

ESSAYS IN INTERNATIONAL FINANCE

No. 130, December 1978

THE MANAGEMENT OF AN OPEN ECONOMY
WITH "100% PLUS" WAGE INDEXATION

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AND
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INTERNATIONAL FINANCE SECTION

DEPARTMENT OF ECONOMICS

PRINCETON UNIVERSITY

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International Finance Section

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1 Introduction

The purpose of this essay is to analyze the relationships among inflation, aggregate demand, external deficit, and government deficit in an open economy where wages are set from time to time in nationwide bargaining and protected by indexation at a rate of 100 per cent or more against changes in prices. We shall label this economy "100% plus." Our analysis will help us to identify economic policies that can be pursued in such an economy to reduce inflation and unemployment simultaneously.

A concrete example of a "100% plus" economy is provided by Italy, where an agreement was reached in early 1975 on a novel form of cost-of-living adjustment. All covered workers (the bulk of the labor force) were granted the *same* number of lire per point change in a designated cost-of-living index, *independently* of each worker's wage level.

The long discussion that has followed this agreement seems to have established the following points: (a) a large range of wages, and probably the majority of the wages of industrial workers, are now indexed at more than 100 per cent; (b) total wages in industry are indexed at about 96 per cent; (c) with continuing inflation, the system of wages would converge in time toward a unique real wage protected by 100 per cent indexation. An agreement of this type also has important redistributive effects, of course, because a persistent inflation will gradually reduce the initial wage spread (except to the extent that the spread might be regenerated through wage drift or new wage contracts). It will also tend to generate redistributive and distortive effects between industries by causing a relative increase in the labor costs of sectors relying more heavily on less skilled, lower-paid labor.

In the simple aggregative model on which we shall rely for our analysis, we neglect these redistributive aspects, which are specific to Italian institutions, and focus our attention instead on the implications of a high degree of overall wage indexation, possibly exceeding 100 per cent. This, incidentally, is the aspect that has received less consideration by economists who have analyzed Italian wage indexation, their thinking being conditioned by an intellectual climate where distributional problems have

This paper is an extensive revision of an earlier Italian version that appeared in *Moneta e Credito*, 30 (1^o trimestre, 1977), under the title: "La Politica Economica in una Economia con Salari Indicizzati al 100 o Più." The authors wish to express their deep appreciation to the many colleagues who read and criticized various drafts of the paper, in particular to Nino Andreatta, Lucio Izzo, Bruno Sitzia, Rudiger Dornbusch, Andrew Abel, and Jeffrey Sachs.

more importance than problems of growth. By considering only aggregate effects, however, more light can be shed on what looms these days as the most fundamental of all distributional problems, that between employed and unemployed.

We shall assume that the major objective of the political authority is to keep economic activity and employment at a high level while assuring a condition of price stability that will keep the external deficit within limits that can be financed. For more than forty years, this problem has been at the core of both macroeconomic thinking and economic policy. In a "100% plus" economy, however, it presents features that are significantly different from the usual ones. Our essay tries to shed light on these issues.

Some Propositions

In what follows, we endeavor to establish a number of propositions about the relationships among the real contractual wage, national income, inflation, and external balance, and about the effectiveness of various policy measures in a "100% plus" economy. For the convenience of the reader, we summarize here the major propositions that emerge from our analysis.

Proposition 1. For given levels of productivity and indirect and social security tax rates, there exists, for each level of the contractual real wage, at most one level of output and employment that is consistent with price stability. This critical level is referred to hereafter as the "noninflationary rate of output," or the NIRO.

Proposition 2. If output is maintained above the NIRO by appropriate demand policies, then, even if output is maintained below full employment, a process of continuous inflation will be set into motion. The rate of inflation will tend toward a steady value that is higher the greater the excess of output over the NIRO. There is thus a tradeoff between the rate of inflation and output, and it is monotonically increasing.

Proposition 3. The critical level of output and the tradeoff mentioned in proposition 2 are adversely affected by an increase in unit labor cost from any source, particularly by a rise in the contractual real wage or by a fall in productivity.

Proposition 4. Given the value of all the parameters listed in propositions 1 and 3, the rate of inflation will tend to be an increasing function of the frequency with which wages are adjusted for intervening changes in the escalator price index (unless, of course, output is at the critical NIRO level).

Proposition 5. It follows from proposition 2 that output can be maintained at any constant level above the NIRO if, and only if, the money

supply is allowed to grow at a constant rate appropriate to accommodate the rate of inflation associated with that output level. This result further implies that neither a one-time change in the money supply nor changes in fiscal-policy variables can permanently keep output above the NIRO for a given money supply.

Proposition 6. Neither the NIRO nor the tradeoff between inflation and the excess of output over the NIRO can be affected by the standard fiscal instruments (government expenditure and income taxes) or by monetary policy. These generalizations must be qualified only in the sense that the noninflationary rate of employment may be affected by direct government employment policies.

Proposition 7. It follows from propositions 5 and 6 that fiscal policy can affect the *rate* of output only temporarily. Fiscal policy does, however, control the *composition* of output between the private and public sectors and between consumption and investment (contributing thereby to the determination of the real money supply). In the longer run, of course, the share of output devoted to investment will have effects on the tradeoff via productivity, and hence on unit labor costs.

Proposition 8. Proposition 6 does not hold if the fiscal action takes the form of an increase in indirect taxes. In the "100% plus" economy, such an increase cannot be used alone to shift the rate of inflation. But, because it is equivalent to a rise in direct unit costs, it produces an unfavorable shift in the entire inflation-output tradeoff, lowering the NIRO in the process. The increase in tax rates will generally reduce the deficit, but only at the cost of a permanent increase in inflation. It is not only a wasteful device for the purpose of making room for additional investment but it is inequitable. The only way that higher inflation can be avoided is by accepting a lower level of output, which may even imply a lower rate of investment, since in the "100% plus" economy the higher indirect taxes will fall largely, if not entirely, on profits.

Proposition 9. Proposition 8 applies equally well to a change in social security taxes, and for this reason a reduction in those taxes may appear to be a promising device to reduce inflation. However, if the reduction in social security taxes is financed by a corresponding increase in indirect taxes, the two tax changes will tend to offset one another, with little net beneficial effect on the NIRO.

Proposition 10. Given the rate of output and the associated rate of monetary growth, the rate of inflation is entirely independent of the magnitude of the real deficit or surplus in the government budget (except for limiting cases, and with due regard to the long-run effects of the deficit on the tradeoff via investment, mentioned under proposition 7).

Proposition 11. All the above propositions hold for the open economy with relatively minor modifications. The main qualification relates to propositions 1 and 6, to the extent that fiscal policy can be used to affect the volume of imports directly for a given level of aggregate income and given terms of trade. However, the mechanism driving inflation when output exceeds the NIRO differs in some important respects in the open economy. In the closed economy, inflation is driven basically by the inconsistency between the contractual real wage and the real wage that firms are prepared to pay to produce that output. In the open economy, this mechanism is overshadowed by the external deficit that develops when output exceeds the NIRO and causes a depreciation of the exchange rate, which fosters inflation and, in turn, leads to a further depreciation.

With the help of a simple aggregate model, we establish these propositions first for a closed economy in section 2, and then extend them to an open economy in section 3.

2 The Closed Economy

The Price-Wage Sector

The model. For the purpose of our aggregate analysis, the determinant of the price level can be modeled by means of the following equations:

$$P = (mWs/\pi)t \quad (2.1.1)$$

$$m = m(Q); \quad m' \geq 0; \quad Q \leq Q^0, \quad (2.1.2)$$

where P = overall price level, W = nominal hourly wages, π = output per man-hour, $s = 1 +$ social security tax rate, $t = 1 +$ rate of indirect taxation, Q = aggregate real output, and Q^0 = capacity output.

In equation (2.1.1), Ws denotes the cost of labor, including social security taxes, and therefore Ws/π measures unit labor costs. According to equation (2.1.1), price per unit of output, measured at factor cost, can be approximated in the short run by the expression mWs/π . Here the coefficient m denotes the relation between price at factor cost and unit labor cost, so that $m - 1$ represents the so-called "markup" on direct unit labor costs. Equation (2.1.1) can accordingly be regarded as an identity or as a definition of m .

The basic behavioral hypothesis is provided by equation (2.1.2), which states that, at least in the short run, the markup can be treated as a constant (if $m' = 0$) or as a stable increasing function of the rate of output. This formulation follows directly from the well-known Sylos Labini-Bain model of oligopolistic competition, which has already found ample con-

firmation in empirical studies (except that in that model π should be interpreted as "normal" or long-run productivity). In that model, too, the markup may have some tendency to decrease when there is a reduction in the rate of plant utilization, because oligopolistic discipline may weaken under such circumstances. However, the specification of $m' > 0$ is equally consistent with the classical model of short-run decreasing returns and market price determined by the short-run marginal cost (except that, in this case, π must be understood as a coefficient that can be deduced from the production function).

The market price P is obtained by multiplying the price at factor cost by the rate of indirect taxation t , which by hypothesis has no effect on the markup.

Equation (2.1.1) assumes that price adjusts promptly to variations in unit costs. In reality, for various reasons, the adjustment can be expected to occur only gradually. This phenomenon might be modeled by rewriting equation (2.1.1) in the following form:

$$P = g[(mWs/\pi)t] + (1 - g)P_{-1}; \quad 0 < g \leq 1. \quad (2.1)$$

Assuming for the moment that the rate of indexation is precisely 100 per cent, the determinants of wages for the type of economy with which we are concerned can then be formalized by the equation

$$W = \mu P_{-1}. \quad (2.2)$$

Here, μ denotes the real wage established at the time of the latest national wage contract and preserved thereafter through indexation for the entire period during which the contract holds. The quantity μ is, accordingly, a parameter of the model. At the moment of the next national bargaining period, it becomes a variable determined by such forces as demand conditions, availability of labor, and the bargaining strength of the two sides.

The wage rate is assumed to depend on the *lagged* price level, in recognition of the fact that the labor contract does not (and cannot) prescribe a continuous contemporaneous adjustment of wages to prices. Rather, it establishes that the "correction" is to occur at stated intervals. In the case of Italy, for example, the adjustment is at present once a quarter. Note that the one-period lag formulation of equation (2.2) is consistent with any adjustment interval, provided this interval is conveniently chosen as the unit of measurement of time.

It is also worth noting that, in view of the lag of wages behind prices, the real wage at any point can differ from that established at the time of the contract; in this sense, the escalator clause does not totally insulate real wages from the effect of inflation.

If we now substitute equations (2.1.2) and (2.2) into equation (2.1), divide through by P_{-1} , and rearrange terms, we obtain $(P - P_{-1})/(P_{-1}) \equiv \dot{p} = g[m(Q)A\mu - 1]$, where $A \equiv (st)/\pi$. Here, \dot{p} denotes rate of inflation per unit of time—for instance, the quarterly rate of inflation if the interval between successive adjustments of wages is one quarter. The annual rate of inflation, which we will denote by p , can then be approximated by

$$p \approx ng [m(Q)A\mu - 1], \quad (2.S.1)$$

where n denotes the number of wage adjustments per year¹ (e.g., 4 in the case of Italy).

The relationships among employment, inflation, and contractual real wages. Equation (2.S.1) enables us to establish several useful results, which can be conveniently illustrated by means of Figure 1. The rising curve denoted by B is a graphic representation of the markup function $m(Q)$ multiplied by the parametric constant A . From equation (2.1.1) we can infer that this curve represents the value of the ratio of price to wages that business firms will require in order to produce a given output. The slope of this curve at any point measures the sensitivity of the markup to variations in aggregate output.² The straight line parallel to the Q axis is the graphic representation of $1/\mu$. Since μ is the real wage imposed by union contracts, $1/\mu$ can be thought of as the value of P/W that is imposed by labor and is therefore denoted as L .

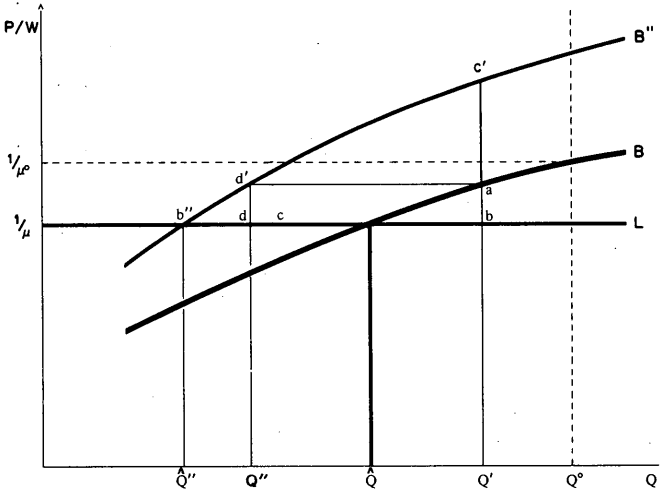
Equation (2.S.1) tells us that, for any given level of output, the rate of inflation P is proportional to the distance between curves B and L in Figure 1. Accordingly, there will exist (at most) one rate of output at which the price level will tend to be stable, namely the abscissa of the point of intersection of the two curves, denoted by \hat{Q} in the figure. This output is the noninflationary rate of output, or NIRO, referred to in proposition 1. In terms of equation (2.S.1), the NIRO is that value of output, \hat{Q} , which satisfies $m(Q)A\mu - 1 = 0$. Note that there may not be a NIRO within the relevant range if curve B is horizontal or sufficiently flat.

It is also apparent that at any given point in time there is a single value of the real wage that is consistent with price stability and full-employ-

¹ In (2.S.1) we approximate $(1 + \dot{p})^n - 1$ with $n\dot{p}$.

² The hypothesis underlying the figure that $m' > 0$, which is supported by empirical evidence for a number of countries, is convenient when dealing with a closed economy in that it helps ensure price stability for some positive rate of output. If $m' = 0$, price stability would be impossible at any output whenever real contractual wages exceeded the level consistent with full employment. However, in the open economy, whether m' is positive or zero turns out to be of little consequence.

Figure 1



ment output, say Q^0 . It is the value given by $1/\mu^0 = m(Q^0)A$ and is represented in our figure by the dashed horizontal line that intersects B at Q^0 . Whenever the value μ exceeds μ^0 , full employment becomes inconsistent with price stability.

If, through appropriate aggregate demand policies, the authorities succeed in maintaining output at some level higher than the NIRO, such as Q' in Figure 1, then, even if Q' is below the full-employment level, the outcome must be steady inflation, at a rate increasing with the excess of Q' over the NIRO (proposition 2). In Figure 1, this rate is proportional to the vertical distance between points a and b .

Recall that the height of curve B is proportional to A . Hence, it is directly proportional to the rate of direct and social security taxes and inversely proportional to productivity. Similarly, the height of curve L is inversely proportional to the contractual real wage. We can conclude, therefore, that an increase in real unit labor cost, from whatever source, will uniformly impair the tradeoff between inflation and output. In particular, it will lower the value of the NIRO (proposition 3).

If the curves B and L in Figure 1 do not intersect in the relevant range of outputs, or, equivalently, there is no value of output that makes the right-hand side of (2.S.1.) equal to zero, inflation will occur at all relevant levels of output, although the rate will still be an increasing function of output as long as curve B has any positive slope at all.

Equation (2.S.1) also shows that for given values of A and μ , the rate

of inflation corresponding to any output larger than the NIRO is proportional to ng , and hence presumably will tend to be higher the greater the frequency, n , with which wages are adjusted for the changes in the cost of living (proposition 4). Indeed, if the value of g were independent of n , the rate of inflation would grow in proportion to n . For example, let us suppose that the distance between the two curves in Figure 1 is 6 per cent and the adjustment of prices to wages in the course of the quarter is very rapid, say, $g = 1$. In this case, the rate of inflation would be 6 per cent per year if the adjustment occurred once a year. But if the adjustment occurred once a quarter, so that $n = 4$, the rate of inflation would be approximately 24 per cent per year [more precisely $(1.06)^4 - 1 = 26$ per cent per year].

In general, however, unless the speed of adjustment is very high, the adjustment per period, g , may be expected to decrease as the adjustment period becomes shorter (as n rises). Accordingly, ng will tend to change less than proportionally to n . To illustrate, suppose the adjustment is 30 per cent within one quarter. The adjustment within a one-year interval will then be 76 per cent.³ In this case, if wages adjust once a quarter ($n = 4$), the annual rate of inflation will tend to be 7.2 per cent per year. Cutting down the frequency to one adjustment per year will reduce the annual rate of inflation to 4.6 per cent per year, or by a factor of less than 2, even though n has been reduced four times.

Equation (2.S.1) and the three propositions based on it apply directly to the case in which indexation is at the 100 per cent rate. But the analysis can be extended without difficulty to the case in which indexation is not at that rate, particularly when it is higher. In this case, in fact, the real wage rate implied by the original contract becomes a function of the price level, taking as a base the level prevailing at the time of the last contract: the parameter μ must be replaced by the variable $\mu(P)$, with $\mu' \geq 1$ according to whether indexation is higher than, equal to, or lower than 100 per cent. We do not propose to give a formal treatment of this case here, and it will be neglected in what follows. But the qualitative effect can easily be seen, since the price level is simply the integral of inflation. For instance, if indexation is above 100 per cent and output is maintained at a level higher than the initial NIRO, the horizontal line L in Figure 1 will decline in time as the price level rises, causing a progressive decline in the NIRO and a steadily increasing rate of inflation, which in turn will displace L downward at an increasing rate. Clearly, the system is unstable except in the neighborhood of the NIRO implied

³ If we denote by g_0 the annual rate of adjustment and by g_n the rate of adjustment for a period of $1/n$ years, then $(1 - g_0) = (1 - g_n)^n$.

by the initial real wage. For the same reason, indexation at a rate lower than 100 per cent is stabilizing insofar as it tends to cause the line L to rise, thus tending to cause inflation to die down, although in this case, line L is likely to make a large downward jump when the labor contract is renewed.

Some implications. What makes it possible to maintain output at a level higher than the NIRO, even at the cost of a high rate of inflation? The answer to this question is simple in the limiting case in which the speed of adjustment of prices to costs is unitary. In this case, it is obvious from equation (2.1) that the markup will remain continuously at the level appropriate to Q' . This means that the real wage or its reciprocal, P/W , will remain precisely at the level "required" by firms in order to produce that output, and this independently of the contractual real wage. In Figure 1, the realized value of P/W will always fall on curve B , whatever the position of curve L . For instance, if output is at Q' , it will be given by the ordinate of point a . This result comes about through the lag in the adjustment of money wages. It does not follow that the contractual real wage has no role to play, but its role is reduced to determining the rate of inflation: the larger the real wage established in the contract (that is, the lower line L relative to the level that is appropriate to output Q'), the higher will be the rate of inflation.

When the speed of adjustment of prices to costs is distinctly below 1, the situation becomes somewhat more complex. In this case, the effective real wage or its reciprocal, P/W , will fall between the contractual level $1/\mu$ corresponding to line L and the equilibrium level required by firms on curve B . In Figure 1, if output is maintained at Q' , the realized P/W will be represented by a point on the line $Q'a$ in the interval ab . The closer g is to zero, the closer to b the point will lie, and conversely. In this case, obviously, the contractual salary influences the effective real wage. As μ increases and line L falls, the value of P/W will fall also, although at the same time inflation will increase.

This last result must be interpreted with caution because it assumes that the speed of adjustment of prices is constant, whereas there are good reasons to suspect that it is variable. The speed of adjustment may be low when the cost increase is at least partly unexpected, is of modest size, and does not hit all firms in the system simultaneously and uniformly. But when a high rate of inflation becomes chronic and generalized, there is reason to think that the speed of adjustment will tend to grow and approach unity.

This consideration suggests that the conclusion based on equation (2.S.1) (that to any value of output higher than the NIRO there cor-

responds a stable rate of inflation) is likely to hold only in the short run. If the inflation rate given by this equation is high, the speed of adjustment and therefore the inflation rate itself are more likely to increase in time, so that, for that same level of output, there will be a growing and not a constant rate of inflation. This process will reach a limit when the speed of adjustment becomes unity. However, one must also recognize that as this begins to happen and the rate of inflation rises, real wages will shrink because of the lag in adjustment. The unions will then try to increase the frequency of cost-of-living adjustments, in order to defend the real wage. The result, of course, will be a further increase in the rate of inflation, while the benefit to real wages will tend to be smaller the closer the speed of adjustment has come to unity.

In summary, even though it is possible in the short run to maintain levels of output distinctly higher than the NIRO, possibly at the cost of a high but stable rate of inflation, this equilibrium tends to become unstable in the longer run. The only stable level is in the neighborhood of the NIRO. In this sense, the contractual real wage or, more generally, the unit labor cost corresponding to this real wage has a fundamental role to play in determining the level of output and employment that the system can hope to achieve and maintain.

Determinants and Control of Aggregate Demand and the Inflation Rate

The model and its steady-state properties. So far, we have treated the level of output as an exogenous variable, concentrating on its effect on the inflation rate. It is useful at this point to endogenize output in order to examine how far output and inflation can be controlled through monetary and fiscal policies, and whether such policies can affect the tradeoff between inflation and output.

For this purpose it is sufficient to limit ourselves to a highly aggregated type of macro model of the Hicksian IS-LM type. Starting from the well-known identities of the national accounts and taking into account the consumption function and the fact that it depends on income net of direct taxes and social security taxes, we can approximate aggregate demand for a closed economy with the following equations:

$$X = Q + (W/P)G, \quad (2.3.1)$$

$$Q = Q(st, \theta, (W/P)G, Q_g, Q_i) \approx \{(st) / [st - c(1 - \theta)]\} \\ [(Q_g + Q_i) + c(1 - \theta)(W/P)G], \quad (2.3.2)$$

where X = real national product, Q = real value added by the private

sector, G = employment in the public sector, Q_g = purchase of goods by the public sector, Q_i = private investment, and θ = rate of direct taxation.

The approximation in equation (2.3.2) holds insofar as the consumption function can be approximated linearly in the relevant interval.⁴ We next assume, for the sake of simplicity, that net investment can be expressed as a function of the rate of interest r , that is,

$$Q_i = f(r). \quad (2.3.3)$$

But note that our analysis could be repeated without significant changes if we assumed that investment depended instead on the rate of growth of credit, expressed in real terms.⁵

Finally, we add an equation that expresses the demand for money:

$$M/P = k(r)X; \quad k' < 0. \quad (2.4)$$

If we take as given the value of M/P and approximate the value of W/P in equations (2.3.1) and (2.3.2) by the real contractual wage μ , the three equations (2.3) with equation (2.4) form a closed system in the four unknowns, X , Q , Q_i , and r . It is therefore logically possible to solve the system for each of these four variables as a function of M/P and of fiscal parameters. In particular, the solution for Q can be expressed in the "reduced form"

$$Q = F(M/P, s, t, \theta, G, Q_g), \quad (2.5.2)$$

where, denoting by F_x the partial derivative of F with respect to the argument x , we know that $F_{M/P}$, F_G , $F_{Q_g} > 0$ and F_{st} and $F_\theta < 0$. If investments were related to the real credit flow, this variable would replace M/P in (2.5.2), assuming the nominal credit flow to be directly controlled by the central bank.

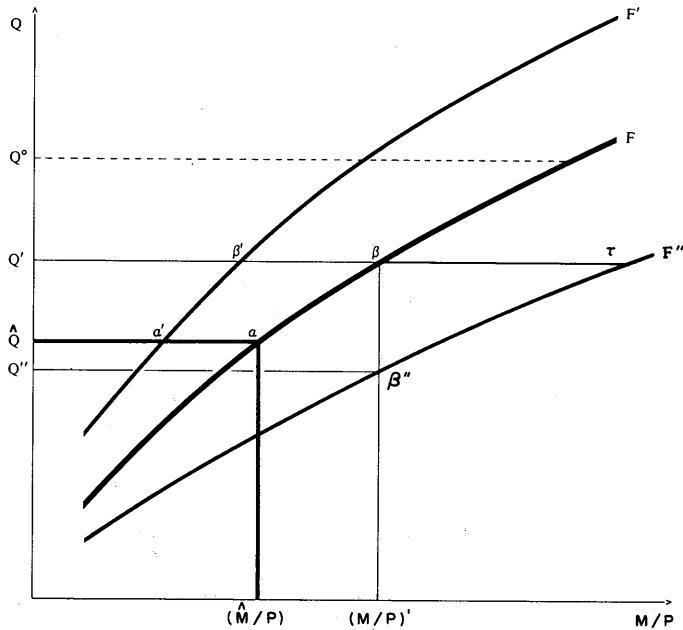
In Figure 2, the curve labeled F shows the relation between Q and M/P for a given value of the fiscal parameters. An increase in G or Q_g will shift the entire curve upward, whereas an increase in the coefficients of taxation θ , s , and t will shift it downward.⁶

⁴ The hypothesis that s and t appear as a product in (2.3.1) is also a convenient approximation (see footnote 8 below).

⁵ In principle, the right-hand side of equation (2.3.3) should contain the expected rate of change of prices along with the nominal rate of interest r . This refinement would seem particularly desirable in our analysis, which deals with the path characterized by differing maintained values of inflation. Nonetheless, we have chosen to neglect this effect in what follows. Omitting it does not appear to bias the analysis, in the sense of significantly affecting any of our conclusions, whereas taking it into account would greatly complicate the graphical presentation (see footnote 6 below).

⁶ It is easy to verify, for example, that if one measures the expected rate of inflation by the actual rate p , the locus F in Figure 2 would no longer be independent of the

Figure 2



Let us suppose that the quantity of money, M , is fixed by the monetary authority, but let us regard P as an endogenous variable. In this case, equation (2.S.2) in the two variables Q and P , together with equations (2.1) and (2.2) in the variables P , W , and Q , form a closed system of three equations in the three variables P , W , and Q . If we combine the curves in Figures 1 and 2, it is easy to show that this system tends toward a unique solution (provided there is a unique NIRO, \hat{Q}): $Q = \hat{Q}$; $\hat{P} = M/F^{-1}(\hat{Q})$; $\hat{W} = \mu\hat{P}$, where F^{-1} is the inverse of the function F . This solution is indicated in Figure 2 by point a at the intersection of curve F with the horizontal straight line \hat{Q} .

That this must be the only stable solution follows from the fact that if the system were initially at some point such as β in Figure 2, where output exceeds the NIRO, Figure 1 asserts that there would be a positive

parameters of equations (1.1) and (1.2), and hence of the position of the two curves in Figure 1. Note also that if Q_i depends on the real rate, the curve F could conceivably have a negative slope—if the elasticity of demand for money with respect to the nominal rate, the elasticity of investment with respect to the real rate, and the responsiveness of inflation to output were all sufficiently high.

rate of inflation. But that means that P would be rising. Hence, for given M , M/P , and aggregate demand, Q would be shrinking along the curve F . A reduction in the real money supply (or in the real supply of bank credit) through higher interest rates (or tighter credit availability) would reduce the demand for investment and other durable goods, and hence aggregate demand. The system can find a resting point only when it reaches point α , where prices, and hence the real money stock, are stable.

The limits of conventional monetary and fiscal policy. From Figure 2, it follows immediately that in the "100% plus" economy the level of output and employment in the private sector can be increased only temporarily by the standard tools of fiscal policy—changes in government expenditure or direct taxes—as long as the money supply remains fixed. The same holds for a once and for all change in the money supply. Neither of those policies can keep output above the NIRO indefinitely (proposition 5). Furthermore, if equations (2.1) and (2.2) and the corresponding curves in Figure 1 are not affected by standard fiscal and monetary parameters, such policies are also powerless to affect the NIRO and the entire tradeoff between output and inflation, as stated in proposition 6.

The fact that conventional fiscal policy does not have permanent effects on aggregate output does not mean that it has no real effects. On the contrary, it will generally have important effects on the *composition* of output (proposition 7). Thus, an increase in government expenditure Q_g or G , a reduction in direct taxes, or an increase in transfer payments will have the effect of shifting upward curve F in Figure 2, as indicated by curve F' . This will initially move the system to a point corresponding to β' and a level of output Q' higher than \hat{Q} . But the process of inflation that gets underway when output exceeds the NIRO will tend to bring the system back toward the NIRO, at α' on F' , by causing a gradual decrease in the real money supply that ends with a return to the NIRO. If the expansionary fiscal policy takes the form of additional government purchases, they will occur entirely at the expense of private demand, particularly of private investment. These will tend to decline because of the reduced availability of investment funds resulting from the increase in demand by the public sector to finance its increased deficit, which will also tend to be reflected in an increased cost of funds. If fiscal policy is carried out through a reduction in direct taxes or an increase in transfers, private consumption will increase, but again entirely at the expense of private investment. In other words, the "100% plus" economy behaves in accordance with well-known monetarist propositions. The fiscal maneuver

has no effect on the level of output and employment, since any expenditure it may increase will crowd out an equal amount of other expenditures (proposition 7).

The above considerations suggest that in a highly indexed economy expansionary fiscal policy of the conventional type may not merely be useless but actually undesirable, because its final outcome is a reduction in private investment. If the goal is to encourage investment, a case can thus be made for a *restrictive* fiscal policy despite the presence of excessive unemployment. The initial effect of such a restrictive policy may be a further reduction in the level of output, but this effect is transitory: if the money supply remains stable, the deflation resulting from the initial fall in output will have the effect of increasing the real money supply and investment, finally bringing output back to the NIRO. Furthermore, a carefully designed policy could attempt to avoid the initial contraction. The fall in consumption demand could be made to coincide with an increase in investment demand by an initial expansion of the money supply designed to bring about the required higher level of the real money supply.

Contrary to the monetarist tenet, there is one conventional fiscal measure, the expansion of public employment, that can increase total employment even though it cannot increase private output. In Figure 2, this action also has the effect of shifting curve *F* upward. As we have seen, this has no effect on the NIRO or employment in the private sector. Nonetheless, it will increase employment in the public sector, and hence total employment. But this operation, too, has a cost in terms of reduced investment, in that the newly employed in the public sector will increase their consumption. This result could be avoided by an appropriate increase in direct taxation. In this case, what would happen is that in effect those employed in the private sector would yield a portion of their consumption to those newly employed in the public sector.

In this sense, the swelling of public employment can offer a solution to the unemployment-inflation dilemma. It has even been suggested that such a development may explain certain aspects of the situation in countries like England and Italy. It should be clear, however, that this is a sick type of solution which replaces productive private jobs with presumably less productive public employment and which, in the long run, will tend to worsen the situation by reducing investment and incentives in the private sector.

We believe, nonetheless, that the above considerations are of some relevance to those who suggest that the root causes of stagflation are to be found in excessive public employment and the resulting waste of man-

power in that sector. Our model suggests that the first effect of a reduction of waste through a reduction of wasteful public employment will be the reduction of total employment unless a simultaneous expansion occurs in the private sector. But private-sector demand cannot expand as long as there is no reduction in the real unit labor cost. Accordingly, the argument that has been frequently advanced by labor spokesmen, for instance in Italy, that there is no point in focusing on real wages and productivity until the waste in the public sector has been eliminated is totally in error. We would suggest that the very opposite is true. There is no point in focusing on waste and overemployment in the public sector until a solution has been found to the problem of expanding private output without inflation—that is, to the crucial problem of reducing unit labor costs.

Output can be maintained at some level Q' above the NIRO only if the nominal money supply expands at a rate sufficient to support the rate of inflation that must accompany Q' . Conversely, if the money supply grows at some constant rate \dot{M} , output must tend toward a constant rate, say Q' , such that the accompanying rate of inflation matches \dot{M} . For, as long as output is less than Q' , the inflation rate will be lower than \dot{M} , causing the real money supply, and hence output, to rise toward Q' , and similarly for output above Q' . This establishes the first part of proposition 5. With the equilibrium level of output determined by the growth of money, fiscal policy again plays the role of determining the composition of output (and the real money supply, M/P) as stated by proposition 7. In Figure 2, for example, the same Q' is consistent with the fiscal parameters underlying curve F and leading to equilibrium at β with money supply $(M/P)'$, or with a "looser" policy resulting in the curve F' and equilibrium at β' . Here the real money supply is lower because the looser policy means that more public or private purchases have crowded out investment through tighter credit and higher interest rates.

One significant implication of the proposition just established is that the rate of inflation is independent of the level of government deficit or surplus (proposition 10). This proposition is clearly at odds with a point of view which is widely held, especially in the financial community, and which is encouraged by the fact that inflation in both England and Italy has been accompanied by very large government deficits. To be sure, the government deficit has a negative effect on investment, and from this point of view there may be good and sound reasons to oppose it, especially since a low rate of investment reduces the chances of offsetting the increase in real wages with increases in productivity. Nonetheless, our results indicate that, in the short run, it is erroneous to attribute either inflation or unemployment to the deficit as such.

The notion that there is a direct connection between deficit and inflation arises from the unwarranted view that the deficit is the cause of monetary expansion because the central bank is somehow required to acquire and thus monetize the issues of public debt that must be floated to cover the deficit. In reality, in a country sufficiently developed to be able to rely on a wide market for securities, there is no logical reason why government securities should be placed with the central bank rather than in the market. Of course, if the central bank wants to maintain output at the level Q' , it must necessarily expand the money supply at a rate consistent with this target. If it does not buy public issues, it will have to monetize an appropriate quantity of private issues. But refusal to monetize a certain volume of public debt will have no effect on interest rates as long as purchases of public securities are replaced by purchases of private debt. If they are not, interest rates will be driven up, but for the reason that the money supply is not growing at the rate required to support the rate of output Q' . In other words, to maintain output at Q' the central bank must monetize enough debt, either public or private, to cause an increase in the money supply at a rate consistent with Q' . But, at least as a first approximation, the division between public and private debt of the securities issued or bought is unimportant.⁷

Finally, let us touch briefly on a semantic issue. Even though the inflation we have described could not be sustained without a commensurate growth of the money supply (or credit), we see little value in asserting that it is "caused" by excessive money creation, thus equating it with the customary type of inflation in which "too much money chases too few goods." At Q' effective aggregate demand is not excessive because there are unutilized resources, possibly of considerable magnitude. It seems far more enlightening to say that, given the excessive unit cost of labor, if output is to be kept from contracting below Q' the central bank has no choice but to expand the money supply at a rate consistent with Q' , even if this means a large expansion. There is usually a hope that the rapid growth of money can soon come to an end as the result of some break that will again make full employment consistent with price stability.

The effects of a change in indirect taxation. The possible role of other tools of fiscal policy remain to be considered, particularly the role of indirect and social security taxes, either singly or in combination with direct taxation. In Italy, for instance, increases in indirect taxes have been frequently suggested, and occasionally used, to reduce inflation. The

⁷ The deficit can become an independent cause of inflation only when it exceeds saving at current output—or in fact that portion of such saving that the public would like to invest in fixed money claims.

higher taxation is held to reduce inflation by reducing aggregate demand, both directly and through a decline in the government deficit, resulting in a reduced growth of the money supply. In addition, the lower deficit is supposed to make room for more investment. However, our analysis suggests that in the "100% plus" economy this policy is ineffective and indeed harmful, as indicated in proposition 8.

Clearly, raising indirect taxes will reduce the government deficit, even though the increase in revenue due to the higher tax rates will be partly offset by a reduction due to the drop in income. But, as we have seen, a reduction in the government deficit has no direct effect on the rate of growth of money or on inflation in any other way. The only possible beneficial effect that could be claimed for higher indirect tax rates is that, by reducing consumption and the deficit, they might free resources for more investment. We contend that higher indirect taxes are a very poor tool to achieve this end, and, in fact, might be able to achieve it only at the cost of aggravating the inflation.

These conclusions may be illustrated by means of Figures 1 and 2. Suppose, in Figure 2, that we start at β on F with output Q' , and that the rate of indirect taxation t is increased, lowering curve F to, say, F'' . If output remains at Q' , the new equilibrium point will be at γ , implying a higher M/P , a lower interest rate, and higher investment. The trouble is that maintaining output at Q' would require accepting a substantially higher rate of inflation and a correspondingly higher growth rate of money. The reason is that an increase in t is equivalent to an increase in direct unit costs, and hence, as is apparent from equation (2.S.1), must shift the entire curve B upward in Figure 1, to curve B'' . Thus, at the original output Q' , the rate of inflation will be proportional to bc' instead of ba in Figure 1. More generally, the rise in t produces an overall deterioration of the tradeoff between employment and inflation.

The final effect of the higher tax rate on inflation and output will of course depend on what point is chosen on the new B'' curve as an appropriate choice of output and supporting growth rate of money. Note that if the output chosen is any larger than Q'' in Figure 1—for which the ordinate of the new B'' curve is the same as the ordinate of the initial curve B at the initial output Q' —the result will be not only *less* employment but also *more* inflation (which would, of course, require a faster growth of M). On the other hand, if the authorities are prepared to accept an output as low as Q'' or lower to prevent a rise in inflation, they cannot even be sure that there will actually be a rise in investment, which is presumably the only ground on which the rise in taxes could be justified. The reason is that the decline in deficit due to the higher taxes will

be offset at least in part, and possibly more than fully, by the fall in saving and the reduced receipts from pre-existing taxes resulting from the reduction in output. Put differently, if the reduction in output needed to prevent a rise in inflation is large enough, it could exceed the decline in consumption brought about by the higher taxes and the fall in income, in which case there would be a *decline* in investment.

This surprising result (proposition 8) reflects the fact that in the "100% plus" economy indirect taxation cannot touch real wages (except possibly to the extent that it leads to a rise in inflation). To be sure, firms will endeavor to shift the tax forward, which results in the indicated upward shift of B , increasing the rate of inflation at any Q' . But, because of indexation, they can only partially succeed, and then only to the extent that inflation increases. In the final analysis, firms will bear the brunt of the tax through the lower markup they will be led to accept as a result of the fall in output that must come about to the extent that the monetary authority refuses to accommodate a higher rate of inflation. We can conclude, therefore, that in the "100% plus" economy, indirect taxes, if they are included in the escalator basket, represent a very ineffective, wasteful, and inequitable tool to reduce inflation or increase investment.

The possibility that an increase in indirect taxes is more likely to increase than to decrease inflation has led some to suggest that inflation could be reduced by *lowering* social security taxes. This suggestion has some merit. Indeed, since both taxes affect the outcome only through equation (2.1.1) and they enter symmetrically—as the product st —the reduction of social security levies must uniformly improve the tradeoff between inflation and output by lowering the B curve. By the same reasoning used to analyze the effect of indirect taxes, it can be established that, because of this improvement a cut in social security levies *could* simultaneously achieve higher output, lower inflation, and higher investment, despite the likely higher deficit.

Of course, it would be possible to reap the full benefit of the improved tradeoff from lower social security levies while avoiding any unfavorable effect on investment via a higher deficit by using other indirect taxes to replace the lost revenue. In a country like Italy, where indirect taxes have traditionally been easier to manipulate, it has been natural to propose the use of such taxes. However, in view of the symmetry noted above, it is obvious that raising the revenue by indirect taxes must largely undo whatever is gained by lowering social security taxes, with no net effect—at least as a first approximation (proposition 9).⁸ For a closed

⁸ The effect is not complete because the two taxes are likely to have different tax bases. The tax base for social security is only the wage bill, whereas the base for

economy, this result may seem fairly obvious. But, as will be shown presently, it continues to hold in an open economy, even if indirect taxes are rebated to exporters while social security levies are not.

Note, finally, that lowering social security taxes can be quite effective if the loss of revenue is made up by direct taxes. The reason is that the replacement of revenue will leave unchanged the fiscal-policy curve F and the equilibrium point β in Figure 2, but curve B shifts down in Figure 1, improving the tradeoff between output and inflation. The improvement in the tradeoff can be used to secure some mix of inflation abatement and output expansion, including higher investment.

3 The Open Economy

The Model

The price/wage sector. International trade affects the price equation in two important ways. First, unit costs will include not only labor costs but also the cost of imported raw materials. Second, prices may be directly influenced by foreign prices through foreign competition in both international and domestic markets. Hence, for an open economy, we are led to modify equation (2.1.1) as follows:

$$P = m[d_1(Ws/\pi)t + d_2i] + d_3i. \quad (3.1.1)$$

Here, i is the domestic price in domestic currency of imported goods, which in turn can be expressed as:

$$i = eP_e t, \quad (3.1.3)$$

where e = exchange rate (domestic price of foreign currency, which we refer to as "the dollar") and P_e = level of foreign prices expressed in "dollars." The markup equation (2.1.2) maintains its original form.

Allowing again for a gradual adjustment, equation (3.1.1) can be rewritten as:

indirect taxes also includes return of capital, profits, etc. As a result, a decrease in social security rates coupled with a rise in indirect tax rates that leaves unchanged the total revenue from indirect taxes may lead to a price decline. This effect, brought to our attention by R. Paladini and C. Casarosa, is modest, however. To illustrate, a constant revenue $\bar{T} = (t-1)ms(W/\pi) + (s-1)(W/\pi)$ requires that $t = [1 + \bar{T}\pi/W + s(m-1)] / sm$. Substituting that expression for t into (2.1.1), we obtain $\eta_{Ps} = (m-1) / mt$, which is close to zero for plausible values of m and t . It is interesting to note that whatever effect is obtained through such a policy comes about because it affects profits asymmetrically, leaving unchanged their purchasing power in terms of labor while reducing it in terms of final goods (including investments). One might think that a systematic exploitation of this effect would eventually lead firms to increase m .

$$P = g\{m[d_1(Ws/\pi)t + d_2i] + d_3i\} + (1 - g)P_{-1}. \quad (3.1)$$

The wage equation must also be modified to take into account the fact that the basket of goods used to compute the escalator index will include not only domestically produced goods but also imported goods. Accordingly, equation (2.2) becomes:

$$W = \mu(a_1P_{-1} + a_2i_{-1}), \quad (3.2)$$

where μ is defined so that $a_1 + a_2 = 1$, and therefore a_2 represents the weight of imported goods in the escalator basket. If the index were based on domestic value added, as has sometimes been suggested, then a_2 would be *negative* and correspond to the import content of domestic output.

The balance-of-payments constraint. Another essential feature of the open economy is the necessity to balance the foreign accounts, that is, to offset imports by exports, or at least to maintain the difference within limits determined by the availability of foreign reserves. This constraint can be formalized by means of an equation that expresses the current-account balance, or excess of exports over imports.

The volume of exports Q_e can be approximated in the short run as a function of the ratio of foreign prices P_e to domestic prices expressed in "dollars," net of indirect taxes, which are typically rebated on exported goods, P/et . It will also depend on world demand, but this can be taken as exogenous for present purposes and hence disregarded. Therefore,

$$Q_e = \phi[(eP_e t)/P] = \phi(i/P); \quad \phi' > 0. \quad (3.5.1)$$

We will initially assume that the volume of imports can be approximated as a function of real income produced Q and the ratio of external prices expressed in domestic currency and inclusive of indirect taxes, $eP_e t = i$, to domestic prices P , or:

$$I = \psi(i/P, Q); \quad \psi_{i/P} < 0; \quad \psi_Q > 0. \quad (3.5.2)$$

The choice of Q as the "income" variable in the above equation has been adopted for convenience. It is, however, open to several objections, which will be reviewed in a section below where we also indicate how much we must modify our conclusions if we discard this assumption.

Using (3.5.1) and (3.5.2), the balance on current account expressed in dollars is given by

$$B_e = (P/et)Q_e - P_e I = P_e[(P/i)\phi(i/P) - \psi(i/P, Q)]. \quad (3.5)$$

Thus, for given external prices, the balance is a function of relative prices i/P and real income Q . From (3.5) and (3.5.2), it is obvious that

an increase in real income, with constant relative prices, increases imports and will reduce the current-account surplus or increase the deficit. We will also assume that the price elasticity of the demand for imports and exports is sufficiently high in the relevant time period to ensure that a rise in domestic prices expressed in dollars will result in a reduction in the current-account balance expressed in dollars.

From equation (3.5) it can then be deduced that, for any value of real income, there is only one value of relative prices that is consistent with current-account balance (or, more generally, with any pre-assigned value of the real balance). Furthermore, this value of relative prices is clearly an increasing function of real income. For if income, and hence imports, increase to maintain an unchanged current-account balance, the relative price of domestic goods must decline, making domestic products more competitive and thus stimulating exports and discouraging imports.

Determinants of aggregate demand. Equations (2.3.1) to (2.3.3) and (2.4) of the closed economy hold in the open economy as well, except that when we allow for the role of exports and imports, the function Q of (2.3.2) must include among its arguments the ratio of domestic to tax-adjusted foreign prices, P/i . From these equations we can therefore derive a reduced form that is a straightforward generalization of (2.S.2):

$$Q = F(M/P, st, \theta, G, Q_g, P/i), \quad (3.S.2)$$

where $F_{M/P}, F_G, F_{Q_g} > 0$ and $F_{st}, F_\theta, F_{P/i} < 0$.

We can now proceed to examine how these various modifications affect the conclusions reached for the closed economy.

Real Contractual Wages, Employment, External Equilibrium, and Inflation under a Fixed Exchange Rate

Implications for the price-wage sector. Substituting (3.2) into (3.1), taking into account (2.1.2), and dividing by P_{-1} , we obtain a formula for the rate of inflation that is equivalent to (2.S.1):

$$p = ng\{m(Q)A\mu a_1 + [m(Q)(A\mu a_2(i_{-1}/i) + d_2) + d_3](i/P_{-1}) - 1\}, \quad (3.S.1)$$

where now $A \equiv d_1 st / \pi$.

The first term in the curly brackets is basically the same as the first term in (2.S.1). But now there is a second term, which has the effect of radically changing the implication of this equation, because it includes the quantity i/P_{-1} . The behavior of this magnitude will depend in general on the behavior of the exchange rate, as it appears in the definition of i in (3.1.3). Let us suppose for the moment that we are in a regime of fixed

exchange rates and that foreign prices expressed in dollars are stable. In this case, it is clear that i is a constant (and therefore also $i_{-1} = i$), but i/P_{-1} is a variable because P changes unless the rate of inflation p is zero. Equation (3.S.1) tells us that for any initial value of P ,

$$p \geq 0$$

according to whether

$$P_{-1} \leq \{[m(Q)(A\mu a_2 + d_2) + d_3]/[1 - m(Q)A\mu a_1]\} i.$$

It follows that, regardless of its initial value, P will tend through time toward an equilibrium value that is given by the right-hand side of this inequality. For if P is initially smaller, prices will be rising, and vice versa, bringing P toward its critical value. At the critical value, inflation is zero and therefore P will remain stable. From an economic point of view, this result means that, in contrast to a closed economy, where an excessive real wage implies a constant inflationary process for sufficiently high income levels, in an open economy under a fixed exchange rate, as long as output does not exceed the full-employment level, the inflationary process will tend to die down independently of the real wage obtained by the trade unions.

To clarify the mechanism leading to these results, let us start from some output and a corresponding equilibrium of P/i and suppose that the real contractual wage makes an upward jump. Equation (3.1) tells us that, keeping output constant, in the first period following the wage rise the price level will rise by a finite amount. The first round in wages thus causes a first round in prices. But the latter will be smaller than the former, both because a part of the cost (the cost of imported raw materials) remains unchanged and because prices of international competitors are fixed. The increase in prices generates, through indexation, a second round in wages. But this wage rise will be smaller than the first round in prices—and *a fortiori* smaller than the first round in wages—because prices of imported goods in the basket remain unchanged. The second round in prices will again be smaller than the second round in wages—and *a fortiori* smaller than the first round in prices—and so on. In this way, the initial shock tends to produce increments in the price level that gradually die out while the price level approaches its new equilibrium level.

Some features of this process are worth noting. First, at its end, the real wage will have increased by the amount established in the wage contract. However, the ratio of wages to domestic prices will increase less than the real wage because prices of imported goods stay constant

and the gain in purchasing power over these goods offsets the loss in purchasing power in terms of domestically produced goods. Second, although output is assumed constant, while the system is approaching a new equilibrium through a price-wage spiral the rate of profit will be falling. The reason is that international competition on foreign and domestic markets prevents firms from passing through to prices the entire increase in labor costs.⁹ Finally, we observe that the inequality above implies that, for a given value of i , the equilibrium price is an increasing function both of the real contractual wage μ and of the level of output. This follows directly from the fact that an increase in either variable increases the numerator and reduces the denominator of the expression that multiplies i in the above inequality. Therefore, for a given value of i the relationship of P/i to Q may be represented by an increasing curve such as FL^0 in Figure 3. This curve corresponds to a given real wage rate, μ^0 . A larger value of μ will be represented by a higher curve, such as FL'' . The notation FL is a reminder that these curves represent the value of P/i that, for any given Q and μ , is consistent with price stability, in the sense that it is compatible both with the markup required by firms and with the real contractual wage secured by labor.

The balance of payments constraint. The fact that the open economy, unlike the closed economy, can reach an equilibrium with stable prices for any level of the real wage and any level of output less than Q^0 may make it seem that international trade opens the gate to an earthly paradise where one can have everything—full employment, price stability, and unlimited real wages—although at the expense of profits. But, in reality, this is not true—unless the rest of the world is ready to finance indefinitely any deficit in the balance of payments. What actually happens is that as the real wage increases for any given output, the domestic price also rises, causing an increase in the ratio of domestic to foreign prices, P/i . But, as we know from equation (3.5), this increase tends to produce an increasing deficit on current account. Thus, the need to balance the foreign accounts implies the existence of a tradeoff between real wages and output just as in the closed economy, although apparently through a different mechanism. The nature of this mechanism can be made clear by drawing another curve in Figure 3 labeled $B_e(0)$ derived from equation (3.5). Curve $B_e(0)$ shows the value of P/i that is needed for any given value of Q in order to ensure current-account balance (or, at least, to

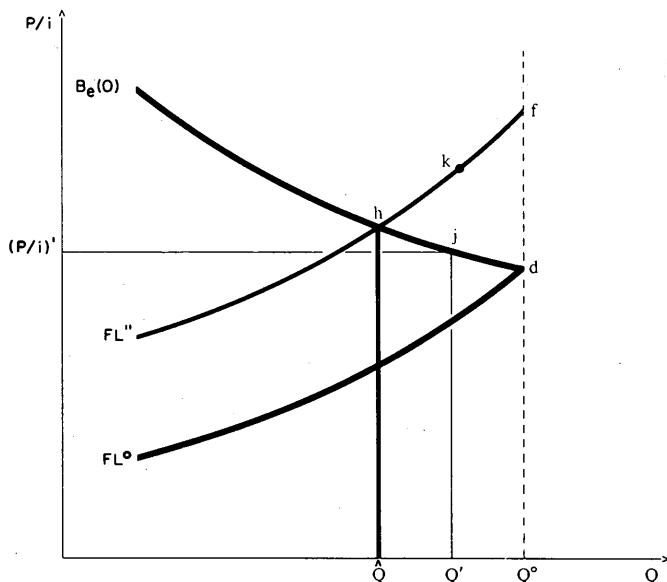
⁹ Let us denote with R gross unit profit, or the excess of income over direct costs. From (3.1.1), we have $R = m - 1 + [d_3 i / (AW + d_2 i)]$, where $A \equiv (d_1 s t) / \pi$. Substituting for W from equation (3.2), $R = m - 1 + \{d_3 i / [A\mu a_1 P + (A\mu a_2 + d_2)i]\}$, which clearly shows that $(dR/dP) < 0$, provided d_3 is positive.

contain the deficit to a size consistent with the availability of foreign reserves). Curve $B_e(0)$ is decreasing, as was shown earlier.

With the help of Figure 3 we can establish first that for given values of productivity and tax parameters there is only one contractual real wage compatible with full employment, external equilibrium, and price stability. It is the real wage μ^0 , corresponding to curve FL^0 intersecting the schedule $B_e(0)$ at point d . We can verify that point d satisfies all three conditions simultaneously. First, it corresponds to a full-employment income because it lies on the vertical line passing through Q^0 . Second, it lies on the schedule $B_e(0)$ and therefore implies external equilibrium. Third, it lies on curve FL^0 , corresponding to μ^0 , and therefore at point d there is stability of P/i , and hence of P , for a given i .

From Figure 3 we can verify next that if the real wage rate is higher than μ^0 , then at most two of these conditions can be satisfied, but never all three simultaneously. Assume, for instance, that the real wage rate, initially set at μ^0 , is raised to μ'' , corresponding to FL'' , and that an appropriate management of aggregate demand achieves the aim of maintaining full employment, or Q^0 . From our earlier analysis, we know that, as a consequence of the increase in the real wage rate, an inflationary process will be set into motion that will gradually bring the economy from point d to point f .

Figure 3



As this process unfolds, there will first be an increasing squeeze on profits, as domestic producers are unable to pass through the entire rising labor cost to higher prices because the prices of foreign competitors are unchanged, and then a growing current-account deficit.

By the time point f is reached, the inflation will have died down, so that this point satisfies two of the three conditions—full employment and price stability. But still f is not a stable point, because it fails to satisfy the third condition—external balance. In view of the deficit incurred at f , and indeed all along the path from d to f , and of limited reserves, the government will sooner or later be forced to abandon the effort to defend the initial exchange rate and to accept a devaluation to re-establish external balance. If it endeavors to accomplish this task while keeping output at Q^0 , it will have to increase the price of the “dollar” by a percentage equal to fd/dQ^0 in Figure 3. The impact of this operation is to increase i and thus reduce the value of P/i in such a way as to lower point f until it coincides with the original point d . It thus re-establishes external equilibrium and the initial level of profits. However, devaluation, like a drug, can provide only temporary relief. Since the devaluation does not move curve FL'' , point d , which lies below it, is no longer a point of price stability. Hence, the devaluation sets in motion a new wave of inflation carrying P/i back from d to f . Furthermore, the new price and wage spiral will be accompanied by a new gradual profit squeeze and by a loss in competitiveness that recreates the initial deficit at the new, depreciated level of the exchange rate. After a period of time, which is shorter the greater the speed of adjustment and the frequency of wage adjustments through the escalator, the effect of the drug will wear off and the system will be back at point f , with the same foreign imbalance and the same pressure to devalue. The only difference will be that the national currency has depreciated in terms of purchasing power both domestically and externally. Moreover, if the alternation between d and f is repeated, it is likely that the time required for the trip will shorten and that devaluation will tend to occur even before the system reaches point f and price stability. The expectation of a devaluation will create speculative pressures that will make it even more difficult to support the existing exchange rate, especially in the face of dwindling reserves.

We can conclude, therefore, that the attempt to hold output at Q^0 when curve FL lies above point d at that output must unavoidably result in a process of more or less continuous inflation. It is further apparent from Figure 3 that a similar conclusion must hold for any other output above the output \hat{Q} defined by the intersection of $B_c(0)$ and FL'' . For instance, at Q' there will be cycling between the poles j and k , which will again be

accompanied by continuing inflation, although presumably at a lower average rate because of the shorter distance between the poles. The only output consistent with price stability, or the NIRO, given the exchange rate is \hat{Q} , because point h falls on FL'' ; \hat{Q} also assures the stability of the exchange rate because h falls on $B_e(0)$ and hence satisfies the external-balance constraint. We have thus established that proposition 1 and the first part of 2 remain valid in the open economy. Furthermore, since a rise in the contractual real wage, or in unit labor costs from any source, raises curve FL and thus shifts the NIRO to the left, proposition 3 also holds. Finally, under the assumption that, as a first approximation, imports depend on Q and not on its composition, proposition 6 also remains valid, since fiscal parameters cannot affect either the FL locus or the $B_e(0)$.

In a closed economy, the simultaneous achievement of full employment and price stability when μ exceeds μ^0 was prevented by the inconsistency of the contractual real wage rate with the markup required by firms. In an open economy, however, the problem goes deeper and extends beyond what might seem to be arbitrary and greedy demands by labor or the collusive behavior of business. The point is that μ^0 is the only real wage rate consistent with a ratio of domestic to foreign prices such that foreign demand for domestically produced goods is sufficient to pay for what the country wants to purchase abroad under conditions of full employment. Or, equivalently, it is the only real wage rate at which domestic and foreign demand for domestically produced goods is such as to absorb full-employment output with equilibrium in the balance of payments. On the other hand, the real wage rate μ'' implies a relative price such that foreign demand makes it possible to cover what the country desires to import only at a level of output \hat{Q} , which is below full employment.

While our analysis so far has enabled us to conclude that maintenance of output at a level above that consistent with the contractual real wage must give rise to an inflationary process, it does not enable us to trace out the laws of motion of the system as we could in the case of the closed economy. The reason is that the inflationary process goes through the exchange rate, and under fixed or managed exchange rates the authorities typically have some choice, especially in the early stages of the process. There is, however, one limiting case in which choice vanishes—when, either owing to a lack of foreign-exchange reserves or by voluntary decision, the authorities refrain from intervening in the foreign-exchange market and therefore the exchange rate is freely floating.

In this case, analyzed briefly in the next section, the path of the system,

and in particular of inflation, can be specified more closely and can be shown to be analogous to the path characterizing the closed economy and summarized in proposition 2.

The Floating Rate

The consequences of maintaining income above its NIRO level. The essential implication of a floating exchange rate is that the rate will tend to adjust continuously so as to keep the ratio of foreign to domestic prices at a level consistent with current-account balance (or with a manageable deficit). Thus, if the management of aggregate demand succeeds in keeping output at some given level, say Q' in Figure 3, the exchange rate must be such as to generate the value of i/P corresponding to the ordinate of point j on $B_e(0)$. More generally, to any maintained value of Q there will correspond a value of i/P enforced by exchange-rate adjustments, given by the reciprocal of the ordinate of curve $B_e(0)$. Denote this value of i/P by $i/P(Q)$. Using this relation, we can express the variable i in equation (3.1) in terms of P and Q : $i = i/P(Q) \times P$. In other words, the movement of the market exchange rate ensures that foreign prices, expressed in domestic currency, move *pari passu* with (or proportionally to) domestic prices P , with the proportionality factor an increasing function of Q . Substituting for i in (3.1) and solving for P , we obtain

$$P = \frac{gm(Q)AW + (1 - g)P_{-1}}{1 - g[m(Q)d_2 + d_3](i/P)(Q)}. \quad (3.6)$$

By setting $g = 1$, it is possible to derive from this equation the value of the ratio P/W necessary for the equilibrium of firms:

$$(P/W)^F = [m(Q)A] / \{1 - [m(Q)d_2 + d_3](i/P)(Q)\}. \quad (3.6a)$$

Similarly, substituting for i in the wage equation (3.2), we obtain

$$W = \mu[a_1 + a_2(i/P)(Q)]P_{-1}, \quad (3.7)$$

remembering that $i_{-1}/P_{-1} = i/P = i/P(Q)$. Therefore, the value of P/W implicit in the real contractual wage is given by

$$(P/W)^L = 1 / \mu[a_1 + a_2(i/P)(Q)]. \quad (3.7a)$$

Dividing both sides of (3.6) by P_{-1} and using (3.6a) and (3.7a), we arrive at the following fundamental dynamic equation, which describes the behavior of inflation under a regime of floating exchange rates:

$$\dot{p} = g \frac{1 - [m(Q)d_2 + d_3](i/P)(Q)}{1 - g[m(Q)d_2 + d_3](i/P)(Q)} \left[\frac{(P/W)^F - (P/W)^L}{(P/W)^L} \right]. \quad (3.S.1')$$

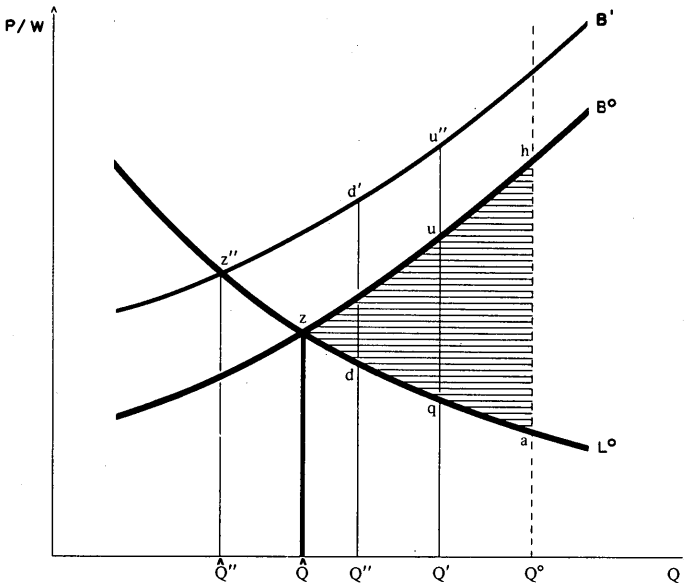
This equation gives the rate of inflation per unit of time equal to the period of adjustment. The annual rate p is obtained again by multiplying the right-hand side by n (bearing in mind that the value of g has to be simultaneously adjusted).

It is obvious that the equation above is very similar to the corresponding equation (2.S.1) of the closed economy. When the contractual real wage rate obtained by the unions exceeds the rate that is required by firms to produce an output Q' , an inflationary process gets under way at a constant rate proportional to the difference between these two quantities. Moreover, the constant of proportionality depends again on the velocity of adjustment of prices to costs, g , and on the annual frequency of escalator adjustments. We have thus established that proposition 2, as well as 3 and 4, applies equally to the open economy.

There are differences, however, between the equations of the open and closed economies that have some bearing on other propositions. In the closed economy, $(P/W)^L$ was a constant $1/\mu^0$, while in the open economy it is a function of output through the term $i/P(Q)$ appearing in the denominator of (3.7a). Since i/P is an increasing function of output for a given μ , $(P/W)^L$ is itself a decreasing function of output. It decreases because, as income increases, the terms of trade deteriorate. To keep the real wage rate constant, the increase in the real cost of the imported goods has to be compensated by a higher purchasing power of wages in terms of domestic goods. This conclusion is illustrated in Figure 4, which is analogous to Figure 1. The relationship between $(P/W)^L$ and Q for a given real wage μ^0 is represented by the *decreasing* curve labeled L^0 , while the corresponding curve in Figure 1 was horizontal. Clearly, a higher contractual wage rate would shift the curve proportionally downward.

The rising curve labeled B^0 represents the behavior of $(P/W)^F$ given by (3.6a) for a given value of A . As in the closed economy of Figure 1, it is an increasing function of Q . In Figure 1, however, the B slope reflects only the effect of the level of aggregate demand on the markup, while in the open economy the slope would be positive even if the markup were constant (and, within limits, even decreasing). As is apparent from (3.6a), in fact, an increase in Q , through the deterioration of the terms of trade, determines an increase in the cost of raw materials with respect to P that has to be compensated by a reduction in the relative cost of labor. Moreover, m appears also in the denominator of (3.6a); for this reason also, curve B^0 of the open economy has a greater slope than curve B of the closed economy for given values of A and m' . It could be concave

Figure 4



with respect to the horizontal axis, even if, as is likely, it would be convex in a closed economy.

Figure 4 can be interpreted exactly like Figure 1. Suppose the value of A is such as to produce curve B^0 and the value of μ , say μ' , results in curve L^0 . Suppose that aggregate output is maintained at Q' . Let us draw the perpendicular through Q' , intersecting curve L^0 at q and curve B^0 at u . The fundamental equation (3.S.1') tells us that, at that level of income, the economy will be characterized by an inflationary process at a constant rate that is proportional to uq/qQ' , with a coefficient of proportionality that increases with n . The figure also confirms that for the given real wage there is a unique NIRO, namely the level \hat{Q} corresponding to point z , at the intersection of the two curves.

The schedule B^0 holds for a given $A \equiv d_{1st}/\pi$. An increase in indirect taxation or in social security levies changes A proportionally; therefore, as can be verified from (3.6a), it shifts the curve proportionally. This is shown by curve B' , which indicates the effect of higher taxation. It reduces the NIRO from \hat{Q} to \hat{Q}'' . If Q remains at Q' , the rate of inflation increases in proportion to $u''q/uq$. That means that proposition 8 is valid also in the open economy.

We can now consider proposition 9 about the effect of a reduction in

the social security tax rate that is financed by an equivalent increase in the indirect tax rate. It has been suggested that this reduction, designed to lower curve *B* without increasing the government deficit, could be effective in an open economy even if it could not succeed in a closed economy. Although the operation would leave unchanged the total tax burden on firms, the reasoning is that it would shift the burden toward indirect taxation and, under prevailing international agreements, indirect taxes can be rebated to exporters, while social security taxes are not.

Our analysis enables us to show, with the help of Figure 4, that these reasons are invalid and that proposition 9 holds in an open economy. First, we can verify that the coefficients *s* and *t* do not appear at all in equation (3.7a) and hence cannot affect curve *L*. Next, we see that *s* and *t* affect equation (3.6a) through the coefficient *A*, in which they enter only as a product. Therefore, a simultaneous change in *s* and *t* that leaves their product unchanged does not in any way modify either of the two curves in Figure 4. Accordingly, it cannot change their point of intersection *z* or the rate of inflation that exists at any level of output larger than the NIRO.¹⁰

To understand this rather surprising result, observe from Figure 3 that, if *Q* is maintained at *Q'*, *P/i* maintains the value of $P/i(Q')$. Thus the operation leaves unchanged the ratio P/etP_e . But since the foreign price in dollars, P_e , can be taken as given, it follows that the operation also leaves unchanged $(P/t)/e$, the price of exported goods in dollar terms. It must therefore increase P/e (the domestic price in dollar terms) in proportion to the increase in indirect taxes. The increase in the domestic price derives from the fact that, as indirect taxes increase, the cost of imported raw materials increases immediately in proportion, and wages also rise soon enough through the effect of imported goods in the escalator basket. The increase in these costs determines an increase in prices that raises the wage rate again, until prices of imported goods, wages, and domestic prices are all increased in the same proportion as indirect taxes. At this point, the competitiveness of foreign goods on the domestic markets is back at its initial level, leaving imports unchanged. On the other hand, the refund of the tax on exported goods exactly compensates for the increase in the cost of production. This explains why the price of exported goods in dollar terms is unchanged, leaving unchanged also the competitiveness of domestic products on foreign markets.

When we apply our negative conclusion to a concrete situation, we must of course allow for possible discrepancies between the real world

¹⁰ But see our qualifications on the equivalent proposition for the closed economy.

and our streamlined description. For example, if there are costs of collecting and refunding taxes, or a different degree of evasion for the two forms of taxation, which is very possible, there may be net losses for society or a difference in the net revenue from the operation. The conclusion should also be modified if indirect taxes fall selectively on goods that are not part of the basket. In that case, the operation would be effective in reducing real wages, and the unit cost of production would increase by less than indirect taxes. These modifications can easily be worked out by the reader once the basic mechanism is clear.¹¹

The limits of monetary and fiscal policy. We have seen that in an economy with floating rates we can assume that the balance on current account is always zero (or some exogenously given value), so that in equation (3.5) we can replace B_e with a constant. If we then solve (3.5) simultaneously with the reduced form (3.S.2) for Q and (P/i) , we obtain an expression for Q in which the ratio (P/i) has been eliminated. The form of this equation is identical to equation (2.S.2) of the closed economy. This enables us to extend to the open economy the validity of propositions 5 and 10, to the effect that a necessary (and sufficient) condition for maintaining income at any level Q' above the NIRO is the growth of money at a rate equal to the rate of inflation appropriate to Q' while the deficit or the surplus in the government budget has no effect on the rate of inflation.

We must still consider the effect of changing indirect taxation and show that the criticism of its effectiveness expressed in proposition 8 remains basically valid in the open economy. To this end, note first that an increase in such taxes must again have an unfavorable effect on the inflation-output tradeoff and lower the NIRO. Indeed, it can be seen from equations (3.6) and (3.7) that a rise in t (a factor of A) must shift up the entire B curve, e.g., from B^0 to B' in Figure 4, while leaving the L curve unchanged. Thus, in order to prevent a rise in inflation, the higher taxes must be accompanied by a reduction of output from Q' to at least Q'' , where the distance dd' to the new B curve from the unchanged L curve is the same as the distance qu of the old curve. Because of this required fall in output, a portion of the intended effect on investment of the larger tax receipts will again be wasted. The only difference is that in the open economy the dead-weight loss of output from Q' to Q'' will tend to be smaller than in a closed economy (compare Figures 4 and 1). This is because the B curve is bound to be steeper in the open economy than in the closed economy, and in addition the L curve slopes down in

¹¹ See, in particular, footnote 8.

Figure 4 instead of being horizontal, as in Figure 1. As a result, in the open economy there is a greater possibility of obtaining more investment without having to accept higher inflation, although this will always require a reduction of output at least as large as the distance from Q' to Q'' .

Even with this qualification, there seems to be no ground for changing our conclusion that if an attack on the problem of inflation and a trade deficit is to be made by tightening fiscal policy, it is definitely preferable, for reasons of both equity and effectiveness, to use direct taxation. In a fully indexed economy, whether closed or open, indirect taxes, unlike direct taxes, fall entirely on profits; in addition, they produce unfavorable inflationary side-effects that may even nullify the desired reduction in inflation.

The Managed Rate: The Three Poles of Economic Policy

We can conclude our analysis of the open economy by considering the regime in which the exchange rate is left free to float only occasionally, while most of the time the authorities intervene on the market to fix the rate or to limit its depreciation. In the long run, the cumulative increase in prices and the external depreciation of the currency in such an economy cannot vary significantly at the same level of income from those in the economy with a floating exchange rate (if the cumulative deficit is kept at roughly the same level).

The major difference in the real world, as illustrated by the Italian case, is that depreciation tends to occur in steps, followed by periods of more rapid inflation. Such a process was described earlier with reference to Figure 3, in terms of the oscillation of the economy between the two poles d and f . Reality is more complex. During the inflationary process that starts at d , the deterioration of the current-account balance will tend to reduce income and employment, so that the economy moves not from d to f but rather tends to take a northwest direction toward a point such as k on the FL'' curve. Accordingly, in the vicinity of k pressure to depreciate comes not only from the deficit but also from a "devaluation coalition" including businesses suffering from the profit squeeze and possibly also portions of the labor force. The high average level of inflation that characterizes the economy's movements between d and k generates from time to time strong pressures for policies to stop, or at least reduce, inflation. Thus, a period of restrictive policies, both fiscal and monetary, will begin. After a devaluation has brought the economy to point d , the central bank may decide not to create enough money to finance the increase in prices on the path from d to k . At this point, income will start to fall (relative to the increase in productivity, which for convenience we have

omitted from our analysis) toward the NIRO, where the balance of payments is in equilibrium and inflation tends to disappear. But such a policy is short-lived: sooner or later, it will yield to the pressure of public opinion rebelling against the depressed state of the economy, the high level of unemployment, and the losses of firms. A period of reflation will thus follow, raising income toward Q^0 , but only at the cost of renewed inflation pushing the system toward f , with a large deficit in the balance of payments and eventually a new depreciation. Therefore, the economy does not move between the two poles d and f , but rather between the three poles d , h , and f or k , each of which satisfies only two of the conditions of full employment, price stability, and external equilibrium. The wandering between these three poles may be appropriately described as the "infernal cycle."

Allowing for Fiscal- and Monetary-Policy Effects on the External Balance

So far in our analysis, we have relied on the convenient simplifying assumption that the main determinant of imports, aside from the terms of trade, is a broad measure of income, which we have identified with aggregate private output Q . In reality, both *a priori* considerations and empirical evidence suggest that aggregate imports may also be affected by the composition of domestic demand, because components such as consumption, investment, and government expenditure may differ appreciably in terms of their import content. This qualification could be of some consequence for our conclusions, since the composition of demand for given income (or real national product) can, within limits, be affected by monetary and fiscal policy.

From a formal point of view, the import equation (3.5.2), and hence the external-balance equation (3.5), should be "generalized" to include among its arguments, in addition to i/P and Q , fiscal parameters such as those appearing in equation (3.5.2). [On the other hand, it is not necessary to display M/P , since from (3.5.2) this variable can be expressed as a function of Q and the fiscal parameters.] In this generalized-balance equation, the effect of a change in a given fiscal parameter depends on the response to this change by various components of demand (subject to the constraint that Q be constant) multiplied by the import content of each component. A rise in the rate of direct taxation will reduce consumption and hence imports of consumption goods. If the other fiscal parameters are unchanged, it must increase investment (through an appropriate rise in the real money supply) and investment imports. The net effect will be to increase or decrease imports depending, roughly, on

whether investments have a higher or smaller import content than consumption, per unit of expenditure.

To see the implications of this "generalization" for our analysis, consider first Figure 3. The B_e curve in this figure was derived from (3.5). If some fiscal parameters are among the relevant arguments of this equation, the ordinate of this curve for any given Q will not be unique but will instead depend on the value of these parameters. In other words, P/i can be made to rise or fall by changing these parameters, depending on whether the change makes for a composition of demand leading to more or less imports for the given Q . Similarly, curve B^0 in Figure 4 was obtained from (3.6a) after expressing i/P in terms of Q through (3.5). Hence, in principle, the ordinate of this curve can also be affected by the choice of fiscal parameters; the same holds for curve L .

We must then conclude that proposition 6 no longer strictly holds in the open economy: fiscal policy can affect the NIRO and the whole tradeoff between inflation and output. It can do so within the limits—presumably fairly narrow in practice—in which it can affect imports for a given income by affecting the composition of demand.

We suggest, however, that this generalization need not significantly influence our analysis or the relevance of our conclusions. Although the locus in Figure 3 might be regarded as a band rather than a curve, in practice the width of this band can generally be taken to be fairly narrow. Second, the band can be reduced to a curve by considering only its upper boundary. In other words, with any Q we can choose the value of P/i corresponding to the lowest level of imports obtainable through fiscal-policy choices. This formulation has serious limitations, however, for it implies that the composition of output is of no concern to the policy-makers except as it affects imports. It also ignores the consideration that structuring fiscal policy with the sole aim of curbing imports to the utmost may violate the international rules of the game and invite retaliation.

A more useful interpretation of the B_e curve is that it represents the result of a stepwise maximization: for every Q it gives the value of P/i corresponding to the composition deemed most desirable with respect to its effects on imports and to any other relevant effect. The resulting single relationships between P/i and Q can be relied upon to produce unique B and L curves in Figure 4. With this interpretation, Figures 3 and 4 and the analysis based on them remain relevant.

Finally, we should recognize some possible effects of fiscal policy by means of capital movements. Moving policy toward an easier fiscal and tighter monetary stance should tend to attract capital (at least short-

term), making it easier to finance a deficit while avoiding depreciation. Clearly, this approach cannot offer a lasting solution to the problem either, although it can be useful in providing temporary relief.

To conclude, in the open economy fiscal policy may play some role in determining the NIRO and the rate of inflation for given output, working through the composition of demand and short-term capital movements. But this role is likely to be narrow once other long-run implications of the composition of demand and of foreign indebtedness are taken into account. In general, therefore, fiscal policy cannot be counted upon to contribute much by itself toward a solution of the three-way problem of achieving full employment, price stability, and external equilibrium, but it can help to make it more manageable for a limited time.

4 Conclusions

We can now briefly review to what extent and in what forms economic policies can help to get the "100% plus" economy out of the infernal cycle and achieving simultaneously the basic objectives of full employment and price stability and the subsidiary objective of external balance on which the first two depend.

Our results can be summarized most conveniently in terms of Figure 3. The infernal cycle can come to an end only if there is conjunction of poles h , f , and d , defined respectively by the intersection of the B_e curve (representing external equilibrium) and the FL curve (representing the trade-off between output and terms of trade) with each other and with the line representing full-employment output. Our first conclusion is that the conventional tools of macroeconomic policy—monetary and fiscal management—cannot be relied upon to produce significant shifts in the position of these curves. Hence, these tools cannot be helpful unless the three poles overlap to begin with, i.e., unless the NIRO corresponding to point h coincides with full employment. In that case, the task of stabilization policies is reduced to the traditional one of ensuring that aggregate demand equals full-employment output. What, if anything, can be accomplished then through less conventional policies?

Lowering the Sights

The most straightforward solution—even though it is not really economic, and hence may appear trivial to the economist—is to redefine the targets. The community could choose to shave the full employment (or at least the full-employment hours) target so as to make it coincide with the NIRO. In Figure 1, moving Q^0 to the left until it meets \hat{Q} is

indeed one way to make the three poles coincide. This solution may be particularly attractive if the "establishment" consists of the employed, if the employed are able to protect themselves from encroachment by the unemployed, and if unemployment relief is minimal—a set of circumstances reminiscent of Italy in recent years. If, however, unemployment is a threat to everyone, or if the employed have to contribute generously to the unemployed, a better solution may be forcible work sharing through reduced hours but at the original hourly rates. All of these are distasteful solutions, the contemplation of which may help to make other solutions more acceptable.

Giving up the second target—price stability—and accepting the high permanent rate of inflation associated with a satisfactory rate of employment might appear to be another way out of the infernal cycle. It would seem to permit an end to stop-and-go policies and to the vagaries of inflation associated with the vain effort to defend the exchange rate, only to abandon it periodically under pressure. But this solution, even aside from its considerable costs, if only because of pre-existing contracts, runs into the difficulty that it is unlikely to be lasting. Indeed, the inconsistency between the contractual real wage and the wage required by firms at output above the NIRO is reconciled by inflation only through a process of "fooling" at least one party—a process that creates social tension and tends to be unstable. To reduce this fooling, adjustment of wages to prices and prices to wages must become faster and faster, leading to accelerating inflation.

Obviously, the third target—external balance—is not one that the community can renounce unilaterally.

Reducing Unit Labor Costs

A second set of solutions revolves around measures to lower the trade-off between output and terms of trade by achieving a reduction in unit labor cost. The most obvious and direct way to do this, of course, is to reduce real wages, but such a measure is likely to meet the stiffest resistance. Increased productivity is an alternative which, if available, may be less painful. This approach is particularly promising where unions have previously encouraged or tolerated a fall in productivity through absenteeism, featherbedding, and other restrictive practices inside the firm, or through limitations on the use of the plant (on holidays, for multiple shifts, etc.).

One problem with this approach is that, although increased productivity will shift the *FL* curve in Figure 3 down and move the NIRO to the right, it will also reduce the employment level associated with any given

output. Hence, it may be hard to "sell" such a program to labor without a commitment to expand output proportionately more than the increase in productivity. Whether such a commitment is consistent with a reduction in inflation depends on the slope of both the FL and the B_e curves in Figure 3. In fact, if we were to measure employment E instead of Q on the abscissa, we would find that an increase in productivity has the effect of shifting both curves down. Accordingly, their intersection, which defines the noninflationary rate of employment, will not necessarily shift to the right. For this to happen, the B_e curve would have to be flat—changes in the terms of trade would have to produce large changes in the level of income consistent with external balance.

Indirect Approaches

Aside from these direct approaches, a number of tax "finesses" and related contrivances are possible. We so label them because they generally turn out to be disguised ways of enforcing one of the above direct methods, relying on some form of tax illusion.

One measure that has found considerable support revolves around the reduction of social security levies. Abstracting from institutional details, such a reduction is tantamount to a subsidy to firms proportional to labor costs. Since this measure again lowers unit labor costs and thus the FL curve in Figure 3, it will bring points h , f , and d closer together. However, unless it is offset by other measures, the reduction will increase the public deficit, possibly reducing the resources available for investment. This outcome is by no means certain, however. The expansion of output that becomes possible without increasing inflation above the original level reduces the deficit and also provides increased saving, which may exceed the residual increase in the deficit. Yet this approach is sure to run into strong "conservative" opposition as destructive of wealth, since, in the final analysis, it involves using saving to subsidize current income in order to reconcile demands for shares of income that exceed 100 per cent. What is forgotten is that the alternative way of reconciling these demands, through lower output and saving, may be even more wasteful.

To prevent or reduce a rise in the deficit, outlays might be reduced first. Ideally, this should be done not by curtailing real benefits but just by eliminating waste. But this approach, if feasible, should be classified under the heading of increased productivity. If it is not feasible and outlays can be reduced only by a curtailment of benefits, the effect is akin to a cut in real wages. The alternative is to offset the lower receipts by means of other taxes. A rise in income taxes to subsidize labor costs is really an indirect way of enforcing a wage cut, to the extent that the self-

employed manage to escape taxes. Indirect taxes provide an alternative only if they are *not* included in the escalator index, so that they imply at least a partial reduction in real wages. Otherwise, the result is a total or near-total washout. On the other hand, when indirect taxes *are* included in the escalator index, a reduction in such taxes becomes one possible device to reduce the *FL* curve, acting much like a reduction in social security taxes.

Improving the Tradeoff between Employment and a Sustainable Current-Account Deficit

Let us begin again by considering the use of standard macro tools. Since these tools can be used to affect the way demand is divided into its major components—consumption, investment, and government acquisitions—they might also be used to raise the B_e curve to the extent that the components of demand are characterized by appreciably different marginal propensities to import. But the room for maneuver is circumscribed by insufficient differences in the propensities and by the practical limits to modifying the composition of output. The composition of demand can also affect the B_e curve by influencing the domestic rate of return—at least on financial assets—and thereby short-term capital movements, but these effects are transitory.

Micro tax policy might also help to raise the B_e curve by imposing differentially high rates on commodities that are primarily imported, as against those produced at home. But heavy reliance on this approach invites retaliation, which shifts the curve back down.

A third approach to raising the B_e curve is by a policy of outright protectionism and self-sufficiency. The wide support for this approach rests on the perception that what stands in the way of full employment and price stability is the deficit that develops short of full employment as output crosses the NIRO. It is therefore tempting to conclude that the problem could be solved by impeding imports—whatever the cost to foreigners—and replacing them with domestic goods.

In reality, as we have argued, the problem lies in an excessive real unit labor cost, and protectionism cannot solve this problem: On the contrary, it can only exacerbate it. True, protectionist measures will tend to raise the B_e curve, but only so long as they do not incite retaliation. Domestic production is more expensive than the foreign goods it replaces, however, so that self-sufficiency tends to have the same effect as a fall in productivity: it shifts the *FL* curve up even more than the B_e curve. Thus, in the end, the three poles are moved farther apart instead of coming closer together. These conclusions should be qualified to the extent

that the reduction in imports might result in an appreciable improvement in the terms of trade, but it is precisely under such circumstances that retaliations are most likely, leading finally to reduced trade and universal loss.

These considerations do not deny the usefulness of incentives to domestic production of import substitutes, when that is possible at competitive prices, or to increased international competitiveness of domestic goods. But import substitution and increased competitiveness are most likely to come about through higher productivity.

In summary, the economist can suggest a variety of policies to attack the stagflation and associated exchange-rate instability that haunt the "100% plus" economy. But short of consenting to live with the disease, there is finally only one sound remedy: increased productivity relative to real wages. The handful of other devices tend, at best, to provide transitory relief—a breathing spell that can be useful only if the more fundamental cure is on the way.

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111. Gerald A. Pollack, *Are the Oil-Payments Deficits Manageable?* (June 1975)
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119. Stanley W. Black, *Exchange Policies for Less Developed Countries in a World of Floating Rates*. (Nov. 1976)
120. George N. Halm, *Jamaica and the Par-Value System*. (March 1977)

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121. Marina v. N. Whitman, *Sustaining the International Economic System: Issues for U.S. Policy*. (June 1977)
122. Otmar Emminger, *The D-Mark in the Conflict between Internal and External Equilibrium, 1948-75*. (June 1977)
123. Robert M. Stern, Charles F. Schwartz, Robert Triffin, Edward M. Bernstein, and Walther Lederer, *The Presentation of the Balance of Payments: A Symposium*. (Aug. 1977)
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12. Ronald W. Jones, "Two-ness" in Trade Theory: Costs and Benefits. (April 1977)

REPRINTS IN INTERNATIONAL FINANCE

13. Benjamin J. Cohen, *Sterling and the City*. [Reprinted from *The Banker*, Vol. 120 (Feb. 1970)]
14. Fritz Machlup, *On Terms, Concepts, Theories and Strategies in the Discussions of Greater Flexibility of Exchange Rates*. [Reprinted from *Banca Nazionale del Lavoro Quarterly Review*, No. 92 (March 1970)]
15. Benjamin J. Cohen, *The Benefits and Costs of Sterling*. [Reprinted from *Euro-money*, Vol. 1, Nos. 4 and 11 (Sept. 1969 and April 1970)]
- *16. Fritz Machlup, *Euro-Dollar Creation: A Mystery Story*. [Reprinted from *Banca Nazionale del Lavoro Quarterly Review*, No. 94 (Sept. 1970)]
- *17. Stanley W. Black, *An Econometric Study of Euro-Dollar Borrowing by New York Banks and the Rate of Interest on Euro-Dollars*. [Reprinted from *Journal of Finance*, Vol. 26 (March 1971)]
18. Peter B. Kenen, *Floats, Glides and Indicators: A Comparison of Methods for Changing Exchange Rates*. [Reprinted from *Journal of International Economics*, Vol. 5 (May 1975)]

