PERIODS OF WAR AND INFLATION

In THIS chapter we shall endeavor to give an explanation of some of the most characteristic aspects of economic movements in periods of inflation. The two phenomena mentioned in the chapter title, war and inflation, are intimately bound up with each other in history. It is true that some wars, particularly minor wars, may have been fought without significant inflationary effects; and inflation, particularly moderate inflation, may occur in a normal business boom in peacetime, as a result, for instance, of high government spending or of unusually favorable export conditions. But all the most pronounced instances of inflation in history have occurred in or shortly after great wars.

A war period or an immediate postwar period will usually be characterized by specific commodity shortages. All three factors of production—labor, capital, and land—will tend to be supplied in lesser quantities than before. The supply of labor will be reduced by the absorption of a large number of men into the armed forces. The interruption of free ocean shipping will reduce the supply of overseas materials. After a certain time, these scarcities may lead to others: land and labor may become less productive, and the stock of capital will deteriorate. The reduced productivity of land is usually the effect of a reduced application of fertilizer and reduced care in tilling, owing to lack of labor. Labor productivity per head is likely to be reduced further by inadequate nutrition, psychic tensions, and the undermaintenance or actual destruction of capital goods.

If, however, unused resources are available, the increased demand that is characteristic of inflation may lead to an increase in output as resources previously unemployed are drawn into

employment. The extent to which this will be possible will depend on the conditions in each country. Often the absence of an adequate supply of imported raw materials may present a bottleneck that will make it impossible to increase total output. However, even if a considerable increase in total output is possible, the physical volume of production will in any case be determined by certain technical limits. After an initial increase, therefore, total output will to a large extent be insensitive to further incentives, such as might be provided by increased prices. Developments in the sphere of prices will, however, affect the distribution of total output over the different groups of the population, both during the war period itself and even for long periods thereafter. The distribution rather than the production of goods and services has therefore received the greatest attention, in particular as regards the past, of economists studying the phenomenon of inflation.

INFLATION IN A CLOSED ECONOMY

In studying inflation we shall deal with it first in its simplest case, that is, in a "closed economy" in which no foreign trade occurs. In a closed economy the most important phenomenon that may be considered as an indicator of the rate of inflation is the general level of prices. At a later stage, we shall expand our analysis to include inflation in open economies; at that time the second important variable to be explained will be the rate of exchange of the currency of the country concerned. When we deal with an open economy, we shall first consider the case of inflation with a stable rate of exchange; subsequently, we shall consider also the rate of exchange as a free variable, the movement of which results from the process of inflation.

In explaining first the price level and then the rate of exchange, we shall have to reduce the movements of these variables to the movements of data or exogenous factors that lie behind them and to establish the mechanism of causation. In doing so we may find that this mechanism leads toward endogenous movements. In explaining the movement in the general price level, it seems reasonable to use the general scheme of demand and supply. It will be our task, therefore, to find the general

eral supply and demand factors that are operative particularly in a situation of inflation and that determine the general price level.

We have mentioned that on the supply side there will be a number of tendencies operating in the direction of increased scarcity. The level of production will, in any case, be limited by certain technical conditions that may be considered as a datum. The productive capacity will change at a much slower rate than prices and the quantity of money.

More important, therefore, than the factors on the supply side is the increase in total demand. We have mentioned before, and we will return to this point later, that total demand may be considered to consist of demand for consumption and demand for investment. In that simple distinction no allowance is made for demand exercised by the government, which may be considered to be subsumed, as a relatively minor factor, under demand for consumption purposes and demand for investment purposes. This treatment is satisfactory when the objects of study are trend movements, or business-cycle movements in general, in conditions where the government plays a relatively passive role. But it is clearly not appropriate indiscussing a war economy, one of the main characteristics of which is the unusually large demand exercised by the government. In wartime the government requires, and acquires by its purchases, a large proportion of the nation's real annual output. To a considerable extent the government will simultaneously take measures to offset its increased demands for the output of resources of the country by measures which will lead to a reduction of demand for resources on the part of the population. Taxes are increased, thus reducing purchasing power and hence demand on the part of the population at constant incomes. By savings propaganda an attempt is made to increase the amount of income saved and hence to reduce the proportion of income spent on consumption goods. Restrictions on investment may force business enterprises to invest less than they would have done otherwise and, possibly, actually to run down their capital. Generally speaking, these government measures toward offsetting the increased government demand were more successful in World War II than

they were in World War I. Nevertheless, they result only in a mitigation of the excess demand of the government; they are never adequate fully to offset that excess demand. In wartime there will always remain a very considerable net additional demand exercised by the government. Although this is not quite accurate, one might, for purposes of convenience, associate this net additional demand by the government with the amount of the budget deficit.

If, at the outbreak of war, considerable unused resources are available, they may be drawn into use first to meet the additional demand. But the increase in supply will at the same time be accompanied by an increase in national income of the same amount. As workers previously unemployed are finding jobs, they will also receive incomes. A considerable portion of the additional income, created by the employment of resources previously unemployed, is likely to be spent on consumption goods. Thus only a small proportion and not the total of the resources previously unused can act to offset the net additional demand on the part of the government. Hence, whenever the additional government demand is large, as in any major war, only a relatively small part of it can be met by drawing into use previously unused resources. This partial offset is not likely to reduce by much the net additional demand on the part of the government.

Whence, then, come the resources that are to meet this demand on the part of the government? We may recall that we have assumed a closed economy. The additional resources, therefore, cannot come from abroad. To some minor extent, they can be obtained by using up commodity stocks. But the results obtainable in this way will be limited both in amount and in time. Hence, the resources the government requires will have to be found mainly by reduction in private consumption. This reduction in consumption is brought about by the movements of the price level. Total demand increased because of the addition of government demand, facing a supply which is reduced or, at best, constant, will tend to push up the prices of all commodities. Let us assume that prices were initially at a level of 100. Now the government requires for war purposes a net

additional amount of resources to the equivalent of, say, 10 per cent of the gross national product. As a result of this increased demand, prices will go up from 100 to, say, 125.

Why does this rise in prices free resources for government use? The rise in prices reduces the real purchasing power of two important groups of the population: (a) those with fixed incomes, such as pensioners, persons living on annuities or on income from bonds, etc., and (b) those with wage and salary incomes which, though not fixed, are not automatically and immediately increased when prices go up. While the real income of these two groups of the population is reduced, the real income of the remainder of the population, mainly the entrepreneurial group, is at the same time increased by the same amount, assuming unchanged total production. There is thus not a reduction in real income but primarily a shift in real income. This shift, however, will reduce consumption demand. It will do so for two reasons. The important factor in this connection is that, broadly speaking, those whose real income has been lowered are the low-income groups, whereas those whose real income has gone up are the high-income groups. The high-income groups are likely to be subject to a higher rate of taxation; hence inflation will tend to reduce the government deficit; and high-income groups will also tend to save a larger proportion of their income. Hence, a good deal of real income shifted by inflation will lead to a reduction of consumption on the part of those who lose income but not to an increase in consumption of those who gain the additional income. If the net amount of reduction in consumption thus produced by a 25 per cent rise in prices equals 10 per cent of the gross national product, no further pressure on prices will remain. An equilibrium position will have been reached in which a reduced consumption matches the increased demand on the part of the government.

The equilibrium will, however, be temporary. Wage-earners will not be prepared to accept for any great length of time a 25 per cent reduction in real wages. Some time after prices have gone up, most wages will tend to be increased, perhaps not fully in proportion to the increase in prices but nevertheless considerably. As a result of this increase in wages, a certain amount of

real income will be shifted back from the entrepreneurs to the wage-earners. By this fact, part of the stabilizing effect of the original increase in prices will have been nullified. There will again be excess purchasing power; prices will rise further until a new temporary equilibrium is reached. But then wages will be adjusted anew, and the spiral of increasing wages and increasing prices will have started.

In actual fact, this process is not likely to proceed by successive steps but rather gradually in a smoothly curved line. As the mobilization of resources for war purposes progresses, the government will gradually require a greater share of national income. Prices of some commodities in ample supply will initially remain unchanged; others will start rising immediately. Gradually, also wage increases will occur, first in one industry, then in another. Thus the index numbers of prices and wages will both tend to go up in smooth curves.

It should be noted that inflation as described in the preceding paragraph is not a rise in prices to a higher level, at which level it would be compatible with the net additional demand of the government. This would be so only if wages were not adjusted at all and if one group of the population were to accept, for the duration of the war, the reduction in real income and consumption necessary to satisfy the requirements of the government. But as wages are adjusted from time to time, inflation will take the form of a constantly rising price level. Thus the equilibrium established is not, as in ordinary supply and demand analysis, one of an equilibrium price level but one of an equilibrium rate of increase of prices. This may be shown in a diagram similar to that used in ordinary demand and supply analysis. We shall presently refer to a diagram of this nature. In the simplest case the rate of price increase per unit of time will be a constant, and prices will accordingly describe a logarithmic curve over time. The rate of price increase will be determined by two sets of factors: (a) the extent of the net additional government demand which, as we saw before, consisted of (1) the increase in demand by the government for resources for war purposes, less (2) the reduction in demand of the population imposed by the government through such measures as increased taxation, propaganda

for increased saving at constant incomes, and restrictions on investment and (b) the degree to which and the speed with which wage rates are adjusted to increases in prices, the progressiveness of the system of taxation, and the tendency to save in the higher-income groups.

The larger the factor under (a), the net additional government demand, the more rapid will be the rise in prices. Similarly, the fuller and the quicker the adjustment of wages, the more rapid will be the rise in prices. The two factors are shown in Figure 44.

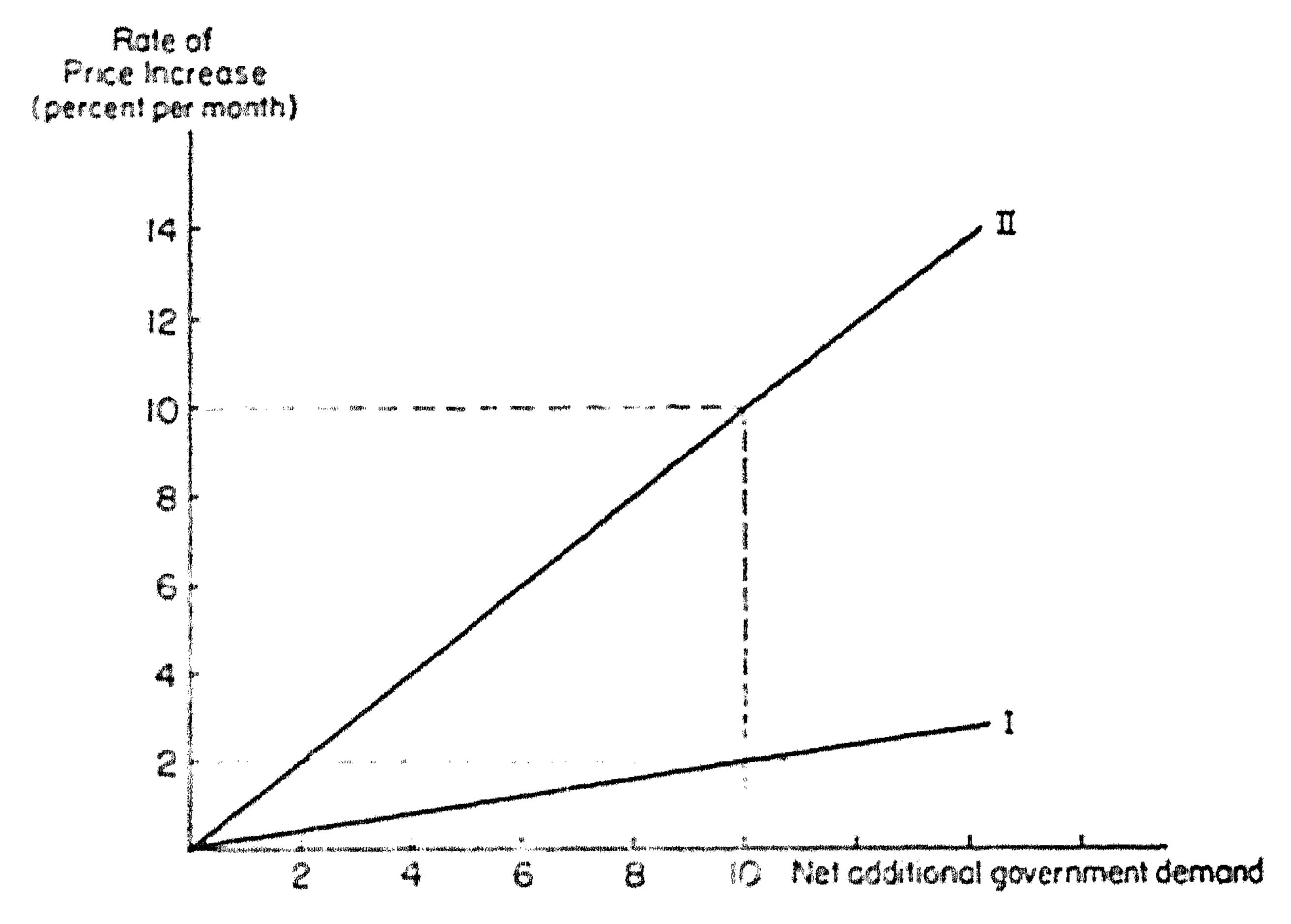


Fig. 44.—Rate of increase of prices as a function of net additional government demand.

Line I shows conditions favorable to a limited rate of inflation: slow wage adjustment, highly progressive taxation, a high marginal propensity to save on the part of entrepreneurs. Line II has been drawn to reflect conditions that would lead to rapid inflation. At the same level of inflationary pressure as expressed by the net additional government demand, the price rise resulting in case I will be much less than that in case II; e.g., if net additional demand is 5 per cent of gross national product, the equilibrium rate of price increase will be 2 per cent per month in case I, according to the diagram, but 10 per cent per month in case II. It is possible, however, that the greater slope of line II may be offset by a smaller amount of inflationary pressure as

shown along the horizontal axis. Thus, if I and II refer to two countries, it may be possible that prices in both countries rise at the same speed. This will occur if in country I inflationary pressure is much greater. Country I might have the same rate of price increase at a net additional demand of 25 per cent of its gross national product as country II would at a net additional demand of only 5 per cent of its gross national product.

We have dealt so far with conditions that lead to a constant rate of inflation, that is to say, to a movement of prices along an exponential curve. As a matter of fact it is likely that inflation, when it has lasted for a certain period of time, will become more rapid. This will be so for two reasons: (1) Workers who have been caught time after time by rising prices after each adjustment of wages will insist on a more rapid adjustment of their money wages in the future. If in the beginning the lag may have been one-half year, it will tend gradually to be reduced to three months, one month, a week, and, ultimately, even as little as a day. As a result of this and other factors tending toward more rapid adjustment, the curve in Figure 44 will tend to become steeper. Gradually the curve, which initially may have been at the level of line I, will tend in the direction of line IIand even beyond that. (2) To the net additional demand on the part of the government (which may remain constant), further factors will be added as inflation proceeds. Manufacturers and traders who have seen prices rising for a long period of time will tend to anticipate further price rises and buy for inventory. Consumers, rather than saving part of their income, will spend the part previously saved on additional consumption goods, either for immediate consumption (since "money loses its value anyway") or for accumulation of stocks of consumption goods. The result of these various actions on the part of the population will be the same as if the government had absorbed a larger proportion of the nation's annual output for war purposes. The point of intersection on the steeper curve caused by the factors under (1) will therefore be moved further to the right, owing to the factors mentioned in this paragraph. For both reasons the equilibrium rate of price increase will tend to be higher.

Figure 44 will readily make clear what the extreme position

will be. If, ultimately, prices and wages are adjusted immediately-if, in other words, the monetary mechanism permits the government no longer to reduce anybody's real income by any finite rate of increase in prices per unit of time-prices will tend to increase at practically an infinite rate. As curve II becomes steeper and steeper, it may finally coincide with the vertical axis of the diagram. At that point any positive net additional demand will lead to an infinitely high rate of price increase: any perpendicular line to the right of the origin will intersect the vertical axis in a point "infinitely far away." Strictly speaking, of course, prices cannot increase at an infinitely fast rate. Various cases in history, however, closely approximate this situation. In the conditions of hyperinflation in Germany after the first World War and in Greece, Hungary, and China after World War II, prices in the last stages did increase at rates which for all practical purposes may be described as infinite. In certain other countries, such as in Poland and Austria after World War I, inflation came very near to this point.

THE QUANTITY OF MONEY

The reader may have observed that no reference has been made so far to the quantity of money, whereas usually an explanation of inflation runs primarily in terms of that quantity. We have preferred to give our exposition initially in real terms because in that way a clearer insight is gained into the shift in real resources which is at the basis of any process of inflation. The quantity of money does, however, come in at two points. The government deficit is normally financed to a considerable extent by the creation of money either directly by the issue of government paper or indirectly by the sale of government debt to the central bank or commercial banks. Thus, if we said that the rate of increase of prices per month was a function of the amount of net additional government demand, we might also have said that the rate of increase of prices was a function of the increase in the quantity of money per month. By the same token we might say that the level of prices, which is the cumulation over time of the price increases, is a function of the quantity of money, which is the cumulation over time of the increases in the quantity of money. There is nothing in this argument, however, that would lead to the conclusion that the increase in prices and the increase in the quantity of money would be proportional, as most theories have held in the past and as has also been found to be approximately true statistically. No such proportional relation may be assumed since we have seen that the rate of price increase depends not only on the net additional demand on the part of the government but also on the responsiveness of the economy (the slope of the curve in Fig. 44). Thus it may be, particularly in modest inflations, that prices increase less than proportionally to the quantity of money and that, accordingly, the velocity of circulation is reduced (assuming a constant volume of output). In periods of rapid inflation, on the other hand, prices may often tend to increase faster than the quantity of money, thus leading to a decrease in the velocity of circulation. Here certain limits exist. The velocity of circulation cannot be reduced infinitely. If, therefore, the mechanism of inflation had in itself the tendency to make prices increase much faster than the quantity of money, a pressure on the banks would result to increase the quantity of money, not to finance the government deficit, but to accommodate the needs of the population at the increased level of prices. The quantity of money will then tend to follow the level of prices.

In attempts to explain the movements of the general price level, use is often made of the formula developed by Professor Irving Fisher. We may review this method in the light of the discussion in the preceding pages. A number of variants of the formula have been used. We select the simplest of these; with respect to the more complicated ones, considerations similar to those which we will develop apply. The simplest formula is as follows:

$$M \times V = P \times T$$
.

in which M equals the quantity of money, V equals the velocity of circulation of money, P equals the general level of prices, and T equals an index of the physical volume of production. The formula expresses the fact that the amount of all payments made is equal to the value of all commodities and services sold.

It disregards changes in the quantity of turnover sold on credit; this simplification is of little consequence for our analysis.

It is well known by now that this formula should be considered as an identity if each of the four quantities mentioned is properly interpreted. Therefore, there can be no question whether the formula is right or wrong. It must always be right. What may be discussed, however, is the question whether the formula can be used for the explanation of the fluctuations of one of these four variables on the basis of the three others. An explanation in a static theory, as the one we are now discussing, should then be a reduction to autonomous factors. Since all four variables in this formula are economic variables, none of them can, strictly speaking, be considered as an autonomous variable. Some of them, however, may be autonomous by approximation. It all depends upon the question whether, in certain situations, three of these four variables may, with sufficient approximation, be considered as autonomous variables to provide an explanation of the developments of the fourth variable. Such situations are possible, and we may mention a few of them.

- 1. If M is determined by pressing causes, such as war conditions dictating the creation of additional money, while V is given by the relatively stable payment habits of the population and T by the technical limits of production, then one may indeed say that, approximately, the movement of P is determined by that of the three other variables. In that sense the formula has often been applied—and, with the qualifications stated, properly applied—to the situation during World War I.
- 2. If P, in an open economy, is determined primarily by the movement of the rate of exchange, V again by payment habits, and T by the productive capacity of the country, the formula may similarly be used to explain fluctuations in the quantity of money. The situation is then one in which "the banks follow the needs of the economy," the needs being determined in this case by the factors to which we have referred. In this way the formula has been applied to certain periods in the early twenties.
- 3. In dealing with a more limited problem, in which not the economy as a whole but only part of it is subject to analysis, the

concept of datum may be somewhat modified.2 Thus, for instance, in dealing with a depression in a small country it may be that the course of prices and turnover is determined by conditions abroad and that the volume of money is primarily determined by development in the economy in the immediate past and by the policy of the central bank. In that case, the formula may be used to determine V. It may be used to show that in a period of depression the velocity of circulation will have a tendency to fall; usually the product PT will fall more rapidly than M. In a period of recovery and boom, on the other hand, the velocity of circulation will tend to increase: PT will increase more rapidly than M. This phenomenon will also occur in a closed or nearly closed economy; in this case, however, P and Tcannot be considered as determined by foreign factors. Even then one might still say that, of the four variables, V is least of all determined by autonomous factors and may therefore be considered most as the "effect" of the other variables.

It will be clear from the preceding remarks that the Fisher formula cannot be used as the only theory to explain certain phenomena if less than three of the four magnitudes—P, T, M, and V—are wholly or nearly wholly determined by autonomous factors. If, for instance, two of these factors are determined, one would require one additional relation in addition to the Fisher formula, in order to specify the magnitude of the other two variables. In other words, additional theoretical considerations would be necessary; the theory implied in the Fisher formula should not be considered as incorrect but rather as incomplete in that case.

INFLATION IN AN OPEN ECONOMY

We have dealt, so far, with inflation in a closed economy. We must now generalize our treatment and incorporate in it the phenomena that occur in a country which has foreign trade. This introduces two new elements. First, the resources to meet inflationary pressure in a country are now no longer necessarily limited to the domestic supply of goods and services. Foreign resources may be available to the country either as a result of

^{2.} Cf. chap. ix.

foreign loans or by the use of the country's gold and foreign-exchange holdings. Second, an open economy is characterized by an additional variable—the rate of exchange.

We shall deal first with the case in which the rate of exchange is constant as a result, for instance, of the central bank's supplying gold or foreign exchange at the gold-export point. In that case, part of the inflationary pressure will be met by the use of foreign resources. Imports will increase as a result of increased demand for commodities in general and possibly also as a result of a tendency of prices within the country to rise compared to prices abroad. Hence part of the inflationary pressure will be drained off; the pressure will be reduced by the amount of the import surplus. Furthermore, if there is a general feeling that prices will continue to rise and that the rate of exchange will continue to fall, a flight of capital is likely to occur; foreign exchange is bought from the central bank, in exchange for local currency, for speculative purposes. As long as the demand can be met, it will also exercise a deflationary pressure, inasmuch as demand which might otherwise have been exercised for domestic resources will now be satisfied by foreign resources.

The use of foreign resources permits a country to have a temporary deficit in its balance of payments. But when the exchange resources have been exhausted by inflation or, even earlier, when the government is no longer prepared to support the rate by losing reserves, an equilibrium in the balance of payments will have to be established. In periods of serious inflation in the past this equilibrium was established almost always by a free rate of exchange. When demand for foreign commodities became too strong, depreciation of the currency ensued automatically.

Depreciation, or an increase in the price of foreign exchange, means an increase in terms of the national currency of the prices of imported commodities and a decrease in terms of foreign currency of the prices of exported commodities. Hence depreciation will tend to increase the volume of exports and to decrease the volume of imports. In normal circumstances this will mean an increase of the supply of foreign exchange and a reduction in the demand for foreign exchange. The exchange market, therefore,

shows characteristics similar to those of a normal market: a price is found by balancing supply and demand, with demand depending negatively and supply positively on price, the equilibrium price being found at the point of intersection of the demand and the supply curve. We treated the market for commodities by reference to autonomous supply and demand factors. We may apply the same terms to the exchange market. The most important autonomous demand factor, in a period of war or in the immediate postwar period, is the strong autonomous need for imports. In wartime the need may be for armaments, raw materials, and foodstuffs. After the war it may be for reconstruction goods, for foodstuffs, and for restocking. This demand often originates by the creation of credit in the country, the inflationary pressure thus created spilling over into the exchange market. It is a matter of choice whether to consider the creation of credit or the autonomous import needs as the factor determining demand. Much will depend on whether one considers the credit creation as necessary and inevitable or not. Similarly, in the case of reparations payments, one may consider either the imposition of these payments or the way in which they were met by inflationary domestic financing as the cause of the additional demand for foreign exchange.

In periods of advanced inflation such as the German and the French inflations after World War I, an additional factor tended to increase the autonomous demand, namely, the lack of confidence in the national currency. Thus an additional speculative element of demand was added to the existing demand for imports. As the rate of exchange increased steadily, there was a tendency to convert holdings of national currency into foreign exchange in order to make an exchange profit.

In a market for an individual commodity it is normally assumed that appropriate price adjustment will bring the market into equilibrium. With respect to the foreign-exchange market in a period of inflation, two very important qualifications of this statement should be mentioned, however.

1. Depreciation may not lead to an equilibrium position if the foreign demand for the export products of the depreciating country and that country's own demand for imports are insufficiently elastic. Depreciation will decrease the volume of im-

ports and hence, assuming constant prices in terms of foreign currencies, the foreign-currency value of imports. Depreciation will increase the volume of exports, but it will not necessarily increase the foreign-currency value of exports. It will do the latter only if the increase in the volume exported is proportionately greater than the decrease in price, expressed in foreign currency. It is conceivable, therefore, that the country would suffer a loss (in terms of foreign currency) in its export proceeds, and this loss might exceed the savings in foreign currency on imports. In that case, depreciation would worsen a country's balance of payments, and the rate of exchange, instead of bringing equilibrium by an initial fall, would tend to fall further and further. Although it is conceivable, it is not very probable that the balance of payments of a country would be unstable with respect to the rate of exchange in the way indicated. A constantly falling rate of exchange is, nevertheless, a real possibility which has occurred frequently in the last twenty years. The explanation of this phenomenon must be found along the following lines.

2. We have seen that in a closed economy the equilibrium established by an initial rise in prices may be only temporary. The same applies in an open economy with respect to changes in the rate of exchange. The equilibrium in the balance of payments established by an initial fall in the rate of exchange may also be only temporary in character. Domestic price adjustment which follows depreciation will tend to raise demand for resources in general, and hence for imports in particular, and will thus lead to a renewed pressure on the balance of payments. As long as inflationary conditions continue, the initial fall in the rate of exchange may lead to further and further declines. The price of foreign currency, like the domestic price index, will rise further and further, in the simplest case, both will move along an exponential curve. The rate of increase of domestic prices and of the price of foreign exchange will depend on the factors which we mention in our discussion of inflation in a closed economy. The fall of the exchange rate may be accelerated as capital flight adds additional demand for foreign exchange to the demand that results from the import need of commodities.

With respect to fluctuations in the rate of exchange during

periods of inflation, reference is often made to the "purchasing-power parity" theory. In a somewhat oversimplified form, this theory holds that the rate of exchange for the dollar in a foreign country should be equal to the ratio of the purchasing power of the dollar to the purchasing power of the currency of that country. If a certain basket of goods costs \$100 in the United States and 30,000 francs in France, the rate of exchange of the dollar should be 300 francs.

This theory has this in common with the quantity theory, that it, too, appears to give a much simpler solution for the exchange-rate problems than the much more general theory of the formation of exchange rates we have just developed. It differs, however, from the quantity theory in that it cannot be considered as strictly accurate. It should be considered rather as an approximation. Strictly speaking, it will hold only for commodities that can be purchased in both countries and can be transported between them and other countries without cost, duties, etc. For the total of all goods in the economy this condition is clearly not fulfilled; the very existence of international trade presupposes that the two countries do not produce the same commodities. If, however, the two countries do not produce the same commodities, the theory should be given in a somewhat more refined form.

In that case, two periods, I and II, have to be compared, and the change in the rate of exchange from the first period to the second has to be taken as the object of explanation. A different package of commodities for each country is considered. This package has a price in the country in period I and in period II. For each country the price change in terms of its national currency for its package may be calculated, and these price changes are compared. If, for instance, the price increase in the one country is three times as large as the price increase in the other country, the rate of exchange between the two countries would have changed, at a ratio of one to three, according to the purchasing-power parity theory. The value of the currency of the country in which prices have risen most would have fallen to one-third its previous value in terms of the currency of the other country.

Various objections may be raised against this theory as an

explanation of rates of exchange. The prices of all commodities do not move together, and the ratio of price increases observed will depend therefore on the package of commodities taken. Perhaps this objection is not the most serious one since it may be assumed that, generally speaking, the movement of prices of the most important commodities in any one country will be at least approximately parallel. But two other sets of factors may make possible, or necessary, a rate of exchange which deviates from that calculated on the basis of the purchasing-power parity theory. Both these factors follow from a shift in the position of demand and supply curves of the countries under consideration.

- a) If a country has a high level of investment (for instance, in order to reconstruct war damage), its demand curve will move to the right and, with a similar price ratio as in a prewar period, it will require more imports. If, at the same time, there is no similar high investment activity in the rest of the world, the country under consideration will have an import surplus even though its rate of exchange may be at its purchasing-power parity level.
- b) Structural changes may affect both the demand and the supply curves for international trade of the country itself or of foreign countries. Exhaustion of the country's natural resources will move its supply curve to the left, and an increased preference for foreign commodities compared to domestic commodities will move its demand curve to the right; in both cases this will lead to a deterioration of the country's balance of payments at a constant price ratio. The same effect will result from movements of the supply or the demand curve in foreign countries in the opposite direction, such as the discovery of more productive natural resources abroad or the development abroad of a preference for national, as against imported, commodities. On this account, too, the balance of payments may be in disequilibrium, notwithstanding the fact that the exchange rate is at the purchasing-power parity point. In all such cases the equilibrium rate, i.e., the rate which would bring the balance of payments into equilibrium,3 would be different from the purchasing DOWER DATE.

In view of these limitations, the purchasing-power parity 3. Assuming that there is an equilibrium rate. Cf. p. 151, supra.

theory can be considered only as an approximate theory of the rate of exchange, valid only in cases of large price discrepancies. Where the price discrepancies are relatively small, the disturbing factors mentioned above may far outweight any disequilibrating tendency resulting from price disparity.

We must make a further observation with respect to the purchasing-power parity theory, and one which is similar to an observation made earlier with respect to the quantity theory: the purchasing-power parity theory may be considered as a theory of the rate of exchange only if the causes to which this theory links the rate, that is, the price changes in the two countries, may be considered as autonomous. In the period immediately after World War I there were indeed good grounds to consider the process of causation in this way. Prices were to a considerable extent determined by monetary conditions resulting from war financing; they could be considered approximately as autonomous factors. Other situations are conceivable, however, where this is by no means the case. If, for instance, the rate of exchange of a smaller country is linked by law to the value of the currency of another, larger, country, then it may be quite possible that the price level in the smaller country is practically determined by prices in the leading country and the legally determined rate of exchange. In that case the rate of exchange cannot be explained on the basis of purchasing parity, but rather the level of prices in one country can be explained on the basis of prices in the other country and of the rate of exchange.