

The Demise of "Demand-Pull" and "Cost-Push" in Inflation Theory

Until the middle-to-late 1960s, the post-war controversy surrounding the nature and causes of the current inflation centred upon the competing explanations offered by demand-pull and cost-push theorists. Over the course of the past decade, however, this dichotomisation of the inflationary process has increasingly fallen out of favour in economics. The purpose of this paper is to chart the major theoretical developments in inflation analysis that have contributed to the demise of this crude distinction between demand and cost inflation.

I. The Basic Arguments

Among demand-pull theorists the general consensus was that the primary cause of the current inflation lay in persistent upward shifts of the aggregate demand schedule against the relatively more stable aggregate supply function. There resulted an inflationary gap of aggregate demand over supply, such that the price level was continuously "pulled" up by the normal operation of market forces. The source of the current inflation, therefore, was attributed to (movements on) the demand side of the aggregate goods market equilibrium condition. Beyond this broad measure of agreement, however, demand-pull theorists differed as to the perceived source of the disequilibrium in the composite goods market. Keynesian oriented demand-inflation theorists pointed to persistent upward surges in the autonomous components of aggregate expenditure (investment, government spending, and the net trade balance on the balance of payments current account) in a post-war market environment dominated by governmental commitment to "full employment" policies. Demand-inflation theorists of quantity theory persuasion, on the other hand, argued

that the inflationary gap in the goods market resulted from a prior disequilibrium in the money market. On their interpretation, the indulgence by post-war governments in expansive monetary policies — which they acknowledged largely to stem from full employment policies — had led to the accumulation of excess cash balances, and increased expenditure from these balances as individuals sought to restore the desired composition of their asset portfolios. This expenditure out of excess real money balances was seen as filtering through to the composite goods market via an array of transmission channels, thereby “pulling” up the price level and reducing the real value of cash balances towards equilibrium. But this area of disagreement was clearly secondary to the more important consensus that existed as regards the primacy of excess aggregate demand in the inflationary process.

Cost-push theorists argued to the contrary that the source of the current inflation lay in shifts of the aggregate supply schedule. While accepting that some of the contemporary inflation might be attributable to demand side elements, and even acknowledging that previous inflationary episodes might have a predominantly demand-pull composition, adherents of the cost-push view emphasised that the current inflation — explicitly termed the “New Inflation” in some treatments (*e.g.*, Bach, 1973, Jones, 1973) — differed from previous inflations in being primarily the result of “spontaneous” (*i.e.*, non-demand induced) surges in one or more elements of production costs. Extending beyond this basic consensus there was, as with demand-pull theory, some divergence of opinion regarding the principal “culprit” among the elements of production costs responsible for the continuous upwards push on prices. Some emphasised union wage rates (the wage-push model), others the target rate of return of corporations (the profits-push model), others still the impact of changes in the domestic currency price of foreign imports, and, in particular, raw materials (the import-price-push model), and yet others of eclectic persuasion allowed that all such sources might be operative (the “general” cost-push model). Again, whatever the precise cause, there was congruence of opinion that the origins of the contemporary inflation process lay in a continuous upward thrust of costs leading, via the induced displacement of the aggregate supply curve, to a persistent upward thrust or “push” on the general price level.

Many economists would now interpret the above dichotomy either as an invalid or spurious one, or as constituting little more than an exercise in semantics. Four major theoretical developments have contributed to this re-appraisal and rejection of earlier thinking: the introduction of price expectations in inflation analysis; the repeal of the assumption that economic agents are price-takers with the evolution of the “new microeconomics”; the recognition of the world dimension of the current inflation and the concomitant development of inflation analyses from a world rather than a national/domestic perspective; and, finally, the (clearer) recognition of the necessity of monetary “validation” or “accommodation” in modern representations of the process of cost-inflation. We next proceed with an examination of each.

II. The Introduction of Price Expectations to Inflation Theory

In the two decades following the war, cost-push theorists seized upon a phenomenon that has been variously labelled “stagflation” and “inflationary recession” in prosecuting their continuing debate with demand-pull theorists. During the downturns in aggregate demand that have occurred in western economies since the war, nominal wages and prices have continued to rise; a phenomenon of inflation twinned with recession, or “stagflation”. Cost-push theorists argued that this concurrence demonstrated that money wages and prices were not determined by — or at the very least reacted only very sluggishly to — variations in aggregate demand and, by extension, that the demand-pull interpretation of the inflationary process was fallacious. Further ammunition was supplied to the cost-push armoury by the upward/outward drift of the Phillips curve in the latter half of the 1960s in all western economies. The emergence of “wage explosions” in a number of such economies enabled cost-push theorists to claim that these developments represented a wage-push phenomenon not captured in the essentially demand side interpretation of the Phillips curve contained in Lipsey’s (1960) seminal treatment.

The two phenomena in question, although related, do differ and their distinguishing characteristics are best pursued diagrammatically. The force of the first criticism — the stagflation

phenomenon — relates to the *slope* of the Phillips curve. Cost-push theorists capitalized on the implication of the demand-pull analysis that wage (and thus price) change was responsive to variations in aggregate demand. In other words, the Phillips relation was perceived to be (relatively) steeply sloped, as shown by the C_1C_1 curve in *Figure 1*; whereas the stagflation phenomenon, according to cost-push theorists, pointed to an observed Phillips relation that was (nearly) flat, as shown by the curve C_2C_2 in *Figure 1*. Apparently, wage and price inflation was (now) unrelated to the conventional excess demand proxy, namely the percentage level of unemployment (Phillips, 1958; Lipsey, 1960).

Figure 1: THE SLOPE CRITICISM OF THE DEMAND-PULL VIEW OF THE PHILLIPS CURVE

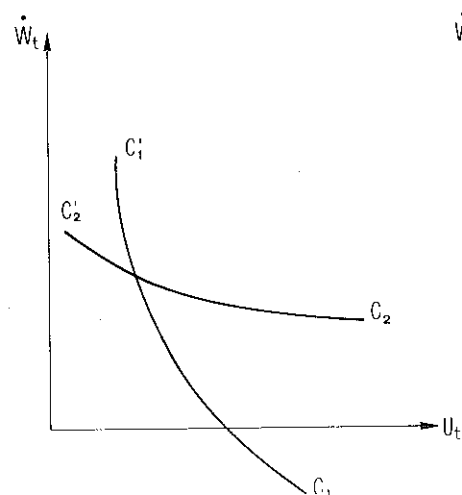
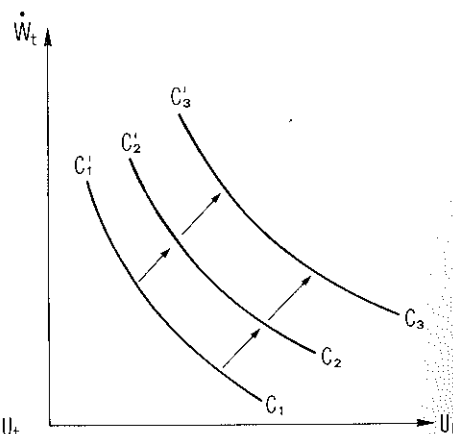


Figure 2: THE 'DRIFT' CRITICISM OF THE DEMAND-PULL VIEW OF THE PHILLIPS CURVE



Key: W_t = the percentage rate of growth in money wages in period t .
 U_t = the percentage labour force unemployment rate in period t .

The second criticism — the upward/outward drift of the inflation/unemployment relationship — relates to the *position* of the Phillips curve. The thrust of Phillips' (1958) own empirical investigation was to suggest that the curve was essentially long-run stable, although he allowed that the position of the curve could shift *over a cycle*, according to the state of demand expectations. Lipsey's (1960) theoretical refinement of the Phillips

relation likewise allowed that the curve could shift over the cycle (and, by extension, secularly) in response to changes in the structure/dispersion of unemployment in the economy. Neither account seemed to explain the outward drift of the Phillips curve in the mid-1960s onward, given the evidence on the dispersion of unemployment and the state of the cycle. This phenomenon again permitted cost-push theorists to mount an attack on the demand-pull interpretation of events: the position of the Phillips curve was "drifting out" secularly, from C_1C_1 through C_2C_2 to C_3C_3 (etc.), as shown in *Figure 2*, for reasons unrelated to those envisioned by Phillips and Lipsey.

The force of both criticisms was much attenuated, if not entirely defused, by Friedman's (1966, 1968) introduction of the concept of price expectations, and the related concept of wage expectations (Phelps, 1968), to inflation theory.¹ The unifying theme underpinning both developments was the basic theoretical observation of orthodox micro-economics that labour (and goods) market participants are concerned not with the nominal magnitude of wages but this value *in relation to* money prices and other money wages; that is, with the real and relative dimensions of wages. Furthermore, the inter-equilibrium market adjustment hypothesis of standard price theory (the so-called Walras-Hicks-Samuelson postulate, or "Law of Demand and Supply"), which Lipsey (1960) had sought to employ in producing a theoretical underpinning of the Phillips curve, in fact states that the excess demand in a market determines the rate of change of the *relative* price in that market and not the rate of change of the *absolute* price assumed by Lipsey.

The Phillips-Lipsey approach was to relate the proportionate rate of change in nominal wages to excess demand, which was in turn functionally related to the unemployment rate. Thus there was said to exist a unique (inverse) relation between nominal wage change and the level of unemployment, provided that the latter remained a consistent measure of excess demand through time. According to the basic postulates of micro-economic theory,

¹ Although often considered to be a new departure in inflation theory, this development in fact represented a re-introduction of ideas formulated much earlier, notably by von MISES (1953) and LERNER (1949).

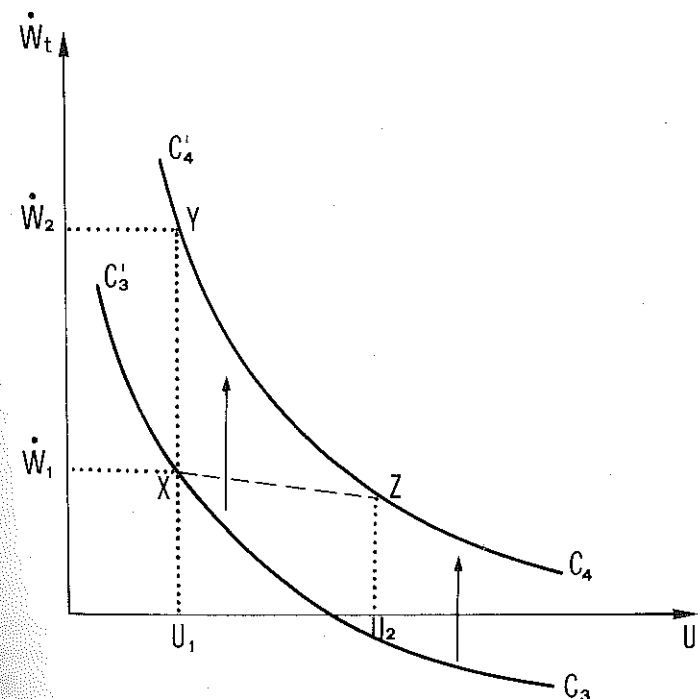
however, the correct specification of the Phillips relation points to an association between the proportionate rate of change in *real* wages and excess demand, linked as before to the level of unemployment. Alternatively put, nominal wage changes in period t are functionally related to excess demand in that period *plus* the contemporaneous rate of price inflation. Moreover, allowing the fact that the current rate of price inflation (\dot{P}_t) cannot be known in advance of the wage settlement for period t , labour market participants have of necessity to formulate expectations of the value of that variable (\dot{P}_t^e) in reaching a wage settlement. These expectations may plausibly be viewed as being conditioned by past inflationary experience or, somewhat more formally, as being based on a distributed lag of past experienced inflation rates.

The development of this expectations-augmented Phillips curve suggested an explanation of the phenomena of stagflation and Phillips curve "drift" alternative to that offered by cost-push theorists. Thus the drift phenomenon could be explained as a consequence of rising expectations of future inflation stemming from higher experienced rates of inflation. The new interpretation of inflationary recession afforded by the expectations-augmented Phillips curve is a little more involved, and is again treated diagrammatically. After *Figure 3*, assume that the economy is currently at point X on curve C_3C_3 , corresponding to an unemployment rate of U_1 and a wage inflation rate of \dot{W}_1 . Assume further that the actual rate of inflation has been rising in preceding periods (or, alternatively, that the average of past inflation rates is rising) and that the current period is followed by an interval of sharp deceleration in the rate of growth of the money supply. The past experience of a rising rate of inflation would lead, via the synthetic price expectations generating mechanism, to an upward revision of inflationary expectations and hence to an upward displacement in the position of the Phillips curve, to (say) C_4C_4 . If the monetary authorities were to attempt to hold the unemployment rate at U_1 , then the rate of wage inflation would rise from \dot{W}_1 to \dot{W}_2 . However, the assumed deceleration of monetary growth would move the economy down the new curve from position Y to (say) position Z. Thus the net effect of escalating price expectations *and* monetary deceleration would be to move the economy from X to Z. Joining these two points (as shown by the dashed line in the figure) yields an *apparent* trade-off between the

discommodities of inflation and unemployment that is very flat; such that a large rise in unemployment has been accompanied by a very modest moderation of the rate of inflation. As Gordon and Hynes (1970, p. 391) put it, the concatenation of rising inflation expectations and monetary deceleration will

"... generate evidence that could mislead the eclectic observer to perceive the causal mechanism of inflation as one of cost-push... the tightening of monetary policy... will appear to be ineffective against price increases that are, in fact, simply delayed responses to the past increase in aggregate demand".

Figure 3: THE APPARENTLY FLAT PHILLIPS CURVE PRODUCED BY THE COMBINATION OF ESCALATING INFLATION EXPECTATIONS AND MONETARY DECELERATION



Subsequent to this theoretical (re-) introduction of price expectations effects to inflation analysis, attempts were made to estimate expectations-augmented Phillips curves so as to assess the empirical relevance of "adding on" a price expectations variable to the naive Phillips wage change/unemployment model. Some earlier studies of this sort (e.g., Solow, 1968; Gordon, 1971) found that although the coefficient of the price expectations term was statistically significant and of the right sign, it was (a little) less than unity. However, subsequent tests conducted with larger runs of data were unable to reject the hypothesis that the coefficient was equal to unity, or suggested that it might vary in response to the inflationary environment, reflecting differential costs of adjustment to inflationary situations of varying intensity and persistence (see, for example, Eckstein and Brinner, 1972; Gordon, 1972).

Whatever the precise magnitude of the coefficient, the increasing theoretical and empirical recognition of the role of price expectations in inflation led many economists to conclude that cost-push inflation was an "illusion" (e.g., Gordon and Hynes, 1970, p. 390), and that the phenomena of stagflation and Phillips curve drift were better understood as the result of price expectations effects.

The introduction of price expectations to contemporary inflation analysis vitiated the distinction between demand-pull and cost-push in yet a further important manner. According to the new analysis, all economic agents — firms, consumers, employees, etc. — formulate expectations of inflation. These expectations condition both the demand and supply sides of goods and factor markets. Moreover, there is the implication that aggregate demand and aggregate supply are interdependent, because any change in aggregate demand will ultimately, through its effect on actual and expected inflation, influence the position of the aggregate supply schedule, and *vice-versa*. Thus Laidler and Parkin (1975, p. 742) were to conclude, in their extensive survey of modern inflation analysis, that:

"It is helpful to distinguish between supply-side and demand-side factors when analysing a single micro-market, but the interdependence of aggregate demand and supply is a central feature of modern macro-economics. Since inflation is a phenomenon affecting the whole

economy, we find the cost-push/demand-pull distinction analytically unhelpful..."

The overall impact of the "expectations revolution" in inflation theory was to suggest to many economists (e.g., Laidler and Parkin, 1975, p. 743) that a more relevant and useful distinction than demand-pull vs. cost-push was that between equilibrium or fully-anticipated inflation (where $\dot{P}_t = \dot{P}^e_t$) and disequilibrium or imperfectly-anticipated inflation ($\dot{P}_t < \dot{P}^e_t$).

III. The Repeal of the Price-Taker Postulate in the Analysis of Competitive Markets

Another major theme developed by proponents of the cost-push school in the 1950s and 1960s concerned the inconsistency between the assumptions underlying the orthodox micro-economic theory of competitive markets and the realities of wage and price formation in the contemporary economy. The orthodox analysis — both in the form of the partial equilibrium model of perfect competition and the Walrasian general equilibrium model — assumed that all economic agents were price takers, and lacked the power to vary the terms and conditions at which they could sell or purchase. All market participants had to accept the price set by "the market" (in the perfect competition model) or by the "secretary of the market" (in neo-Walrasian treatments of competitive exchange markets). Cost-push theorists argued that such a postulate was clearly contradicted by the realities of modern "institutionalised" labour and product makers, in which unions and enterprises possessed the market power to determine wages and prices to some degree, and to create wage and price surges. The real world, in other words, was one of price-makers and not one of price-takers. The theory of cost inflation built on this insight, and laid claim to realism on that basis.

However, the development of the so-called "new microeconomics" in the past decade (Phelps *et al.*, 1970) has served to defuse this particular line of criticism. In general terms, the new microeconomics models of competitive markets removed the assumption that all transactors had perfect information of price

and wage vectors (costlessly provided by the market auctioneer in the neo-Walrasian version of orthodoxy), and instead had themselves to bear the costs of information production and market adjustment. More specifically, one branch of the new microeconomics literature, exemplified by several of the contributions in Phelps *et al.*, analyses a model of wage and price formation against the backdrop of costly and imperfect information. In this variant, each firm is seen as setting — “making” — prices and wages, each having a degree of “dynamic” monopoly and monopsony power in the product and labour markets respectively, arising from the existence of imperfect information on the other side of the market about opportunities elsewhere.²

This new theoretical development had the side effect of further eroding the distinction between demand inflation and cost-push inflation. Hitherto, as visualised in the tradition of Keynes of the *Treatise* (Keynes, 1930, pp. 166-168) and Hansen (1951, pp. 14-18), demand-pull analysis dealt with inflation in a world of price takers, and cost-push with inflation in a world of price-makers. The distinction evaporated because the new microeconomics variant demonstrated that, even in a world of atomistic competition, all firms were price-makers in a regime of imperfect and costly information acquisition. Thus, as one of the major figures in the development of the new microeconomics was to argue, “The customary attribution of cost inflation to the existence of... large economic units is unnecessary and insufficient” (Phelps, 1970, p. 126). Likewise, Gordon and Hynes (1970, p. 392) were led to claim that the phenomenon of “administered” wages and prices

“... rather than being associated with some static measure of monopoly power involving the slope properties of demand and cost functions is more fruitfully linked to the degree of uncertainty and the resulting problems of learning that face the decision maker”.

Here again, then, a new analytical development evolved to cut the ground from under the demand-pull/cost-push distinction by

² The other branch of the new microeconomics or microfoundations literature assumes price-taking households and firms. But Phelps' own approach of modelling firms as price setters seems at once realistic and, as the subsequent development of the so-called “new-new” microeconomics (GORDON, 1976) was to show, to offer insights into short-run dynamics.

showing how supposedly cost-push phenomena could be squared with the existence of a demand inflation.

IV. The Recognition of the World Dimension of the Current Inflation

Prior to the late 1960s, economic commentators and analysts alike had considered inflation primarily from a domestic perspective; the implication being that the ongoing world inflation was but an aggregate reflection of national inflations, of possibly diverse origin. Thereafter, however, there was to be an increasing awareness among economists of inflation as a worldwide phenomena, and of the interdependent international character of the contemporary problem of inflation (e.g., Meiselman and Laffer, 1975; Krause and Salant, 1977).

In this developing global view of inflation, the domestic focus of earlier inflation research gave way to a visualisation of a world economy characterized by integrated capital and product markets, with a fixed exchange rate system (up until 1973) that operated as the international equivalent of a common currency. In consequence, price level developments in separate nations were envisioned as intimately linked by capital flows and the dynamic of international competition in just the same way as inflationary developments in different regions of a nation state are linked by the use of a common currency.

This development was closely related to the erection of the so-called “monetary approach” to the international generation and transmission of inflation, notably in the treatments of Mundell (1971), Johnson (1973) and Laffer (1975), *inter al.* As with the new microeconomics, the monetary approach is not a singular, monolithic theory; rather, it encompasses a number of related models and analyses.³ Common elements are to be found in the form of three principal themes. First, all models incorporate a version of the so-called “monetary theory of the balance of payments”, which views the balance of payments — under fixed exchange rate regimes — as a monetary phenomenon and also stresses its direct

³ For a summary of the models in question, see SWOBODA (1977).

relation to the domestic money supply, international reserves being one component of high-powered money (or the monetary base). Second, all models include an international version of the quantity theory of money, emphasizing the dependency of the rate of growth of nominal income and the price level in the world economy as a whole — again, under fixed exchange rates — on the rate of growth of the world stock of money. A third hallmark of the monetary approach to the analysis of world inflation has been the increasing reference in this literature to the role of international goods arbitrage in establishing a direct linkage of national inflation rates, as contrasted with the role of the classical price-specie flow mechanism.

An important implication of this development, at least in the approach articulated by Johnson (1973), is that it reverses the direction of causation between money supply and money income as depicted in earlier, closed-economy quantity-theoretic analyses of inflation. For example, in Friedman's (1968, 1970, 1971) analysis, variations in the rate of growth of the money supply give rise to variations in the rate of growth of nominal national income, and thus to changes in the rate of inflation. In contrast, the monetary approach implies that the inflation rate is given *exogenously* by the world rate of inflation, with the domestic stock of money responding *endogenously* to changes in nominal national income — at least for the case of a small-to medium-sized economy operating under a fixed exchange rate system.

This global monetary approach to inflation was to provide a further rationale for attacking and ultimately rejecting the demand-pull/cost-push dictomy of earlier thinking on inflation. First, it offered an explanation of the international linkage and correlated movements of national inflation rates that was clearly lacking from earlier treatments of inflation, implicitly premised as these were on domestic factors (Zis, 1976). No longer was world inflation to be regarded as a simple aggregate of separate inflations, reflecting varying demand and cost influences in different nations. Second, and related, it cast doubt in particular on the supposedly autonomous nature of purportedly domestic cost-push phenomena such as "wage explosions". As the late Harry G. Johnson — a stern critic of the notion of cost-inflation on these grounds — was to argue, cost-push mechanisms were inadequate explanations of inflation because they "assign causality to the

mechanisms by which more fundamental causes operate to diffuse the world inflationary process" (Johnson, 1972a). Such notions could "play no part whatsoever in the problem" (Johnson, 1972b, p. 310) of analysing world inflation, since they assigned causality to what was but an endogenous response process to international economic developments.⁴

The demise of fixed exchange rates has not served to deflect the growing recognition of the international character of contemporary inflation because of the realities of managed exchange rates and internationally traded goods. The old terminology of domestic demand and cost elements in inflation has, therefore, slipped further into oblivion.

V. The Recognition of Monetary Validation in Cost-Push Analysis

Contrary to received wisdom, as this is expressed in many of the standard inflation texts, there is nothing intrinsically novel in cost-push notions of inflation. As evidenced by Humphrey (1976), cost-push analyses of inflation proliferated in the 1800s and early 1900s and, although not then known by that name, were the subject of some dispute among neoclassical monetary theorists such as Fisher and Wicksell.

What does differentiate the more recent genre of cost-push from its precursor is the clearer recognition in the contemporary literature of the necessity of the *validation* or *accommodation* of a cost-push by the monetary authorities, if that "push" is to generate ongoing inflation and not simply to result in resource unemployment.

The classic early post-war statements on the theory of cost-push inflation by Reder (1948) and Holzman (1950) clearly assumed that cost-push was accommodated by the monetary authorities. Hicks (1955) described this money supply postulate in the graphic phase "Labour Standard"; in his view, it was now the money wage level that determined the money supply and not the reverse. However, it is also generally true that subsequent cost-push analyses of 1950s and 1960s vintage tended to neglect the

⁴ See also the remarks in JOHNSON (1972c).

monetary environment and to concentrate upon the dynamics of wage-wage or wage-price spirals. Furthermore, there were other voices in the cost-push camp, such as that of Kahn (1958), which, while not denying "some" influence of the money supply, tended to belittle its importance.

However, with the enormous growth in the empirical literature on the effects of money on economic activity and the price level in the 1960s and 1970s, it became increasingly clear that the importance of the role of money in the inflationary process could not be denied. Even Kahn (1976, p. 6) was now to announce:

"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".

By the 1970s, therefore, the postulate of an accommodative monetary policy had become a clear and accepted element in cost-push theorizing on inflation. Yet this very development was to further undermine the validity of the demand-pull/cost-push dichotomy. For if all sides were now agreed that an expansion of the growth rate of the money supply (relative to the growth of real output) was a necessary condition for an ongoing secular inflation, what basis remained for differentiating between the two categories of cost-push and demand-pull? Thus Brittan and Lilley (1977, p. 46) were to argue that "there is little or no need to take sides in what is little more than a semantic debate". Gordon (1976, p. 188) likewise concluded in his broad survey of contemporary developments in inflation theory that:

"The distinction between cost-push and demand-pull [made in the 1950s and 1960s] was largely spurious, because a one-shot spontaneous wage- or profit-push could only raise the *level* of prices, not permanently increase their *rate of change*, unless accompanied by faster monetary growth".

Thus the general thrust of such arguments was that Friedman's (1966, p. 18) dictum that "inflation is always and everywhere a monetary phenomenon" had been conceded by the recognition in contemporary cost-push analysis of the necessity of monetary accommodation. In consequence, the dichotomy between demand-pull and cost-push may be said to have finally fallen to the ground.

VI. Concluding Comments

This article has elaborated some four major theoretical developments that have served to defuse a major post-war controversy in economics, focusing upon the competing explanations of the inflationary process offered by demand-pull and cost-push theorists. In the light of these developments, it may reasonably be concluded that the old dichotomy between demand and cost inflation is an unfruitful one.

It will come as no surprise that debate and division among economists as to the causation and explanation of inflation has not dissolved with the gradual erosion of demand-pull and cost-push notions. A new schism has opened up as a direct result of the old controversy, albeit transmuted in such a way as to negate the ground rules of that earlier discussion. Brunner (1976) has labelled the emergent groupings as alternatively "price theoretical" or "sociological" views of inflation. We ourselves have elsewhere elected to employ the terms "monetarist" and "socio-political" analysis (Addison and Burton, 1980).

The signs are that the new schism will have a half-life at least equal to that of the old dichotomy. As we see it, the modern aim should be one of drawing out the positive contributions of both monetarist and socio-political thinking and to combine these positive elements into a coherent and unified analytical framework. But that is to range far beyond the limited scope of the present paper.

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