Inflation, Balance of Payments Deficit and their cure through Monetary Policy: the Italian example(*)

I

An examination of the evolution of the Italian economy during the years 1961-65 is very instructive for several reasons. It serves to illustrate the problems that beset a developing economy with large international trade when it first approaches full employment; it confirms the power of monetary tools in the control of aggregate demand; but, at the same time, it brings clearly to light the limitations of monetary (as well as fiscal) tools in dealing simultaneously with the task of maintaining full employment and balance of payments equilibrium in the face of a cost push; and, finally, it stresses the need for an effective incomes policy.

Between 1961 and 1963, Italy experienced a very fast growth of money wages and prices (1); during the same period the surplus of the balance of payments was converted into a deficit of sizable proportions (2). There is a rather clear evidence of monetary restric-

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(1) The yearly rate of growth of money wages for the period 1960-1966 was:

1960	+ 3.12%	1963	+10.71%
1961	+ 3.81%	1964	+14.54%
1962	+ 8.16%	1965	+ 8.48%

the cost of living index moved during the same period in the following way:

1960	+ 2.66%	1963	+ 8.79%
1961	+ 2.92%	1964	+ 6.49%
1962	+ 5.82%	1965	+ 4.34%

(*Source*: ALBERTO CAMPOLONGO: *La Politica dei Redditi*, Mediobanca, Milano, p. 67).

(2) The net outcome of the balance of payments was (in millions dollars):

1961	+ 577.4	1964	+ 773.9
1962	+ 50.4	1965	+1594.2
1963	−1251.8		

(*Source*: Relazioni della Banca d'Italia).

tions starting with the second half of 1963 (3). In any event, despite some claims to the contrary by the monetary authorities, at the beginning of 1964, whatever the cause, the economy entered a recession: employment, especially industrial employment, fell sharply, national income in real terms went up by less than 3% notwithstanding an increase of exports of some 13%, and investment dropped considerably. At the beginning of the summer 1964 the balance of payments exhibited again a surplus, which has been growing since then to reach the level of 1.6 billion dollars in the course of 1965.

During the second semester of 1965 and more so during the first half of 1966, the economy had shown signs of gathering momentum, but unemployment was still sizable and investment grew very slowly. Monetary indicators point (and did so starting with the second semester of 1964) to a non-restrictive monetary policy to which the economy failed to respond significantly (4).

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(3) The net increase of the money supply between June 1963 and March 1964 was 533 billion lire, to be compared with 1,319 billions for the same period twelve months earlier and 907 billions for the following one. Especially when the figure for 1963-1964 is set against the figure for 1964-1965 — which was a year of depression and of rather abundant liquidity — one can see that in view of the wage and price increase we quoted in footnote one, from summer 1963 onwards the additional supply of money was very much restrained.

The best indicators of the tightness or easiness of monetary policy are two credit indexes. The first is the ratio of loans to total deposits of commercial banks. This index mounts regularly from 72.6% in December 1962 to 78.6 in December 1963 and to 78.5 in March 1964. After that it descends again to 74.4 by the end of 1964. The second index refers to the ratio of liquid assets (cash and money available on short call) to deposits. This ratio reaches its minimum (at 4.5%) in March 1964 and moves quickly up again before the end of the year to 6.0%, which is nearer to its customary level. Yields of bonds went up considerably during the first half of 1964, especially given the policy of trying to peg their courses which the central bank usually follows. They reach their maximum yield in June 1964 with 6.05% and then fall back to yields of roughly 5.50%.

(4) The ratio of loans to total deposits was at 68.7% in September 1965, at 67.7% in December, at 66.3% in March 1966, at 66.7 in June and 66.1 during August 1966. The ratio of liquid assets to deposits was 7.6% in September 1965, 5.4% in December; then it was 6.1% in March 1966, 4.5% in June and 6.0% in August.

National income in 1965 grew at 3.4% in real terms (a figure to be compared to rates of 5 and 6% in real terms for the period up to 1963). As in 1964, this result was largely due to the very fast rate of growth of exports (+19.9%), while investment was largely stagnant. The rate of growth is expected to be roughly 5% in real terms for 1966. But, once more, this result is to be attributed to the very good export performance (+13%). Investment is expected to increase by a mere 6%, which is less than an earlier forecast of some 8% increase.

Thus the picture of the economy is mixed, with some signs of greater momentum and some persisting signs of weakness of aggregate demand.

There appears to be a rather wide agreement among Italian economists, in and out of the Government, on the causes of the balance of payments crisis and of the ensuing recession. This explanation, originally put forward by the Bank of Italy (5), though rather unsatisfactory, has been uncritically accepted or at least has not been challenged in any systematic way.

It is unsatisfactory in our view for a number of reasons. For one thing, it blurs the role of monetary restraints in the determination of the downturn of the cycle and the subsequent improvement of the balance of payments. Furthermore, it stresses elements which are at best of secondary importance and on which the empirical evidence is not very impressive, while neglecting the role of other crucial mechanisms, and finally, it is not free of contradictions in its theoretical setting.

The purpose of this paper is to assess the validity of this explanation and to propose an alternative one. For convenience of exposition we have kept the case of an open economy quite separated from that of a closed one. Section 2 endeavours to formalize the model we are criticizing (we shall often call it, for brevity, the Bank of Italy's model) and to bring out its basic shortcomings. Section 3 presents the alternative model we propose. Section 4 discusses the nature of the Italian inflation and the determinants of wage movements. Section 5 deals with the case of an open economy, a case that should be of rather general interest for its analysis of the relationship between aggregate demand and the balance of payments. Conclusions and four appendices, providing a formal treatment of problems raised in the text, close the paper.

II

The annual reports of the Bank of Italy contain a very detailed analysis of past and present trends of the economy, together with an account of the monetary policy followed by the bank. The core of the report are the "Considerazioni Finali", "Concluding Remarks", by the Governor of the Bank, where a general appraisal of the economic situation is offered. The Considerazioni Finali for 1962, 1963 and 1964 basically deal with only one theme: the consequences on aggregate demand and on balance of payments of wage

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(5) It was presented, in an organic way, in the annual report for 1964 (Rome, June 1965), but the same analysis is to be found in the reports for 1962 and 1963.

increases larger than the average increase in productivity per man. The Bank assigns a crucial role to the distribution of income between wages and profits in affecting both aggregate demand and the balance of payments. In particular, it holds that a redistribution of income from profits to wages will have an unfavourable effect both on investment, and thereby on aggregate demand, and on the balance of payments because of the increase in consumption expenditures which it induces (6).

The main lines of this explanation run as follows: the propensity to save out of wage-income is taken to be substantially lower than the propensity to save out of profit-income. Therefore, whenever money wages rise faster than productivity and prices do not match this rise so as to keep the rise in real wages within the rate of increase of productivity, the distribution of income is going to be modified in favour of wage incomes, the aggregate propensity to save for the economy as a whole will go down and the aggregate propensity to consume will go up.

The increase in the share of aggregate demand going into consumption will determine an increase in imports and hence a deterioration of the balance of trade. The reduction in profits and in the share of savings in national income is going to affect negatively investment for three basic reasons:

(a) a decreased supply of savings on financial markets (7);

(b) a disincentive effect due to the reduced self-financing opportunities available to firms;

(c) a disincentive effect due to the reduction of the rate of profit (8).

All these phenomena arise from the increase in money wages, the level of which the Bank considers largely exogenous. What are,

(6) Cf. the Bank of Italy's Report for 1964, where it claims: "These wage increases (those of 1962-63) tended to raise unit costs. Whenever this determined a rise in prices, the competitiveness of our economy was curtailed and foreign demand negatively affected. Whenever prices were unchanged, profit margins got squeezed. From this a lower propensity to invest followed, a smaller demand for capital goods and finally a smaller aggregate demand" (page 486).

(7) "If one compares the notable amount of new requests for bank credit with the limited amount of resources to be so employed, one has to conclude that the limiting factor has so far been and still is the insufficient amount of saving" (Annual Report for 1963 page 488).

(8) "To the extent that higher wages are matched by lower profits, the new distribution of income may well affect investment" (Annual Report for 1962 page 476-477).

then, the possibilities of monetary policy? The central bank, one infers from the Considerazioni Finali, has a choice between increasing the supply of money and, through this, determine an increase in prices which will keep the distribution unchanged, thus preventing the fall in investment which would otherwise take place and leaving the supply of money unchanged. In the latter case, the distribution of income is going to change with the consequences we have indicated above.

To help the understanding of this model, which is quite unusual for the stress it lays on distribution of income as the key variable controlling both aggregate demand and balance of payments, we shall make use of a diagram. For the rest of this and the following two sections we shall assume that the economy has no international trade. The assumption will be released in Section 5.

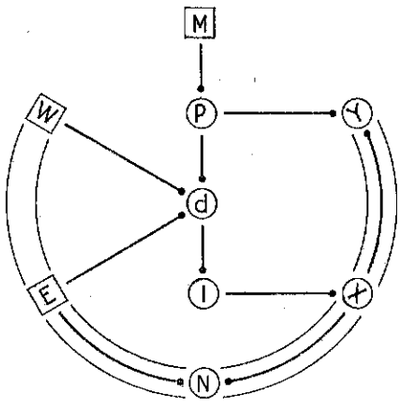


Diagram 1

There are three exogenous variables:

M : the supply of money
E : Productivity per man
W : the money wage rate

and six dependent variables

P : the price level
d : the distribution of income between wages and profits
I : the level of Investment
X : the level of Aggregate Demand in real terms
Y : National Income in money terms
N : the level of employment.

Circles around letters denote the endogenous variables. Boxes indicate the exogenous ones. Arrows denote the direction of causation among the variables. It is interesting to note that the model presented above has no feedbacks. Thus, for istance, the distribution of income is determined by two exogenous variables and by the price level, which is, in turn, determined by the exogenously given supply of money. The direct dependence of aggregate demand on distribution of income is also evident, and so is the role of the supply of money as the determinant of the price level.

It is necessary to emphasize the fact that this model has not been presented in this or any formal way in the Bank's reports. It is our interpretation based on a careful analysis of both the reports and the monetary policy followed in the course of the period 1961-1965. In particular, it seems to be the only way to put together the statement that balance of payments deficit and the fall in employment are to be explained by the same set of " real " circumstances, i.e. by a change in the distribution of income.

The model presented above rests on two crucial propositions. The first is that distribution of income is independent of the level of aggregate demand, being determined, instead, uniquely by wage bargain and the supply of money; the second is that investment and aggregate demand depend on the distribution of income. Let us examine both propositions starting with the second.

As we have seen, there are three mechanisms through which a change in the distribution of income is supposed to affect the level of investment and of aggregate demand (see page 6). We shall consider them in turn.

The first mechanism described by the Bank works through the supply of savings and has itself two components. First there is the empirical assessment that the propensity to save of wage earners is lower than that of profit earners; second, there is the analysis of the consequences of a fall in the aggregate propensity to save on investment and income.

As far as the empirical part is concerned, there are no Italian data which can be used to prove or disprove the point. The only indirect evidence (which goes against the Bank's thesis) is that up to 1963 the aggregate propensity to save had been going up in the Italian economy, notwithstanding a gradual change in the distribution of income in favour of wage income. Moreover, if one makes appeal to international comparisons of the average propensity to save,

the available evidence suggests no significant association between the saving ratio and distributive shares (9).

However, we may take the first part of the proposition as an unsubstantiated assumption and inquire whether the change in the aggregate propensity to save which would follow, *ex hypothesi*, from a change in the distribution of income can *per se* affect the level of investment and of aggregate demand.

The answer to this question is that in general neither effect will follow. In one borderline case, i.e. when the economy is initially at full employment, investment may fall but aggregate demand will stay costant. The Bank's opinion, which appears to be shared by many Italian economists, seems to depend on a failure to distinguish clearly between investment demand, the supply of saving and the aggregate propensity to save. Denote respectively by I, S and X investment, savings and aggregate demand, all measured in real terms and let s stand for the average propensity to save and X* for full employment income. We can then write, in their simplest form, the relationships among these variables as

$$[1] \qquad X = I/s = S/s$$

Now suppose that initially $X < X^*$, and consider the effect of a fall in s. Unless there is an independent change in investment demand, I will be unaffected by the change in s and hence S, the ex-post supply of saving, will also be unchanged. But this clearly implies that the fall in s must entail a *larger* and not a smaller level of aggregate income, X. What happens of course is that income must expand to make room for the additional consumption implied by the lower propensities to save. If, on the other hand, to the initial value of I and s corresponded a value of $X = X^*$, then, a fall in s must indeed force a contraction of investment to a lower level given by

$$[2] \qquad I = S^* = sX^*$$

where S* denotes the new and lower level of aggregate saving at the unchanged full employment income. I, i.e. must now accommo-

(9) See Franco Modigliani, " The Life Cycle hypothesis of Saving, the Demand for Wealth and the Supply of Capital ", *Social Research*, vol. 33, No. 2, Summer 1966.

date itself to the lower supply of full employment saving (10), but obviously aggregate demand remains constant at the full employment level.

Thus, if a redistribution of income were in fact to lower s, unless the fall in s is accompanied by an independent downward shift in the Investment Demand schedule, its final effect would be to increase income, or, in the limit, to leave it unchanged. In short, there cannot be a deflationary effect due to the first of the three mechanisms listed above. The only change that might follow would be a change in the composition of aggregate demand, towards more consumption and less investment (11).

It appears, then, that if a redistribution of income has to have a deflationary effect on the economy, this must come about through significant disincentive effects on investment, that is, through the independent or combined effect of the mechanisms listed under (b) and (c) above.

Mechanism (b) emphasizes the role of the availability of self-financing on the level of investment. The argument applies mainly to business enterprises organized in the form of joint stock companies with shares traded in the stock exchange. These enterprises pay out part of their earnings as dividends, while retaining part to finance investment programs. Whenever their earnings fall, they have to make a choice between an unchanged dividend policy, an unchanged level of retained profits and an intermediate combination of those.

Yet, for mechanism (b) to be strictly correct, it would be necessary (i) that dividends should remain unchanged in the face of lower profits, and (ii) that the whole of retained profits be devoted to investment. Neither (i) nor (ii) can be taken for granted. The retention ratio is likely to depend jointly on the level of profits and on investment opportunities. A lower level of profits, coupled with unchanged investment prospects would lead firms to adopt a higher

(10) It is to be noted though that several economists (e.g. NICHOLAS KALDOR, "Alternative Theories of Distribution", in *Essays in Value and Distribution*, London, Duckworth, 1960) believe that the aggregate propensity to save cannot be taken as a parameter, insofar as it depends on the level of investment. Therefore, when $X=X^*$, instead of investment adjusting to the full employment supply of saving, it will happen that investment will bring forth a distribution of income compatible with full employment and that level of r.

(11) The composition of aggregate demand is very relevant to employment from a long period point of view. From the point of view of short run fluctuations, employment depends mainly on aggregate demand, not on its composition.

retention ratio. Nor are retained profits necessarily invested. They can be used to increase the firm's liquidity or to reduce past debts. Investment, on the other hand, can be financed out of decumulation of liquid assets.

We point out these possibilities to warn against assuming a strict dependence of investment on the level of profits through mechanism (b). It is probable, nonetheless, that a weaker form of dependence may be found to exist, with dividends rather inelastic to changes in total earnings, so that the impact of lower earnings is mainly felt on retained profits.

Let us assume therefore that when profits go down, self-financing opportunities are reduced. Even this assumption does in no way warrant the conclusion that, as a result, aggregate investment, and/or aggregate demand must fall. Indeed a reasoning analogous to that developed on pages 9 and 10 readily establishes that the reduction of internal funds can never imply a shrinkage in the overall availability of investible funds to the point where they become insufficient to finance the level of investment needed to maintain the initial level of aggregate demand.

To clarify this point we may usefully distinguish two possibilities. Suppose first that the fall in profits does not reduce the overall propensity to save. Then, since the level of investment required to support an unchanged level of income is itself unchanged, internal sources will indeed fall relatively to the required level of investment; *but* the fall in internal sources will be precisely compensated by an increase in the potential supply of saving from other sources. If, on the other hand, lower business saving is not compensated by higher saving of other transactors there will be a fall in the average propensity to save and therefore in the sum of internal and external sources at the initial level of income; but this overall reduction will just match the fall in the level of investment required to maintain the same level of employment with a smaller s.

It must be recognized, however, that the shrinkage of internal sources could create some difficulties, even though offset by greater availability of external sources, if firms are unwilling to substitute external for internal financing.

For instance, if new stock issues are needed to substitute for reduced sources of self-finance, the controlling group may fear that dilution of ownership might weaken its control over the firm. Similarly, other things being equal, a firm may be reluctant to

increase its reliance on bank borrowing or on other forms of indebtedness (12).

In analysing the implications of such a phenomenon, it is well to distinguish between " absolute " and " relative " aversions. Absolute aversion means that firms will not substitute external for internal sources, regardless of the conditions under which the external funds might be made available. Such behaviour would indeed pose a serious problem, almost impossible to cope with through the tools available to the monetary authority. There is however very little evidence to indicate that absolute aversion was a problem of major proportions in Italy during the period under consideration, since the financial statistics reveal a notable upsurge of credit demand which the banks were unable to satisfy. We must therefore reject " absolute " aversion as a sufficient explanation for the fall in investment.

There remains the problem of relative aversion, i.e. an aversion which can be overcome by sufficient inducements. The importance of this phenomenon is hard to measure but we are perfectly willing to admit its existence and significance. Relative aversion merely implies that a fall in profits, and hence in internal sources, will tend to reduce investment, as long as the availability and cost of external sources is unchanged. In this sense its *modus operandi* is entirely analogous to the disincentive effect of lower rates of return on investment which constitutes mechanism (c) in our list of page 6.

We may therefore reword proposition (c) into the following very plausible assertion which covers also the viable portion of mechanism (b): a fall in current profits, by reducing both the expected rate of return on investment and the availability of " preferred " internal sources, will tend to reduce the incentive to invest, as long as the cost and availability of external sources remains unchanged. Stated more formally, this proposition says that the rate of Investment I, depends, among other things, on the current rate of profit, with the property

$$[3] \qquad \frac{\partial I}{\partial \pi} > 0$$

Just what does [3] imply for the effect of a fall in profit on aggregate demand, X? Clearly from [3] and [1] it does follow that a fall in π will reduce X, as long as other things are equal;

(12) For a fuller treatment of this question, see FRANCO MODIGLIANI and MERTON H. MILLER, " The Cost of Capital, Corporation Finance and the Theory of Investment ", *American Economic Review*, 1958, pp. 261-296.

and these other things include in particular the average propensity to save, s and the cost and availability of outside financing, which for brevity we associate with r. But of course other things cannot be assumed equal. In particular, according to the Bank's model, s itself is an increasing function of π, or

$$[4] \qquad \frac{\partial s}{\partial \pi} > 0,$$

so that a fall in profits will determine a fall in the average propensity to save. Thus, the negative effect on investment will be partially, totally, or even more than totally offset by the higher income multiplier. The net effect on X will depend on the relative weight of the change in I and the change in s. In formal terms, as is shown in Appendix 2, the outcome depends on the elasticity of investment with respect to profits and on the elasticity of the average propensity to save with respect to the same variable. If the first is larger than the second, national income will fall, if the two are equal, national income will be unchanged, and if the latter outweighs the former, national income will tend to increase (provided it is not bounded from above by the full employment ceiling).

Finally, even if the values of these elasticities are such that, for given r, X would fall, there is no reason why r should not be reduced as well (as a result of monetary policy) to affect positively I through credit conditions or greater credit availability. A change in r may therefore act as an incentive and balance the disincentive effect of a relative aversion to external forms of finance or low realized profit levels. The conclusion of our analysis of mechanisms (b) and (c), then, is that there is no *a priori* reason to expect a fall of realized profits, to cause automatically a fall in aggregate demand especially if monetary authorities are willing to take the steps that might be needed to counterbalance disincentive effects coming from low profit margins.

Let us summarize the conclusions we reached concerning the influence of a redistribution of income on aggregate demand.

1. The reduction of self-financing opportunities consequent upon a fall of profits may determine a fall in investment only in the hypothesis that firms have a total aversion against the use of external sources of finance. The evidence in support of this phenomenon is very scanty.

2. If, for the preceding or for other reasons, the inducement to invest tends to fall as profits fall, an increase in the average propensity to consume is to be welcomed rather than regretted and resisted. In fact, such an increase helps to maintain a high level of aggregate demand and employment.

3. An appropriately expansionary credit policy may be able to counterbalance the disincentive effects of a reduction in profits, should this prove powerful enough.

On the basis of the above considerations we are led to the view that the inversion of the cycle around the turn of 1963 cannot be accounted for by the fall of profits and the incentive to invest, unless there had not also been an active policy of monetary restraint to put a brake on the system. With this assertion we certainly do not wish to deny (1) that in the course of the inflation forces were developping which were making the continuation of the boom increasingly precarious, and therefore also making the system more vulnerable to a policy of monetary restraint, and (2) that the contraction was accelerated and magnified by rather ill-timed contractive fiscal measures hitting the system at a time when the monetary measures were already working their deflationary effects (namely in the spring of 1964). Nor do we want to leave the impression that in our view the Central Bank should be blamed for the restraint and the contraction that followed. At the moment we are concerned only with trying to understand the phenomena that occurred and their causes, leaving for the concluding section the task of drawing some inferences as to what might have been the most desirable course for monetary (and fiscal) policy.

As a final point before leaving this matter, it is important to note that if the Central Bank is concerned with encouraging investment in the face of a fall in the expected return from investment — whether originating in a fall in profit margins or in a fall in demand and the emerging excess capacity — it cannot confine itself to making credit more readily available; it must also take active measures to reduce its cost.

In Italy, interest rates are pegged to a level which has been largely constant (and at any rate inflexible downwards) during the post-war period. In particular, there exists a banks' agreement on credit terms, whose provisions have hardly changed in this period. Moreover, the Central Bank actively operates on financial markets to keep the yield of public debt roughly constant. This behaviour

exerts a stabilising effect on prices of long-term bonds available on the financial market, so that their yield doesn't vary very much through time. By and large, the Italian Central Bank prefers to operate through the availability of credit rather than through its cost. This policy may certainly exert a restraint, when demand exceeds the supply of credit, because " de facto " interest rates tend to go up and availability effects are quickly felt by firms. But it is very doubtful whether this policy can provide a stimulus to expansion. In technical terms, if the marginal efficiency of capital schedule has moved inwards, lower interest rates are a necessary condition (even if not sufficient) for keeping the level of investment unchanged (13). These considerations may help to explain the very disappointing performance of domestic investment in the last two years, when long-term interest rates remained quite high despite the supposed ready availability of credit, and seem to suggest the opportunity for Italian monetary authorities to reconsider their policy of pegged interest rates.

III

In the last section we have shown that distribution of income, alone, cannot determine aggregate demand. In this section we propose to argue that the opposite is true, i.e. that the distribution of income is determined by the level of aggregate demand which in turn is shaped by quite different forces, including monetary and fiscal policy.

For the moment, we find it convenient to retain the assumption that the economy has no international trade relationships and that money wages are fixed through an exogenous bargaining process between unions and business organizations. These two restrictive assumptions will be discarded in the two sections following the present.

To make the discussion simpler and to compare our model with the one discussed above, we have formalised it in a diagram (see also Appendix 1).

For the definition of the symbols, see diagram 1, page 7. The only difference between the variables appearing in the two dia-

(13) It may be, though, that the responsiveness of investment to lower interest rates is small and that investment is basically inelastic with respect to the rate of interest. But until a policy of flexible interest rates is attempted, no information on this elasticity will be available.

grams is that, in ours, there is no variable denoting the distribution of income and there is a variable, r, denoting the conditions and availability of credit. Boxed letters indicate exogenous variables. But since wages will be shown (in section IV) to be only partially exogenous, their box is not solid. Circled letters denote endogenous variables.

Given the level of money wages, the question of what determines the distribution of income boils down to that of what determines (a) the level of aggregate demand, (b) the level of prices.

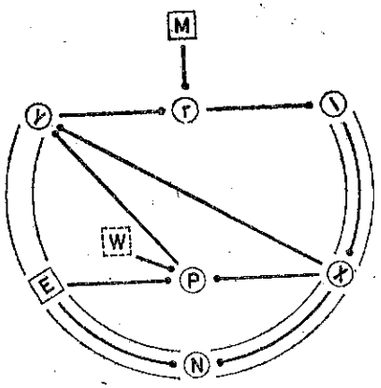


Diagram 2

In the Bank's model, there are partially conflicting statements on the determinants of the level of prices, but, by and large, one can say that, in that model, prices directly depend on the supply of money. Our view is different. We hold that an increase in money wages, larger than productivity, will affect prices even if the quantity of money is unchanged. Given the money wage, the price level depends on productivity per man, E, and the level of aggregate demand. Precisely, for given X and E, the price level, P, will be approximately proportional to the level of money wages. Conversely, for given W, an increase of X will tend to be accompanied by a higher price level.

This conclusion is borne out by various considerations: one was originally advanced by Lord Keynes in the *General Theory*, where the relationship of aggregate demand to the price level is clearly spelled out for the case of a perfectly competitive system. According to this view, real wages tend to the level of the marginal productivity of labour. The latter, in the short run, is a decreasing function of

the level of employment and of aggregate demand. Therefore, given X, real wages are determined. And the price level will be set in such a way as to make money wages correspond to that level of real wages (14).

A more satisfactory approximation to the working of modern economies is to be found in models of oligopolistic behaviour, where the emphasis is on " mark-up " procedures for price determination. According to this view, firms set prices in such a way as to cover direct costs and to secure a given profit margin. The price fixed must be consistent with a " normal " rate of utilization of plant and machinery. In this case a change in money wages (in excess of productivity increases) will tend to be transferred on prices as long as the rate of utilization of capacity is maintained. However the " mark-up " is influenced also by the rate of utilization of capacity, and tends, therefore, to rise with output in the short run. We may also note, for later reference, that when the economy is open, international competition will influence the " mark-up " in much the same way as capacity. In that case, profit margins may be squeezed without a change in the level of aggregate demand or in the degree of utilization of plants, if domestic costs rise relative to foreign costs and prices.

Thus, both in the keynesian and in the oligopolistic model, real wages depend on aggregate demand and employment. This means that, for given X, money wages and prices move together. Changes in aggregate demand, however, will affect the proportionality factor between W and P and in general we will expect that, given productivity per head, real wages will move in the opposite direction of aggregate demand.

We are now in a position to analyse the relationship between the supply of money and the price level. As diagram 2 shows, the supply of money affects the price level through its influence on aggregate demand. It is in fact the latter that, together with E and W, sets the price level. The relationship between M and X can

(14) We are aware that a number of empirical studies on the relationship between the level of output and productivity per man seem to indicate that the two move in the same direction in the short run. This may be taken as a disproof of the perfectly competitive model of the General Theory, in the sense that real wages would not go down when employment goes up and that therefore the price-wage ratio need not increase together with output. On the other hand, these results are open to further discussion, and, moreover, the relationship that we have put as a basis for our analysis, i.e. that, *for given X*, the price-wage ratio tends to be constant, is valid even if the other relationship may be doubted.

be spelled out in greater detail: M influences r; r in turn influences investment expenditures, encouraging or discouraging them, as the case may be. Investment expenditures determine income through the investment multiplier. There is a feedback in the model insofar as the level of money income determines the demand for money and therefore the level of r (15).

A useful way to make the working of our model clear is to suppose that, starting from an initial equilibrium position, money wages rise by a given amount (supposing, for simplicity, that productivity is unchanged). Let us assume that monetary authorities leave the supply of money unchanged. From the considerations developed above, if aggregate demand were unchanged, prices would increase in the same proportion. The demand for money (coming from an expanded volume of monetary transactions) will be pushed up and will exert a pressure on the available stock of money. Thus strains will develop on financial markets, with money being less readily available and with its cost increasing. There will be a larger demand for bank loans leading to higher rates and an increased rationing of credit. And there will be larger issues of bonds and liquidation of bank holdings which can only be absorbed by the public at higher interest rates.

Given its greater cost and lower availability, money will circulate faster, with operators trying to economize on cash holdings relative to transactions. But real aggregate demand too will bear the burden of this scarcity. Firms will consider the opportuneness of cutting some of their planned expenditures which are now more costly and more difficult to finance. It will be mainly new orders of plant and equipment which will be considered the first candidates for these reductions, because of their greater volatility, though current operations may also be somewhat affected.

With aggregate demand being reduced, prices will not be pushed up to the full extent of the wage increase. Eventually the system will settle down to a new position characterized by a higher level of aggregate money demand, a lower level of real aggregate demand and employment, a higher rate of interest and an increased velocity of circulation of money. Since prices rise by a lesser amount than money wages, real wages (of the employed) will be higher than before, and profits per unit of output will be lower. Total

(15) See Appendix 1.

profits, on their part, will be reduced for two reasons: because profits per unit of output are lower and because the total volume of output has shrunk. Nevertheless, distribution of income, i.e. the shares of wages and profits in national income, may move either way (16).

Can monetary policy prevent all this from happening? and at what cost? The answer depends basically on the behaviour of money wages. If they are constant at the new level they have reached, as we suppose throughout this section, then the answer to the first question is positive. If, on the contrary, their rate of change depends on aggregate demand or if unions are determined to reach a given *real wage rate*, then the aims of monetary policy will be frustrated.

Let us assume for the moment that wages are constant at their new level and suppose that monetary authorities set the money supply so as to keep real aggregate demand at the level it was before the wage increase (17). In this case, it is to be expected that real wages will not change, i.e. that prices will grow by the same amount as money wages. Thus, the distribution of income between wages and profits will be unchanged (as a by-product of a constant level of real aggregate demand).

The causal link in our model is exactly the reverse of the one stressed in the Bank's model. Whereas, in ours, the distribution of income is determined by aggregate demand, in the Bank's model distribution of income determines aggregate demand. The fact that both models consider an expansion of the money supply as a necessary condition for preserving a given level of employment does not change the basic fact that the working of the two models is fundamentally different (18).

(16) Distribution of income depends on the elasticity of employment and the elasticity of prices with respect to aggregate demand. When output falls, real wages are higher and unit profits lower. But the share of wages in the (lower) output depends on the number of employed workers as well as on their (higher) wage. If employment is reduced by a large enough amount, the share of wages in output may be lower than before. If one is willing to use the notion of a marginal rate of substitution of capital and labour, the final result depends on the elasticity of substitution between these two factors of production.

In practice, even when the share of wages is reduced, it is probable that profits, in a strict sense, are reduced too as a share of national income, the share of interest and rents (which are rather more inflexible than profits) having increased to account for the difference.

(17) Question: how can monetary authorities know the "appropriate" level of the money supply? The answer is that (at least in theory) they can implicitly find it simply by enforcing a constant interest rate (or set of interest rates), i.e. by releasing money whenever credit and financial conditions become tight, and recalling it when they are too loose.

(18) To mention another difference: we expect velocity of circulation of money to change when credit conditions change, whereas the Bank's model would seem to implicitly

To assert that monetary expansion is a *necessary* condition for preserving employment in the face of a wage push does not imply that such a response is *desirable* or even that it is *sufficient* to achieve that goal. Even if it were sufficient, the monetary authority would still face a difficult dilemma between maintaining employment at the cost of higher prices or maintaining the initial price level at the cost of lower employment. Under certain conditions this dilemma might not be too hard to resolve. *If* one could be sure that wages would not respond to higher prices by further escalation, and *if* balance of payments effects could be disregarded, then a monetary expansion would also prove sufficient to preserve employment. In this case, we, at least, would have no qualms in opting for monetary expansion on the ground that a once and for all rise in prices is a lesser evil when compared with a permanent, or at least protracted, fall in employment. Unfortunately, in general, neither of the above "ifs" could be expected to hold in Italy, as we shall indicate in the following two sections.

IV

In this paragraph we want to address ourselves to the question of the determinants of wage behaviour. In particular, we want to inquire whether it is justifiable to treat money wages as a purely exogenous variable.

Keynes's view was that, by and large, so long as there exists some unemployment, money wages are rigid (both downwards and upwards). At full employment, they tend to move in response to demand changes. Contrary to this view, post-keynesian analysis has emphasized a number of mechanisms which tend to impart an upward thrust to money wages even when the labour force is partially unemployed. Some of these mechanisms link the level of money wages to the price level; some others link the level (or, more exactly, the rate of change) of money wages to the level of employment.

A typical mechanism, linking money wages and prices, is the so-called "sliding scale" clause in wage contracts which provides for an automatic wage adjustment to the price level. When these clauses are effective, an upward movement of wages, inducing — as

deny this. In particular we would expect velocity of circulation to increase when money becomes tight so that an unchanged quantity of money would be accompanied by a higher Y, with P going up somewhat and X being somewhat reduced.

we have seen in the last section — an upward revision in prices, will lead to further wage and price increases. Therefore monetary policy can be successful in preventing a squeeze in aggregate demand and employment only if the central bank is willing to let the supply of money expand in step with wages and prices.

There are two distinct possibilities. The sliding scale mechanism may provide only for a partial adjustment of wages to prices (19). In this case an expansionary monetary policy aiming at a constant level of employment will determine a damped wage-price spiral. But there is no way of knowing what will be the level of wages and prices that will prevail when a stable situation is reached again.

If, on the other hand, the sliding scale mechanism provides for a full adjustment of wages to prices or if trade unions bargain the money wage on the basis *of a level of the real wage they aim at*, an expansionary monetary policy will give rise to an undamped wage-price spiral with prices and wages growing at the same rate.

It is interesting to note, however, that, even in this case, monetary policy may still be able to keep the level of employment unchanged at its initial level, provided there is a certain lag between price changes and wage adjustments. In fact, if monetary expansion immediately follows a wage increase, but wages are adjusted to the new (higher) prices only after a time, although wages and prices grow at the same rate, real wages never exceed that level compatible with the pre-existing level of employment (20).

The previous result depends on the lag structure we have assumed, namely, an immediate adjustment of prices to wages and a delayed adjustment of wages to prices. But if the lag between price adjustment and wage adjustment is in itself a function of the rate of inflation, it will decrease through time with trade unions insisting on shorter and shorter periods between successive wage adjustments. In this case the rate of inflation itself will increase through time (21).

(19) This is the case for Italy, where the "scala mobile" provides for a wage increase of 0.6% for every 1% increase in the cost of living index.

(20) One can easily construct a symmetrical, although less plausible, case, i.e. a situation in which monetary policy reacts to wage changes after a lag of time, whereas wages are instantaneously adjusted to the level of prices (say through a perfect "sliding scale" mechanism). In this case the level of employment will be the one implied by the maximum level of real wages, because monetary policy will manage to inflate aggregate demand just for a fraction of time, but this will not be sufficient to push employment to a higher level, the following wage change undoing what monetary policy is trying to achieve.

(21) See Appendix 3 for a formal discussion of this point.

The mechanisms we have discussed so far are independent of the behaviour of employment. In recent years, following a pioneering study by A.W. Phillips (22), there has been a remarkable interest in testing the hypothesis that the rate of change of money wages is a function of the unemployment rate. In its most common formulation, the hypothesis is that the rate of change of wages is a decreasing function of the unemployment rate.

If this relationship was found to exist, given the rate of growth of productivity per man, the constancy of the price level would require that wages increase at a specified rate, and this would in turn determine the rate of unemployment which should prevail in the economy. A monetary or fiscal policy aiming at a higher level of employment would result in a continuous increase of wages and prices.

The Phillips relationship is not easy to establish, mainly because of the simultaneous appearance, when employment is high, of various phenomena that can explain rapid wage changes. This poses rather complicated econometric problems (23).

Even apart from these difficulties, we do not think that this analysis can be used to interpret the Italian situation between 1961 and 1965, for one basic reason. The countries for which this relationship has been shown to be statistically significant are countries where unemployment is a cyclical phenomenon due to fluctuations of effective demand around its full employment or quasi-full employment level. In Italy, on the other hand, except for the years 1964 and 1965, the change in employment has been largely unidirectional. During the last years of the '50s and the first years of the '60s Italy has moved from a situation of "structural" unemployment to a situation of near full employment. Wage changes taking place in these conditions should not be interpreted against the background of a cyclical model like a Phillips curve (24).

On the whole, we are inclined to think that the high rate of inflation of 1962-1963 is to be explained as a cost-push phenomenon

(22) A. W. PHILLIPS, "The Relation between Unemployment and the Rate of Change of Money Wages in the United Kingdom, 1861-1957", *Economica*, 1958, pp. 283-299.

(23) For a critical view of Phillips Curves see, for instance, E. KUH, "Wage Changes and their Determinants", M.I.T. unpublished, 1966.

(24) Recently, this topic has attracted some attention among Italian economists and lately an attempt to fit a "Phillips curve" to Italian data has been made by A. CAMPOLONGO in the work we quoted in footnote 1.

coupled by an expansionary monetary policy aimed at preserving the level of employment (25). It may well be, though, that some demand pull elements have been contributed initially by the central bank's attempt at maintaining the level of investment in the face of a reduced propensity to save. But, since we do not have clear evidence to substantiate this hunch we mention it only as a possibility (26).

The inflationary process was halted by the policy of monetary restrictions enforced in the fall of 1963. The slack in domestic demand and the pressure of the foreign competition at home and abroad restrained prices from rising too much, and the resulting fall in employment reduced the strength of trade union demands. Although wages and prices were never completely halted in this period, they were kept sufficiently in check and this contributed to the rapid improvement of the balance of payments.

Consideration of the mechanisms we mentioned and in particular of the "sliding scale" adjustment clause should have led monetary authorities in 1961 to doubt the opportuneness of an expansionary monetary policy and should have suggested instead a less buoyant policy. These considerations apply even more forcefully when the balance of payments aspects are taken fully into account, as we will show in section V.

(25) Italian unemployment never fell below some 2% of the total labour force (at least according to one of the available sets of statistics). But this situation was close enough to full employment to make the labour market very tight. In fact, one has to consider where unemployment was mostly located. The industrial areas of the North had reached full employment of the local population some time before 1961. At that time workers were imported from Central and Southern regions of Italy. At least three causes contributed to higher wages:

(a) the proper cost of transferring workers from agricultural areas into industrial regions;

(b) the necessity for Northern Italian firms to compete for immigrant labour with other industrial areas of the Common Market where wages were, at the beginning of the period we are studying, higher than in Italy;

(c) the very high wages (relatively to other firms) paid within the Northern regions of Italy by the largest and most advanced firms, like FIAT, to attract workers from other firms of the area, thus compelling the other firms to raise in turn their wages to keep skilled workers with them.

(26) It is actually possible that during this period there was an upward movement of the propensity to consume of the economy as a whole (it is of no consequence, at this point, to discuss whether it was due to a redistribution of income from profits to wages or to the other causes) that would have called for a lower amount of investment to keep the level of employment unchanged. To press for an unchanged level of investment, when employment was nearly full, may have powerfully contributed to wage increases through the pressure of demand.

V

Models of income and price determination that take into account the complications arising from international trade are rather difficult to describe and analyse in plain English. We have tried to formulate diagrammatically (leaving to Appendix 4 its further formal exploration) the one we think to be appropriate to the Italian situation.

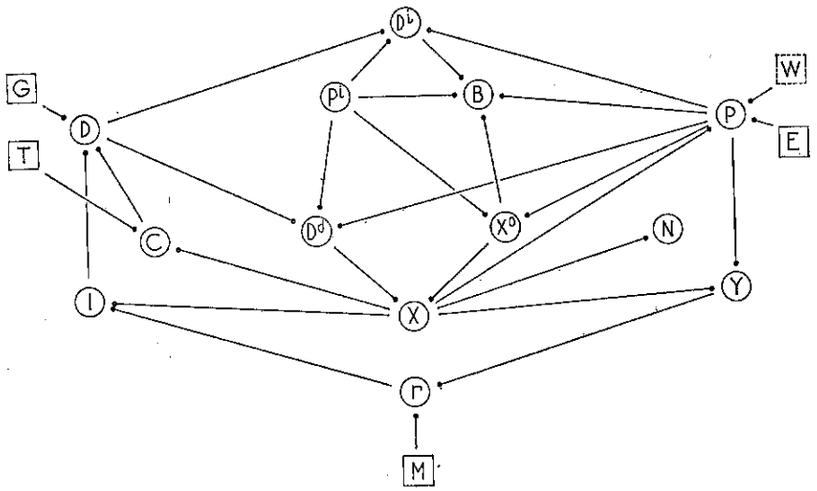


Diagram 3

The symbols appearing for the first time are:

- G : Public expenditure in real terms
- T : Taxes in real terms
- D : Aggregate demand in real terms
- D^d : Aggregate demand in real terms for home produced goods
- D^i : Demand for imports in real terms
- X^e : Demand for exports in real terms
- X : Real national income
- P^i : International price level
- B : Balance of Payments deficit or surplus (— B: deficit; + B: surplus) on current account

E, W, M, r, P, Y, N, C, I, are defined as in the preceding sections. Boxes denote exogenous variables (with the proviso that wages are only partially exogenous and thus their box is not solid) and circles the endogenous ones.

The basic difference between the case of a closed economy and that of an open economy is that, in the former, aggregate demand and national income necessarily coincide, while in the open case, they will in general be different. The difference is accounted for by the balance of payments deficit or surplus. In fact, aggregate demand (i.e. the sum of consumption, investment and public expenditure) does not become entirely national income, because part of it is spent on imported goods. On the other hand, national income includes that part of aggregate demand which is not spent on imported goods, as well as the demand coming from abroad.

The fundamental relationships are therefore

$$[5] \qquad Y \equiv PX \equiv PD + B$$

in money terms, or

$$[6] \qquad X \equiv D + B/P$$

in real terms.

The case of an open economy requires therefore both an analysis of the forces controlling aggregate demand and of those controlling national income. Since there are several feedbacks in the model, a literary exposition of these relationships is very complicated indeed. It is possible, though, by using an appropriate set of simplifying assumptions, to represent diagramatically the relationships we are most interested in, that is, the relationships among money wages, the price level, national income and the balance of payments.

The first relationship we want to derive is that between real aggregate demand and net balance of trade in real terms. For the balance of payments, we have the definitional identity

$$[7] \qquad B = PX^e - P^iD^i$$

which can be expressed in real terms as

$$[8] \qquad B/P = X^e - P^iD^i/P$$

Aggregate demand in monetary terms is, on the other hand,

$$[9] \qquad PD = PD^d + P^iD^i$$

Let us assume, as a first approximation, that import expenditure is proportional to aggregate demand in money terms, but that the factor of proportionality, which we denote by k, is a function of the ratio of internal to international prices (27), or

$$[10] \qquad k = k\ (P/P^i)$$

k represents the average and marginal propensity to import; its value lies between 0 and 1 (28). For a given P/P^i, we will have

$$[11] \qquad P^iD^i = kPD$$

Substituting [11] into [4] we derive

$$[12] \qquad \frac{B}{P} = X^e - kD$$

It is convenient at this point to introduce a second simplifying assumption, namely, that the internal price level can be taken as proportional to the money wage, with the proportionality factor changing over time as productivity rises, but independent, in the short run, of the level of economic activity (29).

It can be shown that the result of our analysis would not change in any significant respect if we acknowledged that in the short run the mark-up of prices on wages is likely to rise with the rate of utilization of capacity, as indicated in section 3. But since this refinement would considerably complicate the presentation we shall treat it only sketchily in footnotes and in the appendix.

With P uniquely determined by W and with P^i taken as a *datum*, it follows that W uniquely determines k, and, by virtue

(27) While we were reading the galley proofs of this paper, it was suggested to us by Professor Sylos Labini and by Dr. Bruni that recent econometric testing has led them, independently, to conclude that the ratio of internal to international prices is not significant in explaining the level of the demand for imports in Italy. The main explanatory variable seems to be aggregate demand.

(28) Average and marginal propensities need not coincide. A more general formulation of equation [8] is:

$$[8'] \qquad P^iU^i = k\ (PU)^\theta$$

In this case the average propensity to import is greater, smaller or equal to the marginal one according to whether θ is smaller, greater or equal to 1.

(29) This approximation is not altogether unsatisfactory, if we limit ourselves to considering small variations of X and provided $X<X^*$ (where the asterisk denotes the full employment value of X).

of [12], also the relation between the value of imports and the level of real aggregate demand D. As for exports, to a good first approximation, they may be expected to depend on world demand and on the ratio of domestic to international prices. But with world demand and prices taken as a *datum* we can conclude that also the level of exports, X^e, is uniquely related to W (30).

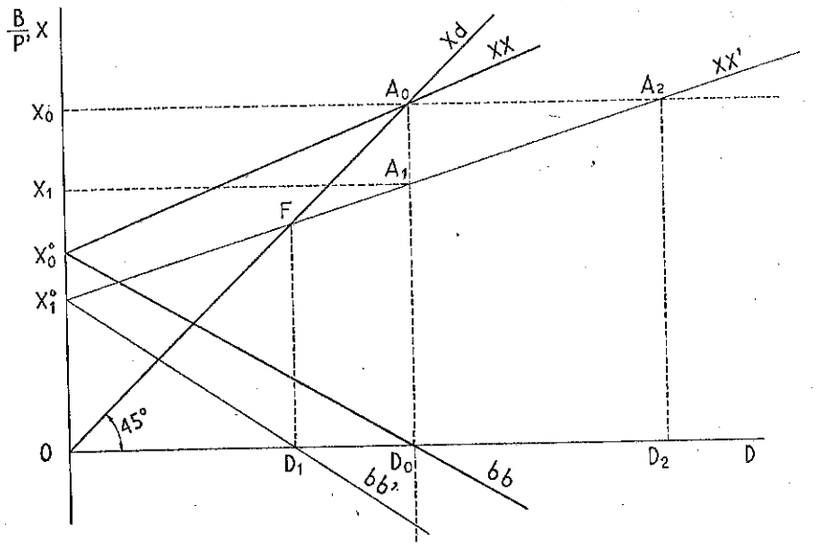


Diagram 4

Equation [12] is now seen to imply that, for a given level of money wages, say W_0, B/P is a linear function of D with intercept X^e_0 and slope $-k$. In diagram 4, this linear relationship is represented by the line *bb*. The relationship indicates that the balance of payments tends to worsen when D rises, because imports increase whereas exports are constant. There is a level of aggregate demand, D, let us call it D_0, for which *bb* cuts the x-axis and thus $B=0$. For

(30) Both *a priori* considerations and the empirical evidence suggest that, for given W and P^i, X^e may be also affected by the rate of utilization of domestic capacity. Taking this effect into consideration would affect the analysis as much as recognizing the dependence of the mark-up on the level of domestic activity. Cf. footnote 31 below.

values of D smaller than D_0, B is positive and for D greater than D_0, B is negative.

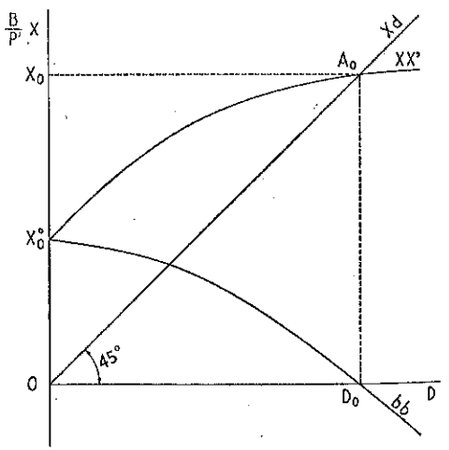
On the same diagram we can represent the relationship between real national income, X, and real aggregate demand D. Equations [6] and [12] together imply that X, under the assumptions made above, is a linear function of D, being the sum of a linear function of D and of D itself. From the *bb* line we can derive the relationship between X and D. We know that the equation of the straight line going through the origin with an angle of 45° is X=D. We will call it the *xd* line. If, for any D, we sum the ordinate of *xd* to the corresponding ordinate of *bb* we get a new line, which we may call *xx*, which represents equation [6]. The ordinate of the point where *xd* and *xx* cross indicates the level of real national income leaving the balance of payments with neither deficit nor surplus (31).

Diagram 4 indicates therefore that there is a unique relationship between aggregate demand, national income and the net balance of payments position. When D goes up, so does national income. B, on the other hand, tends to worsen.

Figure 4 focusses on the dependence of income on aggregate demand. As is apparent from diagram 3, it is also true that D depends on X. This second relation, however, not exhibited in figure 4, is mediated by the policy variables G, T and M controlled by fiscal and monetary authorities. Thus, to a given level of D, there corresponds a given level of X, whereas to a given level of X

(31) If we now abandon the assumption that P is independent of the level of X, and assume that, for given W, P is higher, the higher is national income, the relationships between B/P and D and X and D are no longer linear. *bb* and *xx* (which is still the sum of *bb* and *xd*) become concave towards the origin. The uniqueness of these relationships, which is what we meant to stress, is preserved. Diagram 5 indicates the modifications to introduce in diagram 4 in this non-linear case. If exports are negatively influenced by the level of demand (cf. footnote 30), the curvature of *bb* will be greater and the level of d consistent with B=0, correspondently lower.

Diagram 5



may correspond many different values of D depending on the values taken by G, T and M.

The graphs in figure 4 discussed so far correspond to a given money wage, W. A higher level of money wages under our assumptions implies a higher level of prices. This will affect both the intercept and the gradient of the *bb* and the *xx* line. In particular, a rise in prices will increase the propensity to import and therefore make *bb* steeper. At the same time, it will decrease exports and therefore lower the intercept of *bb* on the y-axis. As far as *xx* is concerned, both its slope and intercept are reduced. It follows that the level of aggregate demand which leaves B=0 is lower than before. We indicate this new level with D_1. A lower level of X, will correspond to it, as the ordinate of the point F in diagram 4 shows (32).

Some applications of the model

With the help of this framework, we can now examine the consequences of an increase of money wages in excess of the increase in productivity. Let us first suppose that the supply of money is unchanged.

As in the closed economy, firms will react to the increase in costs with an increase in prices. Since international prices are independently set, the higher internal prices will adversely affect aggregate demand on four different counts:

(a) exports (and therefore production and employment) will be reduced. The size of this reduction depends on the elasticity of exports with respect to internal prices (33);

(b) for a given level of aggregate demand in real terms, higher domestic prices push up the demand for imports and decrease the demand for home produced goods. The fall in D^d will reduce X. Again the effects will be more or less strong according to the elasticity of D^d with respect to P (see footnote 27);

(32) This conclusion may be easily generalized to the non-linear case discussed in footnote 31.

(33) Demand for exports should be rather elastic because an increase in prices of the exporting country sets two effects in motion: a reduction of consumption in foreign countries of the now more expensive commodity and a shift of purchases from the market where prices have risen to foreign markets.

(c) since D depends on X as X on D, a smaller X will generate a smaller D, which in turn will again reduce X. Part of the reduction in D will be absorbed by the reduction of D^i. There are, in other words, "multiplier" mechanisms leading to a reduction in X larger that the one determined by the initial reduction of D^d and X^e;

(d) finally, the price increase will tend to raise the level of money national income. The expansion of Y will tend to push r up (for an unchanged supply of money) and to reduce D and X in this way. This mechanism is common both to the closed and to the open economy (34).

Thus, employment and national income go down when money wages go up and the supply of money is unchanged. The balance of payments, however, can go either way. In the first place, although the price increase tends to reduce the volume of exports, the increase in their unit value prevents their value (PX^e) from falling as much and may even increase it, if the price elasticity of the demand for exports is less than 1. In the second place, although the price increase tends to direct demand towards imported goods, the fall in income which follows from it, works in the opposite direction i.e. towards a containment of imports. Thus an increase in money wages, even if coupled with a constant money supply, will normally lead to a deterioration of the balance of payments though the opposite result is not impossible if the demand for exports is inelastic and the fall in national income appreciable.

Diagram 4 may be used to illustrate this conclusion. Suppose that *xx* and *bb* and *xx'* and *bb'* represent respectively the relationship between income, aggregate demand and balance of payments before and after the wage and price increase, and suppose that in the former situation, aggregate demand be D_0, so that $B=0$. In the new situation B depends on the new level of D. If aggregate demand is reduced but not beyond D_1, B becomes negative; if, on the other hand, D falls below D_1, B will become positive.

(34) It is interesting to note, however, that this mechanism may not work or may work in the opposite direction. In fact if X falls by a sufficiently large amount (because of the three other mechanisms discussed in the text), Y may be reduced too. In this case the demand for money will be reduced and so the rate of interest may fall and in turn reduce the negative effects on demand and income deriving from the first three mechanisms.

The question we want to discuss now is whether, through monetary or fiscal tools, employment could be kept constant in the face of a money wages push and how such policy would affect other relevant variables.

Let us first suppose that wages move *una tantum*, whatever the behaviour of prices and employment. In this case, our model brings forth three conclusions:

(a) it is possible in general to keep employment and national income constant, provided fiscal and monetary policy are used, jointly or separately, to bring about a sufficient expansion of aggregate demand in money terms;

(b) to preserve the level of employment, it is not sufficient to keep real aggregate demand unchanged, as was the case for the closed economy; it is now necessary *to increase real aggregate demand* and therefore to increase aggregate demand in *money terms* proportionally more than wages and prices;

(c) an unchanged level of employment will necessarily be accompanied by a worsening of the balance of payments. The extent of this worsening depends on import and export elasticities (with respect to internal prices) and on the extent of money wage increases.

To establish the foregoing assertions, we can make use once more of diagram 4. Let us suppose that, after the price increase, the two relevant curves are *bb'* and *xx'*. Assertion (a) is the direct consequence of the dependence of X on D. Any level of X (up to full employment) can be reached, provided D is high enough. In particular, the level X_0 can be preserved, where X_0 is the level of national income preceding the wage and price increase.

As for assertion (b), we can start by noting that if D is unchanged at the level D_0, in the new situation represented by the *bb'* and *xx'* lines, national income would go down from X_0 to X_1. To keep X at the X_0, D has to increase from D_0 to D_2. D_2 is the abscissa of A_2, that is, of the point where *xx'* cuts the line X_0A_0, and is necessarily larger than D_0. Since for an unchanged level of employment, the wage-price ratio is unchanged, aggregate demand in money terms must increase by a larger amount than the increase in wages (35).

(35) Denoting with $\omega=W_1/W_0$ the ratio of wages in two successive moments, if employment is constant at X_0, $P_1/P_2=W_1/W_0=\omega$. Since X_0 corresponds, in the new situation, to D_2, with $D_2>D_1$ we shall have $P_1D_2/P_0D_0>\omega$.

The third conclusion can also be readily verified from the diagram. Given the new position of *bb*, B would be negative even if D were to remain at D_0. This conclusion is reinforced if D has to increase to D_2 in order to keep employment unchanged.

Similar, but even more pessimistic, conclusions follow if wages rise further in response to the initial increase in prices because of mechanisms like the "sliding scale" or because of trade union insistence on a specified level of *real* wages.

In this case too, it is possible to preserve a given level of employment, but the consequences on the balance of payments will be all the worse because of successive wage and price increases. The explicit consideration of the balance of payments therefore makes even more doubtful a policy of monetary expansion when prices and wages tend to move in step.

On the other hand, international trade opens two avenues for moderating the wage-price spiral, which do not exist in the closed economy. In the first place, prices tend to increase less in an open than in a closed economy. This is due to the strength of international competition both inside the country and in foreign markets. Therefore the wage-price spiral is weaker.

In the second place, since part of the wages is spent on imported commodities, their real purchasing power is increased (insofar as international prices are unchanged). Therefore, if wage movements are determined by unions aiming at a given level of real wages, the wage-price spiral will grow weaker through time (36). It is to be stressed, though, that the burden of this milder inflation is borne by the balance of payments, that will turn negative, even under the favourable hypothesis of a final disappearance of the wage-price spiral.

On the basis of the conclusions we reached in this section, we can examine the opinion, which is largely current in Italy, that the deterioration of the balance of payments in 1963 can be traced to the change in the composition of aggregate demand and in particular to the increase in consumption following the redistribution of income from profits to wages. We may note, in the first place, that in our analysis, thus far, we have had no occasion to refer to the composition of demand. This feature is due to the

(36) Moreover, if productivity per man is rising, and unions aim at a given real wage, the rate of inflation will tend to decrease through time for this reason too.

simplifying assumption, introduced in equation [11], that expenditure on imported commodities depends on the *level* of aggregate demand and *not on its composition*. When this assumption is abandoned, the relationship between national income, aggregrate demand and the balance of payments is no longer independent of the composition of aggregate demand. But it is not possible to establish, on a *a priori* basis, whether a change in the composition of demand, towards greater consumption and smaller investment is going to affect favourably or unfavourably the balance of payments. The answer depends on the marginal propensity to import of the two large classes of commodities. A change in the composition of demand towards greater consumption will affect adversely the balance of payments *only if the marginal propensity to import is larger for consumption than for investment goods*. If the reverse case is true, the balance of payments will improve and if the two propensities are equal, composition does not make any difference (see Appendix 4 for further discussion of this point).

To the best of our knowledge, no reliable estimates are available at present as to the relevant marginal propensities, i.e. the response of imports to a marginal increase respectively in consumption and investment expenditure. A superficial examination of the data casts serious doubts on the hypothesis that the marginal propensity is higher for consumption goods than for investment goods; indeed, at least in terms of average propensities, the reverse is definitely true. In any event a numerical example provided in Appendix 4 shows that the difference between the marginal propensities would have to be quite large for the composition of demand to have any appreciable effect on total imports (37).

Our analysis implies instead that the worsening of the balance of trade is to be attributed to the cost and price inflation resulting initially from the wage push fed by an expansionary monetary policy, aimed at maintaining full employment in the face of rising prices, which brought into play the wage-price spiral mechanisms outlined in section IV.

(37) A recent econometric analysis, again reported to us by Professor Sylos Labini, while we were reading proofs of this paper, estimates the propensity to import investment goods to be consistently higher than the propensity to import consumption goods. Furthermore, it appears that in the years after 1960 both propensities moved up, still preserving, though, their relative position. This may be due to internal price increases or to lower barriers on imports (especially from Common Market countries) or to both effects together.

It is true that in 1963 there were unusually large increases in certain imports of consumption goods, notably meat and cars. This phenomenon caught the attention of contemporary observers and led them to associate the deterioration of the balance of payments with the increased consumption and the latter with the shift in the distribution of income. But even apart from the distinct possibility that these sharp increases may have reflected in part transitory phenomena, what is usually forgotten is the equally remarkable increase in investment goods imports in 1963 and the subsequent sharp decrease accompanying the abatement of investment in the following period, which contributed very significantly to the improvement of the balance of payments. Of course, we are not denying that a fall in consumption would have reduced imports of consumption goods; the point is that such a fall, if not offset by a corresponding expansion of investment demand, would have led to a fall in income and employment, while, if offset by the expansion of investment, would have merely led to a replacement of imports of consumption goods with (possibly larger) imports of investment goods.

VI

From the discussion of the preceding sections, the differences between our model and that of the Bank should be apparent.

Both analyses agree that the origins of balance of payments and inflationary problems in Italy are to be found in the large increase in money wages, far beyond the increases in productivity, which unions managed to obtain during 1961 and 1962. But from this common starting point, the two models move in different directions.

According to the Bank's model, the unfavourable consequences of the wage surge spring from the threat of an income redistribution which would increase the average propensity to consume. This would, on the one hand, reduce employment and aggregate demand and, on the other, generate a deficit of the balance of payments.

According to this analysis the Bank, through the great monetary expansion of the period 1961-63, aimed at protecting the level of investment and employment by making it possible for the higher wages to be reflected into higher prices, thus preserving the initial distribution of income.

The Bank however could not entirely prevent some redistribution of income, in part because it was cramped by balance of payments

considerations. The redistribution of income together with the rising prices caused a deterioration in the balance of payments in 1962 and, more dramatically, in 1963, and also gradually worked its unfavourable effects on investments, determining the fall in employment and output of the years 1964-65 (38).

Our own analysis concurs with that of the Bank in some respects but differs crucially in several others. It agrees with the conclusion that the unrestrained monetary expansion of the early years permitted the maintenance of the level of employment in the face of the wage push, through the expansion of aggregate demand; but it suggests that it was the expansion of demand that kept within bounds the redistribution of income, and not the other way around. It further implies that in the absence of direct and effective controls over wages, the chosen course of action was bound to bring into play a wage-price spiral, causing in turn growing deterioration of the balance of payments. It could not therefore provide a permanent solution but only postpone the day of reckoning. Clearly, with limited international reserves, a country cannot indefinitely cope with a large and growing deficit. Conceivably devaluation might provide some transitional relief by improving the competitive position of the domestic product. But unless a country is prepared to embark on the road of repeated devaluation (probably at shorter and shorter intervals) sooner or later it will have to put an end to rising prices by checking the expansion of aggregate demand, through monetary and/or fiscal measures, and accepting the consequent unavoidable contraction in real income and employment.

The alternative course of action would have consisted in containing aggregate demand from the very beginning, thus preventing prices from increasing beyond a limited and unavoidable response to increased unit costs, but at the same time accepting immediately the resulting increase in unemployment. Because of this costly consequence, this alternative seems very unattractive and this may help to explain why it was not adopted as soon as the danger of inflation became apparent. It must be remembered however that, if our analysis is valid, sooner or later the fall in income and employment is unavoidable. Furthermore, this harsh medicine also tends to pave the way for a gradual return to full employment with a satisfactory ex-

(38) The reader may find it useful to take a fresh look at the passage on pag. 486 of the Relazione annuale 1964 cited in footnote 6.

ternal balance. It is in fact reasonable to suppose that the combined effect of unemployment and depressed profits will tend to reduce wage demands and awards, containing the wage increases within the increases in productivity, thus leading to stable or possibly falling prices. Under these conditions, and especially if foreign prices exhibit some rising trend, the competitive position of the economy will gradually improve. In terms of our figure 4, this means that the line *bb* which had been pushed towards the origin by the initial push of wages and prices will tend to shift gradually back, raising the level of aggregate demand and employment consistent with external balance.

The developments of the Italian economy seem to conform rather well with our analysis, with one possible exception, to wit the painfully slow recovery of employment since 1964. However, the fact that the balance of payments has exhibited a substantial and growing surplus in the last two years indicates that this result must be attributed to a failure of monetary and fiscal authorities to reflate aggregate demand at a sustained pace still consistent with the requirement of external balance.

The upshot of the above discussion is that the only real dilemma posed by the initial wage push is, fundamentally, one of timing. Is it preferable to adopt a restrictive stand from the beginning or can something be gained by postponing the harsh treatment?

Our analysis suggests a rather unequivocal answer to this question: the sooner the better. The reason for this conclusion should be clear. The longer the span of time over which the inflationary spiral is allowed to proceed, the higher will be the price level reached by the time the inflationary process is checked. Now, from figure 4, we know that a high price level implies a lower and steeper *bb* curve; and this in turn implies that the higher the price level, the lower will be the level of aggregate demand and employment consistent with external balance. Thus, when a policy of containment is finally adopted in order to reestablish external balance, it will be necessary to create *more* unemployment and the process of reabsorption of it will be more drawn out.

Our model enables us also to throw some light on an issue that has received considerable attention in recent years, namely, whether it is preferable to control aggregate demand though monetary or through fiscal tools. Central banks frequently seem to favour the latter; but apart from the very understandable desire of the monetary

authority to shift the burden of unpopular measures to the Government, is there any valid ground for choosing? The prevailing view among economists nowadays is that the two tools differ primarily in terms of their effects on the *composition of demand*. Monetary tools tend to affect investment and fiscal tools to influence consumption. This proposition provides a useful first approximation though it admits of significant exceptions: fiscal policy can be used to provide incentives or disincentives to invest and monetary policy may have some effect on consumers' investments in durable goods, which are conventionally treated as a component of consumption.

According to our model, the behaviour of employment and of the net external balance on current account depends, to a first approximation, only on the behaviour of aggregate demand and not on its *composition*. It follows that, given some target level of aggregate demand, it is immaterial, at least to a first approximation, whether the target is aimed at through monetary or fiscal tools. This does not necessarily mean that there are no grounds at all for choosing; it does mean, however, that the choice should rest on considerations other than their differential effects on the balance of payments. Among these other considerations one might mention in particular: (a) speed of enforcement and flexibility; (b) effects on capital movements; and (c) long run effects on the stock of physical capital. It would take us too far afield to pursue items (b) and (c). However, with respect to item (a), we suspect that in Italy, and in most other countries, the monetary tool offers distinct advantages, especially when the goal is to reduce aggregate demand.

For the sake of completeness it must also be acknowledged that fiscal tools can be used not only to control aggregate demand but also to influence the demand for specific commodities. It follows that, in principle, fiscal measures could be relied upon to modify the relation between aggregate demand and employment on the one hand and the current balance on the other, by steering demand towards domestic products or products with lower import content. In terms of our figure 4, such measures would have the effect of shifting the *bb* curve away from the origin. It is doubtful however that such selective tools offer much room for manoeuvring in view of existing international agreements designed to prevent or severely limit their use.

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APPENDIX

APPENDIX I: *A model of the interaction of real and monetary phenomena in a closed economy.*

Notation: X = Real national income
Y = Money national income
P = The price level
W = The money wage
r = The rate of interest and credit conditions
C = Consumption
I = Investment
M = The quantity of money
N = Employment
G = Public expenditure
T = Taxes

The model:

[1] $X = C + I + G$
[2] $I = I(r, X)$
[3] $C = C(X, T)$
[4] $N = N(X)$
[5] $P = P(W, X)$
[6] $Y = PX$
[7] $r = L(M, Y)$

There are seven unknowns: X, I, C, N, P, Y, r. The solution of the system depends on the parameters: M, W, T and G. The model is very much simplified, but it preserves the central feature of our analysis, that is, the interrelationship of monetary and real phenomena expressed in equations [1], [2], [5], [6] and [7] (39).

(39) For a fuller analysis of a model of this sort, see FRANCO MODIGLIANI, "The Monetary Mechanism and its Interaction with Real Phenomena", *Review of Economics and Statistics*, No. 1, part 2, 1963, pp. 79-107.

APPENDIX II: *Effects of income redistribution on national income.*

We assume that investment is a function of actual profits. Denoting investment by I and profits by π, we write (40):

[1] $$I = I(\pi)$$

If investment positively depends on profits, we shall have:

[2] $$\frac{dI}{d\pi} > 0$$

The average propensity to save, s, depends on the distribution of income, so that we may write in general:

[3] $$s = s(\pi)$$

If there are only two classes of income, wages and profits, s will change with a change in the distribution of income if the propensities to save of the two classes differ. If they are different, it is, *a priori*, reasonable to expect s to be an increasing function of π. Thus we have

[4] $$\frac{ds}{d\pi} \gtrless 0$$

National income depends on I and s. The relationship is

[5] $$X = \frac{I}{s}$$

where X stands for national income.

The effect of a change in profits on national income is:

[6] $$\frac{dX}{d\pi} = \frac{\partial X}{\partial I}\frac{dI}{d\pi} + \frac{\partial X}{\partial s}\frac{ds}{d\pi}$$

and since $\frac{\partial X}{\partial I} = \frac{1}{s}$ and $\frac{\partial X}{\partial s} = -\frac{I}{s^2}$, by substituting in [6], we get

[7] $$\frac{dX}{d\pi} = \frac{1}{s}\frac{dI}{d\pi} - \frac{I}{s^2}\frac{ds}{d\pi}$$

It follows that the sign of $\frac{dX}{d\pi}$ depends on the sign of

$$\left[\left(\frac{1}{s}\frac{dI}{d\pi}\right) - \left(\frac{I}{s^2}\frac{ds}{d\pi}\right)\right]$$

(40) In fact we should write $I = I(\pi, r)$, but since we will assume that r is constant, we can specialize the function into the form [1].

Let us put this expression in a more readily interpretable form by multiplying both terms by $s\pi/I$. We can conclude that

$$[8] \quad \begin{cases} \dfrac{dX}{d\pi} > 0 \text{ if } \dfrac{\pi}{I}\dfrac{dI}{d\pi} > \dfrac{\pi}{s}\dfrac{ds}{d\pi} \\ \dfrac{dX}{d\pi} = 0 \text{ if } \dfrac{\pi}{I}\dfrac{dI}{d\pi} = \dfrac{\pi}{s}\dfrac{ds}{d\pi} \\ \dfrac{dX}{d\pi} < 0 \text{ if } \dfrac{\pi}{I}\dfrac{dI}{d\pi} < \dfrac{\pi}{s}\dfrac{ds}{d\pi} \end{cases}$$

$\dfrac{\pi}{I}\dfrac{dI}{d\pi}$ and $\dfrac{\pi}{s}\dfrac{ds}{d\pi}$ are two elasticity coefficients, namely, the elasticity of investment with respect to profits and the elasticity of the propensity to save with respect to profits. If the former is larger than the latter (as is indeed the case if $\dfrac{d\pi}{ds} = 0$) a redistribution of income will reduce national income, if the reverse is true, national income will increase, and if the two elasticities are equal, national income will be independent of the distribution of income.

Let us now consider the case of extreme propensities to save, namely, that profits are completely saved and wages completely consumed. In this case [2] becomes $\dfrac{dI}{d\pi} = 1$ and [4] becomes $\dfrac{ds}{d\pi} = \dfrac{1}{X} = \dfrac{s}{I}$

Inserting these values in [7], we can rewrite it as

$$[7'] \quad \frac{dX}{d\pi} = \frac{1}{s} - \frac{Is}{s^2 I} = 0.$$

In this case, national income is independent of income distribution, although investment and the propensity to save both depend on it.

Appendix III: *The dynamics of cost inflation.*

In this appendix we shall give two examples of the way in which the wage-price relationships we discussed in section 4 may give rise to an inflationary process.

Let us assume that prices depend on wages according to the linear relationship

$$[1] \quad P_t = \alpha W_t$$

where P_t is the price level at time t, W_t the money wage rate at time t, and α a constant greater than 1.

Let us suppose, moreover, that wage bargaining by the unions is aimed at a given real wage rate, say

$$[2] \quad \frac{W_t}{P_t^e} = \beta$$

where β is a constant greater than 0 and P_t^e is the price level expected for time t, and let us finally assume that union expectations are static, as far as prices are concerned, i.e., that they expect prices at t to be the same as prices at time t-1. This may be written as

$$[3] \quad P_e^t = P_{t-1}$$

Supposing wage negotiations to be successful, money wages at time t will be $W_t = \beta P_t^e = \beta P_{t-1}$. Making use of [1] we get

$$[4] \quad W_t = \alpha \beta W_{t-1}$$

This is a difference equation of first order with solution

$$[5] \quad W(t) = W(0) (\alpha \beta)^t$$

where W(t) are wages at time t and W(0) is a constant to be determined by the initial conditions of the system.

For inflation to arise we must have

$$[6] \quad \alpha \beta > 1$$

in this case wages rise through time. If $\alpha\beta = 1$ wages are constant and if $\alpha\beta < 1$ money wages tend to fall through time.

Price movements may be described in an analogous way, i.e. (by substitution of [1] in [4])

$$[7] \quad P(t) = P(0) (\alpha \beta)^t$$

with prices rising, staying constant or falling according to the value of $\alpha\beta$.

The meaning of condition [6] is that the price-wage ratio imposed by firms (α) is larger than the price-wage ratio desired by the unions ($1/\beta$). Since unions manage to get wages to rise to the extent they desire but firms adjust prices to the new wage levels, inflation follows.

Our second example illustrates the possibility, which we referred to in section IV, of a growing rate of inflation through time.

Let us keep equation [1] and insert in lieu of [4]

$$[4'] \quad W_t = \beta_1 P_t + \beta_2 P_{t-1}$$

where

$$[8] \quad \beta_1 + \beta_2 = \beta \text{ and } \beta_i \geqslant 0 \ (i = 1,2).$$

with β_1 depending on the recent rate of increase of prices and tending to β. This formulation reflects the hypothesis that union tend to shorten the period between successive bargaining periods when prices react, by rising, to wage increases. [4'] may be rewritten in the form $W_t =. \frac{\alpha\ \beta_2\ W_{t-1}}{(1 - \alpha\ \beta_1)}$ a difference equation whose solution is

$$[5'] \qquad W(t) = W(0)\left[\frac{(\alpha\beta_2)}{(1 - \alpha\beta_1)}\right]^t$$

[5'] will determine a positive rate of increase of wages and prices if

$$[6'] \qquad \alpha\ \beta_2 > 1 - \alpha\ \beta_1$$

By using condition [8] we can show [6'] to be equivalent to [6]. In fact, $\alpha\beta_2 = \alpha(\beta - \beta_1) = \alpha\beta - \alpha\beta_1$ and substituting this expression in [6'] we get $\alpha\beta > 1$.

We shall now denote with λ the expression $\frac{\alpha\ \beta_2}{1 - \alpha\beta_1}$ and find out how it varies when β_1 changes.

In the first place, for $\beta_1 = 0$, $\beta_2 = \beta$ and [5'] and [5] become equal. Let us now take the derivative of λ with respect to β_1:

$$[9] \qquad \frac{d\lambda}{d\beta_1} = \frac{-\alpha(1 - \alpha\beta_1) + \alpha(\beta - \beta_1)\alpha}{(1 - \alpha\ \beta_1)^2} = \frac{-\alpha + \alpha^2\ \beta}{(1 - \alpha\ \beta_1)^2} = \frac{\alpha\ (\alpha\ \beta - 1)}{(1 - \alpha\ \beta_1)^2}$$

If $\alpha\ \beta > 1$, [9] will be positive. This indicates that the rate of inflation is a positive function of β_1. Moreover for $\beta_1 = 1/\alpha$ the denominator of [9] is null. On the other hand, condition [6], if satisfied, guarantees that the numerator of λ is bound away from 0 when $\beta_1 = 1/\alpha$. Thus the rate of inflation tends to increase without limit.

Appendix IV: *A model of the interaction of real and monetary phenomena in an open economy.*

Notation:

- X = Real national income
- Y = Money national income
- P = The price level
- P^i = The international price level
- D = Aggregate demand in real terms
- D^d = Aggregate demand in real terms for home produced goods
- D^i = Aggregate demand in real terms for imported goods
- X^e = Exports in real terms

- Q = World demand
- B = Net balance of payments in money terms
- W = The money wage rate
- r = The rate of interest and credit conditions
- C = Consumption
- I = Investment
- M = The quantity of money
- N = Employment
- G = Public expenditure
- T = Taxes

The model - Identities and definitions:

$$[1] \qquad X = D^d + X^e$$

Definition of real national income: domestic output for home use + exports.

$$[2] \qquad PD = PD^d + P^iD^i$$

Definition of aggregate demand in money terms: expenditure on domestically produced commodities and services + import expenditure.

$$[3] \qquad D = C + I + G$$

Real aggregate demand: Consumption + investment + public expenditure.

$$[4] \qquad B = PX^e - P^iD^i$$

Value of exports - Value of imports.

$$[5] \qquad Y = PX$$

Money national income.

Other equations:

$$[6] \qquad N = N(X)$$

Employment as a function of national income.

$$[7] \qquad X^e = X^e(Q, P, P^i)$$

Exports depend on world demand, national and international prices.

$$[8] \qquad P^iD^i = D^i(PD, P, P^i) = P^if(D, P^i/P)$$

Imports expenditure is a function of aggregate demand in money terms, internal and international prices. It is homogeneous of the first degree in the

three variables and can therefore be written in either of the two forms. From [8] we derive as an implication: $D^d = D - \frac{P^i D^i}{P} = D - f(D, P^i/P)$.

[9] $$P = h(X/X^*)W$$

Prices are proportional to the ratio of wages to productivity per man. Since productivity may be taken as constant in the short period, prices are proportional to money wages, the proportionality factor being given by the ratio of actual to full employment national income.

[10] $$I = I(r, X, P^i/P)$$

Investments depend on the rate of interest, on real national income and on the ratio of international to internal prices.

[11] $$C = C(X, P^i/P, T)$$

Consumption depends on national income, the ratio of international to internal prices and tax policy.

[12] $$r = L(M, Y)$$

The rate of interest depends on the money supply and money national income.

Properties of the model. The role of aggregate demand.

There are 12 endogenous variables in this model. They are: X, D^d, X^e, D, D^i, C, I, B, P, Y, N, r.

There are three exogenous ones: P^i, Q, W, and three instrumental (or policy) variables: M, T, G.

The model we have presented has an interesting property, which is at the base of the analysis carried in the text. The property is that, if one takes equations [1], [2], [4]-[9], these 8 equations contain 9 of the 12 endogenous variables. Therefore it is possible to solve this sub-system for 8 of its unknowns as a function of the remaining one. For instance, every variable of it can be expressed as a function of real aggregate demand, D. Figure 4 of the text and figure 5 in footnote 31 represent the relationship between balance of payments and aggregate demand and between real national income and aggregate demand.

The four remaining equations can be used to analyse the relationship of D to X, a relationship influenced by the policy variables, M, T and G. It is interesting to note that these three variables do not appear in the sub-system [1], [2], [4]-[9].

If monetary or fiscal policy aims at attaining a given level of X, say $\overline{X}$, this adds one equation to the system and sets a constraint between the three policy variables in the sense that, given two of them, the third one has to assume a certain specified value. The same is true if one intends to have any other endogenous variable assume a given value, say $B = \overline{B}$. It is not possible, though, in our model, for two endogenous variables to assume exogenously prescribed values, unless they are, by fluke, mutually consistent. Thus, in general, an economy cannot aim, at the same time, at a certain level of X — say to full employment national income — and at a certain level of B — say B = 0. In this case, for the two conditions to be satisfied an exogenous variable has to become endogenous. The most likely candidate should be W. There exists in general a value of W — say W* — such that X = X* and B = 0. What is this value of W? It is the value implied by X* in equation [9] once the internal price level consistent with B = 0 has been determined from equation [4] and the rest of the system. We may reach exactly that value by chance or it may be brought to that level if it is lower. It is difficult, though, that it could be brought to that value if it is too high, as is usually the case. In these circumstances, the same results might be achieved through a currency devaluation, that is, through a change in the ratio of internal to international prices. If W is fixed in money terms and does not move, then this measure might prove effective. Changes of W will, on the other hand, largely frustrate the purpose of the devaluation.

A generalization of the model. The effect of the composition of aggregate demand on the balance of trade.

Some of the properties of the model we have been discussing depend on the form of equation of aggregate demand. To be more general, we may rewrite [8] as

[8'] $$\frac{P^i D^i}{P} = f\,(C, I, G, P^i/P).$$

Denoting with f_C, f_I and f_G the partial derivatives of [8'] with respect to C, I and G, we can still get [8] in the special case of $f_C = f_I = f_G$. In general, however, B is not independent of the composition of demand. It can be shown, though, that changes in the composition of demand can have but limited effects on B/P.

To establish this result we have to measure the effect on B/P of a change in consumption accompanied by a compensating change in investment. Let us

start from the fundamental identity $X = U + B/P$ which can be rewritten, by using [3], [4] and [8'], as

$$[13] \qquad X = C + I + G + X^e - f\,(C, I, G, P^I/P)$$

Differentiating equation [13] totally with respect to C and imposing the condition that X is unchanged, we get

$$[14] \qquad 0 = 1 + \frac{dI}{dC} - f_C - f_I \frac{dI}{dC}$$

which can be written as

$$[14'] \qquad \frac{dI}{dC}_{|x=\bar{x}} = -\frac{1 - f_C}{1 - f_I}$$

We now differentiate [4] with respect to C and get

$$[15] \qquad \frac{dB}{dC} = -P\left[f_C + f_I \frac{dI}{dC}\right]$$

Substituting [14'] in [15] we get

$$[16] \qquad \frac{dB}{dC}_{|x=\bar{x}} = -P\left[f_C - f_I \frac{(1 - f_C)}{(1 - f_I)}\right] = -P\,\frac{f_C - f_I}{1 - f_I}$$

which can be rewritten (P being constant for this analysis) as

$$[17] \qquad \frac{dB}{d(PC)}_{|x=\bar{x}} = -\frac{f_C - f_I}{1 - f_I}$$

If $f_C = f_I$ the balance of payments is unaffected by a change in the composition of demand. If the former is smaller than the latter, to increase consumption will improve B, and if the propensity to import consumption goods is greater than the propensity to import investment goods, an increase in consumption will worsen the balance of payments. But, even in this case, the effects on the balance of payments are likely to be small unless the two propensities differ by a sufficiently large amount.

A numerical example may be useful to make the order of magnitude of the phenomenon quite clear. In 1963, Italian imports represented roughly 18% of aggregate demand. We may take this figure as an approximation to the marginal propensity to import and consider it a weighted average of the marginal propensity to import consumption and investment goods. Let us suppose that f_C is 30% higher than f_I. Since consumption represented roughly 85%

of national income, we can calculate that f_I is approximately 0.15 and f_C is 0.20. Inserting this data into [14'] and [17] we get respectively

$$[18] \qquad \frac{dI}{dC} = -\frac{0{,}80}{0{,}85} = -0.94.$$

and

$$[19] \qquad \frac{dB}{d(PC)} = -\frac{0{,}20 - 0{,}15}{1 - 0{,}15} = -0{,}06.$$

Thus, a reduction in consumption of the order of a thousand billion lire, compensated by investments for roughly 940 billion lire (which is as high as 13% of total investment in 1963), would improve the balance of payments by some 60 billions, barely a 1% of total imports of 1963.

Moreover, as noted in the text, there are no indications that f_C is larger than f_I. On the contrary, some evidence, which we have already referred to, points in the opposite direction.

F. M. - G. L. M.