The Great Inflation in the United States and France: A Structural Analysis

Riccardo DiCecio and Edward Nelson

Federal Reserve Bank of St. Louis

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Email addresses of authors: Riccardo.Dicecio@stls.frb.org; Edward.Nelson@stls.frb.org.
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1. Introduction

In this paper we study the Great Inflation in both the United States and France. Our concentration on more than one country reflects our view that a good explanation should account for the experience of the Great Inflation both in the United States and beyond. We also emphasize that an explanation for the Great Inflation should be consistent both with the data and with what we know about the views guiding policymakers.

In the course of our paper, we hope to establish that:

(1) U.S. policymakers believed that inflation was a nonmonetary phenomenon, in a sense made precise below and which implied a belief that cost-push forces could produce inflation in the long run, even without monetary accommodation.
(2) The nonmonetary view of inflation was held consistently by Arthur Burns consistently from late 1970 until his departure in 1978, and adhered to by other senior policymakers during Burns' tenure and in 1978–79.
(3) As a corollary, 1970s inflation outcomes did not reflect policymakers' use of a Phillips curve model (with or without the vertical long-run property).
(4) Nonmonetary approaches to inflation analysis and control also dominated 1970s policymaking in France, so the explanation is valid across countries.

What We Hope to Do in the Complete Draft

We see our complete draft as consisting of:

Section 1: Introduction.
Section 2: Two Underlying Principles.
Section 3: Official U.S. Doctrine on Inflation in the 1970s.
Section 4: Official 1970s Doctrine on Inflation Control and Analysis in France.
Section 5: A Structural Model to be Estimated for Both Countries.
Section 6: Empirical Analysis for Both Countries.
Section 7: Conclusion.

This pre-conference version contains drafts of Sections 1 to 3. The existing versions of Sections 2 and 3 follow.

2. Two Underlying Principles

Two underlying principles guiding our study of the Great Inflation in the United States and France are compactly summarized in this excerpt from a 1969 news report on a talk given by Milton Friedman:[1]

> Friedman said the Federal Reserve produced inflation because it followed an erroneous theory of the relation between monetary policy and the economy.
>
> Inflation was not purposely caused by the Fed, he said.

Each of the above paragraphs encapsulates an important principle that is not adequately taken into account by much of the Great Inflation literature. The first principle is that one should recognize that there were specific *theoretical* errors underlying monetary policy decisions (and inflation policy more generally) during the Great Inflation. It would not be satisfactory to offer an explanation that accounts for the data outcomes during the 1970s but does so with a story that attributes to policymakers the correct theoretical framework (leaving policy errors to be explained by misguided objectives or by inadequate information on the state of the economy). Therefore, despite our ultimate interest in accounting quantitatively for the policy decisions and inflation outcomes of the 1970s, we provide below an intensive analysis, using documentary material, of the doctrine underlying 1970s policymaking, and we reconcile policy decisions with this doctrine.

The second principle is that we need to recognize that inflation was not *consciously* created by policymakers. This is a much-neglected feature of the Great Inflation. Any story of the Great Inflation that appeals to time-consistency arguments or to policymaker use of a Phillips curve equation is, at heart, claiming that policymakers deliberately injected inflation into the economy. This claim flies in the face of the evidence that 1970s policymakers believed inflation was not a monetary phenomenon. Policymakers in the 1970s had a modern view of the costs of inflation, but lacked a modern view of their power to determine the inflation rate through monetary policy. An approach that attempts to be realistic about the considerations driving 1970s monetary policy decisions must take this fact into account.

[1] *Daily News* (New York), November 7, 1969.

3. Official United States Doctrine on Inflation in the 1970s

Milton Friedman felt that the appointment of Arthur Burns as Federal Reserve Chairman in January 1970 would mean that theoretical errors regarding inflation would no longer drive U.S. monetary policy decisions. This hope was justified by Burns' positions upon taking office as well as the similar views held by several key Nixon Administration personnel. But both Burns and other senior policymakers rapidly changed their view of the inflation process in favor of a predominantly nonmonetary approach.[2] In fact, it is our contention that Burns' views throughout the period from late 1970 to his departure as Chairman in early 1978, as well as those of other major officials in 1970–78 and into 1979, are well captured by the following inflation equation:

$$\pi_t = b + \alpha D_t (y_t - y_t^*) + \delta\Delta(y_t - y_t^*) + E_t\pi_{t+1} + \xi_t \qquad (1)$$

Here π_t is inflation, b is a constant, $y_t - y_t^*$ is the output gap (i.e., the log of the ratio of output to potential output), Δ is the first-difference operator, and ξ_t is a cost-push process that is highly persistent and undergoes shifts in mean. The parameters α and δ are strictly positive, while D_t is an indicator function that depends on the sign of the output gap: $D_t = 1.0$ for $y_t > y_t^*$, but $D_t = 0$ for $y_t < y_t^*$. The presence of this term implies that the output gap level only matters for inflation when the output gap is positive, and that a negative output gap fails to withdraw inflationary pressure.

The preceding equation captures key aspects of U.S. official doctrine on inflation held consistently over 1970–79 (not all completely independent propositions, but listed separately for ease of our documentation below):

(i) Monetary policy can be a source of inflation by producing excess aggregate demand.

(ii) Pure cost-push inflation (i.e., sustained inflation occurring in the absence of excess demand) can occur.

[2] Romer and Romer (2002) contend that Burns entered office already holding cost-push views of inflation. For the contrary argument that Burns underwent a change shortly after taking office, see Nelson (2005). There is no disagreement across these accounts on the importance of nonmonetary views in Burns' thinking from late 1970 to late 1973, and both sources provide considerable documentation. Accordingly, our documentation here focuses on the more contentious and less documented issue of what were Burns' views from 1974 to 1978.

(iii) It follows from (i) that monetary restraint (e.g. monetary policy designed to remove the excess of nominal spending growth over potential output growth in the long run) is a necessary element of inflation control.

(iv) But from (ii) above, monetary restraint is not *sufficient* for inflation control, even in the long run.

(v) There is a first-difference or speed-limit term driving inflation dynamics irrespective of the sign of the output gap.

(vi) There is no long-run tradeoff between inflation and the output gap (or equivalently, no long-run tradeoff between inflation and unemployment relative to its natural rate).

We now document each of these points and so justify our specification (1) as a characterization of policymakers' views.

(i) Excess demand can add to inflation

Chairman Burns accepted that "policies that create excess aggregate demand… lead ultimately to galloping inflation" (July 30, 1974, testimony to Banking and Currency Committee, House of Representations, in Burns, 1978, p. 30). Accordingly, for inflation arising from excess demand, "the raging fires of inflation will eventually burn themselves out" if the boom was wound back by restrictive aggregate demand policies (Burns, August 6, 1974, p. 17).[3] Burns accepted that excess demand conditions had been created in the late 1960s and in 1973; accordingly, the "current inflation began in the middle 1960s" (August 21, 1974, p. 6) with "the underlying inflationary trend caused by lax financial policies" (July 27, 1976, p. 671), while 1973 had again seen an "overheating of the economy" (September 20, 1974, p. 4). More generally, Burns observed that "we also know that when the money supply grows excessively, inflation will be generated." (July 26, 1977, testimony. in Banking, Finance and Urban Affairs Committee, House of Representatives, 1977a, p. 99.) This proposition was especially relevant to the medium

[3] References given in the text with a date and page number but no other bibliographical information are from Chairman Burns' statements and speeches as given in the *Federal Reserve Bulletin* or in the Federal Reserve Bank of St. Louis' FRASER archive of Burns' public statements (available at http://fraser.stlouisfed.org/historicaldocs/statements/). Further bibliographical information on these statements is given chronologically in Appendix A.

term: "excessive monetary growth will eventually result in more rapid inflation" (September 25, 1975, testimony. in Budget Committee, U.S. Senate, 1975b, p. 177); and therefore: "If we create money at a more rapid rate than we have been doing, sooner or later that money will go to work and express itself in higher prices." (July 29, 1975, testimony. in Joint Economic Committee, 1975, p. 158.)

Burns' successor as Federal Reserve Chairman, G. William Miller, shared this perspective, contending, "If the Fed takes the restraint off and lets the money be printed, then, sure, there could be lower interest rates for a while, but then there would be a terrible inflation—and disaster."[4]

(ii) Inflation can be a purely cost-push phenomenon

Federal Reserve officials during the 1970s also believed, however, that exogenous cost-push forces (the ξ_t term in equation (1)) could produce sustained inflation without monetary accommodation. For example, an unsigned article in the *Federal Reserve Bulletin* of October 1970 stated,

> The United Kingdom provides the clearest example among the industrialized countries of inflation that is primarily of the cost-push variety. The British economy is clearly operating below its productive potential… Yet labor costs have been rising rapidly… (Board of Governors, 1970, p. 749.)

Around this time, Chairman Burns came to the view that the U.S. economy had inherited the cost-push characteristics perceived as relevant to the United Kingdom. By mid-1975, when asked if he expected wages to respond to fundamentals, Burns was saying, "I hope you're right about the behavior of wages. That's the way things should work, but they haven't worked that way in recent years in this country or in Canada or in Great Britain." (May 1, 1975, testimony. in Banking, Housing and Urban Affairs Committee, U.S. Senate, 1975, p. 194.)

Burns cited wage-push as a major source of inflationary pressure: "I do think that our trade unions at the present time have excessive market power. I also think that some of our legislation has been conducive to increases in wages and, therefore, to higher inflation rates…" (September 4, 1975, testimony, in Agriculture and Forestry Committee, U.S. Senate, 1975, p. 16.) Wage-push from unions would, however, prevail even in the

[4] Quoted in the *New York Times*, July 4, 1978.

absence of wage-increasing legislation: "inflation has not come to an end… One of the most important sources it is coming from and will continue to come from is the increase in wages." (July 29, 1975, testimony, in Joint Economic Committee, 1975, p. 152.) And in 1977 Burns claimed: "in the last analysis the wage increases that take place are fundamental to the rate of inflation…" (November 9, 1977, testimony, in Banking, Housing and Urban Affairs Committee, U.S. Senate, 1977, p. 30.)

But Burns also cited firms as originators of cost-push pressure: "my impression is that many of our business corporations are no longer paying attention to factors on the demand side in the same way they did in earlier years." (October 2, 1975, testimony, in Budget Committee, House of Representatives, 1975, p. 169.) Prices in particular sectors were also important, a key example being food prices: "concern about the effects of rising food prices on the overall rate of inflation is clearly warranted." (September 4, 1975, testimony, in Agriculture and Forestry Committee, U.S. Senate, 1975, p. 3.) He had a parallel concern about import prices: "If the dollar depreciates in foreign exchange markets, that releases forces that tend to raise our price level." (July 26, 1977, testimony. in Banking, Finance and Urban Affairs Committee, House of Representatives, 1977a, p. 70.) Any of these factors could aggravate domestic cost-push forces, Burns argued: "Nowadays, inflation from almost any source tends to be built into wages and thus to aggravate the wage-price spiral." (September 4, 1975, testimony, in Agriculture and Forestry Committee, U.S. Senate, 1975, p. 4.) He summed up: "inflation has become, as you correctly point out, a complex phenomenon. I deplore some of the price increases that are taking place… I think, sometimes, that we are moving into a cost-plus economy, and that is a disturbing development." (September 25, 1975, testimony. in Budget Committee, U.S. Senate, 1975b, p. 166.)

Burns' cost-push views were so entrenched that they obscured his interpretation of the Fisher relation between expected inflation and nominal interest rates. He recognized the Fisher relation as fundamental: "Over the long run, the rate of inflation is the dominant influence on interest rates." (September 25, 1975, testimony. in Budget Committee, U.S. Senate, 1975b, p. 166.) But since Burns believed that the wage-price controls introduced in August 1971 had directly reduced inflationary expectations, he felt that nominal interest rates could fall without implying a loosening of monetary policy. In a speech in November 1971, Burns said that "the freeze has been extremely effective," adding: "Interest rates have come down substantially as the inflationary premium has been squeezed out." (November 11, 1971, p. 2.) This viewpoint allowed Burns to see cuts in

interest rates by the Federal Reserve not as force-fed monetary stimulation, but as responses to falling private inflationary expectations: "Interest rates are still falling and yesterday's decline in the Federal Reserve discount rate recognizes that." (November 11, 1971, p. 3.)

(iii) Monetary policy is a necessary part of inflation control

Burns accepted quantity-theory logic in the sense that he realized that the Federal Reserve could be a dominant influence over nominal spending growth ($\Delta m + \Delta v$) over longer periods. Therefore, he accepted that a necessary condition for price stability was for the Federal Reserve to provide nominal income growth rates that were not persistently excessive relative to long-run growth in potential output (Δy^*). Thus he observed in 1975 that existing monetary growth rates "while appropriate in the present environment, could not be maintained indefinitely without running a serious risk of releasing new inflationary pressures." (May 1, 1975, testimony, in Banking, Housing and Urban Affairs Committee, U.S. Senate, 1975, p. 172.) He saw the Federal Reserve as concerned with "bringing the long-run growth of the monetary aggregates down to rates compatible with price stability." (July 29, 1977, testimony, in Banking, Finance and Urban Affairs Committee, House of Representatives, 1977b, p. 68.) Likewise, a downward money growth path was "absolutely *necessary* if President Carter's publicly announced goal of reducing the pace of inflation by two percentage points by the end of 1979 is to be achieved." (Burns, May 3, 1977, p. 467; emphasis added.) We italicize "necessary" because its use instead of "necessary and sufficient" distinguishes Burns' nonmonetary view of inflation from a standard monetary view. Monetary policy, in Burns' conception, was a necessary instrument in securing price stability because monetary policy actions were required to prevent the emergence of positive output gaps. Thus, when an excess-demand problem was perceived as having emerged in 1973, Burns observed that "classical tools of economic stabilization—that is, general monetary and fiscal policies—can be more helpful at such a time" (February 26, 1974, statement, in Joint Economic Committee, 1974, p. 720).[5]

[5] Burns therefore recognized, in line with equation (1), that excess demand pressure could be superimposed on cost-push factors as a source of inflation, and acknowledged that an excess demand problem had emerged in 1973. Burns' 1974 statements on the need for demand restraint thus do not constitute a repudiation of his cost-push views of inflation, contrary to the position of Romer and Romer (2004, p. 141).

(iv) Monetary policy is not sufficient for inflation control

But Burns believed that monetary policy was not sufficient for inflation control. Again in quantity-theory terms, for $\Delta m + \Delta v$ to secure dependable control of inflation (π), inflation should be endogenous and continously related to aggregate demand. In those circumstances, actions on $\Delta m + \Delta v$ ultimately bear down on π alone, leaving Δy to be pinned down by the exogenous value of potential output growth Δy^*. If π is instead insensitive to aggregate demand over a large range, as it is in equation (1), then aggregate demand control cannot secure inflation control by itself.

Reflecting the latter perspective, in the following exchange Burns explicitly denied that one could speak of a specific noninflationary growth rate of money, or equivalently, a specific monetary policy that could deliver price stability:

> Mr. NEAL. … [W]hat would have happened had the money growth rate been consistent with price stability?
>
> Dr. BURNS. I don't know that I or anyone else could ever answer that question, because we would be dealing with an imaginative reconstruction of the past. In any such reconstruction of the past, you would certainly have to specify the character of fiscal policy in the country. You would have to specify the labor policies pursued by the Government and by the trade unions and by business firms. You would have to specify pricing policies. Then you might get some approach to a meaningful answer… But I don't think you would learn a thing merely by asking what would have happened if monetary policy had kept the rate of growth of the money supply at a level that is consistent with general price stability. (July 27, 1976 question and answer session, in Banking, Currency and Housing Committee, 1976b, p. 28.)

With monetary policy actions insufficient for inflation control, Burns believed that incomes policy was needed, a position he repeated emphatically even after the abolition of wage-price controls in April 1974. For example, in August 1974, Burns said that "monetary policy should not be relied upon exclusively" and called for "[f]resh efforts" at incomes policy arrangements (August 6, 1974, pp. 17, 18). In 1975, Burns argued, "Sooner or later, in my judgment, we will move once again toward an incomes policy in this country… I think the world will continue to look in this direction for part of an answer to its problems." (July 29, 1975, testimony, in Joint Economic Committee, 1975, p. 145.) In the same year Burns offered a specific proposal: "I think we ought to hold up for public airing those instances where we have some reason to believe that there is an

abuse of economic power, whether on the part of our corporations or our trade unions..." (October 2, 1975, testimony, in Budget Committee, House of Representatives, 1975, p. 179.)

These positions were reaffirmed by Burns in 1976 and 1977. In 1976, he observed, "In the kind of world that we live in—with trade unions playing a large role in the determination of wages, so that competition in the labor market is very limited, and with not a few of our business firms having market power, as I think we all know—if we try to rely solely on monetary and fiscal policies to achieve general price stability, I believe we are likely to fail… I am convinced that we will return to an incomes policy sooner or later…" (March 22, 1976, testimony, in Budget Committee, U.S. Senate, 1976, p. 85.) In 1977 Burns stated, "I feel, Senator, that some sort of incomes policy will have to be developed in our country…" (November 9, 1977, testimony, in Banking, Housing and Urban Affairs Committee, U.S. Senate, 1977, p. 29.)

Relative to an earlier period during which aggregate demand management was a sufficient tool against inflation, Burns said, structural change had produced a "catch"; there were now "tremendous nonmonetary pressures…tending to drive costs and prices higher." (August 13, 1977 speech in Burns, 1978, p. 417.) A favorite formulation of Burns was that monetary policy in the new circumstances should do what it can against inflation, but that monetary policy was not enough. For example, Burns said in 1975: "The Federal Reserve is firmly committed to *do what it can* to restore general price stability in this country." (May 1, 1975, testimony, in Banking, Housing and Urban Affairs Committee, U.S. Senate, 1975, p. 173; emphasis added.) And he stressed in 1976: "Monetary policy alone, however, cannot solve our nation's stubborn problem of inflation." (November 18, 1976, speech in Burns, 1978, p. 250.) Even at his final FOMC meeting (in February 1978), which he presided over on an interim basis, Burns described himself and his colleagues as "do[ing] what we can to reduce the rate of inflation" (February 28, 1978, p. 31). G. William Miller adopted similar formulations during his tenure as Federal Reserve Chairman (see e.g. Nelson, 2005).

Monetary policy within this framework was seen as able to provide a floor but not a ceiling for the inflation rate. As Burns put it, "if a 5 per cent rate of price advance were to be accepted complacently by Government, inflationary expectations would intensify, and the actual rate of price increases would then almost certainly move toward higher levels." (February 3, 1977, p. 123.)

Policymakers (erroneously) saw the predominant situation of the 1970s as one of coexisting cost-push inflation and negative output gaps. Therefore, the perceived function of monetary policy became one of avoiding a compounding of the cost-push inflation that would occur if a positive output gap (and accompanying demand-pull inflation) were permitted. Thus Burns described his money growth target choices in 1975–76 as designed to "facilitate substantial recovery in economic activity without aggravating the problem of inflation." (July 27, 1976, p. 671.) Similarly, the following year he said that the "basic objective of monetary policy in the recent past has been to promote conditions conducive to substantial expansion in economic activity, while guarding against the release of new inflationary forces." (March 2, 1977, p. 229.) "New" here refers to demand-pull forces on top of the existing cost-push forces. Or as Treasury Secretary Michael Blumenthal characterized the policy assignment in 1978, "Bill Miller has to keep the money supply from going through the roof."[6]

Burns summed up his necessary-but-not-sufficient vision of monetary policy in 1976: "Monetary policy—no matter how well designed and implemented—cannot do the job alone. Adherence to a moderate course of monetary policy can, however, make a significant contribution to the fight against inflation." (July 27, 1976, p. 671.)

(v) The growth rate of the output gap matters for inflation

Burns took as a lesson from his studies of the business cycle that the first difference of the output gap mattered for inflation. Burns (1951, p. 198) observed, "inflation does not wait for full employment," and this belief carried over into his 1970s observations. For example, in 1976, Burns argued, "Some step-up in the rate of inflation was perhaps unavoidable in view of the vigor of economic recovery." (February 19, 1976, p. 233.) Later in the year he warned that underlying inflation "could well increase as our economy returns to higher level of resource utilization." (November 18, 1976, speech, in Burns, 1978, pp. 244–245.) Likewise, in 1977 Burns stated: "As we should know by now, pressures on resources and prices can arise even at a time of substantial unemployment." (February 23, 1977, p. 226.) He dismissed a negative output gap level as a restraint on inflation and emphasized instead the speed-limit channel: "Substantial amounts of idle capacity and manpower provide little assurance that price pressures will not mount as the

[6] Quoted in *New York Times*, July 4, 1978.

economic growth rate speeds up. Indeed, the historical record of business cycles in our country clearly demonstrates… that the prices of final goods and services gather substantial upward momentum well before full utilization of resources is achieved…." (March 22, 1977, p. 361.)

In Burns' view, the first-difference term mattered symmetrically: not only, as noted above, did he believe that very rapid expansion promoted inflation, but additionally, slow growth in output (relative to potential) restrained inflation (e.g. February 3, 1976, p. 5). This first-difference term could however be overwhelmed by the other factors mattering for inflation, so cost-push forces could raise inflation even during periods of a widening output gap (see his July 30, 1974, remarks on 1970–71 developments, in Burns, 1978, p. 170). Likewise, weakening cost-push forces could mean that inflation fell during a strong recovery, as in 1975–76.

The speed-limit element in Burns' view of inflation helps reconcile his cost-push views on inflation with other, seemingly more standard, statements emphasized in other studies. Romer and Romer (2004, p. 141) interpret Burns' warnings of inflationary pressure in 1977 as reflecting "changes in [his] beliefs in the mid-1970s" toward believing that inflation responded to the level of slack as well as an assessment on Burns' part that output was exceeding potential, though they admit that they cannot reconcile 1976–77 monetary policy ease with this change of beliefs. No inference of change in Burns' views is necessary, however; policy statements by Burns throughout 1974–77 are consistent with the cost-push plus speed-limit views that we believe he held consistently over the 1970–78 period.

Moreover, on further inspection it appears that Burns did not believe that the output gap was positive in 1977; the 1977 quotation Romer and Romer offer from Burns refers to "the pace of economic activity," i.e., a speed-limit not a gap-level channel from demand to inflation; and in the above quotations Burns explicitly referred to a level of economic slack existing in 1977, i.e., a negative output gap. Indeed, Burns' statement that "there is now considerable slack in the economy" (February 23, 1977 p. 226) and his observation of "[s]ubstantial amounts of idle capacity and manpower" (March 2, 1977, p. 361) specifically refute Romer and Romer's contention that Burns believed that the gap had turned positive by 1977. Moreover, Burns' views on potential output had not adjusted downward adequately in 1977, as he endorsed a potential output growth rate estimate of

"3.5 percent or a shade below that." (May 2, 1977, testimony. in Banking, Housing and Urban Affairs Committee, U.S. Senate, 1977, p. 17.)

Burns' speed-limit view can also reconcile his many statements about the limited power of monetary policy with his occasional statements that the Fed could, in fact, eliminate inflation. For example, Burns said in 1974, "we could stop this inflation in a very few months, and stop it dead in its tracks…" (February 26, 1974, testimony, in Joint Economic Committee, 1974, p. 747). In 1977, he stated, "For our part, we at the Federal Reserve know that inflation ultimately cannot proceed without monetary nourishment." (July 29, 1977, testimony, in Banking, Finance and Urban Affairs Committee, House of Representatives, 1977b, p. 69.) And similarly, he observed, "serious inflation could not proceed without monetary nourishment" (in his August 13, 1977 speech, in Burns, 1978, p. 417.)

As discussed below, statements like these are often interpreted as implying that Burns really had a monetary view of inflation whereby monetary accommodation was crucial in making cost-push shocks matter for inflation. This interpretation is insupportable, as it contradicts Burns' many denials (including in 1974–77) that a specific inflation rate was implied by a particular monetary policy choice. But we can reconcile the statements in the above paragraph with these denials by using equation (1), which represents our characterization of U.S. official doctrine in the 1970s. With equation (1), it is possible, starting from conditions of a zero or negative output gap, for a monetary policy to offset cost-push forces by making the output gap more negative.

Such a monetary policy effect on inflation has different characteristics from those arising from a standard view of inflation determination. According to the latter, a given negative output gap exerts ongoing downward pressure on inflation, and no alternative policy could remove inflation. But equation (1), in which negative levels of the output gap do not matter for inflation, implies that a given degree of aggregate demand restraint would exert only a temporary effect on inflation; a widening output gap (i.e., continuous negative growth in the output gap) is required to maintain downward pressure on inflation. Moreover, since cost-push forces are an independent source of ongoing inflation under specification (1), that specification suggests that it is valuable to remove these forces directly by nonmonetary policies.

Thus, Burns argued, the Fed could stop inflation via a restriction channel, but "the only way we could do that is to bring the distress of mass unemployment on this nation." (February 26, 1974, testimony, in Joint Economic Committee, 1974, p. 747.) Similarly, CEA Chairman Charles Schultze stated in 1978: "We can't wring this inflation out of the economy through measures which promote unemployment and economic slack. Such policies have only a limited impact on the kind of inflation from which we now suffer..."[7] Note the reference to a "limited impact"—i.e., a temporary impact arising from the gap-growth channel.

(vi) Inflation cannot purchase permanent gains of output above potential

Burns repeatedly denied the existence of a tradeoff between unemployment and inflation. For example, in 1975 he stated: "Whatever may have been true in the past, there is no longer a meaningful tradeoff between unemployment and inflation." (September 19, 1975, speech in Burns 1978, p. 221.) He elaborated: "There was a time when there was a tradeoff, and you could see it on a chart, between inflation rates and unemployment rates. Today, the nice relationship that previously existed no longer appears. In my judgment there is no tradeoff any more." (September 25, 1975, testimony, in Budget Committee, U.S. Senate, 1975b, p. 164.) Similarly, in 1977, Burns observed: "Economists and public officials used to argue about the tradeoff between inflation and unemployment. Whether or not such a tradeoff existed in the past, I doubt that it exists at the present time." (May 3, 1977, testimony, in Banking, Housing and Urban Affairs Committee, U.S. Senate, 1977, p. 15.)

In contrast to the long-run-tradeoff view, according to which higher inflation can permanently buy an excess of output above potential, Burns saw low inflation as desirable and conducive to achievement of policymakers' real goals. For example, Burns testified in 1974: "There is no conflict between the objective of maintaining the integrity of the currency and the policy declared in the [Employment] Act of 'maximum employment, production, and purchasing power.'" (February 26, 1974, testimony, in Joint Economic Committee, 1974, p. 757.) He observed in 1975: "among its several major objectives the Federal Reserve should seek over the long run to help this country return to a stable price level." (July 24, 1975, testimony, in Banking, Currency and Housing Committee, House of Representatives, 1975a, p. 219.) In 1976, Burns

[7] Quoted in *Daily News* (New York), March 31, 1978.

reaffirmed that "elimination of our disease of inflation must therefore remain a major objective of public policy." (July 27, 1976, p. 671). He went on to be more specific: "Our objective ought to be a zero rate of inflation; no other objective, I think, will serve this country well." (July 27, 1976, testimony. in Banking, Currency and Housing Committee, 1976b, p. 20.)

Our recognition of Burns' rejection of a tradeoff is incorporated in the specification of equation (1): while positive gaps have a positive relation with inflation conditional on expected inflation, the coefficient on the expected-inflation term is unity, so there is no relationship between the absolute levels of inflation and the output gap in the long run.

Incidentally, if there were evidence that the Federal Reserve during the 1970s internally used Phillips-style regressions that implied a tradeoff, this would not be good evidence that the most authoritative officials believed in a tradeoff. For his part, Burns said that he took computer models "with a grain of salt" (May 1, 1975, testimony, in Banking, Housing and Urban Affairs Committee, U.S. Senate, 1975, p. 194.) He also noted: "Economists these days have made life easy for themselves by using econometric models. I must say to you that, rightly or wrongly, I do not trust the results that are wrung out of these models. The models are based on average experience over a considerable period of time. I think we have been passing through a unique period and the characteristics of this period are not built into the econometric models that economists often rely upon." (October 2, 1975, testimony, in Budget Committee, House of Representatives, 1975, p. 180.) Burns' belief that the U.S. economy had been transformed into a cost-plus economy would have reinforced his skepticism about econometric estimates.

We have found that we can characterize Burns' views with a simple equation, but we do not suggest that this was estimated or reestimated econometrically. Indeed, it is not econometrically identified using aggregate data. Burns' intuition about inflation behavior was based not on macroeconometric estimates but on the cost-push behavior (and implied source of the ξ_t shocks) that he thought he could observe directly at the firm and industry level.

Comparison with other interpretations

Here we compare our interpretation of U.S. official doctrine with some others available

in the literature.[8] Very early studies that attribute, as we do, cost-push views to Burns and other leading policymakers are Friedman (1972) and Laidler (1974). We already have laid out some alternative interpretations of 1974–77, as well as agreement on 1971–73, with the studies of Romer and Romer (2002, 2004). We have also laid out problems with approaches (such as Sargent, 1999) that attribute Phillips-curve-tradeoff views to policymakers.

Chari, Christiano, and Eichenbaum (CCE) (1998, p. 467) claim that Chairman Burns "clearly understood" that inflation required monetary accommodation. But they adduce no unambiguous evidence of this allegedly clear understanding on Burns' part. Indeed, both CCE and Christiano and Gust (2000) provide one quotation after another from Burns to the effect that excess demand no longer drives inflation and that higher growth rates of wages and other costs automatically push up inflation—i.e., affirmations of the strict cost-push position on inflation. CCE do provide one seemingly orthodox statement by Burns regarding the monetary character of inflation; it is from a 1977 speech, near the end of Burns' tenure. In passages of the speech that follow the orthodox statement that CCE quote, Burns repeated his claim that the character of inflation had changed to cost-push, and acknowledged only that lower money growth would "probably" reduce inflation.[9] Even late in his tenure, therefore, Burns would not grant that monetary restraint would reduce or eliminate inflation for certain, and he was emphatic that modern inflation conditions did not reflect a positive output gap. Even more crucially, via the speed-limit term in equation (1), we are able to reconcile Burns' 1977 statement with his other statements on inflation, without attributing a monetary view of inflation to Burns.

Hetzel (1998) is an important early study that stresses Burns' cost-push views on inflation. In one passage, however, Hetzel (1998, p. 35) seems to concur with the CCE position that Burns understood that sustained inflation required monetary accommodation. But he does not reconcile this claim with Burns' many statements to the contrary; and as we have stressed, the full record of Burns' views suggests a cost-push plus speed-limit view of inflation, not a modern or standard view of inflation.

The more general message that we believe should be borne in mind is that Burns largely accepted that monetary policy could determine aggregate demand but did not, we argue,

[8] Other studies such as Taylor (1992), DeLong (1997), Orphanides (2003), and Orphanides and Williams (2005) will be considered in a complete version of this paper.
[9] See Burns' August 13, 1977, speech, reprinted in Burns (1978).

accept that the same was true of determination of inflation. His statements about accommodation should therefore be interpreted carefully: indeed, on one occasion, Burns observed, "I don't know what 'accommodate' means precisely." (March 13, 1975, testimony, in Budget Committee, U.S. Senate, 1975a, p. 835.) If one believes that monetary policy can determine $\Delta m + \Delta v$ and so the *sum* $\pi + \Delta y$, but that monetary policy is powerless regarding π, then "accommodation" of a higher $\Delta m + \Delta v$ rate does not imply that the policymaker is *permitting* higher inflation. Rather, the exogenously-determined inflation rate would (according to this view) prevail *irrespective* of the $\Delta m + \Delta v$ value; in these circumstances, accommodating higher nominal income growth simply corresponds to giving room for output to grow. Or as Burns once framed the issue, "This is a rather high rate of [M1] expansion by historical standards, but it is not too high when idle resources are extensive and financing needs still reflect rising prices." (May 1, 1975, testimony, in Banking, Housing and Urban Affairs Committee, U.S. Senate, 1975, p. 172.)

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