

<sup>2</sup>A word of caution is required here. This analysis is based on simple statistical procedures. Also, tests of the empirical relation between total demand and real output are of necessity limited by availability of data. For example, there are no cases of severely deflationary or inflationary conditions. This article must be considered a tentative and exploratory investigation of the relation between total demand and real output and the conclusions subject to change with the use of a wider range of data or more sophisticated statistical tests.

the favorable effects of steady growth in total demand does not imply anything about the average rate of growth in total demand. It is the average rate of growth in total demand and its effect on growth in real output that are examined here.

A frequently used measure of total demand is gross national product at current market prices (nominal GNP); in this article total demand will be measured by nominal GNP. A primary objective of public policy is to influence the utilization of resources in some desired direction. The actual utilization of resources can be measured by gross national product at constant prices (real GNP); in this discussion real output will be measured by real GNP.

Government takes monetary and fiscal actions to influence the level of total demand with a view to achieving a target level of real output. Thus, it is important to understand the relationship between total demand and real output.<sup>3</sup> As a first approximation, the analysis can be facilitated by distinguishing between an economy at effective full employment of its resources and one at less than full employment.<sup>4</sup> When an economy has a high level of utilization of its labor force and its stock of capital, additional growth must depend upon increases in the labor force and increases in the stock of capital plus growth in technology. The relation between total demand and real output would not be strongly positive under full employment conditions unless growth in total demand corresponded (by accident or design) to growth in productive capacity.

On the other hand, if there are unemployed resources in a country, there may be a positive causal relation between changes in total demand and real output. That is, an increase in total demand may cause an increase in purchases of goods and services, stimulating business to increase output. This will require the employment of idle resources and thus contribute to the growth in real output.

The difference between changes in total demand and in real output represents price changes.<sup>5</sup> In the

<sup>3</sup>For a technical analysis of this relationship see Michael W. Keran, "Theoretical Note to 'The Effect of Total Demand on Real Output,'" July 1966, available upon request to the Research Department, Federal Reserve Bank of St. Louis.

<sup>4</sup>The definition of full employment can differ over time or between countries, depending upon a variety of geographic, institutional, and historical factors. However, for any given country at any given time there is usually a consensus of what is full employment.

<sup>5</sup>Prices are measured by the GNP implicit price deflator, which is equal to nominal GNP divided by real GNP. Some price increases may be an illusion representing faulty adjustments for

post-World War II period prices in industrial countries have, on the average, been increasing both in periods of expansion and in periods of contraction of real output. In the eight countries in the years surveyed, a total of 116 observations, there were only 13 years of price stability.<sup>6</sup> This implies that factors other than the relation of total demand to real output are affecting prices. Oligopolistic<sup>7</sup> business firms dominate important segments of many industrial economies, and they respond initially to a decline in demand by changing output while trying to maintain prices at previous levels. Unions exert the same type of pressure in the labor market. Unions, if forced to make a choice, generally take an increase in wages even at the cost of increased unemployment, because the employment effects fall most heavily on nonmembers or the members with the least seniority. Government policies which put a high premium on full employment indirectly strengthen the ability and incentives of business and labor to hold up prices and wages. There are other government policies, such as agricultural price supports and minimum wage legislation, which directly prevent prices from falling.

In spite of oligopoly conditions and government policies which have tended to make prices resistant to downward pressures in both the commodity and labor markets, the simple relation between total demand and real output described above is generally useful. To develop a better understanding of this relation, the experience of eight industrial countries is reviewed to see what, if any, experiences are common to all.

(Continued from col. 1)

improvements in quality of products. This would understate the growth in real output and overstate the growth in prices. This is probably important with respect to consumer durables. (Most people would prefer \$1,000 worth of new 1966 model household products to \$1,000 worth of new 1940 model products.) However, considering the wide range of goods in which quality changes are not important and the adjustments which are made where quality is important, this problem probably would not explain more than one percentage point of the difference between total demand and real output.

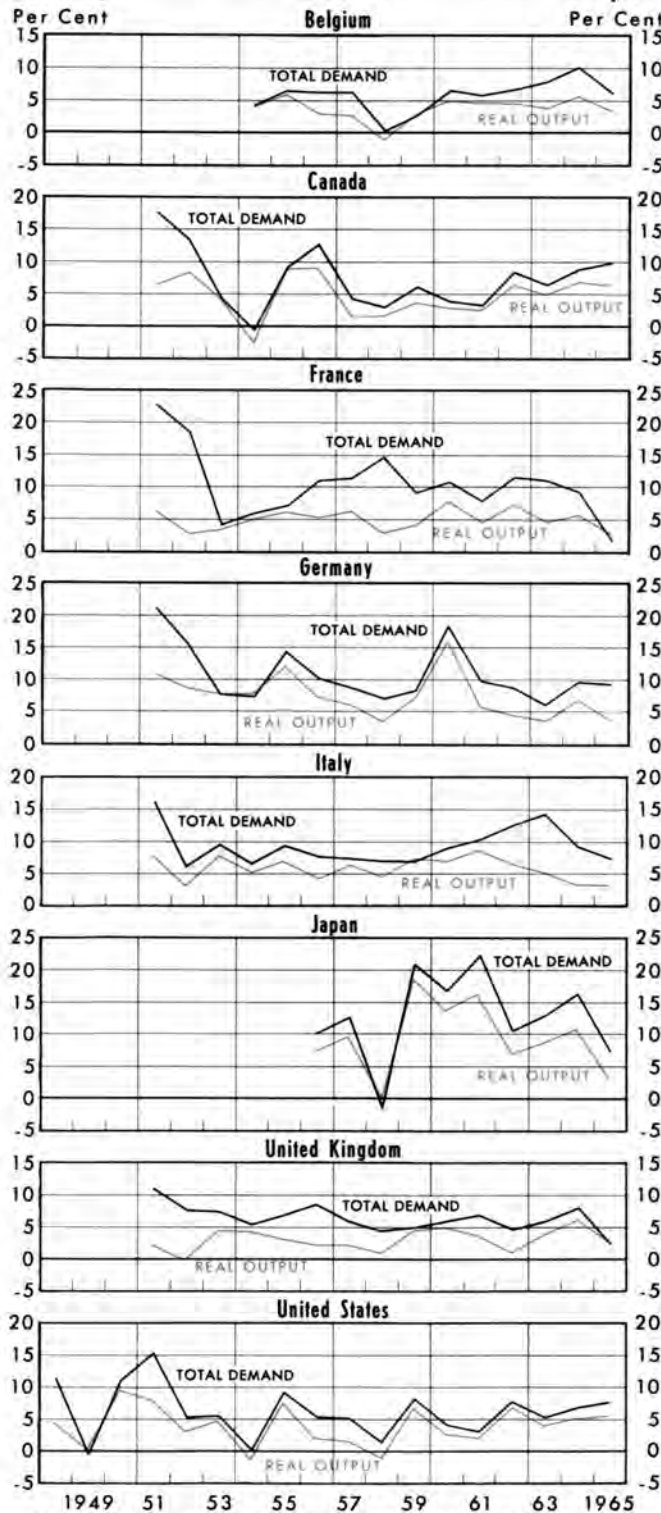
<sup>6</sup>If the price deflator increased one per cent per year or less, prices were considered stable. This roughly adjusts for the upward bias in the price index described in footnote 5.

<sup>7</sup>An oligopoly industry is one with only a few producers. The pricing policies in such industries must not only take into consideration the effect on customers but also the reaction of competitors. In general, this leads to the desire to hold prices constant in the face of changes in demand and to use nonprice competition such as advertising, service, convenient location, etc. Price changes initially are made *sub rosa* by reducing services and eliminating discounts. List prices usually increase only after *de facto* prices increase.

### Cyclical (Short-Term) Relation

The year-to-year relation between changes in total demand and real output is shown in Chart 1 for Belgium, Canada, France, Germany, Italy, Japan, United Kingdom, and United States.

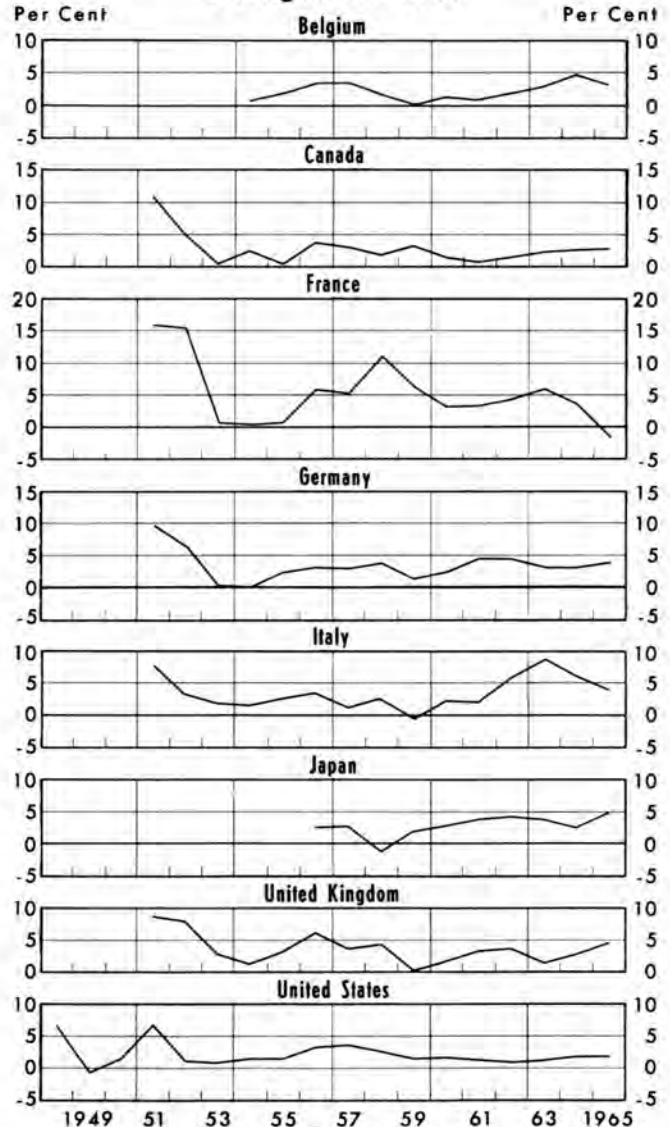
Chart 1  
Changes in Total Demand and Real Output



Total demand is measured by GNP in current prices. Real output is measured by GNP in constant prices.

In years when total demand is rising faster than real output, prices increase, and when total demand is rising slower than real output, prices decrease (Charts 1 and 2); however, it can be seen that instances of price decreases are rare (Chart 2). On the average, prices have been rising during the postwar period in all countries, even during years of less than full employment. The United States' reputation for recent price stability is based on its prices rising at a slower rate than those of other industrial countries.

Chart 2  
Changes in Prices



Prices are based on GNP implicit price deflators.

On the basis of Chart 1, it is clear that year-to-year movements in total demand and real output, in general, are in the same direction. For the eight countries, in only 15 of the 116 years considered did total demand and real output move in opposite directions. In about half of these exceptions the difference

between the movements in the two series was small. For those cases where the growth in total demand and real output moved significantly in opposite directions, some special factors usually accounted for the divergence. France in 1958 was in the middle of a political upheaval which resulted in the establishment of the Fifth Republic. In that year growth in total demand increased to 15 per cent while growth in real output fell to 3 per cent. In 1959 total demand was brought under firmer control by the new De-Gaulle administration and grew at the relatively modest rate of 9 per cent while real output, responding to increased political stability, recovered slightly to a 4 per cent growth rate. In the early 1950's there were also one-year instances in which total demand and real output moved significantly in opposite directions in Canada, France, the United Kingdom, and the United States. All these cases represent shifts in total demand to or from very high rates of growth around the time of the Korean War.

The relatively close correspondence of year-to-year movements in total demand and real output in all of the countries considered can be explained in terms of the previous analysis of unemployment. A short-term decline in the growth in total demand was usually associated with a decline in the utilization of the current stock of labor and capital, while a short-term increase was associated with increased utilization of labor and capital. Thus, in the short run total demand and real output generally have moved in the same direction.

### *Secular (Long-Term) Relation*

The relation between total demand, real output, and prices in the long run is not so easy to assess as in the short run. Two possible relations could reasonably be expected to exist between total demand, real output, and prices in the long run.

The data used in this article are based on a release entitled "Rates of Change in Economic Data for Ten Industrial Countries, Annual Data 1948-1965," prepared by the Research Department of this bank and dated March 18, 1966. That release contains tables of compounded annual rates of change for seven time series relating to money supply, prices, employment, and output for Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Switzerland, the United Kingdom, and the United States. A revised version of the release can be obtained by writing the Research Department, Federal Reserve Bank of St. Louis, P. O. Box 442, St. Louis, Missouri 63166.

One possibility, referred to as Proposition I, is that the long-term growth in real output cannot be affected by long-term growth in total demand. On this basis, the average growth in real output is considered to be primarily dependent upon the growth in productive capacity, which in turn depends on such real factors as growth in the labor force and the stock of capital and the introduction of new technology. Thus, a given growth in real output is consistent with any of a wide range of growth rates in total demand; in the long run, changes in total demand lead only to changes in prices in the same direction.<sup>8</sup>

A second possibility, referred to as Proposition II, is that, while real factors are important in determining capacity, the growth in total demand is important in determining the degree of resource utilization and resulting real output. If total demand does not grow at some optimal rate, not all of the increasing stock of labor and capital will be employed. The close year-to-year relation between changes in total demand and in real output implies that a high growth bias to total demand can add to the real growth rate. During a period of decline in the real growth rate it is advisable to stimulate total demand. On the other hand, during periods of expansion it is undesirable to restrict total demand because, with prices resistant to downward adjustments, a decline in total demand would cut the real growth rate while only partially containing inflationary pressures.<sup>9</sup> This line of reasoning leads to the conclusion that some inflationary bias in the overall application of policy tools is desirable. The tendency for total demand to grow at a faster rate than real output during the postwar period (as indicated in the charts) means that inflation, whether by deliberate policy action or not, has occurred.

The choice between these two propositions concerning the secular impact of growth in total demand on the long-term growth in real output hinges on whether prices behave in the long run as they appear to behave in the short run. If prices are more flexible

<sup>8</sup>This position does not require that total demand have no effect on real output. For example, a steady growth in total demand, which can reduce the year-to-year fluctuations in real output, may enhance business expectations and lead to increased investment and a larger stock of capital and capacity. However, stability in the growth in total demand is consistent with any average growth in total demand. In statistical terms it is the size of the standard deviation of the growth in total demand which affects real output, not the mean value of the growth in total demand.

<sup>9</sup>It is useful to remember that total demand is nominal GNP ( $Y$ ) which equals real GNP ( $X$ ) times some index of prices ( $P$ ).

$$Y = XP$$

If  $Y$  decreases and  $P$  is unchanged (or does not decline proportionately), then  $X$  must also decline.

in the long run than in the short run, a smaller growth in total demand can put more downward pressure on prices without necessarily putting downward pressure on output. This would mean that growth in real output is primarily determined by growth in real inputs (capital, labor, and technology) and essentially unaffected by any of a wide range of rates of growth in total demand (Proposition I). However, if prices resist downward pressures in the long run, then a decline in the growth of total demand will lead to a decline in the growth of real output and a period of some secular unemployment of labor and capital (Proposition II).

In order to clarify the long-term relation, average growth rates over relatively long periods were examined and are presented in Table I. For each of the eight countries considered, the postwar period was divided into two subperiods in which the rate of growth in total demand differed significantly.<sup>10</sup> For each subperiod, column (1) shows the average growth rates in total demand, column (2) the average growth in real output, column (3) the average growth in prices, and column (4) the ratio of the average growth in prices to the average growth in total demand. This last column shows the share of growth in total demand which was reflected in price increases. Table I provides the basic data for making three interrelated tests of the validity of Propositions I and II.

The first test compares the direction of change between subperiods in total demand with the direction of change in real output. If these two growth rates move consistently in the same direction between subperiods, i.e., if they are positively related, there is prima facie evidence that growth in total demand may have affected growth in real output (Proposition II). If the two growth rates do not move consistently in the same direction, this is evidence that growth in total demand has not affected growth in real output (Proposition I). The table shows that in half the cases (Belgium, Canada, Germany, United States), changes between subperiods in total demand and real output were in the same direction (Category I, Table I), and in the other half (France, Italy, Japan, United Kingdom), changes between subperiods were not in the same direction (Category II, Table I). Considering the postwar experience of the eight countries, changes in the growth in real output did not move consistently with changes in the growth in total demand. Thus, growth in total demand does not seem to have had

<sup>10</sup>A significant difference was considered to exist if the average annual growth rate differed by at least 1.5 percentage points between the two subperiods. The subperiods chosen were such that a slight change in the initial or terminal year would not substantially affect the result as presented here.

Table I  
LONG-TERM RELATION BETWEEN TOTAL DEMAND,  
REAL OUTPUT, AND PRICES

Country	Years	Annual Rates of Change			(4) Ratio of Prices (3) to Total Demand (1)
		(1) Total Demand	(2) Real Output	(3) Prices <sup>1</sup>	
<b>Category I</b>					
Belgium	1954-61	4.9	3.0	1.9	.39
	1961-65	7.7	4.0	3.5	.45
Canada	1950-56	9.2	5.3	3.7	.40
	1956-65	6.0	3.8	2.2	.37
Germany	1950-60	11.7	8.3	3.2	.27
	1960-65	8.7	4.5	4.1	.47
United States	1950-55	6.9	4.3	2.5	.36
	1955-65	5.4	3.4	2.0	.35
<b>Category II</b>					
France	1950-58	11.8	4.5	6.9	.58
	1958-65	8.7	5.0	3.7	.43
Italy	1950-59	8.5	5.8	2.6	.31
	1959-65	10.5	5.4	4.9	.47
Japan	1955-60	11.5	9.6	1.8	.16
	1960-65	13.8	8.9	4.5	.33
United Kingdom	1950-56	7.8	2.5	5.1	.65
	1956-65	5.4	3.1	2.3	.43

NOTE: For the countries in **Category I** changes between periods in total demand and real output are positively related; for the countries in **Category II** changes between periods in total demand and real output are not positively related.

<sup>1</sup>Prices are based on GNP implicit price deflators, which are equal to nominal GNP divided by real GNP.

a predictable effect on growth in real output. The results of this test are consistent with Proposition I: over longer periods growth in real output depends on the growth in the supply of inputs (capital, labor, and technology).

A second test compares changes in total demand with price changes. If changes in total demand between subperiods are found to be positively related to changes in prices, this will lend support to Proposition I: changes in the average growth in total demand lead mainly to changes in prices rather than to changes in real output. In seven of the eight countries prices moved in the same direction as total demand, as Proposition I would indicate. The exception was Germany,<sup>11</sup> one of the countries in which growth

<sup>11</sup>The German real growth rate from 1950 to 1960 was higher than for any country in this survey except Japan. Because of relatively conservative policy with respect to growth in total demand, the price index increased more slowly in Germany than in any other major European country except Italy. The change in the German growth rate between subperiods was greater than in any other country in the survey (from 8.3 per cent per year to 4.5 per cent per year). Part of this decline occurred because immigration of highly skilled labor from East Germany was cut off in 1961. This has been only partially compensated for by increased hiring of unskilled foreign labor from Italy, Greece, and Turkey. The decline in growth of total demand in the 1960's was in line with the conservative German monetary and fiscal policies. However, because it was not proportional to the decline in real output, prices increased faster in the 1960's than in the 1950's.

in total demand and real output were positively related (Category I). This means that in the other three cases in which changes in rates of growth in total demand and real output were in the same direction, prices also moved with total demand. A measure of the relative importance of changes in prices and real output associated with changes in total demand would therefore seem to be useful.

The third test, then, measures the sensitivity of rates of change in prices to changes in rates of expansion of total demand. The share of growth in total demand for each period which was accounted for by price increases is shown in column (4). If this ratio is .50, for example, then for every 1 per cent increase in total demand there is a .50 per cent increase in prices. In seven of the eight cases, changes in this ratio were positively related to changes in the rate of growth of total demand. That is, when the rate of growth in total demand increased, the ratio increased, and, when the rate of growth in total demand decreased, the ratio decreased. Thus it can be observed that there is flexibility in the rate of change in prices with respect to differing rates of change in total demand in the long run. In five countries (Belgium, France, Italy, Japan, and the United Kingdom) the change in the ratio was substantial; in two countries (Canada and the United States) the change in the ratio was moderate; and in one country (Germany) the change in the ratio was inverse. With changes in total demand largely reflected in changes in prices rather than in changes in real output, this test tends to support Proposition I.

Before any conclusions are drawn, it should be remembered that these tests are based on observations which cover only part of the range of possibilities: The secular rates of growth in total demand range from 5.4 per cent to 13.4 per cent. Thus, the empirical evidence on extremely stimulative or restrictive conditions of total demand and the effects these would have on real output and prices are not available. There are no examples where the average growth in real output exceeded the average growth in total demand. Thus, we have no direct evidence of the effect on real output of a slower growth in total demand, which would be accompanied by absolute price decreases. These reservations should be noted in drawing inferences from this study for the current economic situation in the United States, where variations in the data were even more limited than in the other countries.

## Conclusion

The results of this study indicate a close relationship in the short run between total demand and real output; i. e., year-to-year rates of change move in the same direction. In the long run, however, the relation between total demand and real output is much weaker (Proposition I). Furthermore, in the long run there seems to be more downward flexibility in the rate of increase in prices than in the short run. Therefore, the evidence presented in this article suggests that in the long run a change in total demand has a greater impact on prices and a smaller impact on real output than it does in the short run. These observations imply that if growth in total demand were limited to the long-run rate of growth in capacity of the economy, trend growth in real output would not be adversely affected.

These observations have major implications for monetary and fiscal policy. To the extent that policy tools control the growth in total demand they are useful in achieving cyclical stability in the economy because year-to-year movements in real output can be influenced by changes in total demand. On the other hand, policy tools are not apt to be of as much use in stimulating the long-run growth rate in real output because of the apparently weak link between total demand and long-run growth. In view of this weak relationship, policy actions designed to increase long-run growth by expanding total demand may result primarily in price increases.

With regard to the present economic situation in the United States, this study suggests three considerations for monetary and fiscal actions. First, if the recent acceleration in total demand is continued at a time of high-level resource utilization, prices will probably begin to rise even faster, since real output cannot increase proportionately with total demand. Second, if short-term policies are introduced to restrict expansion in total demand, prices may be expected to rise less rapidly, but there may also be some decline in the short-run rate of growth in real output. Third, the long-term growth rate in real output is not likely to be significantly affected by a moderate restriction of growth in total demand. Furthermore, this analysis tends to support the possibility that price stability can be restored, without impairing the long-term growth rate, by a return to the less expansionary monetary and fiscal policies followed prior to mid-1965.

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