HAS THE COST OF FIGHTING INFLATION FALLEN?

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ABSTRACT

During the 1980s, many OECD countries adopted labor-market policies designed to enhance wage flexibility and reduce unemployment. They also attempted to bolster the credibility of their anti-inflation measures through exchange rate and fiscal policies. These measures should have lowered the costs associated with fighting inflation. In this paper, we compare sacrifice ratio measures of the cost of disinflation in the most recent OECD recession with measures for the mid-seventies and early-eighties recessions. Surprisingly, in the overwhelming majority of OECD countries, the cost of reducing inflation has increased rather than declined. This conclusion stands, even if we take into account that it may be more expensive to fight inflation at lower inflation rates.

JEL Classification: E24, E31, E64, J58, J60

Has the Cost of Fighting Inflation Fallen?

During the 1980s, most member countries of the Organization for Economic Cooperation and Development (OECD) adopted labor-market policies designed to enhance wage flexibility and reduce unemployment. At the same time, many of these countries attempted to bolster the credibility of their anti-inflation measures through exchange rate and fiscal policies. According to economic theory, these measures should lower the costs associated with fighting inflation by eliminating barriers to labor- and product-market adjustment.

In this paper, we evaluate whether the structural changes in labor markets and the attempts to boost credibility have effectively lowered the cost of fighting inflation. We explain why it is expensive to lower the inflation rate, review the policies adopted over the 1980s to reduce disinflationary costs, and compare the costs of the most recent OECD recession with those of the mid-seventies and early eighties. To estimate these costs, we calculate sacrifice ratios; these are the yardsticks commonly used by economists to measure production losses associated with policies to reduce inflation.

Surprisingly, in the overwhelming majority of countries, the cost of reducing inflation has increased rather than declined. This result arises in part because fighting inflation is more expensive at lower inflation rates. However, even when we take into account that the most recent recession occurred in a low-inflation environment compared with that of the mid-seventies and early eighties, the cost of disinflation in the recent period is equivalent to, if not greater than, the cost in the earlier periods.

Why is it Expensive to Fight Inflation?

Anti-inflation policies cause unemployment, output losses, and economic dislocation because prices and wages adjust sluggishly to economic changes. When the Federal Reserve undertakes anti-inflation policies that slow nominal demand growth, businesses at first do not meet the slowdown in demand by reducing price increases. Consequently, firms lose sales and, faced with falling profits and inflexible wages, cut employment to lower payroll costs. Unemployed workers spend less, firms lose more sales and cut employment further, economic growth falters and, typically, the economy goes into recession. Eventually, however, wages do slow down in response to mounting unemployment, allowing firms to pass on smaller price increases, expand production, and re-employ workers.

Thus, fighting inflation is costly because, with sluggishly adjusting wages and prices, lowering inflation requires an economic slowdown during which output falls below the economy's productive capacity.[1] The slowdown and its cost of low production can be avoided only if firms and workers coordinate efforts to lower price and wage growth when nominal demand slows. If such steps are not taken, the duration of the slowdown needed to wrest inflation out of the system and, hence, its economic costs will depend on how long it takes before wage growth slows down.

Why do wages take a long time to respond to an economic slowdown? First, the wages of employed workers are governed by multi-year wage contracts that are difficult and time-consuming to renegotiate. In addition, generous unemployment benefits encourage workers to

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[1]A slowdown in activity is sufficient, in principle, to lower the inflation rate. In practice, however, most OECD countries have had to suffer full-blown recessions to achieved sizable reductions in inflation.

face unemployment rather than accept lower wage increases. Even if workers were ready to accept slower wage growth, firms' labor costs often have a large fixed component beyond workers' control. These costs arise from limited flexibility of working hours as well as statutory social security, unemployment insurance, and medical insurance contributions.

Second, unemployed workers often have little or no impact on the general level of wages. Unemployment benefits reduce the workers' incentives for active job search. Even if the unemployed are willing to work for lower wages than currently employed workers, legislation or collective bargaining agreements may prevent employers from paying them less. Furthermore, firms may be reluctant to hire additional labor because of legal and institutional restrictions on their freedom to lay off the workers later on.

In addition, the degree of wage and price flexibility depends on two important factors: recent inflation history and policymakers' anti-inflation credibility. In a high-inflation environment, wage contracts are renegotiated more often and firms change prices more frequently. That is, wages and prices are more flexible at high inflation rates; thus, the cost of fighting inflation is lower at high inflation rates. By contrast, cutting inflation may be costly if the inflation rate is already low.[2] Disinflation is less costly when policymakers have inflation-fighting credibility in the eyes of the private sector.[3] If firms and workers believe that policymakers are willing to bear the economic and political cost of reducing the inflation rate, they will expect prices and wages to decelerate more rapidly in response to anti-inflation

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[2] For an analysis of the relationship between initial inflation and the cost of disinflation, see Ball, Mankiw, and Romer (1988).

[3] For a formal analysis showing that limited credibility increases the cost of disinflation, see Ball (1995).

policies. As a result, they will be more willing to moderate their price increases and wage demands and, hence, reducing inflation will require less economic dislocation.

Policies Adopted to Reduce the Cost of Fighting Inflation

During the 1980s, the governments of OECD countries implemented a large number of structural policies to increase wage flexibility and foster a more efficient labor market. These changes were expected over time to reverse the trend rise in unemployment and reduce the cost of combating inflation.[4] In addition, many countries adopted policies aimed at bolstering the anti-inflation credibility of their policymakers.

Labor Market Policies

Measures undertaken to increase labor-market flexibility can be divided into two broad groups: (1) regulatory and institutional changes to increase wage flexibility, and (2) so-called active labor market programs to improve the training, placement, and rehabilitation of unemployed workers to increase their employability.

Wage flexibility was enhanced by several factors, including a widespread trend toward decentralized wage negotiations and a drop in unemployment benefits and in statutory minimum wages relative to prevailing wages. These changes were most notable in Austria, the Netherlands, Spain, the United Kingdom, and the United States. The United Kingdom, in addition, provided incentives for the adoption of profit-related compensation schemes.

The most significant source of the decline in wage rigidity, however, was a general trend

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[4]For an extensive review of labor market policies introduced during the 1980s, see OECD (1990), chapter 2. A capsule overview can be found in OECD (1989).

toward greater flexibility in working time. As a result, firms could more freely adjust labor costs to changes in demand though greater use of part-time and fixed-term employment rather than through layoffs. In the majority of countries, notably Australia, Canada, Japan, Sweden, Switzerland, the United Kingdom, and the United States, increased use of part-time workers occurred without legislative intervention. Widespread use of fixed-term contracts occurred in response to both a shift in labor demand and to official encouragement, particularly in Germany, Spain and the Netherlands.

Working-time flexibility increased against the backdrop of a European trend toward shorter working hours which, by effectively raising the fixed cost of employment, partly counteracted the trend toward increased wage flexibility. In addition, institutional and legal constraints on employment and redundancy, which discourage firms from expanding employment in response to increasing demand, remained in place except in the United Kingdom.

Active labor market policies are the second group of measures undertaken during the 1980s to increase labor-market flexibility. Such policies included administrative reforms to enhance the productivity of employment agencies and subsidies for the employment and geographic relocation of workers. The bulk of resources were devoted to training programs for employed and unemployed workers, with special emphasis on training for the long-term unemployed and unemployed youths. In addition, Australia, Canada, the Netherlands and the United Kingdom took action to tailor training to specific job requirements.

These labor market programs expanded rapidly over the 1980s. By 1988, about 3 percent of the OECD labor force, or 25 percent of the stock of unemployed workers, participated in labor market programs. Overall, countries in the European Community increased expenditures on

active labor market policies as a share of GDP during the latter half of the eighties. However, spending was reduced in the United States and Japan, where active policy expenditures had been low, and in the Nordic countries, where they had been among the highest in the OECD.

The United Kingdom made the greatest strides in increasing labor-market flexibility, both by implementing legal-institutional reforms and active policies. Continental Europe, whose labor markets had become increasingly ossified during the 1970s, was successful in implementing active labor market policies, but less so in deregulating labor markets. The United States and Japan, at the other end of the scale, implemented fewer policies to increase labor market flexibility.

Attempts to Bolster Anti-Inflation Credibility

If policymakers lack anti-inflation credibility, wage and price expectations are likely to respond slowly to anti-inflation policies, raising the costs of disinflation. During the 1980s, a number of countries adopted policies to bolster credibility, in part to counter the erosion of credibility in the decade of high inflation that started in the early 1970s.[5] Most prominently, European Community members adopted the Exchange-Rate Mechanism (ERM), a system of fixed exchange rates aimed at anchoring inflation expectations. Countries such as France, Italy, the Netherlands, Spain, and, much later, the United Kingdom, hoped to gain some of the German Bundesbank's anti-inflation credibility by tying their currencies to the deutsche mark.

Fiscal policy can undermine or enhance the credibility of disinflation policies. For example, high debt or deficit levels may lower credibility by persuading the public that the government has an incentive to inflate away its debts or raise its revenues (taxes are typically not

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[5]For evidence of a loss of credibility in the U.S., see Judd (1995).

neutral with respect to inflation). By this logic, fiscal consolidation measures undertaken in the 1980s should have enhanced credibility in the United Kingdom, Germany, France, and Japan, while continued deficits should have undermined the anti-inflation credentials of policy makers in the United States, Canada, and Italy.

Overall, European nations, and particularly the United Kingdom, made significant efforts to bolster credibility and increase labor-market flexibility. As a result, we would expect to see a drop in the cost of fighting inflation in these countries.

The Cost of Disinflation in Historical Perspective

To investigate whether the cost of fighting inflation has fallen in the industrial world, we analyzed the experiences of 13 OECD economies chosen on the basis of data availability. For each country, we distinguished major disinflations in three periods: the mid-1970s, early 1980s and late 1980s/early 1990s. For each of these episodes, we calculated the sacrifice ratio, a commonly used measure of the cost of reducing inflation. To determine the impact of longer term structural change, we compared the sacrifice ratios for the three episodes.[6]

Our sacrifice ratios measure the output cost of reducing the inflation rate by one percentage point. The output cost is expressed as the percent loss in gross domestic product (GDP) relative to its long-term growth potential. The inflation rate is measured by the four-quarter percentage change in the GDP deflator. We use the GDP deflator to calculate inflation

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[6]Two recent studies that compare sacrifice ratios across countries and time are Andersen (1993), Ball (1994) and Judd (1995). Andersen and Ball try to explain the variation in sacrifice ratios across countries, while we are primarily interested in changes over time. Judd's work is closer in spirit to our's, but focuses on credibility.

because, as the price index for domestic value added, it is the broadest measure of price trends. It is not unduly influenced by energy price shocks that are beyond policymakers' control, since most industrial countries are not self-sufficient in energy. Furthermore, it is not subject to import price disturbances over which policymakers have, at best, little influence.[7]

To calculate the sacrifice ratio, we identify disinflationary episodes with cyclical downturns in GDP--that is, episodes in which GDP fell for two or more successive quarters. Each of the major downturns selected was associated with a significant slowdown in inflation. For each episode, we identify the peak and subsequent trough of the general price inflation rate; these typically occur well after the peak and trough in GDP.[8] The inflation benefit associated with the disinflationary episode is the decline in the general price inflation rate from its peak to its trough. The output cost is the cumulative deviation of GDP from its trend, beginning at the quarter after the cyclical peak in output, and ending at the quarter when GDP returns to its trend, expressed as a percentage of annual trend output.[9] Finally, we calculate the sacrifice ratio by dividing the output cost by the inflation benefit.[10]

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[7]   We also calculated alternative sacrifice ratios. In particular we measured the costs of disinflation in terms of increased unemployment, rather than lost output, and the benefit in terms of consumer price inflation. These measures gave essentially the same results as those reported here.

[8]The peak is defined as a maximum preceded by at least two quarters of rising inflation and followed by at least two quarters of falling inflation; the trough is defined analogously.

[9]Trend output is obtained by applying the Hodrick-Prescott filter to the log of GDP. This procedure yields a smooth trend that is similar to measures of potential output estimated by more sophisticated methods. In general, the method of de-trending affects the precise numerical estimate of the sacrifice ratio, but the results from any smooth trend are comparable to those obtained with the Hodrick-Prescott filter.

[10]   The sacrifice ratio can also be estimated by more sophisticated statistical methods. These methods yield an estimate of the average sacrifice ratio over a long span of time (30 to 40 years).

The components of our sacrifice ratios for the United States are illustrated in Chart 1.
The upper panel shows the cumulative deviation of output from its trend over the course of the
most recent and earlier cyclical slowdowns. Inflation gains are illustrated in the lower panel.
From Chart 1, we observe that GDP is typically above trend at the cyclical peak, and that the
most recent recession was comparatively mild, with the total output loss on the order of 3 percent
of one year's trend GDP. As a result, the inflation rate also declined a modest 4 percentage
points.

Table 1 shows that in the overwhelming majority of countries the output cost of reducing
price inflation in recent years is higher, or at best no lower, than in the mid seventies or early
eighties. During the 1990s, the sacrifice ratios range from a high of 1.00 (percent decline in
output per percentage point fall in general price inflation) in the case of the United States to a
low of 0.13 in the case of Sweden. Of the 13 countries in the sample, two countries have
sacrifice ratios in excess of 0.7 (the United States and Canada) and four have sacrifice ratios
below 0.4 (Italy, Switzerland, Norway, and Sweden). In three countries (Germany, Switzerland,
and Sweden), there is evidence that the cost of disinflation has fallen over the 1980s, but it is not
clear that the declines are large enough to be economically meaningful. The sacrifice ratio is
much higher than in past disinflations in four countries (the United Kingdom, the Netherlands,
Spain and Japan) and roughly the same in two (the United States and Italy).[11]

Thus, for our purposes of comparing sacrifice ratios in different historical disinflationary
episodes, direct measurement from the changes in output and the general price level is the only
feasible alternative.

[11] As noted earlier, the general tenor of these results is unchanged if the cost of fighting
inflation is measured by unemployment instead of output, or if the consumer price index rather
than the GDP deflator is used to calculate the inflation rate.

Strikingly, the change in the cost of fighting inflation bears no obvious relation to policies undertaken during the 1980s. We would have expected a large decline in the United Kingdom sacrifice ratio arising from extensive labor market initiatives, fiscal consolidation, and entry into the ERM. Instead, the U.K. suffered a dramatic increase in the cost of fighting inflation. In the United States, at the other extreme, labor market policies received little emphasis and budget deficits reached peacetime highs, but the sacrifice ratio is much the same as a decade ago.

More generally, the pursuit of active labor market policies in the major European nations appears not to have had much impact on their sacrifice ratios. Similarly, the results for France, Italy, the Netherlands, and Spain show that attempts to boost credibility by fixing the exchange rate also did not lower the sacrifice ratio.[12] Finally, Germany appears to have made some progress since the mid-1970s in reducing the cost of fighting inflation, although many labor-market rigidities survive.[13]

The surprising finding that sacrifice ratios have increased in the overwhelming majority of the countries in our sample suggests that the policies to increase labor market flexibility and enhance credibility bore little fruit in lowering the cost of fighting inflation. We now turn to some potential objections to this conclusion and show that it withstands closer scrutiny.

Some Complications and Extensions

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[12]Notably, France also implemented extensive labor market measures and fiscal consolidation.

[13]Labor unions, for example, remain powerful in Germany. In fact, the cost of disinflation in the most recent German slowdown may have been comparatively low precisely because unions acted in concert to slow wage growth.

As explained earlier, the evidence suggests that as the inflation rate falls, wages and prices become progressively less flexible, and the cost of disinflation, progressively higher. Some may argue that the generally higher sacrifice ratios we find may reflect the low-inflation environment of the late 1980s rather than the ineffectiveness of policies to increase labor-market flexibility and to bolster credibility. We conducted a statistical analysis to evaluate this hypothesis and found that a decline in the inflation rate does lead to a significant increase in the sacrifice ratio.[14]

For 10 of the 13 countries in our sample, the sacrifice ratios in the most recent recession were neither higher nor lower than what we would have expected, given the statistical relationship between initial inflation and the sacrifice ratio (Table 2, upper panel). A different test (Table 2, lower panel) confirms this result: the coefficient on the 1990s dummy, which measures the reduction in the sacrifice ratio associated with structural policies, is not significantly different from zero. Thus, it appears that we can attribute part of the increases in the sacrifice ratios seen in Table 1 to the general decline in inflation over the 1980s. By the same token, there does not seem to be any evidence that the structural changes over this decade lowered the cost of fighting inflation.

There is, however, a potential source of bias in the sacrifice ratio comparisons discussed thus far. As noted earlier, the output costs in a cyclical slowdown typically precede its inflation

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[14]For our sample of countries, the estimated statistical relationship between the sacrifice ratio and the inflation rate at the beginning of the disinflation is given by the equation

$$SR = 0.70 - 0.23\ln(IN), \quad R^2 = 0.28,$$
$$\quad\quad (0.16) \quad (0.07)$$

where SR is the sacrifice ratio, IN is the initial inflation rate, R^2 is the adjusted r-squared for the relationship, and the figures in parentheses are standard errors.

benefits. As a result, we might have underestimated the inflation gains and overestimated the sacrifice ratios for the most recent cyclical slowdown -- at least in countries where inflation has not yet begun to accelerate.[15] To eliminate this potential bias in our comparisons of these countries, we recalculated their sacrifice ratios for earlier cycles at a stage of the disinflation similar to the current stage of the most recent downturn.[16] The modified sacrifice ratios do not, however, provide compelling evidence that the output cost of lowering inflation fell over the 1980s. Our conclusion that this cost increased is reversed for only two countries: Austria and the Netherlands.

Finally, it is possible that the labor-market policies adopted over the 1980s had an impact on the inflation process that we did not pick up with our sacrifice ratio calculations. This might be the case if the policies lowered the unemployment rate above which inflation typically starts to accelerate--the NAIRU or nonaccelerating inflation rate of unemployment. Under this scenario, the average rate of inflation over long time horizons would be lower, but the short-run trade-off between inflation and unemployment (or output losses) captured by the sacrifice ratio would be unaffected. Research to date shows that this scenario is unlikely -- recent OECD publications suggest that policies have been successful in redistributing unemployment among different groups in the labor force, but not in affecting its overall level.[17]

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[15] The countries in question are Japan, France, Italy, the Netherlands, and Austria.

[16]For example, if our most recent inflation figure is for the 15th quarter after the inflation peak, we calculated cumulative inflation benefits for earlier cycles to include only the first 15 quarters after the inflation peak.

[17]See OECD (1991).

V. Conclusion

The sacrifice ratios presented in this article show that the loss of output required to reduce inflation has been higher in the most recent OECD disinflationary episode than in the mid 1970s or early 1980s. Even if we take into account that the most recent disinflation occurred in a low-inflation environment compared with that of the mid seventies and early eighties, and that the cost of fighting inflation tends to be higher at lower inflation rates, sacrifice ratios are equal to, if not higher than, what we would have expected in the majority of countries. Consequently, the policies undertaken in the OECD to lower the cost of fighting inflation have been ineffective or too timid or short-lived to achieve the desired result.

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CHART 1

U.S.: CUMULATIVE DEVIATIONS OF REAL GDP FROM TREND
Percent

Most Recent

Early-80s

Mid-70s

Quarters after Recession Peak
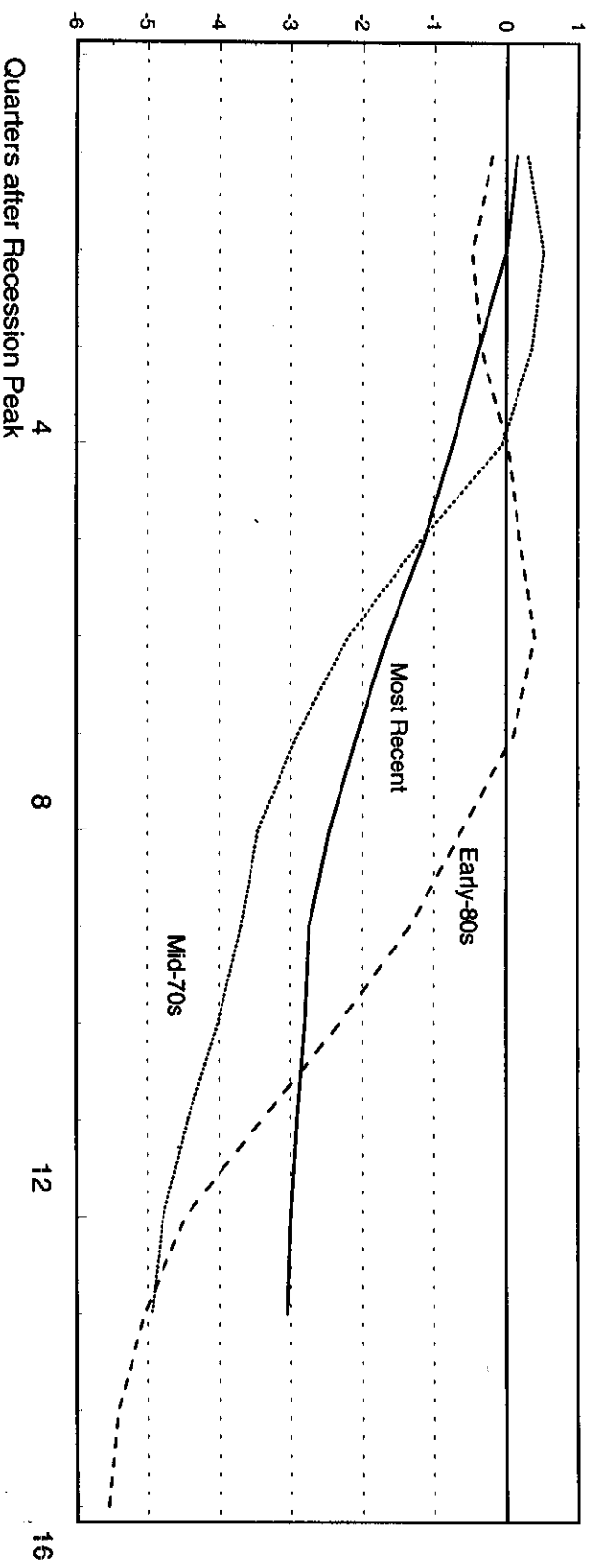
U.S.: CUMULATIVE DECLINES IN CORE CONSUMER PRICE INFLATION
Percentage Points

Mid-70s

Most Recent

Early-80s

Quarters after Core CPI Peak
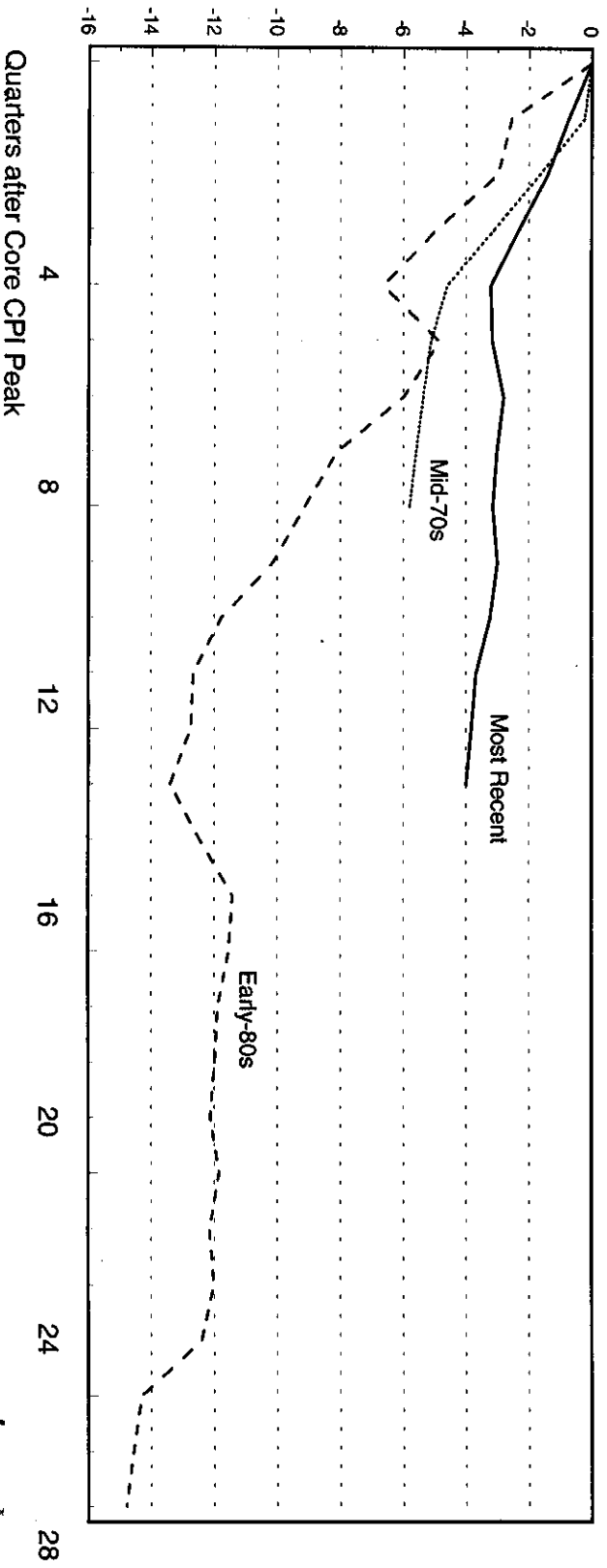
TABLE 1: SACRIFICE RATIOS RELATIVE TO EARLIER CYCLES

COUNTRY	70s	80s	90s	90s Highest?
United States	0.98	0.70	1.00	YES
Canada	--	0.62	0.73	YES
United Kingdom	0.12	0.24	0.68	YES
Germany	0.77	0.34	0.63	NO
France	0.46	0.27	0.56	YES
Italy	0.30	0.12	0.33	YES
Netherlands	0.36	0.26	0.67	YES
Switzerland	0.56	0.04	0.23	NO
Austria	0.41	0.34	0.55	YES
Norway	--	0.19	0.26	YES
Sweden	0.18	0.54	0.13	NO
Spain	0.07	0.13	0.48	YES
Japan	0.24	--	0.50	YES

NOTE: Sacrifice ratios are calculated as the percent output loss per percentage point reduction in GDP deflator inflation for all countries except the Netherlands and Sweden. These two countries lack sufficient deflator data; thus, the deflator is replaced with the consumer price index excluding food and energy prices.

TABLE 2:

HAS THE SACRIFICE RATIO DECLINED? STATISTICAL EVIDENCE

A. SACRIFICE RATIOS RELATIVE TO EXPECTATIONS

LOWER *	SAME	HIGHER *	TOTAL
2	10	1	13

* These sacrifice ratios fall outside of the 95 percent confidence band around   the regression line that relates the sacrifice ratio to the peak inflation rate at the start of the disinflationary episode.

B. TEST OF SHIFT IN SACRIFICE RATIO-INFLATION RELATIONSHIP

Sacrifice Ratio = 1.08 - 0.07*(1990s Dummy) - 0.27*(Log Inflation)

(3.74)   (-0.51)   (-2.85)

NOTE: Coefficients in parentheses are t-statistics.