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Retrospectives
Cost-Push and Demand-Pull Inflation: Milton Friedman and the "Cruel Dilemma"

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This feature addresses the history of economic terms and ideas. The hope is to deepen the workaday dialogue of economists while perhaps also casting new light on ongoing questions. If you have suggestions for future topics or authors, please contact Joseph Persky, Professor of Economics, University of Illinois, Chicago, at jpersky@uic.edu.

Introduction

James Tobin (1967) spoke for a substantial share of the economics profession at the time when he described the Phillips curve as a "cruel dilemma," because it suggested that full employment was not compatible with price stability. Many economists of the 1950s and 1960s regarded inflation not as an exclusively monetary demand-pull phenomenon, but as also emerging due to cost-push forces related to market institutions and imperfections, like strong unions, which interacted with monetary policy and aggregate demand. In his famous presidential address to the American Economic Association in 1967, Milton Friedman (1968) presented an analytical framework to support his long-held position that no such structural conflict between the two policy goals existed and that monetary policy was not only an inappropriate but also ineffective tool to influence the rate of unemployment in the long run. Friedman's criticism regarding the Phillips curve trade-off built

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on two pillars: First, his framework defined a natural rate of unemployment that would result from the structures and institutions of a real-world economy, including factors cited as cost-push forces such as union power. Second, Friedman emphasized the role of inflation expectations in the Phillips curve, so that a trade-off between unemployment and inflation could only exist in the short run before inflation expectations fully adjusted—but in the long run, the economy would revert to its natural rate of unemployment.

The following discussion begins by focusing on the importance of cost-push factors that many economists emphasized with respect to Phillips curve analysis in the 1950s and 1960s. I then turn to the evolution of Friedman's thought on this issue. His arguments through the 1950s and into the 1960s grappled explicitly with the notion that inflation might have an underlying cost-push dimension, though Friedman rejected the idea of structural cost-push inflation particularly due to union power. In Friedman's (1968) presidential address, factors cited as cost-push forces like unions become determinants of the natural rate of unemployment and as such are rendered irrelevant for the inflationary process by his analytical framework, while fully-adjusting inflation expectations become a decisive element for monetary policy to consider. Friedman's critics argued that he was dodging the issue by equating his concept of the natural rate of unemployment with full employment when these ideas need not be the same. Moreover, critics made a case that ongoing cost-push inflation could exist at full employment and therefore a genuine Phillips curve dilemma cannot be swept aside by assumption.

Though Friedman's rejection of cost-push inflation is one of the pillars of his criticism of the Phillips curve trade-off, his presidential address is mainly remembered today (together with the parallel work of Phelps 1967, 1968) for pointing out the role of inflation expectations in macroeconomic analysis, and for distinguishing that an economy would adjust to its natural rate of unemployment in the long run but could display an unemployment-inflation trade-off in the short run. These ideas have played a large role in the macroeconomic research that followed. However, questions about what causes inflation to move—and in recent years, what has caused inflation to remain so stable—have continued to the present day.

The "Cruel Dilemma" and the Phillips Curve

The "cruel dilemma" view of the Phillips curve was based on earlier experience that inflation sometimes emerged before full employment was achieved. As one example, Morton (1950, p. 26) points at 1937, when wages rose despite millions of unemployed in the United States. Some episodes after World War II, particularly the years from 1955 to 1958, also featured a rise of inflation to what seemed like high levels at the time, despite ongoing unemployment. Thus, the policy issue at hand was "that inflation may exist concurrently with non-frictional unemployment" (Bowen 1960, p. 205).

A number of economists discussed the possibilities that general market imperfections such as bottlenecks and factor immobility could lead to inflation even without full employment, but the usual focus was on trade unions. In 1950, US union membership had risen to 40 percent of the labor force outside of agriculture (Slichter 1954, p. 329). Though the issue of cost-push inflation due to unions was already the focus of prominent economists before World War II (Humphrey 1977), there was no consensus on how to explain the wage-setting behavior of unions. Some argued that unions acted as monopolies (for example, Friedman 1951b, p. 206), while others were skeptical of applying that framework to union behavior (for example, Haberler 1951, pp. 34–35, n. 2). More fundamentally, the question arose as to whether union behavior could be understood as maximizing the income of its members or if union behavior is driven by political aspects (Reder 1952). Despite these disputes, there was a general consensus that union wage demands also pulled up nonunion wages, which caused the impression that "our wage-fixing arrangements have an inflationary bias" (Slichter 1954, p. 345). In the same vein, Slichter (1952, p. 54) pointed at the inflationary effects of strong unions even before full employment is achieved: "At some point short of full employment the bargaining power of most unions becomes so great that they are able to push up money wages faster than the engineers and managers can increase output per man-hour." In the context of the UK economy, *The Economist* wrote a series about "The Uneasy Triangle" (1952a, b, c) and remarked that there seems to be a "three-cornered incompatibility between a stable price level, full employment, and the free collective bargaining."

In the contemporary editions of Paul Samuelson's prominent introductory textbook (1958), he emphasized that this kind of cost-push inflation is at the heart of the issue of macroeconomic policy debates:

> It is hardly too much to say that this price-wage question is the biggest unsolved economic problem of our time: *Can business, labor, and agriculture learn to act in such a way as to avoid inflation whenever private or public spending brings us anywhere near to full employment?* A wage and price policy for full employment—that is America's greatest problem and challenge (p. 360).

At the end of the 1950s, the original Phillips (1958) curve paper seemed to provide a quantitative answer to the inflation–unemployment problem because the results (p. 299) implied that it would be possible to stabilize the price level in the United Kingdom with an unemployment rate of 2.5 percent.[1] However, when Samuelson and Solow (1960, p. 192) estimated a Phillips curve for American data, their results suggested that price stability would require an unemployment rate of 5 to 6 percent, which was regarded as too high a cost to accept for price stability

[1] Forder (2014, forthcoming) questions the views that the Phillips curve was originally seen as promoting inflation, and that Friedman (1968) was intended as a challenge to the feasibility of such policy. In Schwarzer (2016, pp. 113ff.), I critically consider these and related issues.

by a substantial share of economists (according to a survey of "economic experts at colleges and universities" by the Joint Economic Committee 1958). Indeed, at this time a 3 percent unemployment rate was often associated with "full employment" (for example, Bronfenbrenner and Holzman 1963, p. 627), which implied 4 to 5 percent of inflation based on the Samuelson–Solow Phillips curve and as such conflicted with the goal of price stability.

Although the Phillips curve was originally interpreted as a demand-pull relation (Schwarzer 2012, p. 982), it was in principle compatible with cost-push approaches (Lipsey 1960, p. 31) and thus became a handy framework within which to discuss inflation from either source. As a prominent example, the 1961 edition of Samuelson's textbook (p. 383) interpreted the downward-sloping Phillips curve as "a modified cost-push model" and added: "There is, so to speak, a choice for society between reasonably high employment with maximal growth and a price creep, or reasonably stable prices with considerable unemployment; and it is a difficult social dilemma to decide what compromises to make."

The concern about the risk of inflation without apparent general excess demand, often phrased as a result of dynamics arising from union wage-bargaining, persisted through the 1960s and beyond. For example, it was discussed in contemporary studies aimed at policy advice such as the reports of the Commission on Money and Credit (1961, pp. 15ff.) or the Council of Economic Advisers (1966, pp. 178ff.). Gardner Ackley (1966, pp. 70–71), who chaired the Council of Economic Advisers under the Johnson administration, wrote that the "tendency of wage rates to increase every year, no matter what" is to be regarded as an "institutional inflationary bias." In a similar vein, Solow (1966, p. 42) pointed out that the tendency of money wages and prices to rise while there is still slack in the economy "creates a dilemma for public policy."

None of the possible solutions to this inflation–unemployment dilemma had much appeal for a variety of economic, political, or social reasons.

For example, one policy option was to accept an ongoing positive rate of inflation. However, this was thought to result in undesirable side-effects such as the distortion of saving–investment decisions or the slowing down of growth (for a discussion, see Schwarzer 2014, pp. 187–88). Moreover, it was often feared, as Jacoby (1957, p. 23) warned, that "[w]hat began as 'creeping' inflation will become 'running' inflation." Therefore, Jacoby concluded, "[t]he policy of a responsible government *must* be to maintain an absolutely stable price level; it is a dangerous illusion to think otherwise."[2] Indeed, there was a strong aversion towards inflation in general as, for example, Clark (1960, p. 12) remarked that an inflation rate of 2.5 percent "would be quite serious enough, and materially higher rates would spell economic calamity."

A contrasting option was to "do business with the [inflation] dragon—buying some reduction in the degree of inflation by feeding him a certain number of jobs" (Lerner 1967, p. 3). However, this solution, that is, "[t]he creation of

[2]Such concerns over the stability of a positive rate of inflation were not unanimous at the time. For a more optimistic discussion also framed by the apparent policy dilemma, see Lipsey (1961).

unemployment as a cure for inflation," as many economists feared, "is politically unacceptable" (Smithies 1957, p. 281). Of course, the Phillips curve also offered in-between choices, with Reuber (1962) providing one of the first detailed analyses, albeit focused on the Canadian economy.

Other options seemed no more attractive. Solow (1966, p. 43) pointed out that any remedy that involves breaking the market power of unions or large firms was "more than a little unrealistic." On the other hand, "direct price and wage controls," as remarked by Samuelson (1958, p. 359), "would involve a degree of planning incompatible with past, and probably present, philosophical beliefs of the great majority of the American people." A common proposal, often viewed as a compromise, was to restrain inflation through a voluntary incomes policy of following wage and price "guideposts" (in the phrasing of the Council of Economic Advisers 1962, pp. 185ff.). These guideposts suggested that wages rise in line with trend productivity growth while prices should follow unit labor costs, "so that expansion policy could close the [output] gap and not be dissipated in price increases" (Staff of the Cabinet Committee on Price Stability 1969, p. 125). There was ongoing controversy over whether such a program would have beneficial effects—or whether a voluntary program would have any effect at all. For some, the Phillips curve encapsulated this issue of cost-push inflation and the possible role of guideposts. A few months before Friedman's presidential address, Samuelson (in Burns and Samuelson 1967, pp. 54–55) emphasized its relevance, stating that the Phillips curve "is one of the most important concepts of our times" so that "[a]ny criticism of the guideposts which does not explicitly take into account the Phillips curve concept I have to treat as having missed the fundamental point of all economic policy discussions." Indeed, as I will show in the next section, Friedman's criticism of cost-push inflation became embedded into the Phillips curve framework in his presidential address.

How Friedman's Views Evolved

Milton Friedman had long argued that there was no structural conflict between price stability and full employment, or as stated in his presidential address, no long-run trade-off between unemployment and inflation for monetary policy.[3] As an early example of his views, Boulding (1951, p. 79) summarized in rhyme the results of a discussion taking place during a 1950 conference about the economic effects of unions: "We all (or nearly all) consent/ If wages rise by ten per cent/ It puts a choice before the nation/ Of unemployment or inflation." The one economist at that 1950 conference not joining the consensus view, and thus the "nearly all" referred to in Boulding's verse, was Milton Friedman. A few years later, when asked by the Joint Economic Committee about his view on the conflict between inflation

[3]This section benefited from Ed Nelson's comments on a previous draft of the paper and his comprehensive contributions on Friedman's work. See Nelson (forthcoming, pp. 586ff.) for an in-depth analysis of how Friedman's views on cost-push inflation evolved over time.

and unemployment, Friedman (in Joint Economic Committee 1959, p. 626) clearly stated that no dilemma existed:

> Senator Bush. ... One of the principal objectives of this committee's work this year is to try to find out the relationship between the maintenance of employment and price stability. ... Do you think those are mutually conflicting or not? ...
>
> Mr. Friedman. I do not believe they are mutually conflicting. …

The underlying assumption behind this view that there is no structural conflict between full employment and price stability can be found in Friedman's (1963 [1968], p. 39; 1966b, p. 18) famous statement: "Inflation is always and everywhere a monetary phenomenon." In this view, ongoing price increases cannot be due to cost-push pressures but are the outcome of demand-pull forces driven by monetary policy.

But in the years leading up to Friedman's 1967 presidential address, he did on various occasions acknowledge the possibility of cost-push inflation arising from collective bargaining as well as certain contexts in which an unemployment–inflation trade-off might arise. For example, in the 1950 conference on the role of unions, Friedman (1951a, pp. 243–44) mentioned "the logical possibility of inflation from the cost side in an economy of strongly organized producer groups," so that "the phenomenon of higher prices plus unemployment ... is logically possible" but—at least in the USA—not "an empirically important possibility" (see also Friedman 1951b, pp. 227–28; 1955, p. 404).

Friedman also suggested at times that inflation could arise if the monetary authority feels responsible for achieving full employment, if this desire for full employment implies accommodating any wage increase, no matter how large. For example, Friedman (1963[1968], pp. 29–30) writes that "it is true that the upward push in wages produced inflation, not because it was necessarily inflationary but because it happened to be the mechanism which forced an increase in the stock of money," which is why "[f]ull employment policy is ... a modern invention for producing inflation." In Friedman's (p. 39) view, this happened in "Britain these past few years."

This line of argument suggests the possibility of a policy dilemma in which high union wage demands force a policymaker to decide between unemployment and inflation. In Friedman's view, this still means that monetary policy is ultimately responsible for whether inflation occurs. But as the next section will discuss in more detail, Friedman's contemporary critics often saw his argument as an evasion of structural cost-push pressures that should also be treated along with demand-pull factors as a cause of inflation. Indeed, those concerned about cost-push inflation often argued that monetary policy is likely to be driven by such cost-push pressures (Bronfenbrenner 1950, pp. 622–23) or that the effective money supply (via the expansion of bank credit or an increase in velocity) would rise endogenously in the

wake of cost-push pressures (Machlup 1960, p. 127; Fleming 1961, p. 515). In pure cost-push scenarios—that is, if cost-push pressures are completely independent of the rate of unemployment and actual output—no such accommodation of the cost-push implied a one-for-one fall of income to compensate the rise in the price level, while the Phillips curve at least offered the option for the policymaker to moderate cost-push pressures by reducing aggregate demand.

In the year before Friedman's presidential address in December 1967, he confronted the argument of cost-push pressures from unionization in a more direct way. In a discussion reprinted in a 1966 conference volume, Friedman (1966a, p. 57) reasoned that any level of market power of unions is in line with price stability since "[i]nsofar as market power has anything to do with possible inflation, what is important is not the *level* of market power, but whether market power is *growing* or not." The reasoning is that a one-time cost-push inflation[4] due to a growing market power of unions is possible, as unions exploit that increase in market power to establish "the maximum real income and real wage rate that they thought it was worth their while." But once that increase in market power is fully exploited and the higher wage established, there will be no further push for even higher wages.

In the same comment, Friedman (1966a, p. 60) combines this rejection of cost-push theories of inflation with the importance of fully-adjusting inflation expectations in an explanation of why guideposts (in addition to concerns such as the likely distortion of the price system as discussed in Friedman 1966b, pp. 37–38) are not an appropriate answer to inflation:

> Hence, the alleged case for the guidelines seems to me to rest on two basic fallacies: first, that market power is a source of rising prices, and second—on the belief that somehow or other you can fool the people all the time—that by increasing the rate of monetary expansion, you can thereby induce people to maintain a [permanently] lower level of unemployment.

Also in the same comment, Friedman (1966a, p. 60) offered a definition of the natural rate of unemployment: "But for any given labor market structure, there is some natural level of unemployment at which *real* wages would have a tendency to behave in accordance with productivity." Notice that Friedman's definition takes the structure of the labor market as given, and in this way suggests that the natural rate of unemployment might well be different between two countries with high and low rates of unionization. Furthermore, real wages at the natural rate of unemployment grow in line with productivity by definition, so that the absence of cost-push wage-pressure is an inherent feature of the natural rate concept.

[4] This one-time rise of the price level due to the increase in union power is, in Friedman's view, not necessarily to be interpreted as cost-push but as demand-pull inflation even without any increase in either the money supply or its velocity, since the increase in union power will reduce potential output (Nelson forthcoming, pp. 76, 414, 591).

As becomes clear from the very first paragraph of Friedman's (1968) AEA presidential address, his talk is shaped by this ongoing debate of whether or not the goals of "high employment, stable prices, and rapid growth" are "mutually compatible." As Friedman (in Taylor 2001, p. 124) later recalled, a basic cornerstone of his presidential address, the natural rate hypothesis, "grew out of the discussions about [income] guidelines and, in particular, out of the Samuelson and Solow paper on the Phillips curve." His address tied together many of these themes and made the arguments explicit in a highly visible setting, but also refocused the arguments in ways that would prove of lasting salience in macroeconomic research. In Friedman's criticism (1966a) of the Phillips curve trade-off in the year before his presidential address, the explicit rejection of cost-push inflation goes hand in hand with the important role of fully-adjusting inflation expectations. In the address, his criticism regarding cost-push inflation is now fully translated and embedded into the natural rate concept, making his rejection of cost-push inflation an integral part of his framework, though less visible than the emphasis on the role of fully-adjusting inflation expectations.

The natural rate of unemployment in Friedman's (1968, p. 8) address is determined by "the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the costs of mobility, and so on." In this way, labor unions and other factors cited as cost-push forces are incorporated into the natural rate: for example, as Friedman (p. 9) writes, "the strength of labor unions ... make[s] the natural rate of unemployment higher than it would otherwise be."[5] Given Friedman's (1966a) earlier reasoning that unions at constant market power can at best only be made responsible for high but not continuously rising wages, treating the strength of labor unions as a determinant of the natural rate, and therefore rendering them irrelevant for the inflationary process, follows naturally. Because all other cost-push factors that were discussed as having the potential to build up inflationary pressure also become determinants of the natural rate, only monetary forces are left for explaining inflation, so that the natural rate "separate[s] the real forces from monetary forces" (Friedman 1968, p. 9). Indeed, unemployment below this natural rate is labeled "excess demand for labor" (p. 8), which hints at the demand-pull view and suggests the coincidence of full employment with the natural rate. Because the natural rate of unemployment is compatible with price stability as well as with any rate of inflation or even deflation, there is no necessity to choose between the two policy objectives.[6] Furthermore, even if such a conflict existed, there would be no possibility for monetary policy to

[5] See also Friedman (1972, p. 194; 1975, p. 30). In his Nobel Lecture (Friedman 1977, p. 458), the strength of labor unions is not explicitly listed as a determinant of the natural rate, though "the extent of competition or monopoly" is (see also Friedman 1966a, p. 60).

[6] In the same year when he gave his presidential address, Friedman (1967, p. 13) explicitly stated that "[w]e do not have to choose between inflation and unemployment." A few years later, Friedman (1975, p. 14) made his view clear that at the natural rate, "[u]nemployment is zero—which is to say, as measured, equal to 'frictional' or 'transitional' unemployment."

"peg the rate of unemployment for more than very limited periods" (p. 5) anywhere else than at the natural rate. With inflation expectations ultimately coinciding with actual inflation and having a unit weight in the Phillips curve, the Phillips curve becomes vertical in the long run with only "unanticipated inflation" (p. 11) altering the rate of unemployment in the short run.

In short, because there is no need *and* no possibility to choose between the two policy objectives, monetary policy should and can only focus on the desired nominal target such as the rate of inflation without any connection to real objectives such as unemployment in the long run (p. 11).

Reactions to Friedman: Cost-Push and Demand-Pull Entangled

Many economists at the time interpreted Friedman's (1968) reasoning regarding the "cruel dilemma" not as innovative, but as dodging the issue. The counterargument was that Friedman, by subsuming all kinds of market imperfections and cost-push forces under his definition of the natural rate of unemployment, was defining away the conflict between full employment and price stability. In response to Friedman's (1966a, b) essays in the run-up to the presidential address, Ackley (1966, p. 68) expressed his "complete disagreement with Mr. Friedman's proposition that in any operationally meaningful sense inflation is caused by an excessive increase in the quantity of money and by nothing else." Though Ackley does not deny that inflation can be the result of general excess demand, he emphasizes that "the definition of productive capacity, by comparison with which total demand may be excessive, is itself a significant issue" and makes an implicit reference to Friedman's natural rate concept:

> I believe the evidence is inescapable that we can have inflation without what *I* would call excess demand, as the result of excessive income claims by labor or business or both. Of course, one can define this possibility out of existence. If one defines the total productive capacity of the economy as that degree of utilization which, if exceeded, leads to rising prices, then all inflation becomes excess demand inflation and the issue disappears.

From this perspective, the issue was that Friedman's natural rate concept offered no solution to the perceived policy dilemma, since accepting structural cost-push elements such as union power as a determinant of and limit to the full employment level implied giving up on the original full employment target, and instead regarding any further inflation as caused purely by demand-pull factors for which restrictive monetary policy was an appropriate and, in effect, costless solution.

Other critics focused on Friedman's argument that cost-push inflation is only reasonable if there is a change in market power. Haberler (1969, p. 69–70) emphasized the difference between monopolies and labor unions, since the latter "are out for large *annual* wage increases and not merely for a once-for-all substitution

of a higher monopoly wage for the lower competitive wage." The reasoning was that even without unions, real wages would rise with productivity, and money wages would rise at price stability and therefore render "it a perfectly natural objective for union policy to push continuously for money wage increases that are higher than is compatible with full employment equilibrium at stable prices." Thus, Haberler (p. 71) remarked that "once labor unions have acquired strength . . . we can expect continuing wage push without any further acquisition of 'market power.'" Haberler (1972, p. 238) hence emphasized that "[w]age-push by powerful labor unions is an obvious reality" and complained that "[n]o more would need to be said about the existence of the problems, if some monetarists had not denied the connection between inflation and the monopoly power of labor unions for so long." With respect to the theory of monopolies, Ackley (1966, p. 71) emphasized that it is market power as such, and not necessarily a rise in market power, that is important. An increase in demand that strengthens a producer's ability to realize the desired monopoly price would in its wake increase costs for other producers, who would also raise prices in order to restore their desired margins. Given a general nominal downward inflexibility of prices and wages due to market power on both sides (as argued by a report from Ackley's Council of Economic Advisers 1966, p. 179), inflation would arise, which would further be fueled by desired wage adjustments on the side of labor to make up for the rise in the cost of living. As such, an inflationary spiral may be possible without any additional rise in market power.

Four years after Friedman's address, James Tobin (1972), in his own presidential address to the American Economic Association on the subject of "Inflation and Unemployment," revisited what he had earlier called the "cruel dilemma." In contrast to previous critics of Friedman, Tobin (p. 14) endorsed the argument that market power of unions cannot be a source of ongoing cost-push inflation and thus implicitly accepted one pillar of Friedman's argument. Nonetheless, Tobin cautioned that the natural rate should not be unconditionally equated with full employment (p. 2), and he still argued in favor of a genuine long-run Phillips curve trade-off. Tobin reasoned that when there are downward nominal rigidities, ongoing relative price adjustments necessary to remove sectoral disequilibria can be a source of inflationary pressure without general excess demand (pp. 9ff.). This "passive cost-inflation mechanism" (as it was called in Dow 1962, p. 45) was regarded by many economists as another important source of the perceived incompatibility of full employment and stable prices, and thus served as a rationale for accepting a positive rate of inflation as the outcome of a full employment economy subject to permanent change and growth creating ongoing sectoral disequilibria (Schwarzer 2016, pp. 125ff.).

Friedman acknowledges the prevalence of nominal rigidities throughout his writings (as discussed in Nelson 2008, pp. 103ff.) but in his presidential address instead turns that into an argument for the merits of a stable overall price level. Friedman (1968, p. 13) argues that "in the United States, there is only a limited amount of flexibility in prices and wages. We need to conserve this flexibility to achieve changes in relative prices and wages that are required to adjust to dynamic

changes in tastes and technology. We should not dissipate it simply to achieve changes in the absolute level of prices that serve no economic function." Friedman thus rejected the alleged long-run benefit of inflation for facilitating relative price adjustments because it may eliminate the (downward) flexibility of prices and wages. In this context, he emphasized that the best monetary policy can do is to assure "that the average level of prices will behave in a known way in the future—preferably that it will be highly stable."

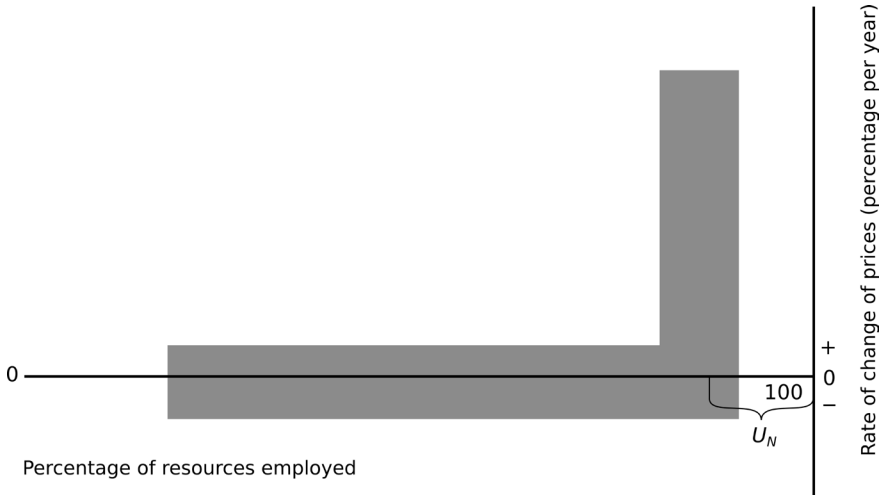
These professional disputes also lingered regarding whether there are theoretical arguments that inflation expectations do not always fully adjust or are not fully translated into wages and prices (for example, Tobin 1972, p. 13) and whether such full adjustment can be found in the data (for example, Solow 1969). In the aftermath of Friedman's (1968) speech, prominent textbooks started to comment on the role of inflation expectations and the natural rate, but nonetheless continued for some years to teach both cost-push and demand-pull factors and to discuss a conventional downward-sloping Phillips curve which offered choices for policymakers.

For example, the 1970 edition of Samuelson's introductory textbook (p. 811, n. 10, figure 41-3) includes side-by-side diagrams of a Phillips curve for the pure forms of cost-push (horizontal line at the rate of cost-push inflation) and demand-pull (vertical line at full employment) inflation and discusses their policy implications, with pure cost-push as "no tradeoff possible" and with pure demand-pull as "no tradeoff being necessary." However, the downward-sloping Phillips curve which combines both horizontal and vertical forces is presented as "a dramatic way of describing the dilemma for macro policy" (p. 811) because "[i]f we move leftward toward full employment, before we get there, wages and prices may tend to rise and keep rising" (p. 810, caption of figure 41-2).

In an alternative textbook approach, Lipsey (1975, p. 804) did not choose to illustrate the difference between short-run and long-run Phillips curves which is implicitly outlined in Friedman's presidential address and explicitly argued in Phelps (1967, 1968). Instead, Lipsey focused on the implications of Friedman's assumptions about the inflationary process, as shown in Figure 1. On the one hand, because the Phillips curve is vertical at the natural rate of unemployment, while there is otherwise no tendency for inflation to become positive until the natural rate is reached, pure demand-pull inflation is assumed in Lipsey's interpretation of Friedman, so that Lipsey (pp. 803–804) speaks of "[a] revival of the L-shaped relation" and of "orthodox demand-pull theory." However, in contrast to the original L-shaped curve in which full employment is at an utilization rate of 100 percent (pp. 800–801), this rate at which prices start to rise is now shifted to the left and thus lower, so that Lipsey (p. 804, caption of figure 51.7) speaks of "[t]he new theory of the L-shaped relation with a non-zero natural rate of unemployment (U_N)."

Lipsey (1975) presented Friedman's (1968) approach within the concept of the conflict-free demand-pull-only L-shaped relation, while a corresponding downward-sloping Phillips curve, in line with Tobin's (1972) reasoning of ongoing market disequilibria, still implies a conflict between the two policy objectives of full employment and price stability (Lipsey 1975, p. 803). Thus, Lipsey's interpretation

Figure 1
The Natural Rate as an L-Shaped Supply Curve Concept.



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of Friedman's natural rate framework encapsulates the sentiment that Friedman was dodging the issue by offering a different inflationary process and by equating the natural rate with full employment.

Cost-push forces as a source of inflation were still discussed and prominent in the United States after Friedman's (1968) presidential address. Along with the other examples given here, Arthur Burns, who was appointed Federal Reserve Chairman in January 1970, began to endorse a cost-push view of inflation, while Friedman continued his criticism of cost-push inflation and his opposition to guideposts (as discussed in Nelson 2007, pp. 154ff.; Nelson and Schwartz 2008, pp. 841ff.).

Conclusion

From the 1950s into the 1970s, many economists argued that cost-push forces and in particular the market power of unions played an important role in explaining how inflation could arise even when an economy had not reached full employment, as illustrated by the Phillips curve trade-off between price stability and full employment. As Tobin (1967, p. 102) noted in the short paper that emphasized the "cruel dilemma," inflation "is neither demand-pull nor cost-push, or, rather, it is both" so that "[t]he Phillips curve approach forces us to confront squarely the fact that our goal[s] for prices and employment are not wholly reconcilable." Friedman, on the other hand, argued that structural cost-push inflation in the sense of an inflationary

bias at full employment is not realistic, since only growing market power makes union-induced cost-push inflation theoretically feasible. In Friedman's (1968) presidential address, factors cited as cost-push forces such as union power hence become determinants of the natural rate of unemployment, while the structural rate of inflation solely depends on the path of monetary policy. In sum, Friedman's "view is optimistic, because it means that there is no long-run conflict between high employment and price stability" (Friedman 1972, p. 194). This "modern doctrine" (Nelson 2009, p. F345) regarding the inflationary process, as well as Friedman's emphasis on the full adjustment of inflation expectations, have played a major role in macroeconomic research ever since and continue to shape monetary policy.

However, questions about the determinants of inflation have resurfaced in recent years. These questions have focused on the "inflation puzzle" of why inflation has been so stable, despite seemingly large shifts like the Great Recession and the dramatic expansionary monetary policies in its wake (for a comprehensive assessment, see Miles, Panizza, Reis, and Ubide 2017). In a series of speeches, Federal Reserve Chair Janet Yellen (2016, 2017a, b) highlighted three important elements to be analyzed further for an understanding of inflation in recent times: the concept and estimation of the natural rate of unemployment (also stressed by Phelps 2017); the role and measurement of inflation expectations; and the specification of the underlying framework for analyzing inflation dynamics. The answers to such questions will be sought in the ways that demand-pull and cost-push factors interact in an economy with adjusting inflation expectations, imperfect markets, and nominal rigidities. In these arguments, the distinctions and controversies surrounding Friedman's presidential address of 50 years ago may well play a central role.

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