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MACROECONOMICS OF STAGFLATION UNDER
FLEXIBLE EXCHANGE RATES

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ABSTRACT

The concerns of macroeconomic policy in the industrial countries in recent years have shifted the focus of open-economy macroeconomics to new and interesting problems. Although no synthesis, or a fully coherent theory of policy, has yet emerged from this research, the results have already led to major revisions in views about the nature of the problems that policy has to deal with.

This paper provides a selective survey and discussion of some of the results of recent research with emphasis on their implications for policy.

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Introduction

The concerns of macroeconomic policy in the industrial countries in recent years have shifted the focus of open economy macroeconomics to new and interesting problems. Although no synthesis, or a fully coherent theory of policy, has yet emerged from this research, the results have already led to major revisions in views about the nature of the problems that policy has to deal with.

This paper provides a selective survey and discussion of some of the results of recent research with emphasis on their implications for policy.

Macroeconomic Interdependence and Monetary Policy under Flexible Exchange Rates

One of the main arguments of the early advocates of flexible exchange rates was that the flexible rate system would insulate the domestic economy from fluctuations in the world economy while it would free monetary policy to be used for domestic stabilization. Furthermore, it appeared that there would be no need for policy co-ordination under flexible exchange rates since national policies would have only national effects.

This implication is obviously at variance with the experience of the

past eight years, and recent theoretical research has developed new models with many channels through which external disturbances are transmitted despite the flexibility of exchange rates.

It is helpful to discuss first the case when there are no capital movements between countries, so that under flexible exchange rates the current account must be equal to zero. The standard "textbook" model suggested that with zero trade balance there is no transmission, except for the Laursen-Metzler effect which works in the opposite direction, implying that a recession abroad has an expansionary effect on domestic demand and output. The "textbook" model assumes that exports and home goods are perfect substitutes so that any decline in exports can be absorbed by domestic demand without friction. The model assumes further that domestic and foreign prices are fixed and unaffected by exchange rate changes.

As McKinnon has suggested, the "textbook" model implicitly assumes a world in which countries are relatively independent of one another so that exchange rate changes do not have much effect on the domestic economy.

Modern open economy macroeconomics assumes in contrast that changes in export and import prices have significant effects on the domestic economy. In the extreme, the monetarist model assumes that all countries are "small countries" and produce only traded goods.

Several recent papers, including those of Bruno, Sachs, Branson, and Rotemberg, replace the Keynesian assumption of nominal wage stickiness with an assumption of real wage stickiness, which seems to be a more appropriate characterization of wage behavior in the European countries.¹

This change in assumptions introduces a new channel through which fluc-

tuations in world demand are transmitted to the domestic economy. A decline in export demand, for example, causes a deterioration in the terms of trade, an increase in the product wage in terms of domestic output, and therefore leads to a decline in domestic output and employment.

Monetary policy has no real effects in this model: it only affects the exchange rate and the price level. The effect of fiscal policy on output depends on its effect on the terms of trade. If fiscal policy takes the form of an increase in government expenditure, it will have an expansionary effect on output if the government's marginal propensity to spend on imports is less than that of the private sector. In such a case fiscal expansion at home will have a negative effect on foreign output if the foreign country also suffers from real wage rigidity.

A model of two countries, one with real wage rigidity (Europe), and the other with nominal wage rigidity (America), brings out an interesting asymmetry: monetary policy of the first country has no real effects in either country, while monetary policy of the second country has real effects in both countries. This asymmetry has been suggested as an explanation of the U.S.-Europe policy debate in the 1977-78 period.

One implausible implication of the model with a rigid real wage is that price stability can be achieved by means of monetary policy without real effects. One way to modify the model in such a way as to introduce some inertia of inflation is to recognize that there is a time delay in the adjustment of wages to prices. The model of Modigliani and Padoa-Schioppa of "100% indexation" demonstrates that a delay in wage adjustment gives rise

to a Phillips curve with the rate of inflation depending on the deviation of output from its full employment level and the deviation of the target real wage rate from its "warranted" level consistent with full employment.² With this modification, price stability cannot be achieved without output effects. A once and for all decline in the money supply will have only a transitory effect on output and employment as wages take time to adjust to declining prices. A sustained reduction in the rate of monetary expansion will, however, permanently increase the rate of unemployment. This feature of the model arises because it implies a Phillips curve that is not vertical even in the long run. Allowing for anticipatory adjustment of the "base wage" to expected future inflation will, however, make the long-run Phillips curve vertical.

This simple model of the open economy is helpful in understanding the transmission of both inflation and unemployment under flexible rates, and also accounts for the problems of domestic monetary stabilization. The initiating impulse might be a decline in export demand, causing a depreciation of the domestic currency. If the central bank holds the money supply unchanged, new equilibrium will be reached with a higher price level and higher unemployment. This unemployment cannot, however, be eliminated by means of more expansionary monetary policy except transitorily. Restoration of full employment requires that workers accept the decline in their real compensation necessitated by the terms of trade deterioration. An attempt by the central bank to support output and employment by monetary accommodation will only succeed in generating a "vicious circle" of inflation and

currency depreciation. This simple paradigm goes some way towards explaining the stagflation problem of many of the European countries in the period after 1974.

The model also explains the dilemma of price stabilization in an initial situation of high inflation. With delayed wage indexation, price stabilization implies a squeeze on profits in the adjustment period when wages are still catching up with past price increases. Brazil and Italy are two examples of countries where this problem stands in the way of disinflation. The United Kingdom experience since 1979 is another illustration of the depressing effect of monetary stabilization on profitability when wages are insensitive to unemployment.

As a practical matter, the kind of model outlined above can be easily fitted into an "eclectic" Phillips curve model a la Gordon or Perry. In the Phillips curve framework the difference between "real wage rigidity" and "nominal wage rigidity" appears as a difference between "wage-price inflation" on the one hand and "wage-wage inflation" on the other.

Empirical evidence appears to be broadly consistent with the view that the wage-price model is more appropriate in describing the dynamics of inflation in the European countries, whereas the wage-wage model is more appropriate in the U.S case.³

Most of recent theoretical work has emphasized capital mobility and the nature of the foreign exchange market as an "efficient speculative" market. The early Mundell-Fleming model seemed to suggest that despite "perfect" capital mobility flexible rates insulate the domestic economy from external

shocks while monetary policy regains control of nominal GNP. Paradoxically, the model suggested that contractionary monetary policy abroad is expansionary at home: the expansionary effect of depreciation more than offsets the contractionary effect of a higher interest rate.

Exchange rate expectations, the effect of exchange rate changes on domestic prices and wages, and the J-curve effect, change the implications of the textbook model. Thus consider the effects of restrictive monetary policy abroad on the domestic economy. A reduction in the rate of growth of the foreign money supply leads to a reduction in foreign inflation only over time. In the meantime, foreign real interest rates rise and foreign output declines. Suppose that the domestic central bank holds the domestic money supply unchanged. Then, there will be a depreciation of the domestic currency, some increase of the domestic interest rate, and acceleration of domestic wage-price inflation, and a decline in domestic output. The decline in domestic output comes about because of shifts in both the aggregate demand and in the aggregate supply schedule. The depreciation of the domestic currency is likely to be quite sharp because of the "overshooting" of the exchange rate to monetary shocks.⁴

Thus, far from implying "monetary independence", flexible exchange rates make the domestic economy even more sensitive to monetary policies abroad, a dependence that the 1980/81 experience with an appreciating dollar clearly illustrates.

A further implication worth noting is the dilemma of monetarist stabilization policies under flexible rates. If a reduction in the rate of monetary growth succeeds in reducing the rate of inflation, and therefore the

nominal interest rate, there will be an increase in the demand for money. If the central bank does not accommodate the decline in velocity, a deflation of the domestic price level is required before long-run equilibrium can be achieved. If exchange rate expectations are rational, then an expectation of such price level correction is reflected immediately as an overvaluation of the domestic currency. Dornbusch, in particular, has drawn attention to the "velocity problem", and the problem of "real appreciation."⁵

With some time lag, "rational expectations macroeconomics" is finding its way to open economy macroeconomics. As is the case with closed economy models the problem is one of incorporating rational expectations and price flexibility in a way that still leaves some room for anticipated monetary policies to have persistent real effects. Dornbusch and Calvo, amongst others, have explored the implications of inflation inertia caused by staggered wage contracts.⁶ Their results suggest that monetary and exchange rate policies do have systematic real effects, and can be used to stabilize output but only at the cost of destabilizing the price level.

Adjustment to Relative Price Changes

Much of the recent theoretical research has been concerned with the modelling of the "oil price shock" both for an oil importing country and an oil exporting country.

An increase in the real cost of oil imports is like a transfer payment that domestic residents have to pay to the oil exporting countries. In a Keynesian model

with a fixed nominal wage rate, such a transfer reduces domestic demand and leads to a decline in domestic output and employment if the exchange rate is fixed. At the same time there is an increase in the price of domestic output because of the increased cost of oil. Thus macroeconomic policy faces a dilemma between the conflicting objectives of external balance, full employment and price stability.

One adjustment alternative is to let the domestic currency depreciate sufficiently so as to restore balance of payments equilibrium at full employment at the cost of a greater increase in the domestic price level.

Such an adjustment alternative has two problems. One is that it cannot be available to all oil importing countries because as a group they must accept a deficit equal to the surplus of the oil exporting countries. The other problem is that devaluation will not work unless it succeeds in reducing the real wage rate.

In a pioneering paper Bruno and Sachs develop a model of the "oil price shock" in which the real wage rate is rigid.⁷ In such a model an increase in the real cost of oil imports leads to classical unemployment because it reduces the marginal product of domestic labor. There may also be a secondary burden if the price of domestic exports has to decline relative to exports of other oil importing countries so as to restore equilibrium in the balance of payments. With real wage rigidity monetary policy can do nothing to alleviate the unemployment caused by the oil price increase.

The contrast between the Keynesian model and the Bruno-Sachs model is yet another illustration of how recent research has led to a different inter-

pretation of the nature of the policy problem, with emphasis shifting from the demand side to the supply side.

A number of recent papers have been concerned with the problems of industrial countries, with a large energy sector, such as the Netherlands, Norway, and the United Kingdom.⁸ For such countries an increase in the relative price of oil causes structural problems because it leads to a "real appreciation" of the domestic currency. Thus if the exchange rate is flexible the increase in "oil revenue",,, perhaps combined with an inflow of capital to the energy sector, causes the domestic currency to appreciate. As a result, the competitiveness of the "traditional" export and import competing sectors is eroded, leading to a decline of output and employment in those sectors.

Also in this case "Keynesian" macroeconomic policy cannot solve the problem, for what is required is a reallocation of resources between different sectors of the economy, and the problem of policy is how to guide this process of resource reallocation.

A similar problem arises with increased import competition that all "old industrial countries" are experiencing from Japan and from the low-cost newly industrialized countries in many of their traditionally strong industries. A decline in the relative price of imported textiles, for example, will require a reallocation of labor and capital away from the textile industry to other industries that are better able to compete in world markets. Because such reallocation takes time, and because the affected industries tend to be labor intensive, import competition does present a serious unemployment problem which cannot, however, be solved by macroeconomic policy. Instead, what is required are policies that support the process of structural adjustment.⁹

Profitability and Growth

A common denominator in much of the recent research is the emphasis on real wage rigidity. The increase in the real cost of energy, and increased import competition are changes that have reduced the equilibrium real wage rate in the industrial countries. Because actual real wages have not adjusted downwards, particularly in the European countries, classical employment has resulted.

If this is the problem there is another issue that arises. In a situation of classical unemployment firms are not constrained by aggregate demand and therefore the accelerator mechanism is not relevant in explaining investment behaviour. Instead investment now depends on the rate of profit, which in turn is a decreasing function of the real wage rate, and on the cost of capital. Thus an increase of the real wage rate above its equilibrium level leads not only to an once-and-for-all increase in the rate of unemployment, but it also leads to a decline in the rate of capital accumulation and in the rate of growth.¹⁰ If the real wage rate adjusts only slowly in response to unemployment following a disturbance, there will be a long period of slow growth and high unemployment. Restoration of growth at full employment in this situation requires policies that encourage saving and capital formation, promote technological progress and productivity growth, as well as 'incomes policies' that help to reconcile wage claims with productivity.

Fiscal Policy

The emphasis of recent work on real wage rigidity and on classical rather than Keynesian unemployment has also led to revisions in views about fiscal policy.

In a situation of classical unemployment an increase in government demand for privately produced goods and services has no effect on total output and employment, except in the case when it leads to an improvement in the terms of trade, or discussed above. Instead there will be a crowding out of private expenditure and/or an increase in the current account deficit. The effect on the current account depends on whether the increase in government expenditure is tax financed or deficit financed, and on the extent to which future tax liabilities implied by deficit financing are discounted by the private sector.

In order for fiscal policy to increase employment it either has to take the form of direct public employment or subsidization of private employment. Even then there will be at least a partial crowding out of private employment. If workers do not suffer from 'tax illusion' an employment program financed by wage taxes will lead to a reduction in private employment as workers shift the tax burden to protect their after tax real wage. If, on the other hand, an employment program is financed by corporate and capital income taxes, there will be an adverse effect on private investment and future employment.

As Soderstrom and Viotti have emphasized full employment policy is likely to lead to an endogeneous growth of the public sector when the labour market is characterized by classical unemployment.¹¹

A final point worth noting is that an increase in classical unemployment may contribute to inflation by leading to a structural deficit in the budget, which is then financed by money creation. For many developing countries in particular but also for some of the European countries this mechanism explains the emergence of high and chronic inflation in the 1970's.

Conclusion

The emphasis of recent research on the supply side does not imply that aggregate demand policy does not matter, nor does it rule out aggregate demand fluctuations as a cause of fluctuations in output and employment. But the simple fact is that the growth of nominal demand from 1970 to 1980 was enormous in comparison with the growth of nominal demand in the previous two decades in all industrial countries. Most of this increase in nominal demand went into prices while growth of output declined dramatically and unemployment became a major global problem for the first time after the Great Depression. It must be the case that supply side factors have contributed to the decline in output growth and to the emergence of worldwide unemployment.

The research work discussed in this paper does not suggest easy solutions to the macroeconomic malaise of the industrial countries. It does suggest, however, that restoration of growth at full employment requires policies that support adjustments in the labour market, and the reallocation of resources between contracting and expanding industries, and encourage saving and private capital formation. Most importantly, the research also emphasizes the interdependence between countries in an increasingly tightly integrated global economy, and the importance of co-ordination of macroeconomic and trade policies to reduce the costs of transition to lower inflation and the costs of adjustments necessitated by the energy price increase and by changes in the international division of labour.

Footnotes

1. Bruno and Sachs (1981), Branson and Rotemberg (1980)
2. Modigliani and Padoa Schioppa (1978)
3. Sachs (1979)
4. Kouri (1981)
5. D^ornbusch (1980)
6. D^ornbusch (1980) and Calvo (1981)
7. Bruno and Sachs (1981), op. cit.
8. Buiters and Purvis (1981)
9. Bruno (1980)
10. Kouri (1978)
11. Soderstrom and Viotti (1978)

References

1. Branson, W. H. and J. J. Rotemberg, "International Adjustment with Wage Rigidity," European Economic Review V. 13, No. 3, May 1980
2. Bruno, M. "Impart Competition and Macroeconomic Adjustment Under Wage Price Rigidity," NBER Working Paper No. 522, July 1980
3. Bruno, M. and J. Sachs "Supply Versus Demand Approaches to the Problem of Stagflation," in: Macroeconomic Policies for Growth and Stability: A European Perspective, J. C. B. Mohr, Tubingen, 1981
4. Bunter, W. and D. Purvis, "Oil, Disinflation, and Export Competitiveness: A Model of the "Dutch Disease", NBER Working Paper No. 592, 1981
5. Calvo, G. "Staggered Contracts and Exchange Rate Policy" unpublished manuscript, 1981
6. Dornbusch, R. Open Economy Macroeconomics, New York: Basic Books, 1981
7. Kouri, P. J. K. "Profitability and Growth," in a Small Open Economy," in: A. Lindbeck, ed., Inflation and Employment in Open Economics, North Holland, 1979
8. Kouri, P. J. K. "Macroeconomic Adjustments to Interest Rate Disturbances: Real and Monetary Aspects," C.V. Starr Center Discussion Paper No. 81-17, New York University, June 1981
9. Modigliani, F. and T. Padoa-Schioppa, The Management of an Open Economy with "100% Plus" Wage Indexation, Essays in International Finance, 130 Princeton University, 1978
10. Sachs, J. "Wages, Profits and Macroeconomic Adjustment: A Comparative Study," Brookings Papers on Economic Activity, No. 2. 1979
11. Soderstrom, H. T. and S. Viotti "Money Wage Disturbances and the Endogeneity of the Public Sector in an Open Economy," in: A. Lindbeck, op. cit.