Political Regimes and the Cost of Disinflation*

By

Barbara Caporale
Department of Economics
Ohio University
Athens, OH 45701
Mckierna@ohio.edu

&

Tony Caporale
Department of Economics
University of Dayton
Dayton, OH 45469
CAPORALE@ohio.edu

Abstract

This study investigates, using data from 1960-1998, whether the nature of political regimes can help explain cross national and inter-temporal variations in the cost of disinflationary policies, as measured by the sacrifice ratio. We show that, ceteris paribus, rightwing governments have lower costs of disinflations than leftwing governments. We argue this is due to superior credibility resulting from their stronger anti-inflation reputations. In addition (and in marked contrast to previous studies) we find that when we control for political regimes, trade openness, and other standard factors in this literature, central bank independence has no significant effect on the sacrifice ratio.

***We would like to thank an anonymous referee for providing us with very detailed and useful comments. We also thank Kyongwook Choi, Kevin Grier, Farrokh Nourzad, and seminar participants at the 2005 Public Choice meetings.**

1. Introduction

There is a substantial literature analyzing the impact of various factors on the cost, in terms of lost output, of policy-induced disinflations; such authors as Ball (1994), Walsh (1995), Temple (2002), Daniels, Nourzad and VanHoose (2005) and Razin and Loungani (2007) variously test the importance of trade openness, speed and size of disinflations and degrees of central bank independence in explaining disinflation costs. This literature has not, however, addressed the important question of whether government type (left or right) affects the amount of output lost during a disinflation. Our paper, using an expanded sample and several different empirical methodologies, finds that rightwing governments tend to have, ceteris paribus, lower output losses associated with given sized disinflations (i.e., lower sacrifice ratios). We argue that this is due to their generally stronger anti-inflation reputations, which render disinflation policies undertaken during their tenure more credible. Although political factors have been shown to influence monetary policy and inflation changes (e.g., Alesina, Roubini and Cohen (1997)), this paper goes further by showing that the nature of political regimes also helps explain cross sectional and inter-temporal differences in the macroeconomic *effects* of disinflations. In addition we find, in contrast to the previous literature on this topic, that central bank independence has no significant impact on the sacrifice ratio in statistical models which include political factors as well as other variables. If having a more independent central bank does not in itself raise a nation's sacrifice ratio- a hypothesis we cannot reject in our work here- this calls into question the existence of a negative side effect of independence often discussed in this literature.

2. Literature

Although the theory of a negative output-inflation tradeoff and the concept of the sacrifice ratio is an old one in macroeconomics, Ball's (1994) notable contribution has proven particularly useful in quantifying this relationship. The ratio measures the sum of the differences between the logs of trend and actual output divided by the change in trend inflation during a given disinflation episode. It is interpreted as the output loss (or cost) of reducing inflation by one point. Ball (1994) argues that his measure best fits instances where the fall in trend inflation is the result of explicit contractionary aggregate demand policies, and further argues that his algorithm for finding disinflationary episodes accurately identifies examples of those policies. In the same paper he measures the sacrifice ratio for 65 episodes, covering 19 moderate inflation OECD countries, using annual and quarterly data from 1960-1991. Further, he tests several hypotheses concerning the sacrifice ratio's determinants for his cross section of nations. Although he finds that the sacrifice ratio is inversely related to the speed of disinflation, little or no support is found for the importance of the initial inflation rate or the openness of the economy to trade.

This paper adds to the previous literature by studying the determinants of the sacrifice ratio using more observations than most of the previous papers in this field. By obtaining data from Andersen and Wascher (1999), who employ Ball's methodology, we increase Ball's set of disinflation[1] episodes from 64 to 81. We also investigate the importance of *political* factors in influencing the cost of disinflation. The significance of changes in political regimes in influencing macroeconomic outcomes has most prominently been studied using rational partisan models (e.g. Alesina (1987), Alesina and Roubini (1992), Alesina, Roubini and Cohen (1997)). In these models, conservative (or rightwing) governments are

more inflation averse than liberal (or leftwing) governments and are thus more willing to engage in, or passively oversee, contractionary monetary policies (see, for example, Grier (1991)). The prediction of these models is that the probability and severity of recessions significantly rise with the establishment of a rightwing political regime.

The literature on the sacrifice ratio, however, allows us to test the role that politics plays in influencing the cost of *a given amount* of disinflation. That is, although rightwing governments will likely be associated with lower inflation, more frequent and severe disinflationary episodes, and more total output loss (recessions), the cost per point reduction of inflation (the sacrifice ratio) could well be lower under more conservative regimes. This follows because the public will view the disinflation policies of rightwing governments as more credible given their stronger anti-inflation reputations. This credibility advantage causes the short run Phillips curve under rightwing governments to shift downward more quickly for a given negative inflation change, started at a given initial level, holding constant all other structural and institutional factors. We therefore predict that, *ceteris paribus*, rightwing governments should have lower sacrifice ratios. Our empirical work, presented below, strongly supports this hypothesis.

One factor which has received a good deal of attention, leading to interesting results in the sacrifice ratio literature, is the role of trade openness. Ball (1994), following Romer (1993), argues that the output-inflation tradeoff should be smaller for more open economies. This is because a monetary contraction will lead to a real currency appreciation that results in a bigger negative impact on the overall price level. However, if wages are at least partially indexed, the output loss of the contractionary policy will be reduced. Both effects make the Phillips curve steeper (and hence the sacrifice ratio smaller) for more open economies.

Ball (1994), however, finds that trade openness has no significant effect on the sacrifice ratio and argues that this casts doubt on Romer's (1993) theory. Temple (2002), who like Ball (1994) measures openness with imports as a percentage of GDP, presents results similar to Ball's. More recently, Bowdler (2006) finds a weak, negative relationship between openness and the output-inflation tradeoff that is stronger under more flexible exchange rate regimes.

In contrast, a few recent papers have developed microeconomically-based models that lead to the opposite prediction concerning the effect of openness, and have presented evidence to support this. Loungani, Razin and Yuen (2001) measure trade openness using national trade shares as well as financial (i.e., capital account) openness. They find that countries with greater restrictions on capital mobility have smaller sacrifice ratios because they have steeper Philips curves. The theory leading to this result is further developed by Razin and Yuen (2002) who show that since agents in more open economies face fewer borrowing constraints, the real wage (and hence price) effects of negative demand shocks are minimized, resulting in a larger output loss. Razin and Loungani (2007), while again finding that openness raises the sacrifice ratio, develop a theoretical framework which allows them to reinterpret this evidence. Within a New Keynesian open economy macro model, they show that the correlation between the output gap and consumption is weakened in economies with less restrictive capital accounts because agents in those economies can more effectively smooth consumption. Thus, even though those economies have higher sacrifice ratios, the output gap will have a smaller weight in the utility-based loss function for those economies. This work suggests an interesting (albeit beyond the scope of this paper) direction for this

literature; perhaps the "pain" implied by a given sacrifice ratio is not constant across all nations.

A possible problem associated with measuring the effect of trade openness on the sacrifice ratio is omitted variable bias. Daniels, Nourzad and Vanhoose (2005) deal with this by including central bank independence. They follow Walsh (1995) in pointing out that citizens of countries with independent central banks will have lower inflationary expectations and hence will be more likely to enter nominal wage contracts. This makes it more difficult to respond to a policy shock, which raises the sacrifice ratio. Their empirical results suggest that both central bank independence and trade openness increase the sacrifice ratio. In our statistical framework we also deal with this problem by including central bank independence.

3. Data and Hypotheses

a. Initial Inflation, Openness, Central Bank Independence and Political Regimes

In this section, we show that having an independent central bank or a rightwing government is associated with a tendency to disinflate starting at a lower initial rate of inflation. This is consistent with the theoretical arguments discussed above. In addition, we present cross-sectional evidence regarding our variables' impact on the sacrifice ratio.

Table 1 presents the annual dates and locations for the 81 disinflation episodes obtained from Ball (1994) and Andersen and Wascher (1999).[2] The sample consists of OECD countries for which trend inflation has stayed below 20% since 1960. Each disinflation period ends a year before the dates presented (for example, the reported US disinflation for 1979-1983 actually ends in 1982). The last year is included to calculate the total output loss of the disinflation since it is assumed that real GDP takes an additional year,

following the end of the disinflation, to return to trend. The first row of Table 2 provides summary statistics for the sacrifice ratio. The mean value of 1.46 indicates that a one point reduction in inflation is associated with a 1.46% average shortfall of real GDP from trend. However, the large standard deviation, (2.02), and range between its high and low values, (10.35 to -0.85), allow us to efficiently test several hypotheses concerning the sources of variation in the sacrifice ratio.

Data on the nature of the different political regimes are obtained from Alesina, Roubini and Cohen (1997) and Beck, Clarke, Keefer, Groff and Walsh (2001). [3] Both of these works categorize governments using a simple "Right-Left" designation. These definitions are arrived at by looking at party policy positions. The positions include views on government size and optimal levels of taxation. Their methods lead to results that are unsurprising; for example, in the U.K. the Tory party is coded as rightwing, while the Labour party is on the left. Alesina et. al. explain that in ambiguous cases (i.e. coalition governments that are not obviously and purely left or right) they use Banks' (1994) governmental classifications. There are alternative ways of measuring party ideology, but for OECD nations there is general consistency among different measures. One alternative measure is Huber and Inglehart's (1995) survey of experts on party positions. Beck, Clarke, Groff, Keefer and Walsh (2001) uses Huber and Inglehart's work to check their own results. These scholars change coding to Huber and Inglehart's for two countries we include in our sample, Denmark and Ireland. Gabel and Huber (2000) employ party manifestos to place parties across a left/right spectrum, an approach that could prove fruitful in our future work. Here, we are interested in whether parties are on the left or right, but another possibility is

that government control by more extreme parties has a disproportionate impact on the size of a country's sactifice ratio.

We use our data on political regimes to develop two different variables. The first, **% Right,** is the percentage of each disinflation episode that had rightwing governance. (Summary statistics reveal that this variable ranges from 0% to 100%, and its mean value of 61.57 reveals that rightwing governments were in power for 62% of the total time associated with disinflations.) Using the data this way allows us to construct a measure that will tell us whether having at least some periods of rightwing governance impacts the sacrifice ratio. The limitation of this measure comes from its very generality; that is, it does not distinguish between governments voted into, or out of, office during the disinflation, or governments that are rightwing all throughout the episode. Summary statistics in table 2, however, reveal that rightwing governments oversaw a total of 43% of the disinflations in our sample from beginning to end. In other words, almost *half* our disinflation episodes were conducted solely under rightwing governments. This suggests a clearer, more decisive, alternative measure. Our variable **Right Government** is equal to one if the government in power is classified as rightwing for the entire period of the disinflation and zero otherwise. (To compare this to **% Right**, this means that **Right Government** is only equal to 1 when **% Right** is 100%). Defining the variable in this way allows us to cleanly test the simplest form of our hypothesis: that disinflations begun, carried out and ended by rightwing governments should, ceteris paribus, have lower output costs per point drop in inflation than any others because their policies are the most credible. A limitation of this variable worth noting is that it fails to capture governments voted out of office after beginning an unsuccessful (at least politically) disinflation.

Before proceeding with our study of the sacrifice ratio, equations 1 and 2 of Table 3 test if the inflation level at the start of each disinflation is explained by either trade openness (which we measure using the more conventional definition of the share of imports plus exports to GDP)[4], the degree of Central Bank Independence (CBI)[5] or whether the government in power was rightwing at the time. In contrast to Ball (1994) and Temple (2002) our openness variable for each country changes across individual disinflation periods; this provides additional (time series) variation in the variable. Trade openness is shown to have no explanatory power over the starting level of disinflations.

Our statistical results show that nations with more independent central banks start disinflating at lower rates of inflation. Equation 2 reveals that, controlling for trade openness and government type, a one standard deviation increase in CBI is associated with a 1.2% lower initial inflation level. This is consistent with the widely held view that more independent central banks are more inflation averse. Prior studies have thus explained the higher sacrifice ratios associated with nations with higher degrees of central bank independence as caused by the aggregate supply curve "flattening" side effect of the greater nominal wage contracting commonly found in low inflation environments. This does, however, raise the question as to why the higher credibility associated with high CBI nations does not encourage more rapid adjustment of inflation expectations to policy changes, and thus produce lower sacrifice ratios. Given this, and the fact that prior tests of the effect of CBI on the sacrifice ratio have not controlled for the nature of political regimes, we take an agnostic a priori view regarding the effect of CBI on the sacrifice ratio.

Equation 2 reveals that disinflations begun with rightwing governments start at an initial inflation level 1% lower than those started under leftwing governments, i.e., leftwing

governments on average start disinflating with rates of 7.88% verses 6.9% for rightwing governments. This supports the view that rightwing governments are more inflation averse.

The sacrifice ratio literature heretofore contains no analysis of political factors' effect on the macroeconomic impact of disinflations. This is likely due to the fact that monetary policy is usually modeled as either consisting of a central banker choosing an optimal time-consistent rate of inflation (Barro and Gordon (1983)) or setting a targeted inflation rate by implementing a variant of a Taylor policy rule.[6] A problem with these approaches is that large policy-induced disinflations are difficult to reconcile with the concept of a fully autonomous, apolitical, central bank. If, however, following the Rational Partisan literature, monetary policy is at least partially influenced by political factors, then monetary policy regime changes will also reflect governmental preferences. Unlike the CBI case, the theoretical impact of our political variable is clear. Based on the rational partisan literature, monetary tightening under a rightwing regime should raise the credibility of the policy change and, ceteris paribus, lead to a lower output loss per point of lower inflation (i.e., lower the sacrifice ratio). Additionally, since governments are much more transient than central bank institutions, the Phillips Curve "flattening" argument makes little sense when applied to political regimes. That is, because elections (for countries in our sample) take place fairly frequently, a given election's outcome is unlikely to affect the typical length of worker contracts.

b. Cross Section Sacrifice Ratio Regressions

Following Ball (1994) and Temple (2002) we initially model the sacrifice ratios obtained from our 81 disinflation episodes as a pure cross section. Equation 1 of Table 4

regresses the sacrifice ratio on trade openness and CBI.[7] The results indicate that CBI significantly raises the sacrifice ratio; a one standard deviation increase in CBI raises the sacrifice ratio by 20%. This is consistent with the previous empirical findings of Jordan (1997) and the theoretical models of Walsh (1995) and Cukierman (2002). The positive and significant (at the 10% level) impact of our openness measure is consistent with Loungani, Razin and Yuen (2001) and clearly rejects Romer's (1993) prediction of a significant negative relationship.

Equation 2 in table 4 tests our political hypothesis. The variable **Right Government** is a binary variable that is equal to one if the government in power is classified as rightwing for the entire period of the disinflation and zero otherwise. Supporting our credibility hypothesis, the statistical results show that rightwing governance has a negative and statistically significant impact on the sacrifice ratio. The standardized coefficient on the variable is .29. This indicates that a one standard deviation increase in **Right Government** leads to a .29 standard deviation (40% decline) in the sacrifice ratio. The inclusion of our political variable raises the model's adjusted R^2 as well as the value of the overall F-statistic.

An alternative to applying a dummy variable approach, which tests "100% right" versus "everything else," is presented in equation 3 where the variable **% Right** replaces our binary variable. Our statistical results show that this alternative measure is also negative and significant. The standardized coefficient on **% Right** is .20, which indicates that a one standard deviation increase in it leads to a 27% decline in the sacrifice ratio. Since the move from 0% right to 100% right takes 2.336 standard deviations, such a change is interpreted as, ceteris paribus, leading to a 67% fall in the sacrifice ratio.

Although the two political measures yield similar results, we argue that the binary variable approach is the most attractive method of capturing the "credibility" effect on the sacrifice ratio. This follows from the fact that, for our binary variable, the right regime is in place for the entire disinflationary period. Defining the variable this way omits the possible output influence of government regime changes (the more traditional rational partisan effects), and although elections do take place when **Right Government**=1**,** the lack of turnover tends to limit the output effects of electoral uncertainty.[8] In addition, our test statistics (i.e., the root mean squared error of equation 2 verses equation 3) indicate that our binary specification for political regimes (**Right Government**) provides a better fitting model than our continuous **% Right** measure. Therefore, for both theoretical and empirical reasons, we use our binary measure of political regimes for the remainder of the paper.

c. Sensitivity tests for our political variable

We test the robustness of our political variable by first investigating whether the significant negative coefficient found for **Right Government** is driven by a large outlier observation. We jackknife equation 2 (table 4) by running 81 different regressions in which each observation is dropped in turn. The coefficient on **Right Government** ranges from a high (in absolute value) of -1.27 to a low of -0.98, with a standard deviation of .04. This indicates that the coefficient value does not depend on a large outlier. That is, the variable has a clear and consistently negative effect on the sacrifice ratio all through our sample.

Next, we test if the results are robust to the inclusion of additional control variables.[9] Equation 1, in table 5, tests whether the initial level of inflation from which the disinflation begins has an impact on the sacrifice ratio. Ball, Mankiw and Romer (1988) predict that the

sacrifice ratio should be decreasing in the initial level of trend inflation. They argue that this is because higher inflation reduces the level of nominal rigidity and steepens the short run Phillips Curve. Ball (1994) finds no evidence for this hypothesis. In contrast, we find a significant negative relationship between initial inflation and the sacrifice ratio, thus supporting the Ball, Mankiw and Romer (1988) hypothesis. Interestingly, although our political variable and measure of trade openness remain significant, the inclusion of the initial inflation level renders the coefficient on CBI insignificant. This supports the view of Jordan (1997) who argues that since central bank independence is associated with low inflation it is this, rather than independence per se, that raises the sacrifice ratio. Our results in the next section, which take advantage of the time series as well as cross-sectional nature of our dataset, are consistent with this result.

Equation 2 (table 5), following Ball (1994) and Temple (2002), includes the total change in inflation, as well its initial level, as possible determinants of the sacrifice ratio. Sargent (1983) argues that the size of the change in inflation could be important since a large total movement may be perceived as a change in the monetary policy regime. A larger change, then, would be viewed as signaling a move to a long-lasting, lower inflation environment. Anomalously, however, we find that the size of the change in inflation actually significantly raises the sacrifice ratio. The data once again support the hypothesis that a higher initial level of inflation significantly lowers the sacrifice ratio. The coefficient on **Right Government** remains negative and significant and CBI has no significant effect.

Equation 3 (table 5) includes a measure of the **Speed** of disinflation. **Speed** is defined as the total change in inflation divided by the length of the disinflation. Sargent (1983) argues that faster disinflations may be viewed as monetary regime shifts, resulting in

a quicker adjustment of expectations than more gradual movements. The faster expectations are altered the lower the sacrifice ratio will be. An alternative view is found in Taylor (1983) who argues, using a staggered wage adjustment model, that quick disinflations will reduce output but more gradual disinflations can be theoretically costless. Equation 3 finds that the speed of disinflation is negative (supporting Sargent (1983)) and significant at the one percent level. Its inclusion improves the fit of the model. Interestingly, it lowers the absolute value of the **Right Government** coefficient and lowers its significance level to .06.

4. Panel Regression Models

Our sacrifice ratio dataset (Table 1) is a fairly wide (18 countries) and short (either 4 or 5 episodes) series. We extend our empirical analysis in this section by employing methods that more fully exploit the unbalanced panel structure of the data. This enables us to subject our key hypotheses concerning the factors influencing the sacrifice ratio to a more rigorous empirical framework.

Equation 1 (table 6) estimates our model by employing a fixed effects, panel regression model so that the standard errors are clustered by country (i. e., we use clustered standard errors). Use of these linearization/Huber/White/sandwich estimates of variance yields results that are robust to any type of serial dependence in the errors. This approach takes advantage of having repeated observations for each country by allowing the regression error variances to differ across nations. It also allows us to capture permanent differences between countries by including country specific dummy variables. Both the Sargent (1983) theory regarding speed and our hypothesis concerning government type are supported by the data. The regression results indicate that our Right Government variable is negative and

significant at the .01 level. Speed of disinflation is once again negative (lowers the sacrifice ratio) and significant at the .01 level. Trade openness significantly (at the .01 level) raises the cost of disinflation. These results are broadly consistent with our previous results and suggest that our findings are robust across different statistical methodologies.

Once our other variables are included, we again find that Central Bank Independence has no significant impact on the sacrifice ratio. That is, we find that once we control for political regimes, and other factors like the speed of disinflation, inflation's initial level, and trade openness, CBI has no additional explanatory power. This is in contrast to several studies which find and then seek to explain a significant positive relationship between CBI and the sacrifice ratio. In fact, the prevailing view of the positive relationship between the sacrifice ratio and CBI has led some (e. g. Cukierman (2002)) to defend central bank independence from the charge that "too much" of it makes disinflations prohibitively costly. In other words, he argues that the benefits of CBI outweigh the extra cost in terms of lost output. Our results here raise serious questions about the actual existence of these added costs of CBI.

5. An Additional Sensitivity Test

A possible concern about our results' reliability is that common inflation trends across countries could be correlated with common political changes. For example, in the early 1980s many western countries saw a swing toward both rightwing governments and lower inflation rates. Equation 2 (Table 6) deals with this possible problem by incorporating decade dummy variables into our panel-fixed effects model. These dummy variables were coded such that a given disinflation was assigned to the decade in which most of its years

occurred. For example, the Ireland 1989-1993 episode is assigned to the 90s. The results in equation 2 show that sacrifice ratios have significantly increased over time, but most dramatically in the decade of the 1990s. In addition, the incorporation of our decade dummies renders all variables in our model insignificant, with the exception of **Right Government** and **Speed**. These added results raise our confidence about the importance of political factors (especially as they concern policy credibility) in explaining inter-temporal and cross-national differences in the sacrifice ratio.

6. Conclusion

Our paper departs from the existing sacrifice ratio literature in three important ways. First, we have added additional years of data so that our sample extends through the 1990s. Next, by employing a pooled times series/cross section approach we are able to take full advantage of the fact that we have multiple observations for each country. Finally, we include a political variable to capture the effect different political regimes have on the total cost of disinflationary policies. Employing several empirical techniques, we consistently show that rightwing governments have lower sacrifice ratios. We argue that this is due to the credibility advantage caused by their anti-inflation reputations. In addition (and in marked contrast to previous studies) we find that when we control for other factors, we find that central bank independence has no significant effect on the sacrifice ratio.

Table 1

Disinflationary Episodes (N=81)

Australia	***1961-1962,***	***1974-1978,***	***1982-1984,***	***1986-1988,***	***1989-1994***
Austria	***1965-1966,***	***1974-1978,***	***1980-1983,***	***1984-1986***	
Belgium	***1965-1967,***	***1974-1978,***	***1982-1987,***	***1989-1995***	
Canada	***1969-1970,***	***1974-1976,***	***1981-1985,***	***1989-1998***	
Denmark	***1968-1969,***	***1974-1976,***	***1977-1978,***	***1980-1985,***	***1989-1993***
Finland	***1964-1965,***	***1967-1969,***	***1974-1978,***	***1980-1986,***	***1990-1995***
France	***1962-1966,***	***1974-1976,***	***1981-1986,***	***1991-1998***	
Germany	***1965-1967,***	***1973-1978,***	***1980-1986,***	***1992-1998***	
Ireland	***1964-1966,***	***1974-1978,***	***1980-1987,***	***1989-1993***	
Italy	***1963-1967,***	***1976-1978,***	***1980-1987,***	***1991-1998***	
Japan	***1962-1964,***	***1974-1978,***	***1980-1982,***	***1983-1986,***	***1990-1995***
Netherlands	***1965-1967,***	***1975-1978,***	***1981-1983,***	***1984-1986,***	***1991-1995***
New Zealand	***1971-1972,***	***1975-1978,***	***1980-1983,***	***1986-1988,***	***1989-1992***
Spain	***1962-1963,***	***1964-1969,***	***1977-1987,***	***1989-1998***	
Sweden	***1965-1968,***	***1977-1978,***	***1980-1982,***	***1983-1986,***	***1991-1996***
Switzerland	***1965-1968,***	***1977-1978,***	***1981-1983,***	***1984-1986,***	***1991-1998***
U. Kingdom	***1961-1963,***	***1975-1978,***	***1980-1983,***	***1984-1986,***	***1991-1998***
United States	***1969-1971,***	***1974-1976,***	***1979-1983,***	***1990-1998***	

Table 2

Summary Statistics

Variable	Mean	St. Dev.	High	Low	# Obs.
Sacrifice Ratio	1.46	2.02	10.35	-0.85	81
Trade Openness	55.49	26.76	136.6	18.8	81
Central Bank Independence	0.49	0.20	0.93	0.15	81
Initial Inflation	7.88	4.02	18.4	1.27	81
Inflation Change	4.84	2.95	13.86	1.52	81
Speed of Disinflation	1.56	0.82	3.92	0.36	81
Right Government	0.43	0.50	1.00	0.00	81
Percentage Right	61.6	40.9	100	0.00	81
Right at Start of Disinflation	0.64	0.48	1.00	0.00	81

Table 3

Central Bank Independence, Trade Openness and Government Type at the Start of Disinflations

Dependent Variable: Initial Inflation Level (n=81)

Independent Variables	***Eq.1***	***Eq.2***
Constant	***10.87***	***11.70***
	(7.10)	***(9.37)***
Central Bank Independence	***-7.00***	***-6.01***
	(-3.30)	***(-4.94)***
Openness	***.001***	***0.01***
	(0.47)	***(0.85)***
Right at Start	***----***	***-2.31***
		(-3.01)
Adjusted R^2	***.11***	***.18***
F-Statistic	***5.98***	***6.71***

T-statistics are in parentheses. Standard errors are estimated using White's heteroskedastic consistent covariance matrix.

Table 4

Trade Openness, Politics, Central Banks and the Sacrifice Ratio

Dependent Variable: Sacrifice Ratio (n=81)

Independent Variable	***Eq.1***	***Eq.2***	***Eq.3***
Constant	**-0.18** **(-0.25)**	**0.47** **(0.06)**	**0.14** **(0.16)**
Trade Openness	**0.01** **(1.75)**	**0.01** **(1.86)**	**0.01** **(1.95)**
Central Bank Independence	**2.02** **(1.92)**	**2.47** **(2.22)**	**2.43** **(2.07)**
Right Government	**----**	**-1.15** **(-2.83)**	**----**
% Right	**----**	**----**	**-0.01** **(-2.00)**
Adjusted R^2	**.03**	**.10**	**.06**
F-statistic	**3.55**	**3.99**	**3.80**
R.M.S.E.	**----**	**1.86**	**1.91**

T-statistics in parentheses. Standard errors are estimated using White's heteroskedastic consistent covariance matrix.

Table 5

Controlling for the Level, Change and Speed of Disinflation

Dependent Variable: Sacrifice Ratio(n=81)

Independent Variable	***Eq. 1***	***Eq. 2***	***Eq. 3***
Constant	***1.37***	***1.32***	***2.25***
	(1.42)	***(1.45)***	***(2.11)***
Trade Openness	***0.01***	***0.01***	***0.01***
	(1.98)	***(2.23)***	***(1.69)***
Central Bank Independence	***1.74***	***1.56***	***0.96***
	(1.40)	***(1.30)***	***(0.81)***
Right Government	***-1.38***	***-1.26***	***-0.68***
	(-3.32)	***(-3.10)***	***(-1.89)***
Initial Inflation	***-0.11***	***-0.24***	***-0.11***
	(-2.46)	***(3.36)***	***(-1.30)***
Inflation Change	***----***	***0.20***	***0.21***
		(2.30)	***(2.26)***
Speed of Disinflation	***----***	***----***	***-1.08***
			(-4.12)
Adjusted R^2	***.14***	***.16***	***.27***
F- Statistic	***4.15***	***4.19***	***6.01***

T-statistics are in parentheses. Standard errors are estimated using White's heteroskedastic consistent covariance matrix.

Table 6

Panel Model Results Using Clustered Standard Errors and Decade Dummies

Dependent Variable: Sacrifice Ratio (n=81, 18 cross sections)

Independent Variables	***Eq. 1****	***Eq. 2*** **
Constant	***0.38*** ***(0.23)***	***3.58*** ***(1.63)***
Openness	***0.05*** ***(3.01)***	**0.003** **(0.16)**
Central Bank Independence	***1.57*** ***(0.74)***	**1.31** **(0.60)**
Right Government	***-1.24*** ***(-3.09)***	**-0.76** **(-2.19)**
Initial Inflation	***-0.12*** ***(-1.59)***	**-0.04** **(-0.48)**
Inflation Change	***0.13*** ***(1.56)***	**0.04** **(0.46)**
Speed of Disinflation	***-0.91*** ***(-3.54)***	**-0.54** **(-2.58)**
60s	**----**	**-2.67** **(-2.46)**
70s	**----**	**-1.99** **(-2.72)**
80s	**----**	**-1.83** **(-2.36)**
Within-Adjusted R^2	**.25**	**.52**

T-statistics are in parentheses.
***, **, Estimated using clustered standard errors and cross section fixed dummies (not presented) using Stata 9.0.**

References

Alesina, Alberto, (1987), "Macroeconomic Policy in a Two-Party System as a Repeated Game," ***The Quarterly Journal of Economics***, 102: 651-678.

Alesina, Alberto and Nouriel Roubini, (1992), "Political Cycles in OECD Economies," ***The Review of Economic Studies***, 59: 663-688.

Alesina, Alberto, Nouriel Roubini and Gerald D. Cohen, (1997), ***Political Cycles in the Macroeconomy***, Cambridge: MIT Press.

Andersen, Palle S. and William L. Wascher, (1999), "Sacrifice Ratios and the Conduct of Monetary Policy in Conditions of Low Inflation," ***Bank for International Settlements***, Working Paper no. 82.

Bade, Robin and Michael Parkin, (1982) "Central Bank Laws and Monetary Policy," Unpublished Manuscript, University of Western Ontario.

Ball, Laurence, (1994), "What Determines the Sacrifice Ratio?" in ***Monetary Policy***, edited by N. Gregory Mankiw, Chicago: University of Chicago Press: 155-182.

Ball, Laurence, N. Gregory Mankiw, and David Romer, (1988), "The New Keynesian Economics and the Output-Inflation Tradeoff," ***Brookings Papers on Economic Activity***, 1-65.

Banks, Jeffrey, (1994), ***Political Handbook of the World,*** NY: CSA Publications.

Barro, Robert and David Gordon, (1983), "A Positive Theory of Monetary Policy in a Natural Rate Model," ***Journal of Political Economy***, 91, 589-610.

Beck, Thorsten, George R. Clark, Alberto Groff, Phillip E. Keefer, and Patrick Walsh, (2001) "New Tools in Comparative Political Economy: The Database of Political Institutions," ***World Bank Economic Review***, 15, 165-176.

Bowdler, Christopher, (2006), "Openness, Exchange Rate Regimes and the Phillips Curve," Manuscript, University of Oxford.

Chappell, Henry W., Rob Roy McGregor and Todd Vermilyear, (2005), ***Committee Decisions on Monetary Policy: Evidence from Historical Records of the Federal Open Market Committee***, Cambridge MA: MIT Press.

Chappell, Henry W., Rob Roy McGregor and Todd Vermilyear, (2004), "Majority Rule, Consensus Building and the Power of the Chairman: Arthur Burns and the FOMC." ***Journal of Money, Credit and Banking,*** 36: 407-422.

Cukierman, Alex, (1992), ***Central Bank Strategy, Credibility and Independence: Theory and Evidence***, Cambridge MA: MIT Press.

Cukierman, Alex, (2002), "Does a Higher Sacrifice Ratio Mean that Central Bank Independence is Excessive?" ***Annals of Economics and Finance***, 3: 1-25.

Daniels, Joseph P., Farrokh. Nourzad and David D. VanHoose, (2005), "Openness, Central Bank Independence, and the Sacrifice Ratio," ***Journal of Money, Credit, and Banking***, 37, 371-379.

Franzese, Robert J., (2002), ***Macroeconomic Policies of Developed Democracies***, Cambridge Studies in Comparative Politics, Cambridge: Cambridge University Press.

Gabel, Matthew and John Huber, (2000), "Putting Parties in Their Place: Inferring Party Left-Right Ideological Positions from Party Manifestos Data," ***American Journal of Political Science***, 44: 94-103.

Grier, Kevin. B., (1991), "Congressional Influence on US Monetary Policy," ***Journal of Monetary Economics***, 28: 201-220.

Grilli, Vittorio, Donato Masciandaro and Guido Tabellini, (1991), "Political and Monetary Institutions and Public Financial Policies in the Industrial Countries," ***Economic Policy***, 13: 341-392.

Huber, John and Ronald Inglehart, (1995), "Expert Interpretations of Party Space and Party Locations in 42 Societies," ***Party Politics***, 1: 73-111.

Jordan, Thomas J., (1997), "Disinflation Costs, Accelerating Inflation Gains, and Central Bank Independence," ***Weltwirtschaftliches Archiv*** 133: 1-21.

Loungani, Prakash, Assaf Razin and Chi-Wa Yuen, (2001), "Capital Mobility and the Output-Inflation Tradeoff," ***Journal of Development Economics,*** 64: 255-274.

Maloney, John, Andrew Pickering and Kaddour Hadri, (2203), "Political Business Cycles and Central Bank Independence," ***The Economic Journal***, 113: 167-181.

Razin, Assaf, and Prakash Loungani, (2007), "Globalization and Inflation-Output Tradeoffs," ***NBER International Macro Annual***: MIT Press, forthcoming.

Razin, Assaf and Chi-Wa Yuen, (2002), "The 'New Keynesian' Phillips Curve: Closed Economy versus Open Economy," ***Economics Letters***, 75: 1-9.

Romer, David, (1993), "Openness and Inflation: Theory and Evidence," ***Quarterly Journal of Economics***, 108: 869-903.

Sargent, Thomas, (1983), "Stopping Moderate Inflations: The Methods of Poincare and Thatcher," in Dornbush and Simonsen (ed.) ***Inflation, Debt and Indexation***, Cambridge: MIT Press.

Sibert, Anne, (2003), "Monetary Policy Committees: Individual and Collective Reputations," ***Review of Economic Studies***, 70: 649-655.

Taylor, John B., (1983), "Union Wage Settlements During a Disinflation," ***American Economic Review***, 73: 981-993.

Temple, Jonathan, (2002) "Openness, Inflation, and the Phillips Curve: A Puzzle," ***Journal of Money, Credit and Banking***, 34: 450-468.

Walsh, Carl, (1995), "Output-Inflation Trade-Offs and Central Bank Independence," Federal Reserve Bank of San Francisco ***Economic Letter***, 22.

Yanikkaya, Halit, (2003), "Trade Openness and Economic Growth: a Cross Country Empirical Investigation," ***Journal of Development Economics***, 72: 57-89.

Endnotes

[1] In an intriguing recent extension of the rational partisan model, Maloney, Pickering and Hadri (2003) find that central bank independence (CBI) reduces the severity of politically induced business cycles in a sample of 20 OECD countries.

[2] Following Daniels, Nourzad and Vanhoose (2005) we exclude one of Ball's disinflationary episodes (for Luxembourg) since we do not have a Central Bank Independence measure for that country.

[3] The only disinflation periods not included in either political dataset occurred in Spain under the Franco regime. We deal with this by treating the disinflations occurring under Franco (1962-1963 and 1964-1969) as overseen by a rightwing government.

[4] See Yanikkaya (2003) and the references cited within for support of our openness measure. The same measure is also used by the Penn World Table to measure trade openness. Another issue with this variable is whether to use it in log form, in order to reduce the skewness of its distribution. We found that doing so did not substantively change our results.

[5] The CBI measure is from Franzese (2002) and is a scaled average of Cukierman's (1992) measure of legal independence, Grilli, Masciandaro, and Tabellini's (1991) measure of economic and political independence, and Bade and Parkin's (1982) index measure of independence.

[6] An additional problem with many of the positive models of monetary policy is that they treat policy as being chosen by a single (optimizing) decision maker. In reality, central bank decisions are made by committees (not authoritarian leaders) and the policy outcome reached is best represented as a consensus formed by members with potentially different preferences, as well as economic and political beliefs (and loyalties). See Chappell, McGregor and Vermilyear (2004, 2005) and Sibert (2003) for elaborations of these points for the case of the US Federal Reserve.

[7]Daniels, Nourzad and Vanhoose (2005) show that Central Bank Independence and trade openness have a significant interaction effect in their sacrifice ratio regressions. We failed to find this effect in our expanded sample.

[8] We experimented with including dummy variables which capture elections taking place during disinflations for a variety of specifications. In each case such variables were insignificant and failed to alter the size, sign, or significance of the other explanatory variables. This suggests that the effects of electoral uncertainty can safely be ignored.

[9] In this section we include some, but not all, of the variables considered by Ball (1994). We found that including other variables in his paper (e.g. the length of the disinflation and duration of wage contracts) did not change our major results. In order to conserve on degrees of freedom, we decided to include only variables that are influenced by the credibility of a policy change.