

Monetarism, Budget Deficits, and Wage Push Inflation: The Cases of Italy and the U. K.*

Introduction and Summary

While modern day Keynesians and monetarists continue to disagree about the relative strengths of fiscal and monetary policy, much of the current policy debate has moved on to differences in view about wage and price behavior and the causes of inflationary pressures. Although there is no clear logical necessity that it always be so, monetarists and Keynesian-oriented economists tend to differ systematically in their views on a considerable range of macroeconomic issues.¹ For example, Keynesians tend to be optimistic about the effectiveness of various types of incomes policies, while monetarists tend to be skeptical. Likewise Keynesians tend to be dubious of the effectiveness of using aggregate demand policies, whether fiscal or monetary policy, as a method of slowing the rate of inflation, while monetarists strongly advocate the need for such policies.

In this paper we discuss two of the major areas of current disagreement between monetarists and the anti-monetarists. The first concerns inflation-unemployment relationships and the distinction between demand pull and cost push pressures. We argue that in an inflationary environment the distinction between demand pull and

* We gratefully acknowledge helpful comments by John Rutledge, Richard J. Sweeney, members of the seminar in monetary analysis at Claremont Graduate School, and members of the Office of International Monetary Research at the U. S. Treasury, but this paper does not necessarily reflect the official views of these institutions.

¹ There is also a danger in attempting to summarize the views of different schools of thought, but we believe the generalizations made in this paper are characteristic of predominant themes in monetarist and modern day Keynesian thought. These were evidenced for example in a recent series of exchanges in *Lloyds Bank Review* with Sir John Hicks and Lord Kahn representing the Keynesians and David Laidler, Michael Parkin, and the late Harry Johnson representing the monetarists.

See: MICHAEL PARKIN, "Where is Britain's Inflation Going," *Lloyd's Bank Review*, July, 1975, pp. 1-13; Sir JOHN HICKS, "What is Wrong with Monetarism," *Lloyds Bank Review*, October, 1975, pp. 1-13; Lord KAHN, "Thoughts on the Behavior of Wages and Monetarism," *Lloyd's Bank Review*, January, 1976, pp. 1-11; HARRY G. JOHNSON, "What is Right with Monetarism," *Lloyd's Bank Review*, April, 1976, pp. 13-17; DAVID LAIDLER, "Letter to the Editor: Lord Kahn on Monetarism," *Lloyd's Bank Review*, April, 1976, pp. 47-48; and Sir JOHN HICKS, "The Little That is Right with Monetarism," *Lloyd's Bank Review*, July, 1976, pp. 16-19.

cost push pressures loses much of its meaning and that a considerable portion of the difference between Keynesian and monetarist views of wage, price, and employment relationships is that the former group tends to focus on very short run responses in the economy, while the latter group tends to focus on behavior over the longer run.

The second major area of disagreement which we consider concerns the underlying causes of inflationary pressures. It is generally conceded even by anti-monetarists that for high rates of inflation to be sustained, underlying inflationary pressures must be validated by monetary expansion. This highlights the importance of investigating the causes of monetary expansion. While in the discussion of the causes of inflation, non-monetarists frequently fail to mention the necessary linkage of indexed expansion in macroeconomic policies, the emphasis placed on factors such as wage push and the effects of import price increases can be interpreted as hypotheses about the major causes of monetary expansion. On the other hand monetarists have often pointed to budget deficits as the major cause of monetary expansion.

In the latter part of the paper we investigate the impact of four major variables on monetary expansion in Italy and the United Kingdom. We find that when only budget deficits and monetary expansion are compared, the effects of budget deficits are statistically significant for both Italy and the U.K. However, we also find that the relationships are not extremely tight. Furthermore, the hypothesis of monetary expansion to validate high rates of wage increases appears to have as much or more explanatory power for both countries.

Thus while strongly agreeing with the monetarists that autonomous cost push pressures cannot cause high rates of inflation without monetary validation, we believe the evidence suggests that cost push factors as well as budget deficits have been major contributors to the high rates of monetary expansion in both Italy and the United Kingdom. While at least some monetarists tend to be skeptical of any form of cost push argument, we do not believe that our findings contradict any basic monetarist propositions:

We also find that international factors, specifically import price increases and international reserve flows, do not appear to have had a strong systematic influence on the rates of monetary expansion in the United Kingdom over the past two decades and that for Italy only reserve flows were statistically significant. Thus our empirical results suggest that the high rates of monetary expansion and inflation

in these two countries have been largely homegrown rather than imported.

We should stress from the onset that the statistical methods employed are crude and that much more econometric and judgmental analysis is needed before great confidence can be placed in the answers to these questions. We hope, however, that our results will make a positive contribution to the continuing debates over monetarism and inflation.

Inflation-Unemployment Relationships and Demand Pull versus Cost Push Pressures

Monetarists see restrictive macroeconomic policies as a powerful instrument for reducing the rate of inflation over the longer run, albeit at the cost of higher unemployment over the interim. On the other hand, Keynesians tend to view wages and price increases as largely independent of macroeconomic policies over the time spans with which they tend to be concerned. They argue that the failure to validate these increases through expansions in aggregate demand would result primarily in rising unemployment rather than reductions in the rate of wages and price rise.

Keynesians tend to attempt to distinguish between demand pull and cost push pressures when analyzing inflation. As economists have known for many years, however, such distinctions can be extremely difficult to make in practice. This is especially so in a generally inflationary environment. For example, a demand pull inflation that has generated inflationary expectations will in turn generate wage and price increases by firms and workers in order to offset the effects of anticipated inflation on real economic positions. In a world of inflationary expectations, demand pull pressures will end up generating cost push pressures. One can have *excessive* demand in the sense of expansions in aggregate demand validating high rates of wage and price increases, without there being *excess* demand in the sense of upward pressures on the levels of output and employment. In such a world, the problem of reducing inflationary expectations then becomes much the same whether the initial stimulant to inflation was primarily autonomous cost push or demand pull.

Only from a very short run perspective is it legitimate to base policy prescriptions purely on the distinction between cost push and

demand pull inflation. Exclusive focus on the very short run, however, generates serious dangers of adjusting to ever higher rates of inflation over the long run.

There is now rather widespread recognition of the pitfalls of the idea that excess demand would allow a country to move up a relatively stable inflation-unemployment tradeoff schedule (the Phillips Curve). For success, workers, consumers, and businessmen would have to be persistently fooled. Unfortunately, the discrediting of the simple Phillips Curve idea as a rationale for expansionary policies is sometimes used as an argument against the use of restrictive macroeconomic policies to slow down the rate of inflation.

This argument is based on a false analogy, however. The weak link in the stationary Phillips Curve idea was the failure to recognize that individuals and firms are concerned primarily about their real economic positions and that they will catch on over time to the effects of future inflation when setting prices and wages.

The same logic suggests that restrictive policies, if maintained for a sufficient period of time, will lower expectations of future inflation and hence reduce the rate of increase in wage demands and prices. Thus once expectations had fully adjusted to the new policies, the primary effect would be in lowering the rate of inflation, rather than increasing unemployment. Over the long run the same factors which limit the effectiveness of expansionary macroeconomic policies in stimulating employment, also suggest that more restrictive macroeconomic policies will result in lower rates of inflation.

The difficulties come in the process of changing inflationary expectations. The history of short lived attempts at anti-inflationary macroeconomic policies makes the public skeptical about announced government policies. Thus more restrictive macroeconomic policies do not reduce expectations immediately by an equivalent amount. Contractionary policies which are maintained for long periods will gradually begin to reduce inflationary expectations, but the process of reducing inflationary expectations tends to increase unemployment. If one focuses only on a very short time period, then one is likely to see primarily an increase in unemployment with little immediate reduction in inflationary expectations. Thus the short run effects of restrictive macroeconomic policies appear perverse.

In discussions of this topic Keynesians tend to focus on this short run, while monetarists tend to focus on the longer run effects. Focusing exclusively on only the very short run or the very long run can

have disastrous consequences. On the one hand, a decision to never adopt any anti-inflationary policies which would generate any increases in unemployment would leave the economy prone to every escalating inflation, as each new shock is ratified by an accommodating policy of more rapid expansion of nominal demand. On the other hand, recognition that over the long run restrictive macroeconomic policies will have their major effect on inflation rather than unemployment is of limited comfort if full adjustment will take a decade or more.

A further complication is that we cannot be sure that a policy of consistently validating inflationary shocks would minimize unemployment even if we decided that this was the most important objective. Higher rates of inflation tend to be associated with greater economic and financial uncertainty, which can in turn generate higher levels of unemployment over the medium term.²

We strongly believe that it would be an important step toward clarifying current debates over macroeconomic policies if disputants would more frankly admit the extent of the current limitations of our empirical knowledge about inflation-unemployment relationships over the medium term. It should not be surprising that our empirical knowledge on this issue is woefully inadequate. Outcomes depend crucially on the behavior of expectations, one of the most complicated and difficult areas for empirical research. This basic difficulty is compounded by the relatively short time period for which we have had high and rapidly changing rates of inflation for many of the industrial countries.

It is sometimes argued that we need a new Keynes to help us understand our new era of simultaneously high rates of both inflation and unemployment. But, as desirable as it would be to have another Keynes, in our judgment the major difficulty facing the economics profession today with respect to the analysis of macroeconomic policies is not the lack of an adequate theoretical framework within which we can encompass the major views about wage, price, and employment behavior in a logically consistent manner, but rather our lack of empirical knowledge about many of the parameters within this framework. There is a great need for more empirical research in this area.

² For discussion of the interrelationships among inflation, uncertainty, and unemployment see ARTHUR M. OKUN, "The Mirage of Steady Anticipated Inflation," *Brookings Papers on Economic Activity*, no. 2, 1971; DENNIS E. LOGUE and THOMAS D. WILLETT, "A Note on the Relation Between the Rate and Predictability of Inflation," *Economica*, May 1976; and MILTON FRIEDMAN, "Inflation and Unemployment," *Journal of Political Economy*, 1977.

Budget Deficits and Monetary Expansion

A second major area of controversy concerns the causes of monetary expansion. Often differences in view on this issue are left implicit. Michael Parkin made an important contribution by raising this issue explicitly in the context of the ongoing debate over inflation and monetary policy in the United Kingdom.³ Unfortunately, however, he considered only the hypothesis that the major cause of monetary expansion was the size of the government budget deficit. He argued that there are incentives for vote seeking politicians to expand government expenditures more rapidly than revenues from taxation, and that the resulting budget deficits in turn give the monetary authorities an incentive to expand the money supply more rapidly in order to avoid, or at least limit, the upward pressure that would otherwise be put on interest rates.⁴

Parkin presented graphs which clearly established that there has been an important positive correlation between budget deficits and monetary expansion in the United Kingdom. He did not investigate in any detail, however, just how tight the linkage was between budget deficits and monetary growth. He also did not investigate other possible causes of monetary expansion, except to indicate that the money supply provides a better explanation of future price level changes than price level changes provide an explanation of future money supply behavior.

Other Views on the Causes of Monetary Expansion

The nonmonetarists grant that monetary expansion is necessary for significant inflation. As Lord Kahn put it, "It can be readily conceded to the monetarists that an increase in the quantity of money, though not the *cause* of inflation, is a necessary condition".⁵ Thus

³ "Where is Britain's Inflation Going," *op. cit.*

⁴ For discussion of the political incentives to adopt inflationary policies see JAMES M. BUCHANAN and RICHARD WAGNER, *Democracy in Deficit* (Academic Press, 1977); ROBERT J. GORDON, "The Demand and Supply of Inflation," with discussion by Karl Brunner and reply by Gordon, *Journal of Law and Economics*, December, 1976; WILLIAM NORDHAUS, "The Political Business Cycle," *Review of Economic Studies*; and HERBERT STEIN, "The Politics of Inflation," in David Meiselman and Arthur Laffer (eds.) *The Phenomenon of World Wide Inflation* (Washington: American Enterprise Institute, 1977).

⁵ "Thoughts on the Behavior of Wages and Monetarism," *op. cit.*, p. 6.

we may interpret discussions of the inflationary importance of wage and import price increases as implying that these factors should provide major explanations of the behavior of the money supply.

While some monetarists react hostilely to any variety of cost push argument, there is nothing inconsistent with monetarist reasoning in scenarios in which wage or import price increases induce monetary authorities to expand the money supply in order to avoid at least short term increases in unemployment which would otherwise result. Nor is there anything in the monetarist models of which we are aware which would suggest that the monetary authorities would systematically validate "government push" pressures emanating from budget deficits, but not "cost push" pressures emanating from wage or import price increases. (These questions concerning the behavior of the monetary authorities also should be logically separable from the disputes between monetarists and Keynesians about the behavior of the private sector in response to variations in monetary policy.)

Thus, for example, a finding that cost push inflation has been important in the sense of having been a major cause of more rapid monetary expansion would not be inconsistent with monetarists' beliefs that incomes policies have little effectiveness, either because the latter do not work when they are actively imposed, or because when they are removed there is a wage and price surge that calls for monetary accommodation. Such findings, however, would not support the antimonetarist institutional wage push view that tight monetary policies are ineffective in slowing down the rate of inflation.

A Look at the Evidence: Both Wage Push and Budget Deficits Can Be Important

What seems to have been the case in the United Kingdom and Italy? As is indicated in Charts 1 and 2, increases in the budget deficit do tend usually to be associated with higher rates of monetary expansion, but so do wage increases. Neither relationship is tight enough that one could look at the charts alone and discern whether wage push factors or budget deficits were a more important explanation of the increase in the rate of monetary expansion over the past two decades.

CHART 1

CHANGES IN NARROW MONEY STOCK (—) VERSUS
GOVERNMENT DEFICIT (...) AND PERCENTAGE CHANGE
IN WAGES (---) FOR THE UNITED KINGDOM

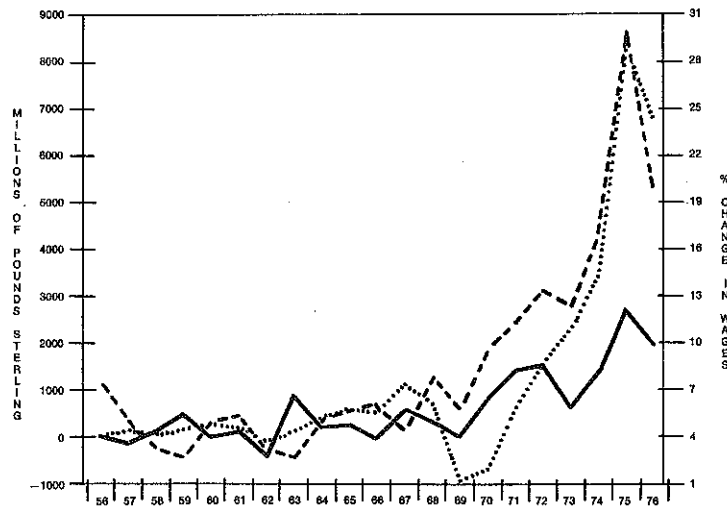
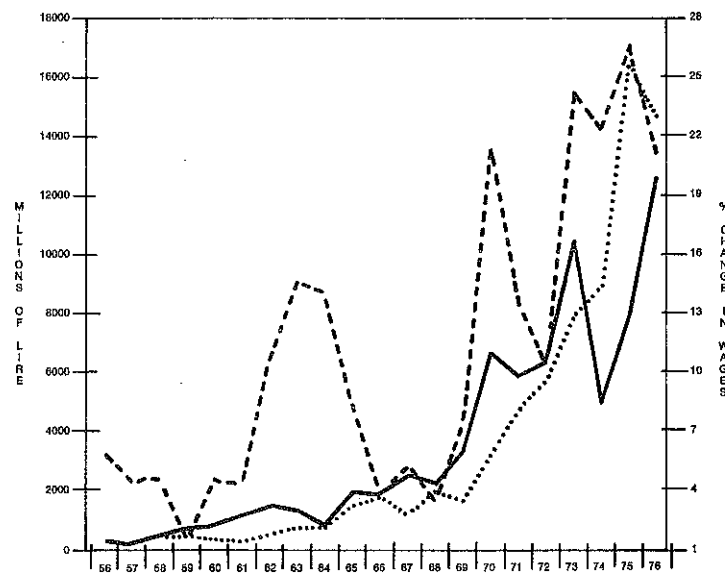


CHART 2

CHANGES IN NARROW MONEY STOCK (—) VERSUS
GOVERNMENT DEFICIT (...) AND PERCENTAGE CHANGE
IN WAGES (---) FOR ITALY



Formal statistical analysis can allow us to discriminate more finely than is possible just from viewing charts, but it does not guarantee that we will find clear-cut results. As part of a large study now in progress on the causes of monetary growth for the major industrial countries, we have estimated a number of equations for the growth of the money supply as a function of several variables which are frequently offered as major "causes" of inflation.⁶ Specifically we considered the following variables:

- 1) the budget surplus or deficit (Parkin's government push hypothesis);⁷
- 2) the rate of industrial wage increases (the wage push hypothesis);
- 3) the changes in international reserves (the hypothesis that balance of payments surpluses have been a major cause of monetary expansion);
- 4) the excess of import over domestic price increases (the import price push hypothesis emphasized by both Hicks and Kahn

⁶ These variables may not serve as expressly formulated operating or intermediate targets for monetary policy, even though certainly these operating targets may be related to them. For a discussion of more explicit operational targets, see VICTOR ARGY, "An Evaluation of Financial Targets in Six Countries," in this *Review*, March 1974, pp. 28-50. For references to the literature on estimating monetary authorities reaction functions see RICHARD MARSTON and RICHARD HERRING, *National Monetary Policies and International Financial Markets* (Amsterdam: North Holland, 1976). More recently a reaction function approach, similar in inspiration, but using a somewhat different methodology than our study, was taken by R. J. GORDON, "World Inflation and Monetary Accommodation in Eight Countries," *Brookings Papers on Economic Activity* 2, 1977, p. 409-477.

⁷ It is usually the concern over limiting interest rate increases that leads monetary authorities to finance budget deficits through money creation. On the operation of this mechanism in Italy see the recent discussion by Giacomo Vacaggio, "Monetary Policy in Italy: The Limited Role of Monetarism," in this *Review*, December 1977, pp. 346-347. In the recent debate on monetarism and inflation in the U. K. Lord Kahn indicated considerable skepticism about Parkin's emphasis on the role of budget deficits in explaining monetary expansion, but offered no alternative empirical analysis of his own. Kahn argued that "...the link between the size of the quantity of money is very erratic," (p. 9) and goes on to indicate that there are many other financial factors which may influence the money supply, for example, the state of the balance of payments, and that the monetary authorities have the power to keep the money supply from expanding in the face of a budget deficit if they so choose. We believe that Lord Kahn has misunderstood Parkin's argument, however, for we doubt that Parkin would differ with either of the latter two statements. We have interpreted Parkin's argument as concerning not the mechanical linkages between various financial and monetary variables, but rather the reaction function of the monetary authorities, i.e., what factors induce the monetary authorities to generate or permit an expansion of the monetary aggregates.

and in recent discussions of the so-called vicious circle of exchange rate depreciation and inflation).⁸

The basic form of the equation estimated was

$$[1] \quad \Delta M1 = \beta_0 + \beta_1 D + \beta_2 \dot{W} + \beta_3 \Delta R + \beta_4 (\dot{I} - \dot{C}) + u$$

where M1 is the narrow money stock, D the central government deficit, \dot{W} is the percentage change in the industrial wage index, R is the level of foreign assets held by the monetary authorities (in local currency), and I and C are the percentage changes in import prices and consumer prices respectively and u is a randomly distributed error term. The last independent variable was specified in this manner in order to capture imported price pressure in excess of domestic price trends.⁹

The results of such equations must be interpreted with some caution. Alternative specifications of the functional form of the equations (for example absolute or percentage changes in the money supply), the use of broad or narrow definitions of the money supply, alternative proxies for the hypothesis (for example, using import prices directly rather than the difference between import and domestic price increases) and the use of quarterly versus annual data were all found in various instances to strongly influence the results for particular countries.

Furthermore, such single equation estimations cannot speak to the issue of two-way causal influences. We may be fairly confident that a strong correlation between budgets and monetary expansion will not be due largely to the effects of the rate of monetary growth on the budget deficit, but we cannot be as sure that a high correlation on annual data between wage increases and monetary expansion is due primarily to monetary policy validating wage increases, rather than

⁸ For discussion of and extensive references to the literature on the vicious circle of exchange rate depreciation and inflation, and on the effects of balance of payments surpluses on monetary expansion, see THOMAS D. WILLET, *Floating Exchange Rates and International Monetary Reform* (Washington: American Enterprise Institute, 1977), Ch. 2; and RICHARD JAMES SWEENEY and THOMAS D. WILLET, "Eurodollars, Petrodollars, and World Liquidity and Inflation," in Karl Brunner and Allan H. Meltzer (eds.), *Stabilization of the Domestic and International Economy*, supplement to *Journal of Monetary Economics*, 1977.

⁹ These results are not substantially affected by using the percentage increase in import prices directly, rather than the difference between the import and consumer price index changes. The general nature of the results are also not affected by specifying the monetary variables as the percentage rate of growth rather than the absolute change in the money supply although the goodness of fit and degree of significance of both the budget deficit and wage variables fall a good bit.

wages reacting to monetary expansion. And it is quite possible that some portion of the positive correlation between budget deficits and the rate of monetary expansion has resulted from countercyclical policies. For example, to combat a recession, fiscal and monetary stimulus might be applied simultaneously. However, we did not find that using cyclically adjusted budget deficit figures greatly altered the results. We also have not attempted to distinguish between trend relationships and the relationships of deviations around trend versus changes in trends.

We would be the first to admit that our results are far from definitive. We do believe that they are of value, however. They do suggest the appropriateness of the emphasis placed by Parkin on budget deficits as a cause of monetary expansion. Across our sample of twelve industrial countries and a number of alternative specifications of the equations, we have found so far in our estimates many more cases of significant coefficients for budget deficits than for any of the other variables. However, we did find instances of significant coefficients for each of the variables, and for some countries, significant coefficients for the budget deficit were not found.

The results for Italy and the United Kingdom are particularly interesting because they are used to support either the wage push or government pull hypothesis if these variables are looked at separately. They thus illustrate the dangers of looking only at single variable explanations of the causes of monetary expansion.

Results for Italy and the United Kingdom

The British and Italian experiences have several elements in common. There are obvious elements of wage push in both. Owing to the institutional nature of the labor movement and the strength of the unions both are countries for which the potential for cost push pressures is unusually strong.¹⁰ Both nations have also had problems with an overextended public sector so that monetization of the public debt

¹⁰ For a recent discussion of the role of labor unions in Italian inflation, see FRANCO MODIGLIANI and E. TARANTELLI, "Market Forces, Trade Union Action, and the Phillips Curve in Italy," in this *Review*, March 1977, pp. 3-36.

On the U.K., see P. SARGENT FLORENCE, "Stagflation in Great Britain: The Role of Labor," in Gardiner C. Means, et al., *The Roots of Inflation* (Burt Franklin and Co., 1975), pp. 69-102.

may be relatively important compared to many countries.¹¹ Finally both are relatively open economies so that international monetary flows and import price validation hypotheses cannot be ignored. It should be noted that "international monetarism", often taken to encompass only the former, can also include the latter. Just as one can be both a monetarist and a believer in cost push pressures on the domestic side if such forces as rising wages require accommodation, one can be an international monetarist if validation of import prices is a major inflationary source.

Table 1 presents three equations each for the U.K. and Italy. Equations 1a and 1b for the U.K. and Italy respectively, include all four basic independent variables. Equations 2a and 2b drop the wage increase term from the specification and 3a and 3b drop the government deficit. Table 2 presents simple correlation matrices of the four chosen pressure variables over the twenty year interval focused upon here. One striking aspect of Table 2 is the relatively high correlation between the two included domestic pressures, the fiscal deficit and wage increase variable. The collinearity between these two series helps explain the results in Table 1.

When all four variables are included the wage term is statistically significant for both countries, but the deficit is not. The beta coefficients, reported to measure the relative importance of the independent variables in explaining variations in monetary growth, also indicates that the wage change is the most important among the four variables for both countries.¹² (For Italy, the beta coefficient on international reserves is almost as large, however.)

¹¹ For Italy, see F. COTULA and S. LO FASO, "The Public Sector Deficit in Italy: Its Causes, Financing and Policy Implications," in *Public Sector Deficits: Current Problems and Policies* (Basle: Bank for International Settlements, 1977), and for the United Kingdom see C. V. DOWNTON, "The Public Sector Deficit and Its Financing in the United Kingdom," *ibid.*

¹² Size of the slope coefficients cannot be taken as any measure of relative importance, since different dimensions of measurement obviously can distort these. Intuitively, the beta coefficients computed here attempt to measure the effect on money stock changes of an "equally likely" change in each independent variable in the specification. If d_w is in some sense the "typical" or representative change in W , for example, and if d_D is the typical change in D , then we might say reasonably that W is more important than D if $b_w d_w > b_D d_D$, where b_w and b_D are the estimated slope coefficients. Since sample variation is a measure of representative change in each series, we may compute the beta coefficient β_w as:

$$\beta_w = b_w (s_w / s_m)$$

where s_w and s_m are sample standard deviations of the wage change term and the dependent variable respectively. Likewise for the other independent variables. Beta coefficients are simply the slope coefficients in a regression of "standardized" varia-

TABLE 1

REGRESSION RESULTS

Dependent Variable = $\Delta M1$ (in local currency)
(Annual 1956-1976)

a. United Kingdom; b. Italy

Equation	Constant α_0	Budget Deficit α_1	Wage Increase α_2	International Reserves α_3	Import Prices α_4	R ²	D. W.	rho	S. E.
(1a)	-193.80 (-1.03)	.08 (.80) [.23]	83.91 (2.65)* [.72]	.18 (1.08) [.15]	-3.17 (-.34) [-.04]	.73 (11.74)*	1.98	-.21	411.6
(2a)	270.60 (1.82)	.29 (5.15)* [.85]		.10 (.63) [.08]	-1.30 (-.13) [-.02]	.65 (10.48)*	2.02	.23	464.3
(3a)	-298.93 (-2.26)*		107.10 (8.53)* [.92]	.12 (.79) [.10]	-3.83 (-.42) [-.05]	.73 (14.83)*	1.97	-.20	407.1
(1b)	211.51 (.16)	.18 (.90) [.25]	199.85 (3.06)* [.44]	.71 (4.01)* [.38]	-47.49 (-1.49) [-.19]	.85 (24.38)*	1.66	.72	1356.0
(2b)	1396.26 (1.42)	.50 (2.59)* [.67]		.56 (2.10)* [.30]	-21.25 (-.46) [-.08]	.78 (18.37)*	1.95	.55	1677.0
(3b)	762.37 (.48)		217.05 (3.69)* [.48]	.74 (4.91)* [.39]	61.66 (-3.13)* [-.24]	.86 (31.37)*	1.73	.83	1334.0

Equation: $\Delta M1 = \alpha_0 + \alpha_1 D + \alpha_2 W + \alpha_3 \Delta R + \alpha_4 I - \% \Delta C$

where: M1 = narrow money stock

D = government deficit (sign reversed)

W = index of manufacturing hourly wage rate

R = foreign assets of the monetary authorities (in local currency)

I = import price index

C = consumer price index

t or F statistics are given in parentheses (* indicates significant at 95% level); Beta coefficients are reported in brackets. Regressions reported are those after a first order rho transformation was performed to correct for serially correlated residuals; estimated rhos from this process are also reported.

Sources: *International Financial Statistics* for all variables except the wage index which was taken from OECD Main Economic Indicators.

TABLE 2
CORRELATION MATRICES OF PRESSURE VARIABLES
(Annual; 1956-1976)
United Kingdom

		(1)	(2)	(3)	(4)
(1)	D	1.00			
(2)	W	.90	1.00		
(3)	ΔR	-.33	-.19	1.00	
(4)	(I-C)	.18	.20	-.10	1.00
<i>Italy</i>					
		(1)	(2)	(3)	(4)
(1)	D	1.00			
(2)	W	.79	1.00		
(3)	ΔR	.43	.21	1.00	
(4)	(I-C)	.35	.45	.19	1.00

When the wage term is dropped in 2a and 2b, however, the budget deficit does display a quite significant t-statistic and the beta coefficient rises markedly.¹³ In 3a and 3b, dropping the deficit does not change overall results so drastically. Although the t-statistic on wages is higher in 3a for the U.K., and the beta coefficient is somewhat larger, the results on wages for Italy are about the same. For both countries, the overall proportion of variations in the dependent variable explained, measured by R^2 , is practically the same when the deficit is dropped as when it is included. When these variables are looked at in combination, however, such clear-cut and conflicting results disappear. There is a strong presumption that both factors have been important.

On the basis of these statistical results alone, it would appear that wage push has been the more important of these variables for both countries. We doubt that our statistical procedures are robust enough to allow us to argue such a conclusion with great confidence, but we do believe that they do strongly establish the case that both

bles. For further development, see A. S. GOLDBERGER, *Econometric Theory* (New York: John Wiley and Sons, 1964), pp. 197-198.

¹³ An illustration of how beta coefficients can yield different results than the straightforward slope coefficients can be seen in 2a and 2b. The dependent variable and the government deficit term in both regressions are measured in units of local currency, so that one might think superficially that the slope coefficients are comparable. The estimated coefficient on the deficit for the U.K. in 2a is lower than that for Italy in 2b, but the beta coefficient is higher.

variables can be important explanations of monetary expansion. Monetary authorities strategies often display a great deal of variability over time. Thus we would not be surprised if during some episodes greater weight is given to one consideration and during other episodes to another. Given the high degree of collinearity between the wage and budget variables for both countries, we expect that attempts to better explain the relative importance of these variables will have to rely on careful judgmental analysis of monetary authorities behavior on an episodic basis.

The collinearity that exists between the two domestic factors included here is not a problem for the other pressure variables. The two international variables perform poorly, and beta coefficients generally are rather low, except for international liquidity effects in Italy. This provides some evidence on the monetary openness of Italy relative to the U.K., indicating either that the former country is less able to sterilize reserve inflows or that it allows the balance of payments position to dictate monetary policy to a greater extent.¹⁴ The beta coefficient calculated for international reserves in equation 1b indicates that such foreign monetary effects rank next to the wage accommodation variable in importance.

The import price pressure variable is never significant with the correct sign. It always enters negatively in every equation in Table 1, and in the third regression for Italy it even becomes significant with this sign.¹⁵ The generally poor performance of this variable would

¹⁴ These results are roughly consistent with other studies of the degree of monetary sterilization in these two countries. Norman Miller (in "Sterilization and Offset Coefficients for Five Industrial Countries and the Monetary Approach to the Balance of Payments," consultant paper to U.S. Government Interagency External Research Group, October 1976) finds a sterilization coefficient not significantly different from minus unity for the U.K., indicating complete ability to sterilize. V. ARGY and P. KOURI (in "Sterilization Policies and the Volatility of International Reserves," in Robert Z. Aliber, ed., *National Monetary Policies and the International Financial System*, Chicago, 1974) estimate a sterilization equation for Italy but are unable to reach definite conclusions about ability to sterilize. Our results do not provide conclusive proof of inability to sterilize reserve flows in Italy either. But at least a relatively strong correspondence between official foreign asset changes and a broader monetary aggregate is found.

¹⁵ Some may suggest a possible simultaneity bias here since changes in the money stock could perhaps influence domestic prices, proxied here by changes in consumer prices, in the concurrent period. Since the consumer price index change enters negatively in this composite term a positive relationship between the dependent variable and consumer prices could cause the overall sign on the fourth variable to be negative. Results, however, are not substantially affected by using the percentage increase in import prices directly rather than the difference between the import and consumer price changes.

This does raise generally the question of adequacy of single equation estimations in an area that is obviously complex and in which two-way causal influences

indicate that this foreign source has not on average been so important for Italy or the United Kingdom. Such a finding is particularly interesting for these countries in light of the frequency with which it has been argued that both have been major sufferers of imported inflation.¹⁶

Concluding Comments

While it is possible that either one or both of the high correlations for the deficit and the wage increase could be almost entirely spurious, so that monetary expansion in Italy and the United Kingdom has really not depended significantly on either of them, we think that this is extremely unlikely.

Our findings on the general strength of the budget deficit-monetary expansion linkage in other countries mirrors these specific findings presented here. On the other hand because of the structure and nature of U.K. labor unions and wage indication in Italy, these were two of the countries for which we originally anticipated that we would

can be common. We may be fairly confident that a strong correlation between budgets and monetary expansion will not be due to the effects of the rate of monetary growth on the budget deficit, but we cannot be as sure that a high correlation on annual data between wage increases and monetary expansion is due primarily to monetary policy validating wage increases, rather than wages reacting to monetary expansion. This particular reverse causation channel is likely to be important more in the context that monetary expansion influences inflationary expectations and therefore raises wage demands; the actual influence of excess monetary demand on wage rates and other prices comes only via a documented lag that may extend to several years.

¹⁶ Such imported inflation due to exchange rate depreciation has been used as an underpinning for the "vicious circle" argument, even though the monetary validation linkage sometimes is not emphasized. This is especially true for Italy. See C. M. PIERUCCI and C. TRESOLDI, *Modello dell'economia italiana* (II edizione - M2B1), "Il settore dei prezzi interni: aspetti istituzionali, schemi di riferimento e verifica empirica," Banca d'Italia, December 1976, for the argument that an (exogenous) exchange rate depreciation is more inflationary than an equal (exogenous) wage increase, since the exchange rate change affects both wages and general prices and also because business material costs exceed wage costs. The problem of whether the exchange rate causes domestic inflation or vice versa has been tested by G. FALCHI and M. MICHELANGELI ("IMF Surveillance of Exchange Rates and the Problem of the Vicious Circle," Banca d'Italia Research Office, April 1977) who find that a vicious circle may apply to Italy but not to other countries. For arguments supporting the inflationary impact of import prices on the U.K. economy, see Sir JOHN HICKS, "What is Wrong with Monetarism," *Lloyds Banks Review*, October 1975, pp. 1-13 and MARCUS MILLER, "Can a Rise in Import Prices be Inflationary and Deflationary," *American Economic Review*, September 1976, pp. 501-519. JOHN WILLIAMSON and GEOFFREY WOOD, "The British Inflation: Indigenous or Imported," *American Economic Review*, September 1976, pp. 520-531, find on the other hand that U.K. inflation has been of domestic rather than foreign origin, generally supporting findings here.

be more likely to find evidence of monetary validation of wage push pressures. Our findings do strongly suggest that the pressures for rapid monetary expansion in the U.K. were predominantly domestic rather than international in origin, and to a lesser extent also for Italy. We should stress, however, that our regressions refer to the average strength of relationships over the past two decades. Clearly the large increases in international commodity prices, especially oil, contributed significantly to inflationary problems in Italy and the United Kingdom and, indeed, for the whole world in the 1970's.

While we are quite sympathetic to monetarists critiques of many aspects of the "wage-push view" of inflation we have argued that there is another aspect of the wage push view, the influence of wage increases on monetary expansion, which cannot be rejected from the evidence we have considered. It should be stressed, however, that a finding that wage increases have had a significant impact on the rates of monetary expansion and inflation does not tell us whether such a policy of monetary accommodation was wise or not. To answer this question one must return to the more traditional areas of debate among macroeconomists reviewed in the first portion of this paper.

We do not ourselves have strong views about the medium term relationships which should influence such policy decisions. We are confident, however, that if governments and their advisers do not adopt at least a medium term rather than short term view, the chances of bringing inflation under control are slim.¹⁷ In the current inflationary environment we cannot safely rely upon the old cost push-demand pull distinction as a guide to macroeconomic policy.

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¹⁷ Despite the readily apparent costs of short time horizon in macroeconomic decision making it is an open question whether the adoption of longer time horizons will prove politically feasible. One optimistic sign in this regard, however, is that a number of countries have moved in recent years toward the achievement of announced monetary growth targets, a move that could take them away from a focus on the pressures included here. Italy and the United Kingdom are not good examples, although Britain has had a ceiling for domestic credit and a range for its broad money stock imposed by recent IMF agreements. GIACOMO VACIAGO ("Monetary Policy in Italy: the Limited Role of Monetarism," in this *Review*, December 1977, pp. 333-348) has discussed the fact that for Italy the trend has been away from such a growth target strategy and emphasized the unavoidable passivity of the monetary authorities in an economy saddled with growing fiscal deficits and increased indexation as well as external constraints. On the trend toward greater use of monetary targets and arguments that this does not necessarily result from a major switch toward monetarism by central banks, see W. D. McCLAM, "Targets and Techniques of Monetary Policy in Western Europe," in this *Review*, March 1978, pp. 3-27.