Revisiting the Supply-Shock Explanation of the Great Stagflation

Alan Blinder and Jeremy Rudd
(This draft: 22 February 2008)

I. Preamble

In a paper published in a 1982 NBER volume, one of the present authors drew the following six conclusions about the two bursts of inflation—one of which was still in progress—that constituted the "Great Inflation" (Blinder, 1982, pp. 262-263):

> "1. The dramatic acceleration of inflation between 1972 and 1974 can be traced mainly to three "shocks": rising food prices, rising energy prices, and the end of the Nixon wage-price controls program. Each of these can be conceptualized as requiring rapid adjustments of some relative prices.
>
> 2. The equally dramatic deceleration of inflation between 1974 and 1976 can be traced to the simple fact that the three factors just named were not repeated. In other words, double-digit inflation went away "by itself."
>
> 3. The state of demand thus had precious little to do with either the acceleration or the deceleration of inflation between 1972 and 1976. This is not to say that aggregate demand management was irrelevant to inflation, but only that it effects were minor compared to the supply shocks.
>
> 4. While the rate of inflation as measured in the CPI rose about eight percentage points between 1977 and early 1980, the "baseline," or "underlying," rate may have risen by as little as three percentage points. The rest of the inflationary acceleration came from "special factors."
>
> 5. The initial impetus for accelerating inflation in 1978 came mainly from the food sector, with some help from mortgage interest rates.[1] The further acceleration into the double-digit range in 1979 mainly reflected soaring energy prices and, once again, rising mortgage rates. Finally, mortgage interest carried the ball almost by itself in early 1980.
>
> 6. The 1970s really were different. Energy shocks are quite clearly a product of the brave, new post—OPEC world. Food shocks are not new.[2] We experienced them in the 1940s, but somehow managed to get away without them in the 1950s and 1960s."

---

[1] At the time, mortgage interest rates directly entered the CPI.
[2] Hamilton's subsequent work showed that this is not quite so.

The analysis in that 1982 paper was based on the following conceptual framework (see Blinder, 1982, pp. 263-264), which we have edited here only slightly for brevity and to update the terminology:

1. At any given moment, there is a normal or [core] inflation rate toward which the actual inflation rate tends to gravitate. This rate is determined by fundamental economic forces, basically as the difference between the growth rates of aggregate demand and aggregate supply.

2. On the demand side, [many] factors [, including monetary and fiscal policy,] influence the growth rate of aggregate demand. On the supply side, the fundamental long-run force is the trend rate of change of productivity, though occasional abrupt supply shocks can dominate the picture over short periods.

3. For empirical purposes, the [core] rate of inflation can be measured by the rate of change of prices exclusive of food prices, energy prices, and mortgage interest rates.

4. The [headline] inflation [rate] can deviate markedly from the [core] rate over short periods. Rapid increases in food or energy prices can push [headline] inflation above [core] for a while. Conversely, declines in food or energy prices can pull inflation below the [core] rate. There are other special one-shot factors as well. For example, the Nixon price controls played a major role in the 1973-75 episode.

These ten numbered points can be said to constitute the supply-shock explanation (more precisely, the special-factors explanation) of the Great Inflation.

Since 1982, all the relevant data have been revised.[3] We have also experienced 26 additional years of macroeconomic history, both in the U.S. and in other countries. Furthermore, macroeconomic theory has gone through several upheavals, in which (among other things) the canonical macro model has changed multiple times. Perhaps most important, an extensive empirical and theoretical literature on supply shocks, partly spurred by Hamilton (1983, *JPE*), has developed. The purpose of this paper is to reexamine the 1982 version of the supply-shock explanation in the light of these new facts, new models, and new econometric findings. Our central questions are: Do we need to rewrite the history of the Great Inflation? And if so, how?

The annotated outline that follows addresses these two questions in four main steps. Section 1 exposits and slightly modernizes the conceptual framework (the last four points above) and reexamines it in the light of much new theory and many new empirical

---

[3] More precisely, since 1980 (when Blinder's paper was written).

findings. Section 2 takes a new look at the evidence on the Great Inflation in the United States—once again making use of new data, new theory, and new econometric findings. Section 3 deals with a series of major objections to the supply-shock explanation, some of which were raised before 1982 and some of which appeared subsequently. And Section 4 looks beyond the narrow historical and geographical confines of the United States in 1972-1984 by considering (albeit briefly) supply shocks in other periods of time (both prior to and after the Great Inflation) and in other countries.

But before doing any of this, two important preliminary points need to be made. First, what this conference calls "the Great Inflation" was in fact *two* distinct episodes, as several graphs in the appendix make clear: There were sharp increases in inflation, followed by sharp decreases, in both 1973-75 and 1978-80. Any coherent explanation of the inflation of the 1970s must explain *both* the ups *and* the downs. Second, the Great Inflation was really the Great *Stagflation*. Any coherent explanation must also explain the contemporaneous recessions, both of which were deep. In particular, not only did real output decline in both episodes, but unemployment also rose sharply—implying that more than a decline in potential output was going on.


II. Annotated Outline

Section 1. What is the "supply shock" explanation of the Great Inflation?
(This section will present the analytical framework.)

A. What is a "supply shock"?

    1. A definition (to distinguish it from a demand shock).

    2. Three types of supply shocks, each defined by its timing and nature (and illustrated by the following graph of the real price of oil).

        (a) a transitory spike that is reversed (example: OPEC II)
        (b) a rise to a permanently higher level (example: OPEC I)
        (c) a persistently rising relative price (example: the period since 2002)

(2007 dollars per barrel)
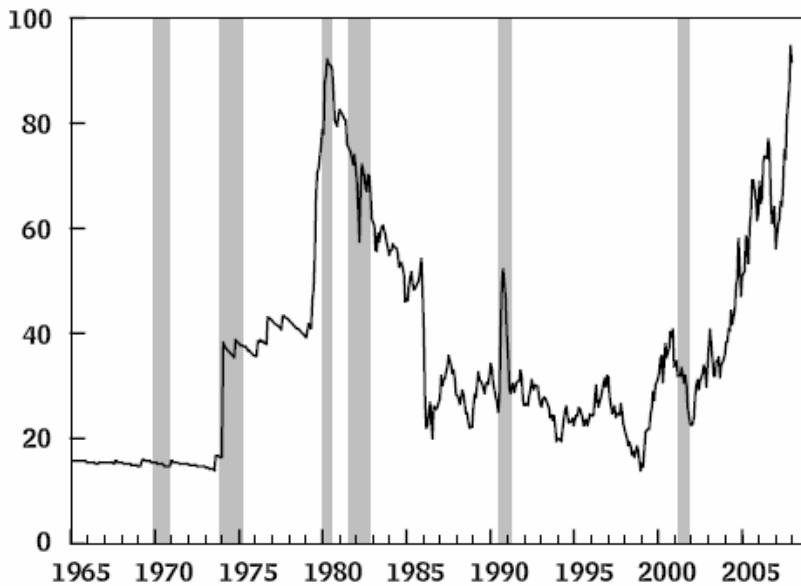
3. Contrast the implications for headline versus core inflation of these three types of supply shocks.

(a) A transitory spike adds to headline inflation on the way up, but then *subtracts* from headline inflation on the way down. It probably has little effect on core inflation.

(b) A rise to a new, higher plateau adds to headline inflation on the way up, just like a spike. But then the shock's effect on headline inflation disappears, rather than changing sign. So headline inflation should rise above core and then converge back to it. The core inflation rate could also be affected—for example, if the oil shock "gets into" other prices or changes inflation expectations.

(c) A persistent rise in the relative price of oil should keep headline inflation above core for as long as it lasts. The core inflation rate can also rise, though the increase should be far less than for the headline rate.

(d) Here we will present evidence that headline converges to core, rather than the other way around, in the U.S. (though perhaps not in Europe).

4. Were the oil shocks (and also the food and commodity shocks) truly "exogenous"? Barsky and Kilian and Cecchetti, *et al.* have argued that the causation really runs from money and inflation to oil prices, rather than the other way around. *(A full discussion of these points is deferred to Section 3, but we might put some simple VAR-based results here—c.f. Blanchard and Gali, also Kilian.)*

B. The effects of a "pure" supply shock

(*Basic idea*: The *AS* curve shifts in along a *fixed AD* curve, resulting in lower output and higher prices—to wit, stagflation.)

   1. It's easy to develop the parallel to productivity shocks by transforming a $F(K,L,E)$ production function into $g(P_E) \cdot f(K,L)$. But comparing the data to the outcomes one would expect from a neoclassical shift along a factor price frontier (*à la* Bruno-Sachs) shows that this shift does not come close to explaining the actual drop in output.

   2. The neoclassical model of the shock also fails to generate unemployment (since both actual and potential output decline equally).

   3. *Conclusion*: There must have been something else going on—probably something "Keynesian" on the demand side.

C. The response of aggregate demand to a supply shock

   1. The so-called "oil tax" impact on aggregate demand (*explain how it works*) must be quantitatively important to explain the large output contractions. (*Examine magnitudes a bit.*)

   2. Supply shocks, with the abovementioned "tax" included, will have different results with and without monetary (or other) accommodation.

   3. *Note*: *Here we will mention the arguments that the main burden of explaining the Great Inflation falls on monetary policy, not supply shocks. But a detailed discussion of this point is reserved for Section 3.*

D. "Second-round" effects

   1. Here we will give some empirics of the price-price spiral via cost pass-through, stages of processing, etc. For example, we might identify the components of core PCE and/or core CPI that have high energy content (this is less relevant for food prices) and see whether these categories made especially large contributions to the rise in core inflation. *(For a start on the analysis, using price-price Phillips curves, see Part 4 of the appendix.)*

   2. We will also give some empirics of the wage-price spiral, for instance, via expectational effects on the wage-Phillips curve. *(Once again, Part 4 of the Appendix makes a first pass at this analysis. We may also make use of some direct measures of expected inflation, for example, the old Hoey data.)*

3. Whether or not there is monetary accommodation may be quite relevant to both of these issues. "Phillips curve effects" should capture that.

4. Note: We will need to come to grips with the usual methodological question: Should we use Phillips curves or VAR evidence or both here? What we have done so far (which is reported in the Appendix) uses only Phillips curves. VARs will come.

E. Beliefs about productivity lag behind reality when productivity growth changes

1. This is a new (that is, post-1982) idea (*c.f.* Braun, Blinder and Yellen, Ball and Moffitt). The idea is that workers' and firms' beliefs about labor productivity growth lagged behind reality when productivity slowed down after 1973, leading to excessive wage demands and real-wage stagflation (see, *e.g.*, Orphanides).

2. Note the close parallel—with the sign reversed—to the productivity acceleration after 1995, which led to faster growth and lower inflation.

3. Can we get direct evidence on this? *(Qualitatively, the behavior of the labor income share over this period is consistent with a persistent differential between real wage and productivity growth. But statistical models of the effect of productivity trend breaks on inflation don't work well, and it's hard to tie down the suggestive correlation shown in Staiger, Stock, and Watson's recent work.)*

Section 2. The evidence on the Great Stagflation
(The focus in this section will be on the years 1972-1984.)

A. The supply shocks themselves--timing, numbers, and origins—and what happened to overall inflation, output, and unemployment.

1. See the oil price chart above, the graphs of food and energy components of the PCE deflator in part 2 of the appendix, and the various graphs of core inflation in part 1 of the Appendix.

2. These tell the following approximate story of what happened to *core* inflation:

- Inflation edged up slightly from the late 1960s into 1970. (The demand pressures from the Vietnam War were surely relevant here.)

- Inflation then fell in 1971 and 1972, reflecting both weaker aggregate demand and the institution of price controls in August 1971.

- Inflation climbed, peaked, and then fell from 1973 to 1975. After 1975, it roughly *stabilized* at around six percent—a level much higher than previous

postwar U.S. experience but only about two percentage points higher than the rate that prevailed after the Volcker disinflation.

- Inflation started to rise again around 1978. (A comparison of the published core CPI with the current-methods series and with the core PCE index highlights the notable distortion in measured inflation that can be induced by including mortgage interest rates in the CPI.)

- Inflation peaked around the middle of 1980 and then started to fall as the effects of a weaker economy were felt.

B. An approximate replication of the 1982 analysis of inflation using revised data.

1. Analysis of the behavior of food and energy (and commodity and import?) prices and their *direct* contributions to CPI, PCE, and GDP price inflation.

2. Description of the behavior of core inflation over this period. (*Note: Using the new data changes the sharp picture of symmetry in Blinder's 1982 paper a bit, but not a lot.*)

3. *Note*: One important point seems to have been forgotten since 1982: There was another series of "shocks" in the form of the institution *and removal* of price controls. (See Blinder and Newton, *JME,* 1977.) The decontrol period roughly coincided with OPEC I, thereby substantially clouding the analysis of the first oil shock. So price controls must be controlled for in any analysis of the early-to-mid 1970s. *(Part 3 of the Appendix shows that these were a major part of the story.)*

4. The pass-through issue: quantifying pass-through into core inflation and/or wages. *(We will probably use a reduced-form Phillips curve system and/or a VAR to examine this; might also see whether survey data on inflation expectations—e.g., the Hoey data—could be used to get at this issue. See parts 4 and 5 of the Appendix.)*

C. Analysis of the declines in output and employment.

This relates to the question raised in Section 1: To explain the data, how much of a demand shock do we need? In addition, what does this say about monetary accommodation in practice?

D. Conclusion.

Try to conclude this section with a breakdown of the direct and indirect contributions of the supply shocks to inflation. *(We may have various answers, depending on the method used.)*

Section 3. Arguments against the supply shock explanation
(Here we will outline the arguments and counterarguments, and give a quick view of what the evidence on each suggests.)

A. Relative price shocks cannot affect absolute prices.

    1. They can and will in the presence of nominal rigidities.

    2. Cite Rotemberg-Woodford regarding the role of imperfect competition and impact of intermediate price shocks.

    3. Some of the papers from the 1980s and 1990s on relative price dispersion and mean inflation are potentially relevant here (*e.g.*, Taylor, Ball and Mankiw, Balke and Wynne). *Key question*: Which way does the causation run—from relative price changes to inflation or from inflation to relative price changes?

B. "Inflation is always and everywhere a monetary phenomenon."

- The implication of Friedman's view is that relative-price changes such as those induced by the supply shocks could not have affected aggregate inflation—only money could have done so. (Related arguments are made by Barro, Barsky and Kilian, and Ball, among others.) This is pretty easy to dispose of.

- *Since this argument is so close to point A above, we may merge the two.*

C. Changes in the Fed's reaction function are the key to understanding the differential effects of oil price shocks over time.

    1. This idea can be thought of as a way to conceptualize the policy accommodation issue raised in Section 1. See Bernanke, Gertler, and Watson.

    2. Bernanke, Gertler, and Watson's work has been directly criticized by Hamilton and Herrera; Hooker also points out that it is difficult to use the Bernanke-Gertler-Watson idea to explain empirical Phillips curve instability. See also the recent Blanchard-Gali paper, and the more theoretical papers on oil shocks and monetary policy by Leduc and Sill and Carlstrom and Fuerst.

    3. The central question here is the degree to which the supply shocks were accommodated by monetary policy. So one way to attack the question empirically would involve running a number of monetary-policy VAR models. *(We have not done that yet.)*

D. <u>The root cause of the Great Inflation was loose monetary policy</u>.

 1. The Barsky-Kilian variant: Expansionary monetary policy in the U.S. and other countries led *both* to aggregate inflation *and* to increases in world commodity prices—including oil.
    -- They also argue (less importantly) that the *GDP deflator* cannot be affected by intermediate price shocks. There are a couple of counterarguments against this latter point (see, *e.g*, Blanchard's comment on their paper). But our focus in on consumer prices anyway.

 2. The Cecchetti, et al. *variant*: This work uses cross-country evidence to argue that underlying inflation picked up in a number of countries as a result of insufficient concern about inflation by monetary policymakers.

   (a) There are various problems with this story (see, *e.g.*, Don Kohn's comments on their paper).

   (b) This story is potentially complementary to the supply-shock explanation. Lax attitudes toward inflation could have resulted in significant accommodation of the supply shocks and, as a result, a correspondingly persistent increase in inflation following the shocks.

 3. The De Long variant: De Long argues that trend inflation was picking up *before* the supply shocks because the Fed was trying to exploit what it saw as a non-vertical inflation-output tradeoff. (A more nuanced view would remember the influence of the Vietnam War on chronic excess aggregate demand in the late 1960s.) Supply shocks therefore played only a subsidiary role in the Great Inflation; they were just transitory swings in inflation around a trend that was rising for other reasons. *(See part 5 of the Appendix for a partial rebuttal.)*

Section 4. Other times and other places

<u>A. Evidence from other periods in the U.S.</u>

- For the U.S., we will look retrospectively at the absence of historical supply shocks in the postwar period prior to 1973. (But see also Hamilton's 1983 paper.)

- We will also look forward in time to the more recent oil shocks, which apparently had smaller-than-expected effects on both core inflation and output.

- There is a lot of evidence—starting with Hooker's work and finishing with Blanchard and Gali—of a change in the pass-through of oil or energy price shocks, even after share-weighting the energy price terms, etc. Why is this? Is it the nature of the shocks (Kilian), the nature of the economy (Kilian and others), or the nature of policy (Bernanke-Gertler-Watson)? Blanchard-Gali is particularly relevant here.

Here we will survey (though quite selectively) some of the evidence on stagflation/supply shock-led inflation in other countries.

- One example that stands out is Germany (then, West Germany), where what was in effect a policy of *claiming* to target money-supply growth anticipated Volcker's operational change at the Fed in 1979 and supposedly resulted in less inflation.

- Another instructive case is the different experiences of Japan after OPEC I and OPEC II. Both the German and Japanese experiences point to monetary accommodation as an important factor. One key question is whether countries that avoided inflation also saw larger output shortfalls.

Section 5. A summing up: How much should we rewrite history?

(a) The view circa 1982 (see the preamble).

(b) New facts: To what extent has the passage of time changed the data? To what extent have new episodes of supply shocks changed, or at least questioned, the circumstantial evidence from the Great Stagflation?

(c) New empirical analyses: To what extent have new empirical studies of the Great Stagflation (and other supply-shock episodes) altered our view of what supply shocks do?

(d) New ideas: To what extent have new theoretical developments altered our view, or interpretation, of what happened during the Great Stagflation?

(e) Conclusion: The view circa 2008. To what extent is the analysis of the Great Stagflation still relevant today?

III. Appendix

This appendix contains a number of figures that show various price series in the 1970s and 1980s, along with some preliminary—and very provisional—empirical results on several topics related to the supply-shock explanation of the Great Inflation.

1. Trends for core inflation in the 1970s and 1980s

The charts on the following three pages plot quarterly inflation (defined as an annualized log difference) for a number of core price series, along with a trend that is defined as a centered MA(5) of the quarterly inflation rates. The upper panel of each chart shows the series from 1968 to 1976, while the lower panel plots the series from 1976 to 1984.

The specific core inflation series shown are:

- The published core CPI;
- The core CPI on a "current methods" (methodologically consistent) basis;
- The core PCE price index from the national accounts; and
- Market-based core PCE.

The market-based series removes the imputed prices in PCE (bank service charges, religious and welfare services, etc.—but *not* owner-occupied shelter costs). The series used here extends the "official" market-based PCE price index (which starts in 1997) back to 1959, using—as much as is possible—the same definitions as BEA's series.

The use of a methodologically consistent core CPI series is primarily dictated by the fact that until 1983, mortgage interest rates entered the CPI for shelter costs. The presence of these rates can seriously distort the published CPI (for example, changes in mortgage interest rates added a percentage point to total CPI inflation in 1969-1970, more than a percentage point in 1974-1975, and more than *three* percentage points in 1980).

2. Food and energy prices in the 1970s and 1980s

The next two figures show the PCE price index for food and beverages and energy over these periods; a table below each plot gives the Q4-over-Q4 changes in these series.
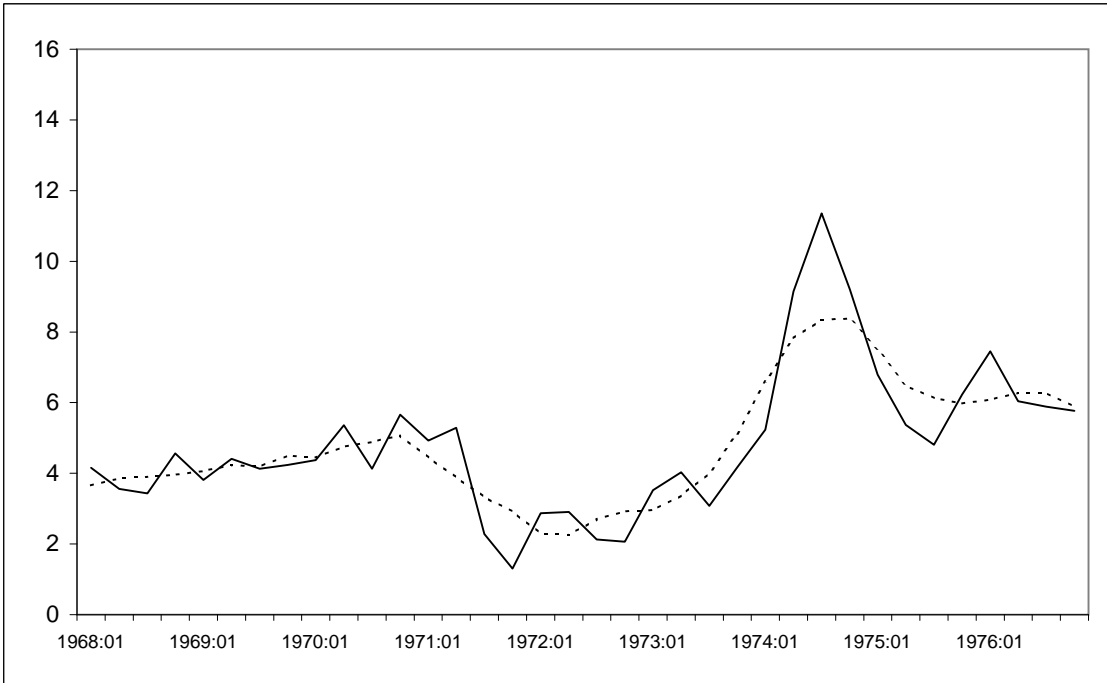
Core CPI inflation, 1968-1976 (published CPI)
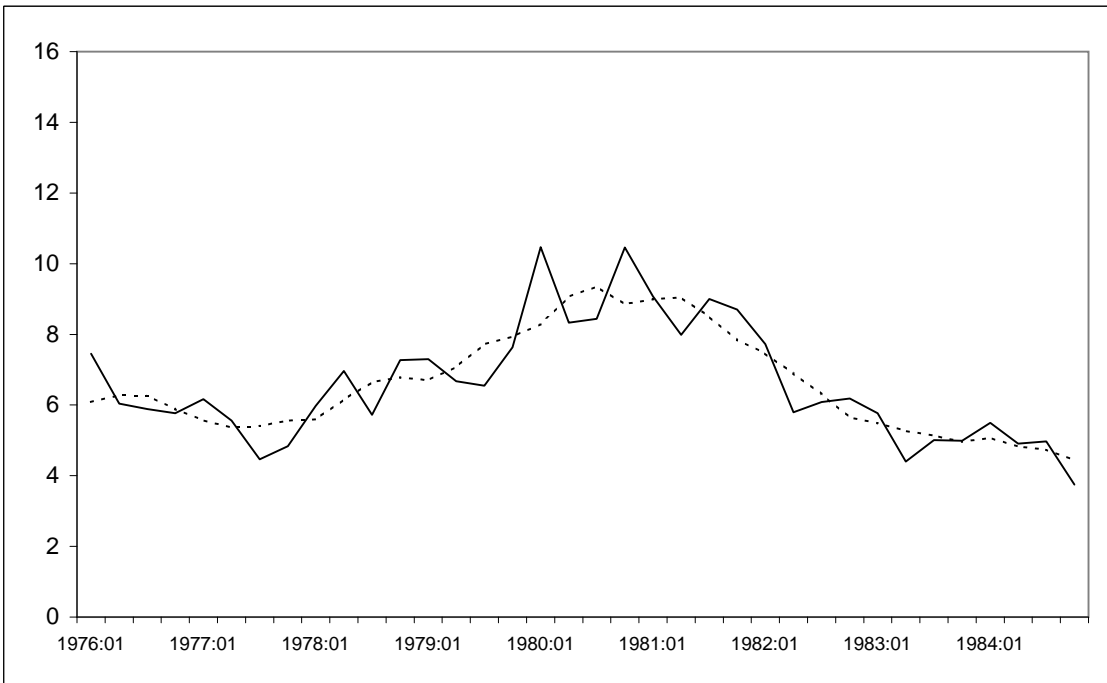Annualized quarterly log differences with centered MA(5)
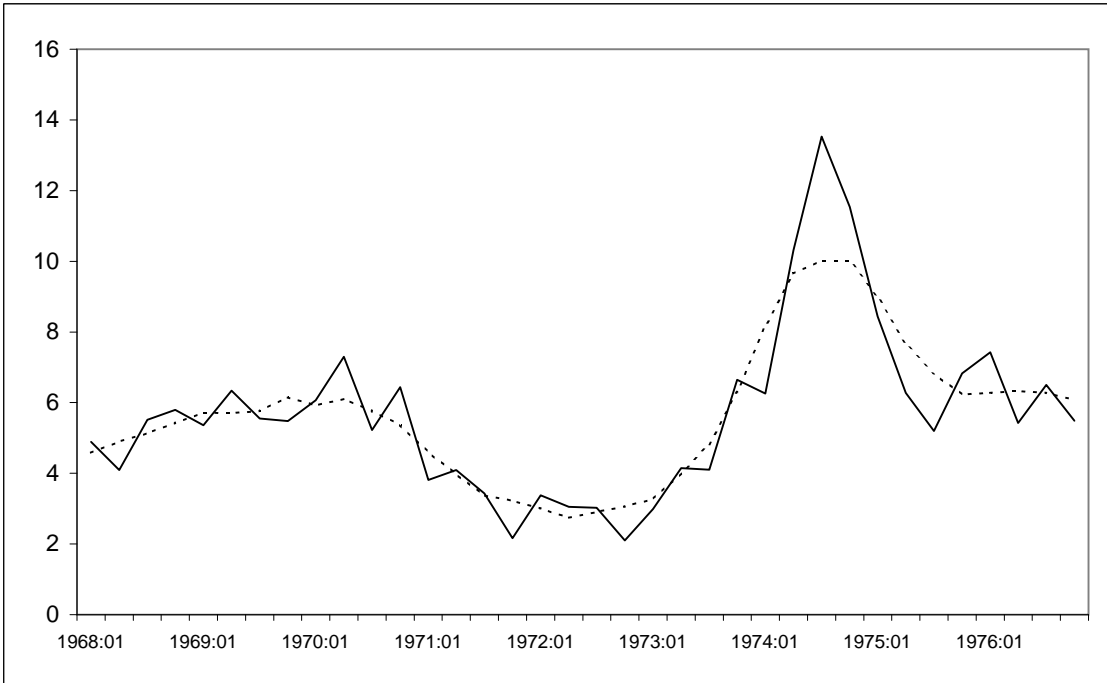
Core CPI inflation, 1976-1984 (published CPI)
Annualized quarterly log differences with centered MA(5)
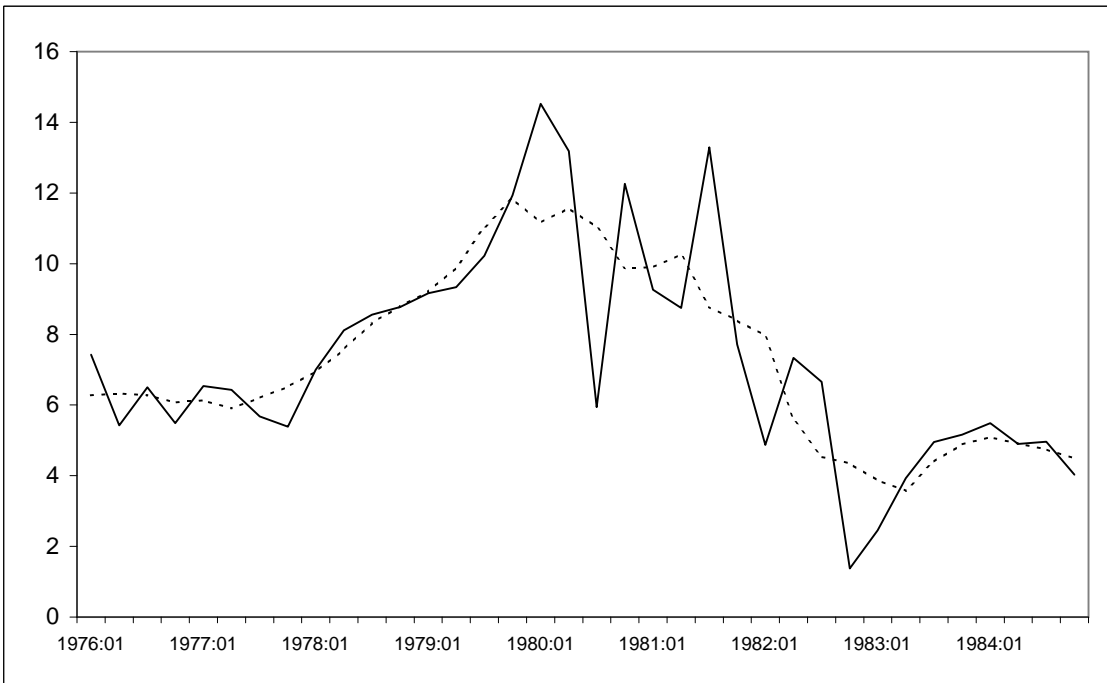
Core CPI inflation, 1968-1976 (current-methods CPI)
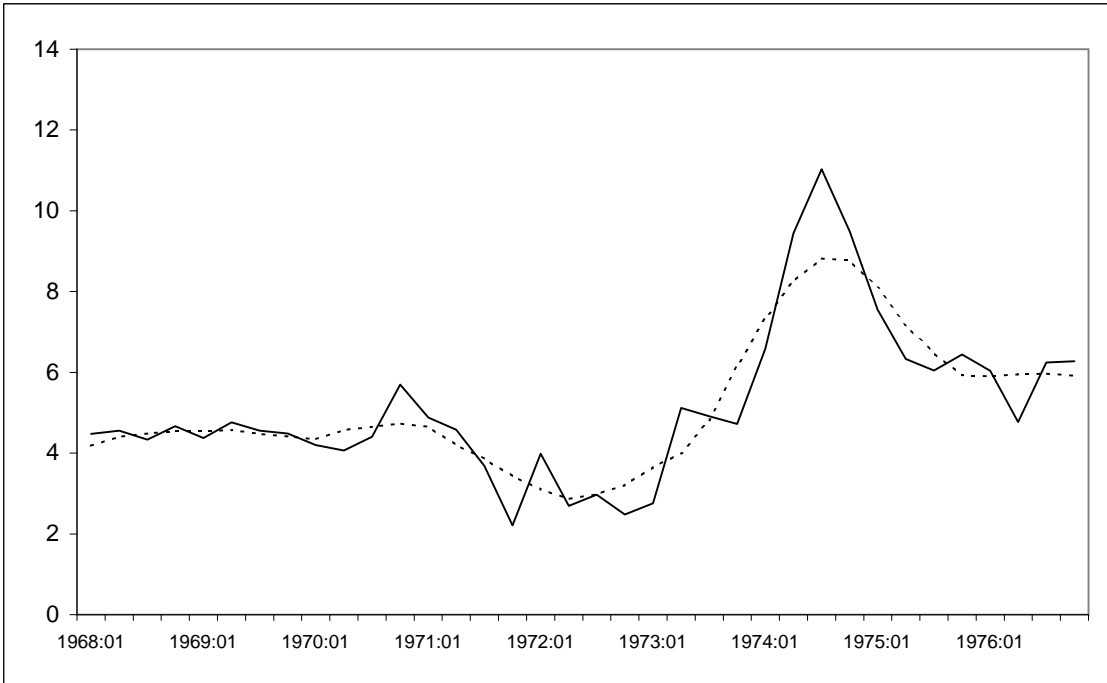Annualized quarterly log differences with centered MA(5)

Core CPI inflation, 1976-1984 (current-methods CPI)
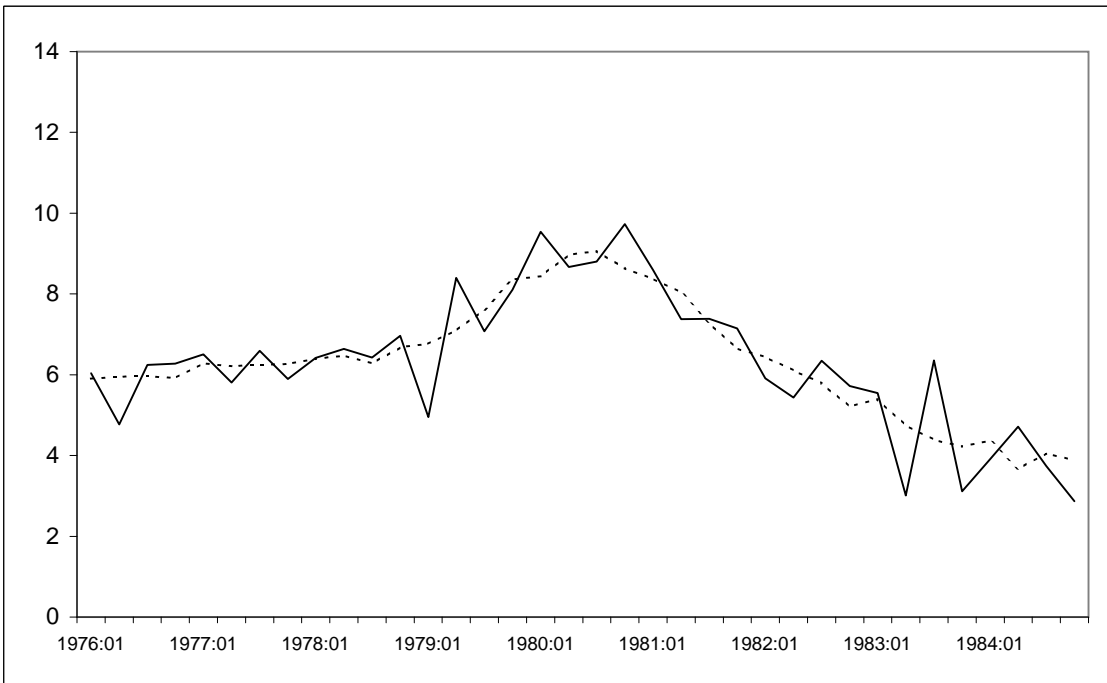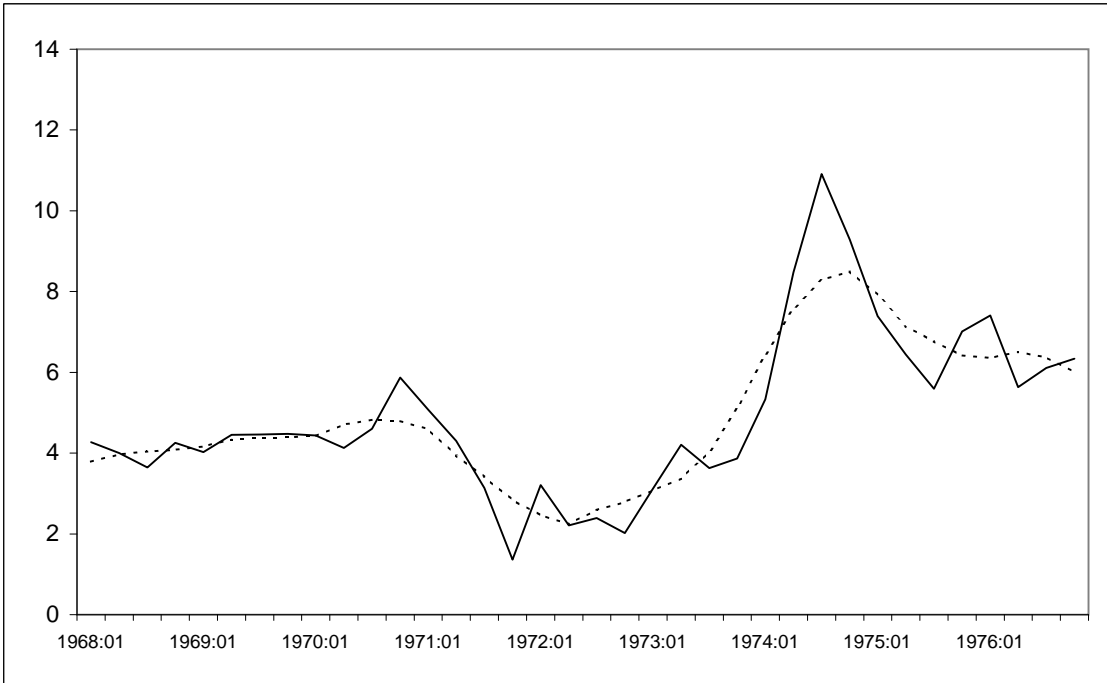Annualized quarterly log differences with centered MA(5)

13

Core PCE inflation, 1968-1976
Annualized quarterly log differences with centered MA(5)
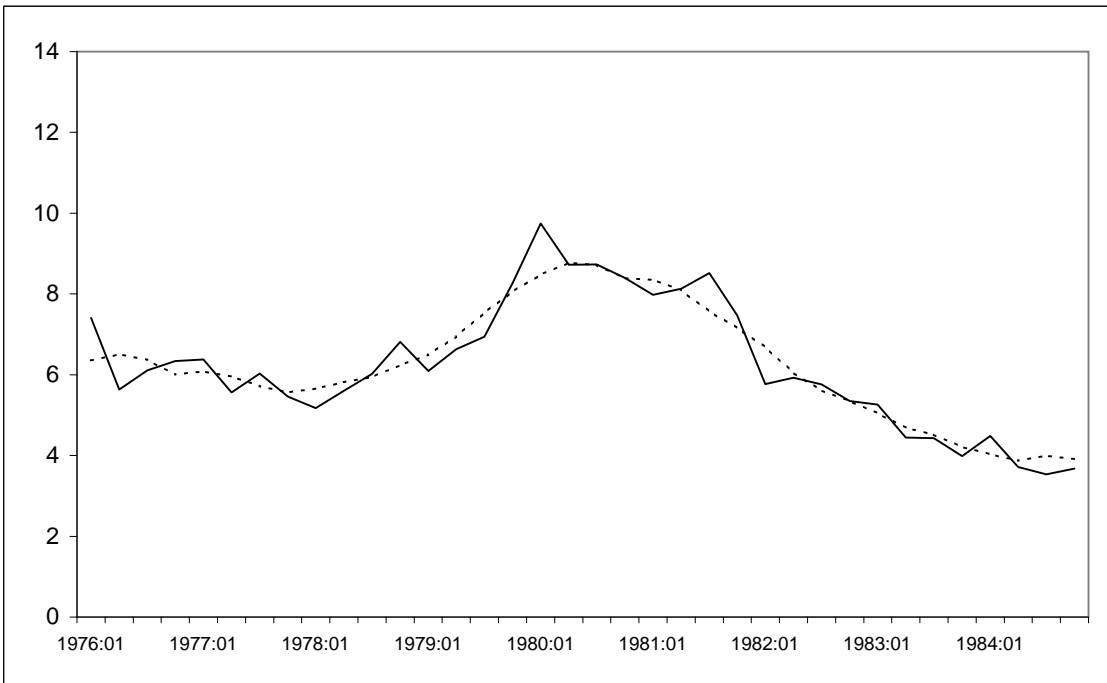

Core PCE inflation, 1976-1984
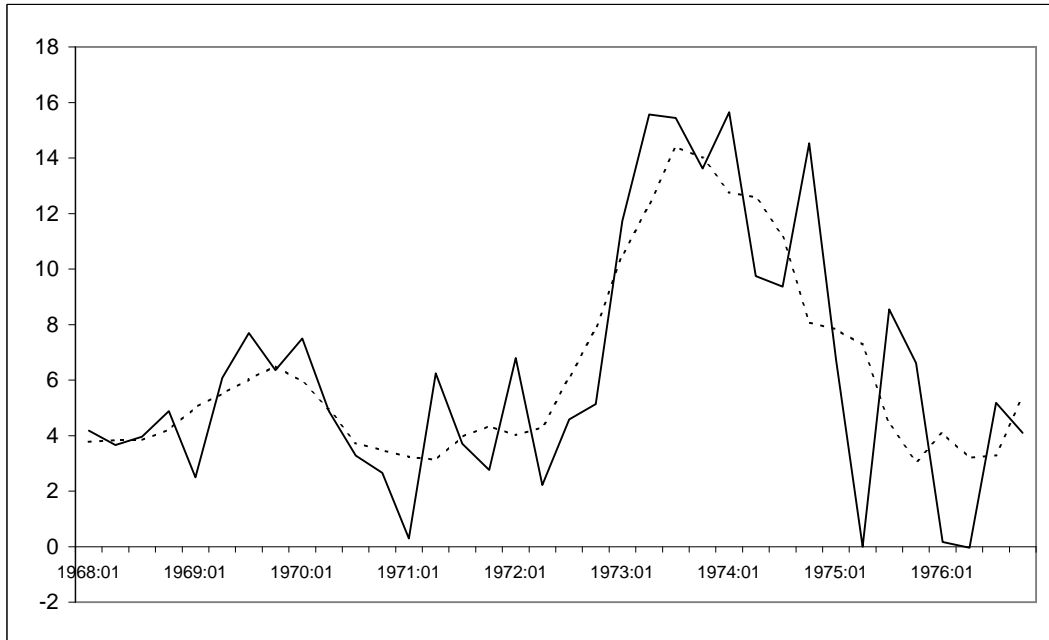Annualized quarterly log differences with centered MA(5)

Market-based core PCE inflation, 1968-1976
Annualized quarterly log differences with centered MA(5)

Market-based core PCE inflation, 1976-1984
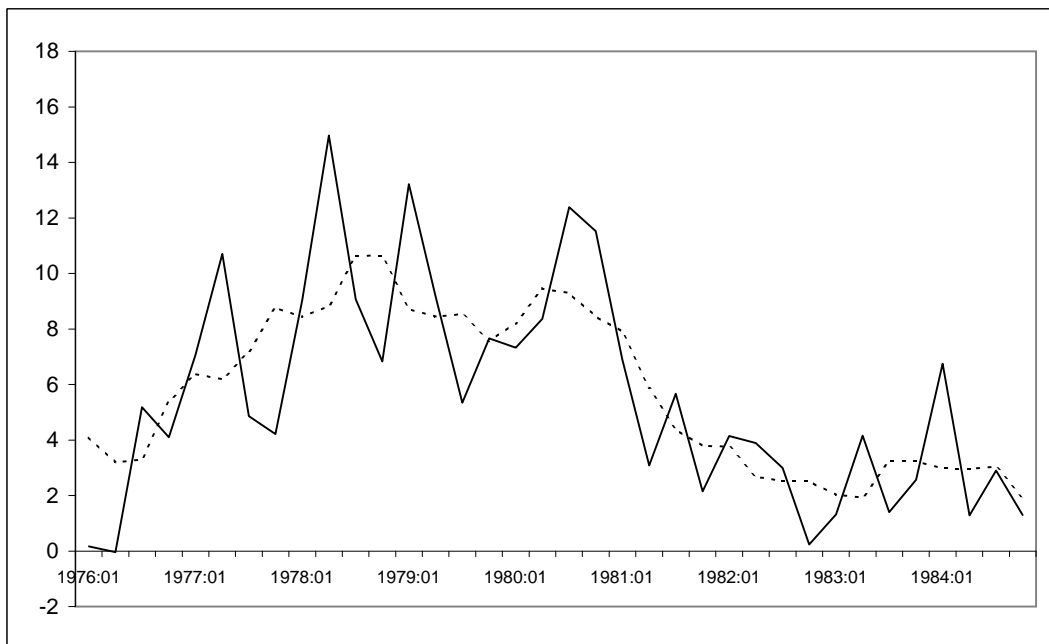Annualized quarterly log differences with centered MA(5)

PCE food and beverages inflation, 1968-1976
Annualized quarterly log differences with centered MA(5)

	1968	1969	1970	1971	1972	1973	1974	1975	1976
Q4/Q4 ch.	4.25	5.82	4.69	3.30	4.79	15.13	13.11	5.62	2.38

PCE food and beverages inflation, 1976-1984
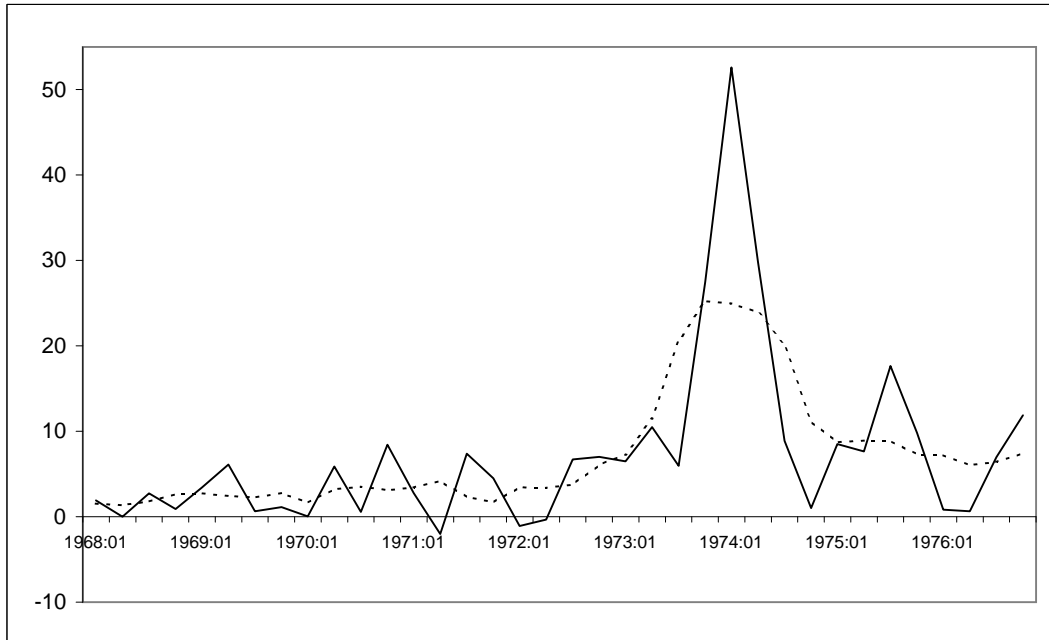Annualized quarterly log differences with centered MA(5)

	1977	1978	1979	1980	1981	1982	1983	1984
Q4/Q4 ch.	6.94	10.50	9.24	10.41	4.55	2.85	2.39	3.11

PCE energy inflation, 1968-1976
Annualized quarterly log differences with centered MA(5)

	1968	**1969**	**1970**	**1971**	**1972**	**1973**	**1974**	**1975**	**1976**
Q4/Q4 ch.	1.39	2.86	3.80	3.21	3.12	13.42	25.96	11.52	5.20

PCE energy inflation, 1976-1984
Annualized quarterly log differences with centered MA(5)
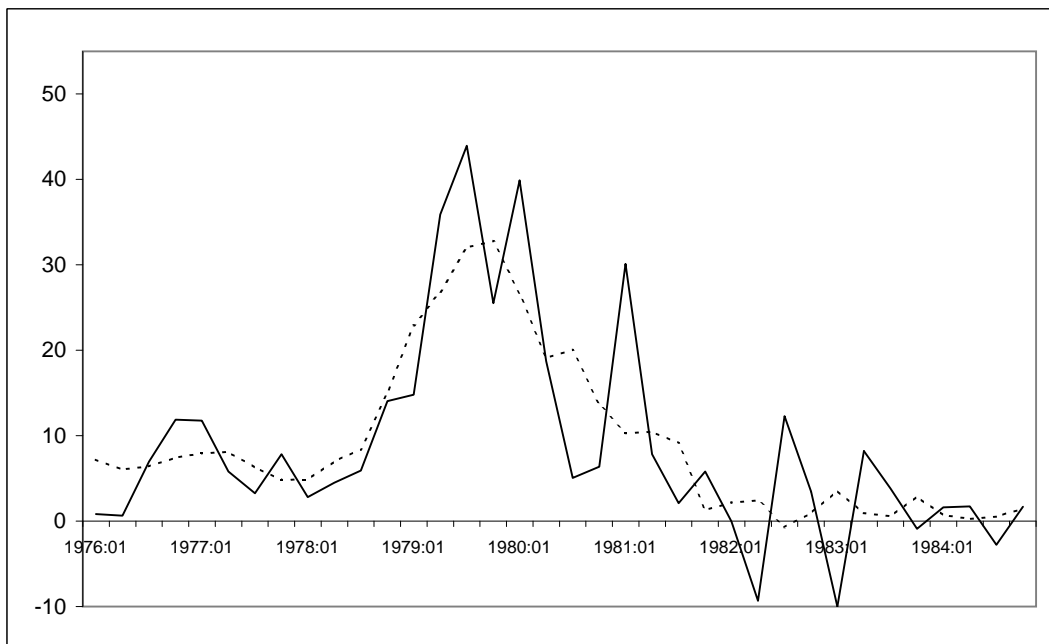
	1977	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**
Q4/Q4 ch.	7.43	7.05	35.05	19.14	12.15	1.61	0.29	0.57

17

3. *The effect of wage-price controls on core inflation*

The following two tables (numbered 2 and 3) use a variant of Blinder and Newton's methodology in order to assess the impact of price controls—and their subsequent removal—on core inflation over the 1973-1975 period. We identify a "peak" period of inflation for the monthly core CPI (table 2) and market-based core PCE price index (table 3), and then employ Blinder and Newton's measure of the extent of price controls in a price-price Phillips curve framework in order to determine how much of the peak reflected the removal of controls. (The various models differ according to how the supply-shock terms are specified and what measure of slack is used.)

While the precise dating of a "peak" inflation period is open to question, it is nevertheless the case that a large fraction of the spike in inflation during this period reflects the impact of price controls. This confirms Blinder and Newton's earlier findings. In addition, since the decontrol period overlapped significantly with the first OPEC shock and the rapid increase in food price inflation, these results underscore the importance of accounting for the impact of the controls on inflation in assessing the effects of the supply shocks.

Table 2: Contribution of Price Controls to Core CPI Inflation Swings, 1973-1975

	Pre-peak (73:07-74:02)	Peak (74:03-74:10)	Post-peak (74:11-75:06)	Implied g
Actual data				
Inflation (AR)	4.23	10.32	6.12	
Acceleration		+6.09	−4.19	
Implied contribution of controls				
Model 1A				
To inflation	−1.73	2.95	0.63	0.064
To acceleration		+4.68	−2.31	
Model 3A				
To inflation	−2.41	3.24	0.78	0.075
To acceleration		+5.65	−2.46	
Model 1B				
To inflation	−2.43	2.48	0.44	0.062
To acceleration		+4.91	−2.04	
Model 3B				
To inflation	−3.37	2.25	0.28	0.070
To acceleration		+5.63	−1.97	

11

Table 3: Contribution of Price Controls to M-B Core PCE Inflation Swings, 1973-1975

	Pre-peak (73:07-74:02)	Peak (74:03-74:10)	Post-peak (74:11-75:06)	Implied g
Actual data				
Inflation (AR)	4.32	9.84	6.08	
Acceleration		+5.52	−3.03	
Implied contribution of controls				
Model 1A				
To inflation	−1.69	2.02	0.59	0.037
To acceleration		+3.70	−1.43	
Model 2A				
To inflation	−1.15	2.20	0.83	0.034
To acceleration		+3.35	−1.37	
Model 3A				
To inflation	−1.97	2.49	0.76	0.045
To acceleration		+4.46	−1.73	
Model 1B				
To inflation	−2.48	1.40	0.11	0.038
To acceleration		+3.88	−1.29	
Model 3B				
To inflation	−2.69	1.55	0.15	0.042
To acceleration		+4.24	−1.40	

12

4. The effect of food and energy shocks on core inflation (1): Evidence from price-price Phillips curves

An important question concerns the degree to which higher food and energy prices acted to boost *core* inflation over this period. One way to answer this question involves simulating a price-price Phillips curve under alternative assumptions about food and energy prices.

The following two figures (labeled "Effects of supply shocks on core…inflation") report some results from such an exercise. (The first chart reports results for the core CPI, while the second chart gives results for market-based core PCE.) The upper panel of each figure plots the relevant measure of actual inflation, along with a baseline dynamic simulation from the price-price model (the dotted line). The panel also shows the path of inflation under a counterfactual scenario in which food and energy price inflation are held fixed at their historical (pre-shock) levels—roughly 4 percent per year for food, and 3 percent per year for energy. Finally, the lower panel gives the difference between the baseline and counterfactual paths.

As can be seen from the two sets of plots, the rapid increases in food and energy prices appeared to put significant upward pressure on core inflation. Importantly, the specifications employed here are not accelerationist—while the sum of the lagged inflation terms comes very close to one, imposing the accelerationist restriction results in a noticeable deterioration in the simulations' fit. (Unsurprisingly, using an accelerationist specification—not shown—results in an even larger measured effect of the supply shocks on core inflation.)

Effects of supply shocks on core CPI inflation

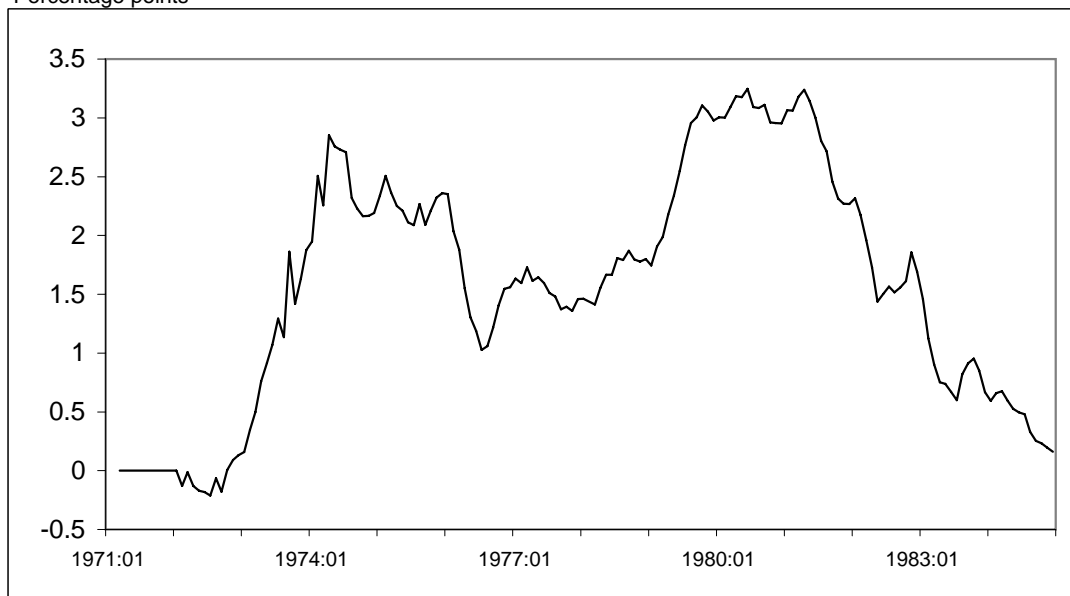## A. Baseline and counterfactual core CPI inflation

Monthly log difference at annual rate
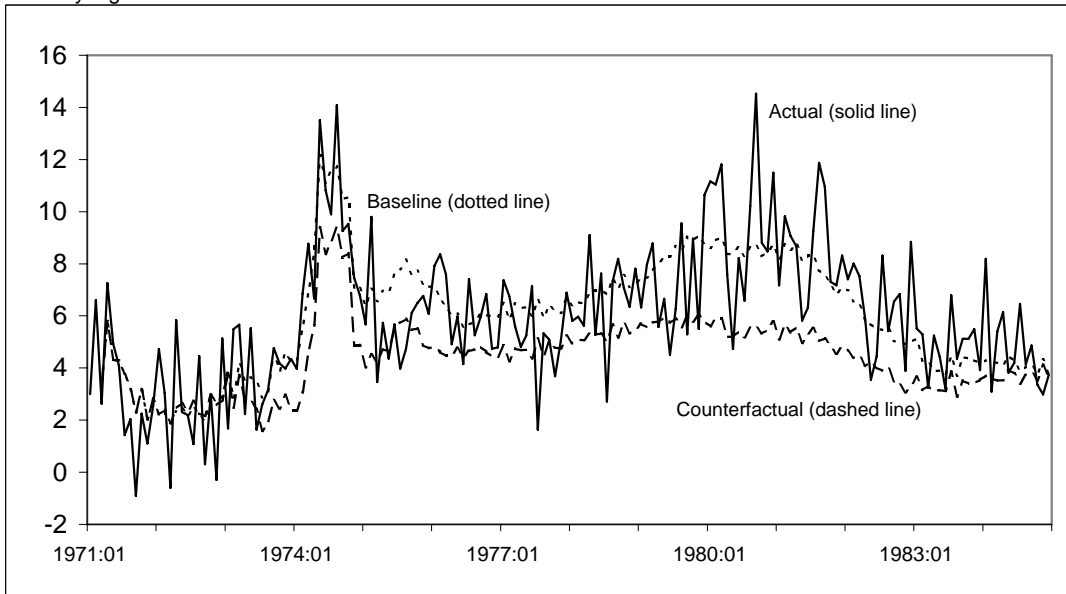
Note: Simulations from price-price specification using methodologically consistent core CPI.

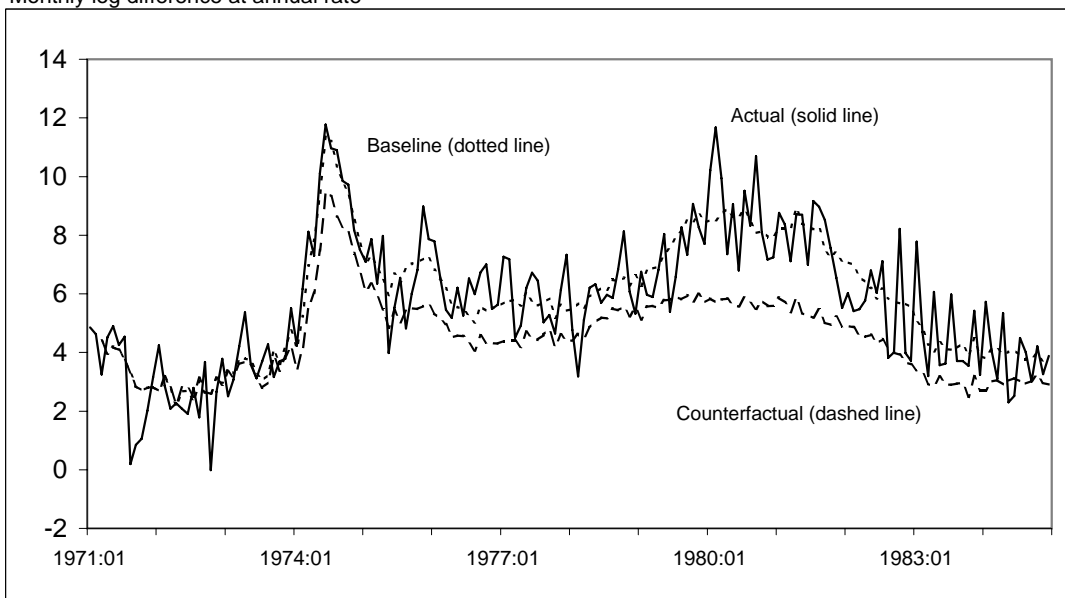## B. Difference between baseline and counterfactual paths

Percentage points

Effects of supply shocks on core PCE-MB inflation

A. Baseline and counterfactual market-based core PCE inflation
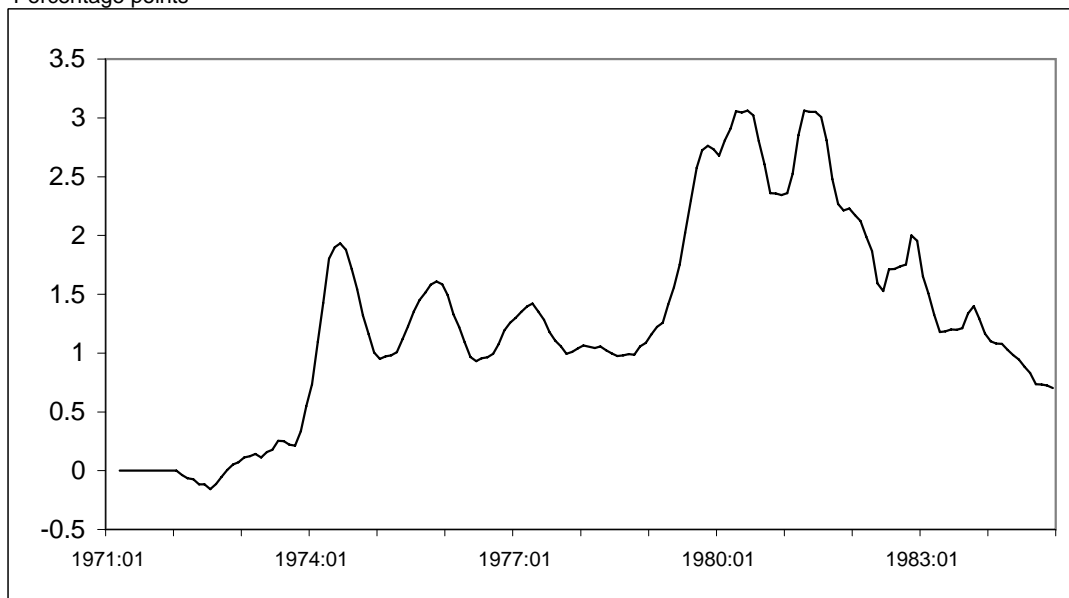
Monthly log difference at annual rate

Note: Simulations from price-price specification using core market-based PCE.

B. Difference between baseline and counterfactual paths

Percentage points

5. The effect of food and energy shocks on core inflation (2): Evidence from estimated wage-price systems

An alternative way to assess the indirect impact of the supply shocks on core inflation involves examining how much of the shocks fed through into wages. In his interpretation of the Great Inflation, De Long (1997, p. 269) uses the behavior of wage inflation in support of his claim that supply shocks had no persistent effects: "…the bursts of inflation in 1972-74 and 1978-80 are very visible in price inflation, yet are invisible in the track of…wage growth."

The top panel of the next figure plots the rate of change of hourly nonfarm business compensation, together with two simulations from a conventional wage-price Phillips curve. In the first (baseline) simulation, the actual rate of headline consumer price inflation is used in the model. In the second simulation, food and energy prices are set equal to their pre-shock historical averages; as can be seen from a comparison of the resulting two paths for wages, the increases in energy and food price inflation made a significant contribution to wage inflation over this period.

We can assess the impact that this higher wage inflation had on core prices by appending a markup equation to the wage model. (Note that both the wage-price and markup equations impose the accelerationist restriction; this turns out to have very little adverse effect on the quality of the dynamic simulations implied by the system.) Simulations from the resulting two-equation system are shown in the lower panel of the figure; as can be seen, the higher wage inflation that resulted from the supply shocks puts significant upward pressure on core inflation in this model.

These last two sets of results are highly provisional, and are subject to a number of econometric objections and caveats. Nevertheless, they provide suggestive evidence that an important fraction of the increase in core inflation over this period can be traced to the indirect effects of the supply shocks, either through a wage-price spiral or other forms of cost pass-through.

Supply shocks and wage-price dynamics

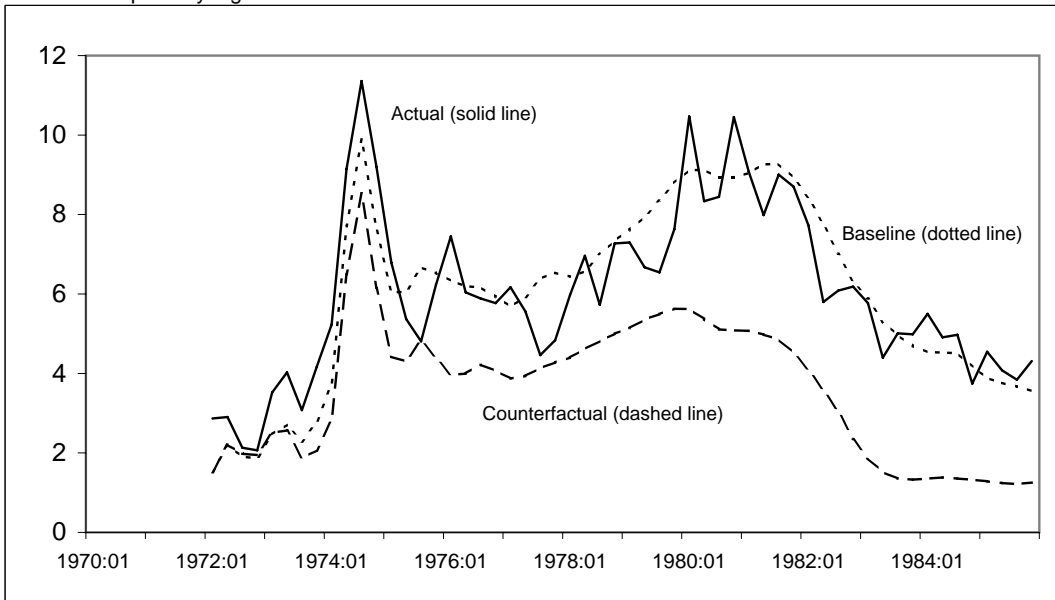## NFB compensation inflation from wage-price equation

Annualized quarterly log difference
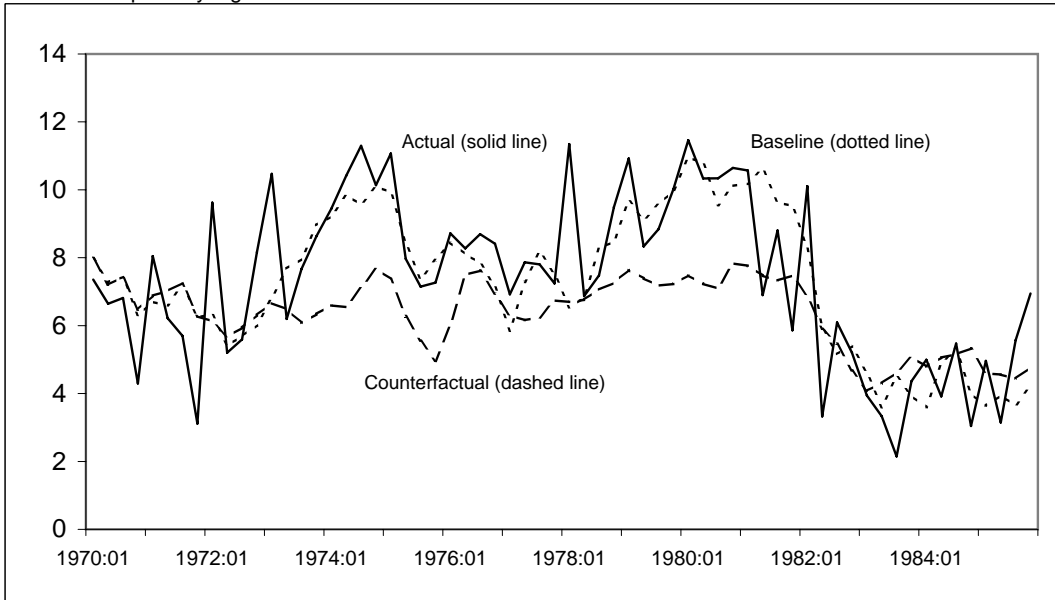
Note: Estimates from accelerationist wage-CPI model.

Core CPI-CM inflation from wage-price system

Annualized quarterly log difference

Note: Estimates from accelerationist wage-CPI model combined with markup equation for core CPI.