NBER WORKING PAPER SERIES

WHY DOES INFLATION DIFFER ACROSS COUNTRIES?

Marta Campillo
Jeffrey A. Miron

Working Paper 5540

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
April 1996

Comments from Maury Obstfeld, Christina Romer, David Romer, Greg Mankiw and seminar participants at Brown, Yale, Colgate, and Hamilton are appreciated. Adam Posen kindly provided his data on Financial Opportunities to Inflation. This paper is part of NBER's research program in Monetary Economics. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

NBER Working Paper 5540
April 1996

WHY DOES INFLATION DIFFER ACROSS COUNTRIES?

ABSTRACT

This paper attempts to explain the differences in inflation performance across countries. Earlier research has examined this topic, but it has considered only some of the factors that might be empirically important determinants of inflation rates. We consider the distaste for inflation, optimal tax considerations, time consistency issues, distortionary non-inflation policies and other factors that might be empirically important determinants of inflation performance. Overall, the results suggest that institutional arrangements - central bank independence or exchange rate mechanisms - are relatively unimportant determinants of inflation performance, while economic fundamentals - openness and optimal tax considerations - are relatively important determinants.

Marta Campillo
Department of Economics
Boston University
270 Bay State Road
Boston, MA 02215

Jeffrey A. Miron
Department of Economics
Boston University
270 Bay State Road
Boston, MA 02215
and NBER

1 Introduction

The inflation performance of economies is interesting to academic economists, policy-makers, politicians, and the electorate. Economists are in broad agreement about how policy actions affect inflation rates, and they share much common ground about the factors that policy should consider in choosing an economy's inflation rate.

Perhaps surprisingly, given the relative consensus about what determines inflation and about how inflation rates should be set, inflation differs substantially across countries. Figure 1 graphs the inflation rate by country for the 1973-1994 period. The highest average inflation rate in the sample is 127% (Brazil) and the lowest is 2% (Central African Republic). Even excluding what might be considered special cases, inflation rates differ markedly. If these differences reflect differences in the factors that determine desired inflation, given the constraints each economy faces, then the differences provide support both for economic models of inflation and for the notion that policy makers choose inflation in a reasonably intelligent fashion. If the differences in inflation cannot be at least approximately attributed to factors that should explain these differences, then either economists' models, policy makers' actions, or both, are lacking.

This paper attempts to explain the differences in inflation performance across countries. Some earlier research has examined this topic, but it has considered only a few of the factors that might be empirically important determinants of inflation rates. In particular, existing research has focussed on institutional characteristics like central bank independence (Grilli, Masciandaro, and Tabellini 1991, Cukierman, Webb, and Neyapti 1992), on the degree of openness (Romer 1993, Lane 1995), and on financial sector opposition to inflation (Posen 1993,1995). These factors are potentially important determinants of inflation, and existing evidence supports a role for each. Nevertheless, *a priori* reasoning suggests a number of additional factors that should matter as well.

We analyze the degree to which prior inflation experience, optimal tax considerations, and time-consistency issues other than central bank independence, as well as the factors considered in the existing literature, are important determinants of inflation rates across countries. The basic approach, as in earlier papers, is cross-country regressions of average inflation rates on country characteristics. The innovation of this paper is simply to include a broader range of country characteristics on the right-hand side.

The paper provides several interesting conclusions relative to the ex-

isting literature. First, institutional arrangements play almost no role in determing inflation outcomes, once other factors are held constant. Thus, central bank independence and the nature of exchange rate arrangements are not empirically important determinants of inflation rates. Second, time-consistency issues other than central bank independence play a more significant role in determining inflation rates: openness, political stability, and proxies for government policy distortions are all related to inflation in the direction suggested by time-consistency considerations, usually in a robust manner. Third, optimal tax considerations are an important determinant of differences in inflation performance: countries with greater expenditure needs make greater use of the inflation tax, and countries that face greater difficulty in collecting non-inflation taxes make heavier use of the inflation tax. Fourth, financial sector opposition to inflation does not explain much of the cross-country variation in inflation. Finally, prior inflation experience – possibily through its effect on the taste for inflation, possibly because it proxies unmeasured but persistent determinants of current inflation – plays a non-negligible role in determining inflation performance. All of these conclusions are subject to significant caveats, which we discuss in the concluding section.

2 Review of the Literature and Discussion of Additional Issues

This section summarizes briefly the earlier empirical work on the determinants of average inflation rates and then discusses the additional factors that we consider in our analysis.

2.1 Review of the Literature

The framework that has guided the literature to date consists of time-consistency models of inflation, especially Kydland and Prescott (1977) and Barro and Gordon (1983). In these models, the absence of credible committment devices means central banks choose higher than optimal inflation rates, even though they share the private sector's preferences for inflation relative to output. This class of models suggests that institutional features of a central bank, as well as other politicial and institutional features of an economy, might have important effects on inflation outcomes. For example, central banks whose governors are appointed for long terms might

be better insulated from political pressures to inflate, implying a relatively low inflation rate. More generally, this line of reasoning suggests that low inflation should be associated with the degree to which central banks are insulated from political pressure, a condition usually referred to as central bank independence (CBI).

A number of authors examine the relation between average inflation and proxies for CBI. Grilli, Masciandaro, and Tabellini (1991), for example, construct one indicator of political independence and another of economic independence for a sample of high income countries. They regress cross-country differences in inflation rates on both indicators and a dummy variable for participation in the EMS. The indicators of central bank independence always have the expected negative sign while the estimated coefficient of the EMS dummy is not significantly different from zero. Alesina and Summers (1993) report a similar result using closely related indices and samples. Cukierman, Webb, and Neyapti (1992), using a more sophisticated index of independence, also document a negative relation between inflation and CBI for high income countries, but they show that the relation has the wrong sign for middle and low income countries.

The failure of CBI to correlate negatively with inflation in developing countries is just one problem with this literature. A second is that the relation between CBI and inflation is not necessarily causal, a point emphasized by Posen (1993,1995). He argues that CBI is not universally desired because of the distributive consequences of alternative monetary policies. Given these consequences, CBI is unlikely to be self-enforcing, so the preferences for price stability embodied by CBI require political support. If CBI does not embody such preferences, it will not affect inflation, and if such preferences were already supported, independence is unnecessary.

Posen argues that a major source of political opposition to inflation derives from the financial sector. Moreover, national differences in both the financial sector's distaste for inflation and its ability to express that distaste are likely to play a major role in determining both inflation and CBI. Posen creates a variable called financial opposition to inflation (FOI) that is designed to measure these two effects. The index is a significant predictor of CBI and also of average inflation rates. Moreover, CBI does not predict averages rates of inflation once Posen controls for FOI. The commonly presumed ability of CBI to lower inflation, independent of the central bank's political context, is not supported by his analysis.

Posen's results apply both to the OECD and to a broader sample consisting of low-to-moderate-inflation countries. Posen suggests that the re-

lationship should not hold for high or hyperinflation countries, since the financial sectors of such countries have long since given up opposing inflation. To survive in hyperinflations, banking and other financial firms adapt to their monetary environment, and once adapted they have much less incentive to oppose inflation. With its main protector absent, an independent CB cannot pursue a sustained counter inflationary policy, so CBI will not affect inflation in this case. According to this view, the pattern of which countries' inflation levels correlate negatively with CBI is explained by the incentives facing the financial sector.

Another issue that arises in interpreting the results of the CBI literature is whether other aspects of a country's political structure are important determinants of its ability to precommit. Cukierman, Edwards and Tabellini (1992) note that, controlling for the stage of development and the structure of the economy, more unstable and polarized countries are likely to collect a larger fraction of their revenues from the inflation tax, at least partially because such countries are likely to have difficulty in maintaining a time-consistent policy. They provide evidence, based on various measures of political stability, that inflation is higher and central bank independence lower the greater is the degree of political instability.[1]

The literature summarized so far examines the political and institutional constraints on the central bank's ability to choose low inflation. A different line of work examines the central bank's incentive to choose low inflation, political and institutional constraints held constant. Romer (1993) argues that unanticipated monetary expansion causes real exchange rate depreciation, and since the harms of real depreciation are greater in more open economies, the benefits of surprise inflation are a decreasing function of the degree of openness. This implies that in the absence of binding precommitment, monetary authorities in more open economies will on average expand less, and the result will be lower average rates of inflation.

The empirical evidence indicates that average rates of inflation are significantly lower in more open economies. These results are stronger in countries that are less politically stable and have less independent central banks. This is consistent with the idea that the openness-inflation relationship arises from the dynamic inconsistency of discretionary policy, since one would ex-

[1]Grilli and Milesi-Ferretti (1995) also provide evidence that political factors play an important role in determining inflation outcomes. The primary focus of their paper, however, is not inflation but the effects and determinants of captial controls. Moreover, their empirical specification differs substantially from the one we consider below, so we do not examine further the particular issues addressed in their paper.

pect such countries to have had less success in overcoming the dynamic inconsistency problem. The link between openness and inflation holds across virtually all types of countries with the exception of the most highly developed countries. In this small group of countries average inflation rates are low and essentially unrelated to openness. Again the results are consistent with the view that these countries have largely overcome the dynamic inconsistency of optimal monetary policy.

Lane (1995) argues that Romer's explanation of the influence of openness on inflation is a limited one, because it applies only to countries large enough to affect the structure of international relative prices. He claims the openness-inflation relation is rather due to imperfect competition and nominal price rigidity in the nontraded sector. The idea is that a surprise monetary expansion, given predetermined prices in the nontraded sector, increases production of nontradables. This expansion is socially beneficial because of the inefficient monopolistic underproduction in the nontraded sector in the equilibrium before the shock. The more open an economy, the smaller is the share of nontradables in consumption and the less important the correction of the distortion in that sector. Assuming the existence of a government that cares about social welfare, this generates an inverse relationship between openness and the incentive to unleash a surprise inflation, even for a country too small to affect its terms of trade.

Lane shows that the inverse relationship between openness and inflation is strengthened when country size is held constant; that is, independent of the size of the country, openness impacts negatively on inflation, consistent with the small country explanation of the relationship advanced in his paper. The result is robust to the inclusion of additional control variables such as per capita income, measures of central bank independence and political stability. Moreover, controlling for country size makes the result strong and robust in the high income countries, the one sample in which Romer did not find a strong result.

Overall, therefore, the existing literature suggests that central bank independence is associated with lower inflation in rich countries, that this relation derives significantly from political constraints flowing from the financial sector, and that openness is negatively associated with inflation, possibly through a number of mechanisms.

2.2 Additional Factors to Consider

Our analysis considers three main issues in addition to those addressed in the existing literature.

The first is whether differences in inflation across countries reflect differences in the distaste for inflation. Such differences might arise for a number of reasons. Countries that experienced high inflation in the past might be more aware of the negative consequences of high inflation and therefore be more opposed to repeated episodes; this explanation is frequently offered to explain Germany's low inflation rate. Similarly, countries that experienced variable inflation in the past might be relatively inflation averse, either because the electorate does not readily distinguish between means and variances or because high inflation is indeed more likely to be variable (Ball and Cecchetti, 1990).

Inflation aversion might also differ across countries at a given point in time because of existing institutional and legal structures. For example, a country with an indexed tax system might be less opposed to inflation, other things equal, than one without such indexation. Other factors along these lines include the degree of wage indexation and the prevalence of long term contracts. Each of the factors is endogenous with respect to inflation over a sufficiently long period of time, but since these arrangements take time to change, they might be regarded as approximately predetermined at any point in time.

Still another factor that might determine a given country's aversion to inflation is its industrial structure. In particular, the financial sectors of economies have traditionally been active opponents of inflation (Posen, 1995), so countries with relatively large and politically influential financial sectors might tend to experience low inflation.

A second set of issues we introduce consists of optimal tax considerations. A considerable literature examines whether the behavior of inflation over time, and especially its relation to other taxes, is consistent with the principles of optimal taxation (e.g., Mankiw (1987), Poterba and Rotemberg (1989), Grilli, Masciandaro and Tabellini (1991)). With the exception of Mankiw's results for the United States, this exercize has generated relatively little support for the hypothesis that inflation rates change from year to year because the optimal inflation tax changes from year to year.

The analysis here considers a cruder question, which is whether differences in average inflation rates across countries are consistent with optimal tax considerations. On the one hand, optimal tax considerations sug-

gest that countries with higher expenditures (relative to output) should have higher levels of all taxes, including the inflation rate. On the other hand, these considerations imply that holding expenditures constant, inflation should be higher in countries where the demand for money is relatively inelastic. Differences in this elasticity might occur because of differences in the sophistication of the banking system, since highly developed banking systems provide good substitutes for money and therefore more elastic money demand. Alternatively, differences might occur because of differences in the size of the underground economy, since illegal activity will tend to be conducted with currency rather than demand deposits or other substitutes.

The third new issue we address concerns aspects of the time-consistency problem other than central bank independence. Models like those of Barro and Gordon (1983b) indicate that the incentive to create surprise inflation exist only if the rate of output targetted by central bank differs from the rate of output consistent with non-accelerating inflation (the "natural" rate). The central bank might target a rate higher than the natural rate if it believes the natural rate is below the social optimum. Thus, the rate of inflation should be increasing in the difference between the natural rate of output and the socially optimal rate, and several observable factors might produce such a difference. Unemployment insurance, minimum wages laws, and other labor market policies are likely to reduce the efficiency of the labor market and thereby lower the natural rate of output. Other sources of distortion include excessive levels of government purchases.

3 Empirical Specification and Results

We examine the determinants of country-level inflation rates as measured by the Consumer Price Index for the period 1973-1994.[2] Our basic specification differs slightly from earlier papers, especially Romer (1993) and Lane (1995); they consider a shorter sample period (1973-1989), use the log rather than the level of inflation as the dependent variable, and measure inflation using the GDP/GNP deflator. As demonstrated below, none of these differences makes a significant difference to the results. We employ the CPI because this measure of prices is available for the broadest sample of countries and for the longest sample periods.

The basic sample we consider consists of the 62 countries for which CWN provide their measure of CBI. We restrict the basic sample in this way for

[2]Specifically, the dependent variable is $(1/21)\ln(CPI_{1994}/CPI_{1973})$.

two reasons. First, the role of CBI has been regarded as central in much of the previous research on cross-country variation in inflation, so it seems important to include this variable in our initial examinations. Second, many of the other variables we consider are unavailable for a number of countries outside this list of 62, so restricting the sample in this way sacrifices relatively few observations in any event.

Figure 2 plots inflation for this sample of 62 countries. Although we have dropped a number of observations in going from the longer to the shorter list of countries, most of the really high inflation countries remain. Thus, we have not inadvertently excluded all the interesting variation in the key variable.

In addition to considering our basic sample, we examine a number of subsamples. To determine whether our results derive mainly from the influence of a few extreme observations, we consider samples that omit countries with average inflation in excess of 100 percent per year or in excess of 50 percent per year. To determine whether the results apply mainly to developed or less-developed economies, we split the basic sample into the eighteen high-income countries versus all the remaining countries.[3]

The estimation technique is Ordinary Least Squares, with standard errors estimated by the White (1980) procedure. Data are from the International Financial Statistics of the International Monetary Fund, except as noted.[4]

Tables 1a-1c and 2a-2c present summary statistics – means, standard deviations, and cross correlations – for the variables considered in the analysis below. We refer to this information later in interpreting our results.[5]

3.1 Preliminaries

We begin by reproducing the key results from the previous literature using our data set. Although these results are not new in any interesting sense,

[3]The eighteen high-income countries are the same as in Romer (1993): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Japan, Luxembourg, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and the United States.

[4]When we calculate the mean of a variable over a period of time, we do not always have observations for all the years in the specified period. In cases where the number of missing observations is large, we drop the country from that regression. In cases where it is small, we calculate the mean based on the available sub-sample.

[5]The results for the samples that exclude high-inflation countries are similar in most respects to those for the full sample.

they allow us to conclude that the new variables we introduce, rather than some difference in specification, are responsible for any differences in results.

Tables 3a-3d review the results on central bank independence. Table 3a displays the univariate regression of inflation on CWN's measure of CBI.[6] In the eighteen high-income countries, the relation is negative and robust, consistent with the predictions of standard time-consistency models. In the low-to-moderate income sample, however, or in the entire sample for which CBI exists, the relation is positive, albeit insignificantly. This is not simply the influence of a few extreme countries; exclusion of the very high inflation rate observations still leaves a positive relation.

Table 3b adds Barro's (1991) measure of political instability (the number of coups and revolutions) to the regression, while Table 3c adds the log of income per capita in 1980, and Table 3d adds both. In some cases these additional variables enter significantly, and we discuss their interpretation below. None of these modifications changes the basic story documented in Table 3a, however. Thus, our data set suggests the same basic conclusions about central bank independence documented earlier: the predicted negative relation holds in high income countries but not generally.

In Tables 4a-4c we review the Romer (1993) and Lane (1995) results on openness. Table 4a reproduces the basic result in Romer, which is that openness is negatively associated with inflation. The relation holds for the overall sample, for the less developed countries, and for the sample that excludes countries with high or very high inflation. The relation does not hold for the high income countries, as noted in Romer. Table 4b adds the log level of income in 1980, as suggested by Lane. This modification always leads to a larger absolute value of the coefficient and a smaller standard error; in particular, the relation becomes significant in the high income countries (although the magnitude of the effect is still relatively small). Table 4c adds central bank independence, political instability, and per capita income to the specification; the results on openness remain robust. Thus, our data set also reproduces the basic results about openness.

[6] In our main regressions, we use the CWN index that is based only on the legal and institutional structure of the central bank and its operating procedures (CWN, Table 2, p.362). We use this index, rather than one that partially reflects the performance of the economy, since we believe it is more plausibly taken as predetermined relative to inflation performance. We demonstrate in our robustness checks that this choice has little effect on the results.

3.2 Basic New Results

We now turn to examining the additional issues raised in Section 2. We first provide a base case regression and then consider robustness checks.

The basic regression contains the following variables: CBI, political instability, openness, the log level of output, the log level of output per capita, an exchange-rate-regime dummy (explained below), the average inflation rate during the 1948-1972 period, the level of government debt relative to output in 1975, and the grade assigned by Summers and Heston (1988) to the quality of their national accounts data for each country. Several comments about this specification are in order.

The average inflation rate from the pre-sample period is included as a possible measure of the taste for inflation. According to one view, high past inflation implies lower current inflation because countries learn about the costs of inflation and then reform. This implies a negative coefficient. According to a different view, high past inflation leads the economy to invest in technologies for avoiding inflation's negative effects, which subsequently reduces the costs of inflation. Under this interpretation, the coefficient should be positive. Alternatively, past inflation might measure persistent aspects of the factors that determine inflation but are unmeasured or poorly measured in our regressions, which again implies a positive coefficient.

We include political instability to proxy a number of possible effects. The most commonly discussed is that more instability makes it difficult for policy makers to commit to low inflation. In addition, countries with political instability probably tend to have larger amounts of underground activity, which raises the optimal inflation rax. Similarly, countries with political instability tend to run inefficient economic programs, which suggests their natural and socially optimal rates of output or unemployment diverge. Nothing in our regressions allows us to sort out these effects, but in each case the expected sign on the coefficient is positive.

We include debt relative to output in 1975 as a measure of the need for tax revenue.[7] This variable will not capture all differences in expenditure paths, but the effect of a high initial level of debt on desired tax collections is unambiguously positive, and this variable is less obviously endogenous with respect to inflation than other possible measures. We show below that other measures, such as expenditure relative to output, produce similar results.

[7]Since we measure inflation over the period 1973-1994, it might be preferable to use debt over output in 1973 or 1974. We could not construct this variable for a sufficient number of countries, however.

We include the log of income per capita in 1980 to capture several possible effects. A higher level of income per capita is likely to be accompanied by a more sophisticated tax system and a more developed financial system, both of which imply lower optimal inflation tax and thus a negative coefficient. On the other hand, high-income countries might be better at innovating technologies for reducing the costs of inflation, so their inflation aversion might be lower. This implies a positive coefficient.

We include the Summers and Heston quality-of-data score to control for the level of the inflation tax relative to other taxes. For example, countries with large informal sectors, which are typically untaxed, are also likely to have poor quality data. The Summers-Heston score is higher for countries with better quality data, so the coefficient should be negative if the reasoning offered here is correct. This variable might also be correlated with factors that make the socially optimal rate of output or unemployment diverge from the natural rate; again, the expected coefficient is negative.

We include a dummy variable for the kind of exchange rate regime, as in many previous papers, as a further check on the role on the time-consistency considerations. In particular, countries that have agreed to peg their currencies, especially when those agreements involve many countries, may face political costs of excessive inflation and therefore find it relatively easy to maintain a consistent policy. The variable we construct takes a value of 2 for countries that were in multilateral exchange-rate systems in 1974, 1 for countries that were in unilateral exchange-rate systems, and 0 for countries that allowed their currencies to float. Thus, a higher value of the variable implies, other things equal, a greater committment to low inflation, so the coefficient should be negative according to the time-consistency hypothesis.

We note that our measure of the exchange rate regime is possibly a poor proxy for any effects of the exchange rate mechanism on inflation. By using data for 1974 we are failing to capture any effects that might have resulted from decisions about the exchange rate regime later in the sample. It is important to avoid using a variable that measures the exchange rate regime during the middle of the sample, however, because such a variable is likely endogenous with respect to inflation. A country might maintain a pegged exchange rate over much or all of a particular sample period *because* it has solved the time-consistency problem, even if the decision to peg has no marginal effect on its ability to maintain low inflation. Even the variable we construct is problematic, since countries with an underlying distaste for inflation might choose multilateral exchange-rate systems consistently, knowing they will have the discipline to live within the implied constraints.

The beginning of sample measure should be "less endogenous," however, and we attempt to control for the differences in inflation aversion separately.

This specification omits two key variables. First, we have no direct measure of the discrepancy between the natural rate of output and the socially optimal rate of output. Political instability and quality of the data might capture this effect to some degree, and we attempt more direct measurement below. These attempts are problematic, however, so we omit them from the basic specification. Second, we do not include FOI since it exists only for a narrow sample. Additional results below suggest this omission is not critical.

Table 5 presents the main results. Central bank independence enters with the wrong sign in all samples except the high income sample, and even in this case the coefficient is nowhere near significant. Thus, CBI appears even less reliably related to inflation than indicated by the more parsimonious regressions in Tables 3a-3d. The dummy for the exchange rate regime enters with the wrong sign, although not significantly.

Political instability enters positively, which is consistent with each of several possible mechanisms, but the result is not overwhelmingly consistent across samples. The magnitude of the estimated effect, however, is large. A one standard deviation higher level of political instability is associated with almost a 14.0 percent higher rate of inflation in the full sample and with a more than 12.0 percent higher inflation rate in the low-to-moderate-income sample. The estimated effect is essentialy zero in the high-income sample, perhaps unsuprisingly.

Past inflation experience is consistently positively associated with current inflation, although the strength of the relation is modest outside the high-income countries. The estimated coefficient in the entire sample is about 0.6, which means one percentage point higher value of prior inflation is associated with more than half a percentage point higher value of current inflation. The estimated effect is more than three times greater in the high-income sample.

The relative strength and magnitude of this relation in the high-income countries might simply indicate that we have failed to capture some determinant of inflation that is especially persistent in the high-income countries. A more interesting possibility is that high inflation induces investments in techologies for avoiding the costs of inflation. Once these are developed, they are not costly to use so they reduce future aversion to inflation. The creation or adoption of such technologies might be easier in high income countries (e.g., they have better developed financial markets), which would

explain the comparative strength of this effect in the high income countries. The positive relation documented certainly fails to indicate that countries with bad past inflation performances learn from their mistakes and therefore choose lower inflation in the future, other factors held constant.

Openness and the level of income both enter negatively and significantly, although the magnitudes of the estimated effects and their statistical significance fall relative to the more parsimonious regressions in Table 4a-4c. Thus, earlier results appear to have produced estimates of these effects on the high side, but the basic message is robust to controlling for a number of factors not considered in earlier papers. Moreover, the magnitude of the estimated openness effect is still substantial. For the whole sample, the coefficient estimates indicate that a one standard deviation lower import share is associated with an almost 8.0 percent higher inflation rate. In the high-income sample the estimated effect is only about 1.5 percent, while in low-to-moderate-income sample it is over 12.0 percent.

The two variables proxying optimal tax considerations enter consistently with the correct sign and are quite robust: an initially high level of government debt is associated with high future inflation, and countries with lousy data, which we interpret to be countries where collecting revenue via non-inflation taxes is difficult, make relatively greater reliance on the inflation tax. These results do not determine whether the inflation tax (and other taxes) are set at exactly the right level given past and future expenditures, nor whether the inflation tax is set exactly right relative to other taxes; in this sense the tests being carried out are far weaker than in the optimal tax literature on the time path of inflation. Nevertheless, the results are consistent with the view that inflation is being used roughly as it should be from an optimal tax perspective.

The magnitudes of these two effects are also substantial. A one standard deviation higher level of the debt-to-income ratio is associated with a more than 8.0 percent higher inflation rate in the full sample and with a more than 1.5 percent higher inflation rate in the high-income sample. A one standard deviation higher data-quality score is associated with almost a 9.0 percent lower rate of inflation using the full sample estimates and with a more than 1.0 percent lower inflation rate using the high-income sample estimates.

The final result is that, holding constant all the factors discussed, the level of income per capita is consistently positively related to inflation, usually in a robust manner. This outcome suggests the second of the two interpretations offered above, namely, that richer countries adapt to inflation more easily, so their distaste for inflation is lower. The magnitude of

the relation is again large: a one standard deviation higher level of income per capita is associated with approximately a 14.0 percent higher inflation rate using the full-sample estimates and with an almost 2.0 percent higher inflation rate using the high-income-sample estimates.

To summarize, the results in Table 5 suggest the following: institutional characteristics of an economy, particularly central bank independence and exchange rate arrangements, are unimportant determinants of inflation. Time-consistency issues play a substantial role through the openness mechanism, and possibly through political instability, and optimal tax considerations are critical as well. We now examine whether these conclusions stand up to more rigorous scrutiny.

3.3 Robustness Checks

As a first check on the robustness of the results presented above, it is useful to examine the simple correlations between the variables shown in Tables 2a–2c. The key fact is that the main results discussed above are present and reasonably robust just in the simple correlations. Central bank independence is positively correlated with inflation in the full sample but negatively correlated in the high-income sample. The exchange rate variable is essentially uncorrelated with inflation in both samples. In most other cases, the signs on the simple correlations are the same as in the multiple regression, and these correlations are often statistically significant.[8] The main exception is income per capita. The simple correlation with inflation is negative, but the estimated regression coefficients are always positive. The explanation appears to be that income per capita is positively correlated with a number of other variables, especially the quality of data variable.

The next set of checks considers other measures of the taste for inflation. One possibility is that high inflation plays an important role in shaping the tastes for inflation only when past inflation is extreme in some manner. As one check on this possibility, we include the standard devation of past inflation as an explanatory variable in addition to the mean of past inflation. In all cases, this variable enters negatively, with a t-statistic between 1.0 and 1.5, and the other coefficients are not strongly affected. Thus, this specification provides mild evidence that countries reform in response to past mistakes.[9]

[8]The calculations of the t-statistics follow Bickel and Doksum (1977), pp.220-221.

[9]All the additional results summarized in this section are available on request from the authors.

A third set of checks concerns our measure of the need for tax revenue. Instead of using the initial level government debt relative to output, we include the average level of government expenditure relative to output over the 1973-1994 period. The results from this specification are consistent with those in Table 5; expenditure over output always enters positively, although the statistical significance is not overwhelming. When we include both expenditure over output and initial debt relative to output, debt enters positively and robustly while expenditure tends to enter positively but not significantly.

We have also considered a number of alternatives to the Summers-Heston quality-of-data variable as an indicator of countries' ability to raise non-inflation tax revenue. These include the share of agriculture in GDP, the infant mortality rate, and the high school enrollment rate. None of these variables enters in a robust manner, but the coefficients on all the remaining variables are not particularly sensitive to treatment of this issue.

We have not pursued one further approach to examining this effect, which would consist of estimating the interest elasticity of money demand for each country and including that as a regressor. Such a variable is problematic for our purposes since the estimated elasticity in a particular country in a given time period is likely a function of that country's inflation rate. This problem is small if the estimated elasticities are approximately equal to the underlying structural parameters, but this condition seems unlikely to hold in practice. The elasticities might be relatively free of this bias if they were estimated for sample periods that do not overlap with our inflation rate sample period, but we do not have the necessary data for the appropriate time periods for a sufficiently large sample of countries.

Our fifth set of robustness checks attempts to measure more directly the gap between the socially optimal rate of output/unemployment and the non-inflation-accelerating rate of output/unemployment. One natural measure of this gap is the average level unemployment, assuming the socially optimal but unobserved rates of output/unemployment are not systematically related to policies that create divergences between the two rates. Unfortunately, data on unemployment tend to be inconsistent, both over time and across countries, so we can construct this variable for a relatively limited set of countries. In this set, the variable enters negatively, contrary to the implications of the time-consistency models, but the relation is weak. In the high income countries, the estimated relation is positive, although again weak.

As a second way to measure the degree to which policy makers other than

the central bank have given the central bank an incentive to raise output, we add the level of government consumption relative to output, with and without the square of this variable. Assuming such consumption increases economic efficiency up to a point but decreases it thereafter, the expected effect on inflation is positive according to the time-consistency models. In both specifications, however, we fail to find a significant effect, and the sign of the estimated effect is sometimes negative.

An issue related to our estimated standard errors is that some observations might be correlated cross-sectionally, perhaps through common involvement in a given exchange-rate mechanism or perhaps because geographic proximity produces common susceptibility to certain kinds of shocks. As a crude attempt to address this issue, we re-estimated the basic specification including dummy variables for geographic regions.[10] This modification has almost no effect on the results in the full sample. It does lead to significant changes in the high-income sample, but these should be discounted since they are based on a regression with only three degrees of freedom.

The fact that we employ a different measure of CBI than in the papers by Romer and Lane raises the question of whether this decision plays a role in the results. We have also estimated the basic specification with the measure used by Romer and Lane, which includes information on actual rates of central bank governor turnover. This modification has no substantive effect on the results.

One hypothesis we have not examined above is that supply shocks produce inflation differentially across countries. We consider this hypothesis by adding oil imports as a share of output to the basic regression. This variable enters positively in all samples, and the relation is strong (t-statistic of 2.8) for the high-income sample. The remaining coefficients are not affected to any substantial degree by the addition of this variable. Thus, our evidence does suggest that supply shocks play a non-negligible role, especially in the rich countries.

The final issue we address is Posen's measure of financial opposition to inflation. This variable exists for only a subset of countries (roughly, those with inflation rates below 30 percent during the 1960-1989 period), so we cannot add it to all of our specifications. When we add it to our basic regression estimated on Posen's low-to-moderate inflation sample, however, it enters insignicantly and with a much smaller coefficient than in his results.

[10] We included dummies for Africa, Asia, Europe, North and Central America, and South America and omitted Oceania.

This is probably not because our additional variables knock it out. Instead, it appears that FOI is only moderately related to inflation even in Posen's data for the 1970s and 1980s; much of the strength in his results derives from the data for the 1960s.

As a final result, it is useful to consider one further specification. In this regression we drop CBI, since it does not appear to play an important role and since it is the variable that limits our sample most significantly. This specification provides results for a sample of 68 countries that is almost identical to that for the narrower sample for which CBI exists. Thus, the basic relations documented above appear to exist more broadly.

4 Conclusions

The results presented in this paper must be taken with a certain number of grains of salt. Even in the best case, we do not have an enormous number of observations, and in many cases this problem is severe. Many of the proxies we employ are crude, to say the least, and some are potentially endogenous with respect to inflation. The earlier papers in this literature are subject to more or less the same critiques, but caution is nevertheless in order.

Subject to these caveats, our results shed new light on the cross-country determinants of inflation. The more modest conclusions concern the two main hypotheses examined in earlier papers. These papers suggested that central bank independence is not a substantial causal factor in inflation performance, but our results make this conclusion inescapable. Conversely, earlier papers made a strong case that openness causes low inflation, and our results help eliminate any residual doubt.

The more interesting results in the paper concern the new issues addressed. We find some evidence that prior inflation experience plays a non-neglible role in inflation performance. The most interesting interpretation is that high inflation produces investments in inflation-avoiding technologies, which then reduce the costs of inflation. The fact that higher income tends to predict higher inflation is consistent with this interpretation. We recognize, however, that other interpretations are possible.

We also find consistent evidence that optimal tax considerations do matter in determining inflation rates. This is perhaps not surprising, since this result is implied by such a broad class of models and has been documented in the cases of particular countries. But the result has not previously been demonstrated to hold as widely as found here, and we show both that the

overall need for revenue matters and that inflation is adjusted relative to other taxes in the right direction, given the need for revenue.

Our overall summary of these results is that institutional arrangements do not by themselves seem to be of much help in achieving low inflation. Economic fundamentals, such as openness, political instability, and tax policy seem to play a much larger role. This does not mean policymakers should ignore institutions or that institutions play no role; our work might simply have little power to demonstrate the importance of institutions or to isoluate the critical aspects of institutional arrangements. Nevertheless, our results suggest that quick fixes – increasing the tenure of the central bank governor – do not make a big difference unless the underlying conditions for low inflation are present. Creating those conditions is undoubtedly difficult, but it also appears to be essential.

References

[1] Alesina, Alberto, and Lawrence H. Summers (1993), "Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence," *Journal of Money, Credit, and Banking*, 25(2), May, 151-162.

[2] Ball, Laurence and Stephen G. Cecchetti (1990), "Inflation Uncertainty at Long and Short Horizons," *Brookings Papers on Economic Activity*, 1, 215-254.

[3] Barro, Robert J., "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics*, CVI (May 1991), 407-43.

[4] Barro, Robert J. and David B. Gordon, "A Positive Theory of Monetary Policy in a Natural Rate Model," *Journal of Political Economy*, 91, 1983b, 589-610.

[5] Bickel, Peter J. and Kjell A. Doksum (1977), *Mathematical Statistics: Basic Ideas and Selected Topics*, Holden-Day, Inc: Oakland, CA.

[6] Cukierman, Alex, Sebastian Edwards, and Guido Tabellini, "Seigniorage and Political Instability," *American Economic Review*, LXXXII (June 1992), 537-55.

[7] Cukierman, Alex, Steven B. Webb, and Bilin Neyapti (1992), "Measuring the Independence of Central Banks and Its Effect on Policy Outcomes," *World Bank Economic Review*, 6(3), 353-398.

[8] Grilli, Vittorio, Donato Masciandaro, and Guido Tabellini (1991), "Political and Monetary Institutions and Public Financed Policies in the Industrial Countries," *Economic Policy*, 13:341-92.

[9] Grilli, Vittorio, and Gian Maria Milesi-Ferretti (1995), "Economic Effects and Structural Determinants of Capital Controls," *IMF Staff Papers*, 42(3), September 1995, 517-551.

[10] Lane, Philip (1995), "Inflation in Open Economies," manuscript, Harvard University.

[11] Mankiw, N. Gregory,"The Optimal Collection of Seigniorage: Theory and Evidence," *Journal of Monetary Economics.*

[12] Romer, David, "Openness and Inflation: Theory and Evidence," *Quarterly Journal of Economics*, CVII(4), November 1993, 869-904.

[13] Posen, Adam S. (1993), "Why Central Bank Independence Does Not Cause Low Inflation: The Politics Behind the Institutional Fix," manuscript, Harvard University.

[14] Posen, Adam S. (1995), "Declarations Are Not Enough: Financial Sector Sources of Central Bank Indepencence," manuscript, Federal Reserve Bank of New York.

[15] Poterba, James, and Julio Rotemberg (1989), "Inflation and Taxation with Optimizing Governments," *Journal of Money, Credit, and Banking.*

[16] Summers, Robert, and Alan Heston, "A New Set of International Comparisons of Real Product and Price Levels Estimates for 130 Countries, 1950-1985," *Review of Income and Wealth*, XXXIV (March 1988), 1-25.

[17] White, Halbert, "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," *Econometrica*, 48 (1980), 817-838.

Table 1a

Means and Standard Deviations, Whole Sample

	Mean	Std Deviation
Avg. Inflation 1974-94	17.07	23.35
Avg. Inflation 1948-72	6.56	9.57
Central bank independence	0.34	0.12
Political Instability	0.15	0.23
Imports/gdp, 1973-94	33.05	20.95
Log. Income, 1980	17.68	1.76
Log. Income per cap., 1980	8.16	1.08
Exchange rate regime, 1974	1.04	0.76
Debt/gdp (%), 1975	27.87	24.20
Quality of the Data, SH	4.57	1.58

Table 1b

Means and Standard Deviations, High Income Countries

	Mean	Std Deviation
Avg. Inflation 1974-94	7.19	5.12
Avg. Inflation 1948-72	4.11	1.66
Central bank independence	0.37	0.16
Political Instability	0.01	0.05
Imports/gdp, 1973-94	33.99	19.14
Log. Income, 1980	18.39	1.80
Log. Income per cap., 1980	9.13	0.12
Exchange rate regime, 1974	1.33	0.97
Debt/gdp (%), 1975	20.73	13.66
Quality of the Data, SH	5.89	0.32

Table 1c

Means and Standard Deviations, Less Developed Countries

	Mean	Std Deviation
Avg. Inflation 1974-94	22.80	27.66
Avg. Inflation 1948-72	7.99	11.80
Central bank independence	0.33	0.09
Political Instability	0.23	0.25
Imports/gdp, 1973-94	32.50	22.23
Log. Income, 1980	17.27	1.63
Log. Income per cap., 1980	7.60	0.98
Exchange rate regime, 1974	0.87	0.56
Debt/gdp (%), 1975	32.03	27.97
Quality of the Data, SH	3.81	1.51

Table 2a

Correlation Matrix, Whole Sample

	Inf7494	Inf4872	CBI	Political Inst.	Imports	GDP80	GDP80 p.c.	Exch. rate	Debt75	Q
Avg. Inflation 1974-94	1									
Avg. Inflation 1948-72	0.37 (2.74)	1								
Central bank independence	0.08 (0.58)	-0.11 (-0.76)	1							
Political Instability	0.55 (4.53)	0.23 (1.62)	0.08 (0.57)	1						
Imports/gdp, 1973-94	-0.24 (-1.67)	-0.20 (-1.41)	0.07 (0.51)	-0.34 (-2.47)	1					
Log. Income, 1980	-0.17 (-1.16)	0.02 (0.16)	0.04 (0.25)	-0.08 (-0.53)	-0.52 (-4.21)	1				
Log. Income per cap., 1980	-0.32 (-2.31)	-0.20 (-1.42)	0.14 (0.96)	-0.64 (-5.69)	0.26 (1.85)	0.34 (2.52)	1			
Exchange rate regime, 1974	-0.04 (-0.25)	0.03 (0.19)	-0.02 (-0.15)	-0.20 (-1.39)	0.19 (1.30)	-0.30 (-2.14)	0.15 (1.05)	1		
Debt/gdp (%), 1975	0.18 (1.29)	-0.03 (-0.20)	-0.08 (-0.59)	-0.10 (-0.71)	0.28 (1.99)	-0.11 (-0.79)	-0.03 (-0.20)	-0.14 (-0.98)	1	
Quality of the Data, SH	-0.40 (-2.98)	-0.19 (-1.34)	0.15 (1.03)	-0.50 (-3.96)	0.21 (1.51)	0.39 (2.93)	0.81 (9.47)	0.19 (1.30)	0.01 (0.09)	1

t-statistics in parentheses.

Table 2b

Correlation Matrix, High Income Countries

	Inf7494	Inf4872	CBI	Political Inst.	Imports	GDP80	GDP80 p.c.	Exch. rate	Debt75	Q
Avg. Inflation 1974-94	1									
Avg. Inflation 1948-72	0.76 (4.76)	1								
Central bank independence	-0.23 (-0.96)	-0.27 (-1.13)	1							
Political Instability	-0.01 (-0.03)	-0.15 (-0.60)	0.05 (0.20)	1						
Imports/gdp, 1973-94	-0.07 (-0.28)	-0.21 (-0.87)	-0.09 (-0.36)	-0.11 (-0.45)	1					
Log. Income, 1980	-0.54 (-2.57)	-0.44 (-1.94)	0.12 (0.50)	0.30 (1.25)	-0.63 (-3.22)	1				
Log. Income per cap., 1980	-0.12 (-0.49)	-0.40 (-1.73)	0.26 (1.09)	-0.23 (-0.97)	0.15 (0.59)	0.12 (0.50)	1			
Exchange rate regime, 1974	0.19 (0.76)	0.24 (0.97)	-0.03 (-0.11)	-0.25 (-1.05)	0.47 (2.15)	-0.63 (-3.23)	-0.24 (-1.00)	1		
Debt/gdp (%), 1975	0.11 (0.45)	-0.14 (-0.58)	-0.40 (-1.77)	0.43 (1.92)	-0.03 (-0.13)	0.14 (0.55)	-0.30 (-1.25)	-0.10 (-0.42)	1	
Quality of the Data, SH	-0.55 (-2.66)	-0.34 (-1.44)	-0.27 (-1.11)	0.11 (0.46)	-0.02 (-0.09)	0.43 (1.89)	-0.12 (-0.47)	0.12 (0.50)	0.18 (0.73)	1

t-statistics in parentheses.

Table 2c

Correlation Matrix, Less Developed Countries

	Inf7494	Inf4872	CBI	Political Inst.	Imports	GDP80	GDP80 p.c.	Exch. rate	Debt75	Q
Avg. Inflation 1974-94	1									
Avg. Inflation 1948-72	0.32	1								
	(1.85)									
Central bank independence	0.30	-0.10	1							
	(1.70)	(-0.53)								
Political Instability	0.49	0.16	0.31	1						
	(3.00)	(0.89)	(1.74)							
Imports/gdp, 1973-94	-0.28	-0.22	0.22	-0.43	1					
	(-1.57)	(-1.23)	(1.21)	(-2.57)						
Log. Income, 1980	-0.03	0.16	-0.18	0.07	-0.53	1				
	(-0.18)	(0.86)	(-0.98)	(0.38)	(-3.39)					
Log. Income per cap., 1980	-0.14	-0.09	0.02	-0.50	0.38	0.24	1			
	(-0.75)	(-0.49)	(0.12)	(-3.08)	(2.24)	(1.31)				
Exchange rate regime, 1974	0.07	0.12	-0.16	-0.07	-0.04	-0.24	-0.09	1		
	(0.39)	(0.65)	(-0.85)	(-0.39)	(-0.21)	(-1.30)	(-0.51)			
Debt/gdp (%), 1975	0.12	-0.08	0.11	-0.29	0.38	-0.11	0.20	-0.09	1	
	(0.67)	(-0.42)	(0.61)	(-1.61)	(2.22)	(-0.58)	(1.12)	(-0.48)		
Quality of the Data, SH	-0.25	-0.08	0.15	-0.30	0.31	0.29	0.67	-0.03	0.22	1
	(-1.43)	(-0.45)	(0.84)	(-1.71)	(1.73)	(1.65)	(4.92)	(-0.16)	(1.21)	

t-statistics in parentheses.

Table 3a

Dependent Variable = Avg. Inflation rate, 1973-1994

	Whole Sample	High Income	Other Countries	$\pi \leq 100$	$\pi \leq 50$
Constant	15.87	9.92	7.57	11.24	12.23
	(1.48)	(4.81)	(0.41)	(2.42)	(3.11)
Central bank independence	18.88	-7.37	61.33	12.63	3.95
	(0.62)	(-2.24)	(1.16)	(0.85)	(0.36)
R^2	0.005	0.05	0.03	0.008	0.001
N	62	18	44	58	56

White (1980) t-statistics in parentheses.

Table 3b

Dependent Variable = Avg. Inflation rate, 1973-1994

	Whole Sample	High Income	Other Countries	$\pi \leq 100$	$\pi \leq 50$
Constant	9.17	9.92	3.94	8.52	11.08
	(0.86)	(4.66)	(0.21)	(1.78)	(2.69)
Central bank independence	10.30	-7.38	41.30	11.59	3.77
	(0.39)	(-2.29)	(0.83)	(0.87)	(0.36)
Political Instability	61.44	0.36	48.71	22.51	9.54
	(2.82)	(0.04)	(1.93)	(1.80)	(1.13)
R^2	0.18	0.05	0.12	0.07	0.02
N	62	18	44	58	56

White (1980) t-statistics in parentheses.

Table 3c

Dependent Variable = Avg. Inflation rate, 1973-1994

	Whole Sample	High Income	Other Countries	$\pi \leq 100$	$\pi \leq 50$
Constant	70.13	34.55	16.79	43.81	32.56
	(2.77)	(1.38)	(0.43)	(3.29)	(3.19)
Central bank independence	22.90	-6.82	61.15	16.35	6.58
	(0.80)	(-2.04)	(1.16)	(1.20)	(0.65)
Log. Income per cap., 1980	-6.97	-2.71	-1.21	-4.21	-2.62
	(-2.21)	(-0.98)	(-0.22)	(-2.62)	(-2.19)
R^2	0.06	0.05	0.03	0.08	0.05
N	62	18	44	58	56

White (1980) t-statistics in parentheses.

Table 3d

Dependent Variable = Avg. Inflation rate, 1973-1994

	Whole Sample	High Income	Other Countries	$\pi \leq 100$	$\pi \leq 50$
Constant	6.40	35.98	-35.45	33.22	33.21
	(0.20)	(1.31)	(-0.94)	(2.03)	(2.43)
Central bank independence	9.96	-6.76	37.79	14.80	6.66
	(0.37)	(-2.12)	(0.75)	(1.18)	(0.69)
Political Instability	62.51	-1.53	59.12	10.53	-0.66
	(2.34)	(-0.17)	(2.37)	(0.74)	(-0.06)
Log. Income per cap., 1980	0.33	-2.87	5.10	-3.01	-2.70
	(0.09)	(-0.96)	(0.98)	(-1.73)	(-1.86)
R^2	0.18	0.05	0.14	0.09	0.05
N	62	18	44	58	56

White (1980) t-statistics in parentheses.

Table 4a

Dependent Variable = Avg. Inflation rate, 1973-1994

	Whole Sample	High Income	Other Countries	$\pi \leq 100$	$\pi \leq 50$
Constant	36.74	7.83	46.67	23.24	18.25
	(4.49)	(6.14)	(4.66)	(5.23)	(6.56)
Imports/gdp, 1973-94	-0.43	-0.01	-0.55	-0.22	-0.13
	(-2.61)	(-0.87)	(-2.74)	(-2.58)	(-2.24)
R^2	0.07	0.004	0.10	0.07	0.05
N	62	18	44	58	56

White (1980) t-statistics in parentheses.

Table 4b

Dependent Variable = Avg. Inflation rate, 1973-1994

	Whole Sample	High Income	Other Countries	$\pi \leq 100$	$\pi \leq 50$
Constant	137.80	63.79	103.43	95.38	71.73
	(3.21)	(2.87)	(1.62)	(4.55)	(4.29)
Imports/gdp, 1973-94	-0.66	-0.18	-0.67	-0.38	-0.26
	(-3.71)	(-2.78)	(-3.37)	(-3.50)	(-3.39)
Log. Income, 1980	-5.35	-2.74	-3.09	-3.82	-2.80
	(-2.38)	(-2.56)	(-0.86)	(-3.91)	(-3.43)
R^2	0.15	0.56	0.12	0.20	0.18
N	62	18	44	58	56

White (1980) t-statistics in parentheses.

Table 4c

Dependent Variable = Avg. Inflation rate, 1973-1994

	Whole Sample	High Income	Other Countries	$\pi \leq 100$	$\pi \leq 50$
Constant	76.97	-29.75	41.26	83.46	70.54
	(2.15)	(-0.56)	(0.85)	(4.05)	(3.61)
Imports/gdp, 1973-94	-0.51	-0.22	-0.78	-0.38	-0.27
	(-3.18)	(-3.18)	(-3.03)	(-3.15)	(-3.03)
Log. Income, 1980	-5.42	-3.30	-6.09	-4.12	-3.01
	(-2.35)	(-3.13)	(-1.88)	(-3.34)	(-2.90)
Central bank independence	8.46	-8.02	43.44	13.57	6.34
	(0.35)	(-2.00)	(1.07)	(1.15)	(0.69)
Political Instability	56.90	35.06	42.94	9.12	-0.62
	(2.24)	(3.38)	(1.76)	(0.70)	(-0.06)
Log. Income per cap., 1980	5.67	11.78	12.33	1.40	0.40
	(1.43)	(1.64)	(2.06)	(0.69)	(0.24)
R^2	0.24	0.70	0.24	0.22	0.19
N	62	18	44	58	56

White (1980) t-statistics in parentheses.

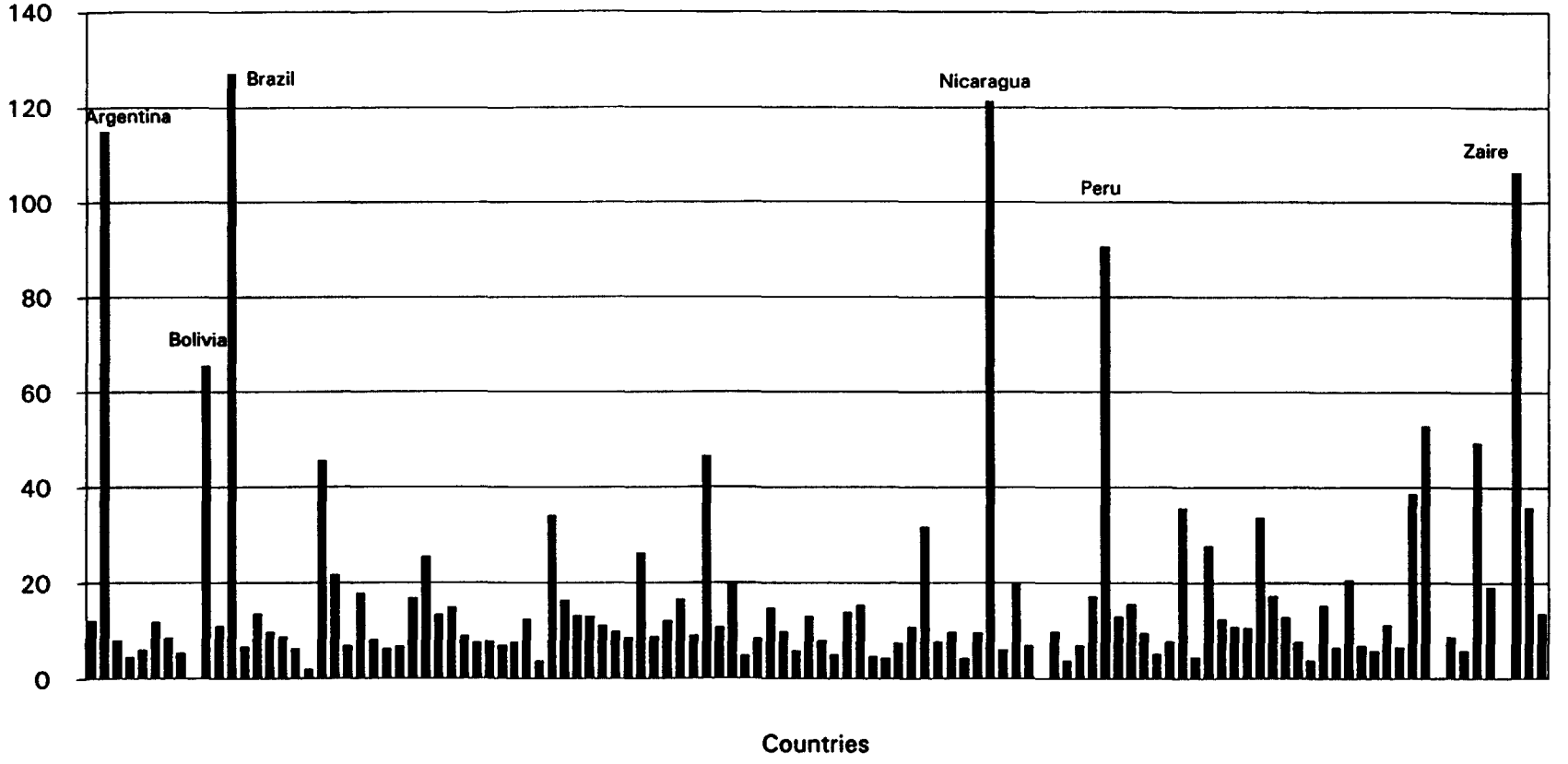
Table 5

Dependent Variable = Avg. Inflation rate, 1973-1994

	Whole Sample	High Income	Other Countries	$\pi \leq 100$	$\pi \leq 50$
Constant	-12.78	-92.31	-29.91	16.61	16.61
	(-0.28)	(-1.29)	(-0.51)	(0.94)	(0.94)
Avg. Inflation 1948-72	0.59	1.83	0.59	0.25	0.25
	(1.31)	(3.63)	(1.41)	(1.58)	(1.58)
Central bank independence	20.63	-3.45	80.11	10.34	10.34
	(1.32)	(-0.71)	(2.47)	(1.15)	(1.15)
Political Instability	60.55	21.51	49.81	7.46	7.46
	(2.64)	(2.38)	(2.17)	(0.80)	(0.80)
Imports/gdp, 1973-94	-0.37	-0.08	-0.55	-0.30	-0.30
	(-3.71)	(-2.38)	(-2.69)	(-5.33)	(-5.33)
Log. Income, 1980	-3.87	-1.12	-4.14	-2.49	-2.49
	(-2.52)	(-3.00)	(-1.75)	(-2.74)	(-2.74)
Log. Income per cap., 1980	12.75	15.13	14.07	7.53	7.53
	(2.13)	(1.96)	(2.06)	(3.65)	(3.65)
Exchange rate regime, 1974	2.58	0.77	5.50	0.78	0.78
	(1.32)	(0.94)	(1.69)	(0.55)	(0.55)
Debt/gdp (%), 1975	0.35	0.11	0.37	0.23	0.23
	(4.98)	(3.48)	(3.57)	(4.25)	(4.25)
Quality of the Data, SH	-5.68	-4.29	-6.33	-5.28	-5.28
	(-2.29)	(-1.86)	(-2.61)	(-3.65)	(-3.65)
R^2	0.58	0.87	0.58	0.55	0.55
N	49	18	31	47	47

White (1980) t-statistics in parentheses.

AVERAGE ANNUAL INFLATION
1973-1994



Average Inflation, 1974-94