



WP/04/215

# IMF Working Paper

---

## What Determines Long-Run Macroeconomic Stability? Democratic Institutions

*Shanker Satyanath and  
Arvind Subramanian*

**IMF Working Paper**

Research Department

**What Determines Long-Run Macroeconomic Stability? Democratic Institutions**

Prepared by Shanker Satyanath and Arvind Subramanian<sup>1</sup>

November 2004

**Abstract**

**This Working Paper should not be reported as representing the views of the IMF.**

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

We examine the deep determinants of long-run macroeconomic stability in a cross-country framework. We find that conflict, openness, and democratic political institutions have a strong and statistically significant causal impact on macroeconomic stability. Surprisingly the most robust relationship of the three is for democratic institutions. A one standard deviation increase in democracy can reduce nominal instability nearly fourfold. This impact is robust to alternative measures of democracy, samples, covariates, and definitions of conflict. It is particularly noteworthy that a variety of nominal pathologies discussed in the recent macroeconomic literature, such as procyclical policy, original sin, and debt intolerance, have common origins in weak democratic institutions. We also find evidence that democratic institutions both strongly influence monetary policy and have a strong, independent positive effect on stability after controlling for various policy variables.

JEL Classification Numbers: E31, E61, E63

Keywords: Macroeconomic instability; political institutions; openness; conflict

Author(s) E-Mail Address: [ss284@nyu.edu](mailto:ss284@nyu.edu); [asubramanian@imf.org](mailto:asubramanian@imf.org)

---

<sup>1</sup> We are especially grateful to Simon Johnson, Edward Miguel, Raghuram Rajan, and Dani Rodrik for extensive comments on an earlier draft. We also thank Ajay Chibber, Bill Cline, Tito Cordella, Josh Felman, Devesh Kapur, Aart Kraay, Ugo Panizza, Alessandro Prati, Rodney Ramcharan, Paul Ross, Martin Schindler, Thierry Tressel, and Xavier Sala-i-Martin for helpful discussions. We thank Dr. Nurul Islam for conveying his prescient understanding of the virtues of democracy, and Carmen Reinhart and Ken Rogoff for kindly sharing their data set. Manzoor Gill and Ernest Sergenti provided superb research assistance.

| Contents   | Page |
|--|------|
| I. Introduction .....  | 4    |
| A. Proximate Versus Deep Determinants .....  | 4    |
| II. The Deep Determinants of Stability.....  | 7    |
| A. Distributive Conflicts.....   | 7    |
| B. Democratic Political Institutions.....  | 9    |
| C. Openness as an Institution.....   | 12   |
| III. Empirical Strategy .....  | 13   |
| IV. Measurement and Estimation Issues.....   | 14   |
| A. Measuring Nominal Instability .....   | 14   |
| B. Estimation Method: OLS, IV, Instrumentation, and Sample .....                               | 16   |
| V. Results.....  | 18   |
| A. Core Results .....  | 18   |
| B. A Causal Story: Institutions, Monetary Policy, and Macroeconomic Instability.....           | 25   |
| VI. Robustness .....   | 28   |
| A. Alternative Definitions of Instability .....  | 28   |
| B. Alternative Measures of Political Institutions.....   | 30   |
| C. Additional Controls.....  | 32   |
| D. Samples .....   | 34   |
| E. Measuring Conflict.....   | 34   |
| F. Central Bank Independence as Institutional Reform .....                                     | 37   |
| G. Time Series Variation .....   | 37   |
| VII. Concluding Remarks .....  | 41   |
| References.....  | 48   |
| Text Tables  |      |
| 1a. Deep Determinants of Macroeconomic Instability: Core Specifications<br>(Small Sample)..... | 19   |
| 1b. Deep Determinants of Macroeconomic Instability: Core Specifications<br>(Large Sample)..... | 24   |
| 2a. Monetary and Fiscal Policies and Macroeconomic Instability (Small Sample) .....            | 26   |
| 2b. Monetary and Fiscal Policies and Macroeconomic Instability (Large) .....                   | 26   |
| 3a. Deep Determinants of Policies (Small Sample).....  | 26   |
| 3b. Deep Determinants of Policies (Large Sample).....  | 26   |
| 4a. Policies Versus Deep Determinants (Small Sample).....                                      | 27   |
| 4b. Policies Versus Deep Determinants (Large Sample).....                                      | 27   |

Tex Tables (Continued)

|  |    |
|--|----|
| 5a. Robustness to Alternative Definitions of Nominal Instability (Small Sample).....       | 29 |
| 5b. Robustness to Alternative Definitions of Nominal Instability (Large Sample).....       | 29 |
| 6a. Robustness to Alternative Measures of Political Institutions (Small Sample) .....      | 31 |
| 6b. Robustness to Alternative Measures of Political Institutions (Large Sample) .....      | 31 |
| 7a. Robustness to Covariates (Small Sample) .....  | 33 |
| 7b. Robustness to Covariates (Large Sample) .....  | 33 |
| 8a. Robustness to Regional Dummies, Influential and Extreme Observance (Small Sample)..... | 35 |
| 8b. Robustness to Regional Dummies, Influential and Extreme Observance (Large Sample)..... | 35 |
| 9a. Alternative Sources of Conflict (Small Sample).....                                    | 36 |
| 9b. Alternative Sources of Conflict (Large Sample) .....                                   | 36 |
| 10. Central Bank Independence (CBI) as Institutional Reform .....                          | 38 |
| 11. Decadal Regressions (Small Sample).....  | 40 |
| 12. Pooled Cross-Section and Panel Specifications.....                                     | 41 |

Figures

|   |    |
|---|----|
| 1. Nominal Instability by Region.....                             | 15 |
| 2a. Deep Determinants of Nominal Instability (Small Sample) ..... | 21 |
| 2b. Deep Determinants of Nominal Instability (Large Sample).....  | 22 |

Appendix Tables

|  |    |
|--|----|
| 13. Variables Description with Data Source.....                                      | 42 |
| 14a. Summary Statistics (Small Sample).....  | 42 |
| 14b. Summary Statistics (Large Sample) .....   | 42 |
| 15a. List of Countries (Small Sample) .....  | 43 |
| 15b. List of Countries (Large Sample) .....  | 43 |
| 16a. Correlation Between Measures of Political Institutions (Small Sample) .....     | 43 |
| 16b. Correlation Between Measures of Political Institutions (Large Sample) .....     | 43 |
| 17. Monetary and Fiscal Policies and Macroeconomic Instability (Small Sample).....   | 44 |
| 18. Policies Versus Deep Determinants (Small Sample).....                            | 44 |
| 19. Robustness to Alternative Measures of Political Institutions (Small Sample)..... | 44 |
| 20. Robustness to Covariates (Small Sample).....                                     | 45 |
| 21. Robustness to Sample Composition (Small Sample).....                             | 45 |
| 22. Alternative Sources of Conflict (Small Sample) .....                             | 46 |
| 23. Central Bank Independence (CBI) as Institutional Reform.....                     | 46 |

Appendix Figure

|   |    |
|---|----|
| 3. Inflation Performance by Region..... | 47 |
|---|----|

*“It has long been obvious that the roots of inflation....lie deep in the social and political structure in general, and in social and political conflict and conflict management in particular.” (Albert Hirschman, 1985).*

*“This particular type of overly expansionary macroeconomic policies which lead to high inflation and severe balance of payments crisis, has been repeated so often, and with such common characteristics, that it plainly reveals the linkages from social conflict to poor economic performance.” (Jeffrey Sachs, 1989).*

## I. INTRODUCTION

Why are some countries more stable macroeconomically than others? It is surprising that while so much of the recent literature has been devoted to, even obsessed with, explaining the cross-country variation in *real* variables—for example, in income (Hall and Jones, 1998, Acemoglu et al., 2001, Rodrik et al., 2004), in growth (Barro and Sala-i-Martin, 2003) and the instability of growth (Rodrik, 1999; Acemoglu et al., 2003a)—there has been much less of a concern with analyzing the cross-country variation in nominal or macroeconomic instability.<sup>2</sup> This is despite the fact that the cross-country variation in nominal or macroeconomic instability is even more astounding than that in income.<sup>3</sup> For example, in a sample of 80 countries that are covered in this paper, average inflation in the post-war period varies from over 1000 percent in Nicaragua to 3.3 percent in Malaysia, a multiple of over 300, which is much greater than the variation in levels of income. Similarly, for our preferred measure of macroeconomic instability—the annual average rate of change of the nominal parallel market exchange rate—the variation between Nicaragua and Denmark is 3167-fold.

### A. Proximate Versus Deep Determinants

There are two plausible sets of explanations for the variations described above. One of these is that macroeconomic policies “cause” nominal instability. The relative inattention to the cross-sectional variation in stability stems in part from the seeming confidence in the profession of knowing that policies are the causal determinant of instability. For instance, much of the IMF’s work including its macroeconomic programs, flows from, and is founded on, this proposition. As Stanley Fischer, the former First Deputy Managing Director of the

---

<sup>2</sup> Exceptions include Romer (1993), Cukierman, Webb, and Neyapti (1992), Cukierman, Edwards and Tabellini (1992), Campillo and Miron (1996), and Desai et. al. (2003). There is a large and growing literature on financial crises but that is not the concern of this paper.

<sup>3</sup> Throughout this paper macroeconomic and nominal instability will be used interchangeably to refer to variability in some nominal aggregate such as prices and the exchange rate. Nominal instability is to be distinguished from real instability, which will refer to the variability in real aggregates such as the growth rate of real GDP.

IMF for 7 years, put it, “It is not worth arguing very much about those two words (“Washington Consensus”), but it is worth arguing for the *policies* that we promote—sound money, prudent fiscal policy .....” (Stan Fischer, 2001).<sup>4</sup>

The uncomfortable corollary of this view is that variation in instability across countries arises from “some, perhaps accidental, lapse of attention or virtue on the part of monetary authorities or misguided concentration on the wrong variables such as the rate of interest in lieu of the quantity of money” (Hirschman, 1985. p. 56). If macroeconomic policies were indeed fundamental causes, we would have to believe, as Rogoff (2003) puts it, that the “monetary authorities just got bamboozled by bad Keynesian theories in the 1960s and 1970s. The great inflation of the 1970s and 1980s was the by-product of macroeconomic teaching malpractice. Once the world’s central bankers started coming to their senses in the 1980s, ending inflation was just a matter of communication and technique.”

On the other hand, if, as seems more plausible, the relationship between policies and outcomes is a proximate one, the question arises as to why some countries follow distortionary macroeconomic policies and not others? If monetary or fiscal policy causes prices, what in turn causes monetary or fiscal policy and hence instability?<sup>5</sup> Such questions justify a search for deeper causes for instability, perhaps residing in political institutions, distributive conflicts, or the economic openness of societies which ultimately drive policy choices. They also justify an effort to identify which of these deeper causes has the most significant and robust relationship with instability. This is the subject of this paper.

The contribution of this paper is to examine empirically the deep determinants of the cross-sectional variation in nominal instability.<sup>6</sup> Our analysis differs from other empirical

---

<sup>4</sup> Hirschman offers another explanation for a policy-based view of inflation: “Economic theories of inflation dominate not because participants in the discussion are convinced that these theories hold the crucial variables, but rather because intricate analytical structures have been developed that lend themselves to ever further elaboration, some empirical testing, and—most important—the formulation of policy advice.” (Hirschman, 1986, p. 53) This explanation is also consistent with the fact that nominal instability has typically been examined in a time-series rather than cross-section context probably because of the availability of high frequency data and the sophisticated tools of time-series analysis that can be deployed. In a policy-based view, inflation is a technical rather than a political issue.

<sup>5</sup> The response to these questions of the “policies-determine-inflation” school is that bad fiscal and monetary policies are the result of weak/ineffective leaders, those who do not have adequate “commitment” to securing stability. This lack of “commitment” or “ownership” on the part of the authorities in power is ritually invoked as an explanation for the failure of IMF-supported programs.

<sup>6</sup> We undertake some preliminary work to exploit the time series variation in the data but the difficulties of such an exercise as well as our interest in the long run and deep determinants means that the cross-sectional variation remains very much our focus.

examinations of nominal instability in its focus on sorting out the relative causal impact of all plausible deep determinants. Romer (1993) focuses almost exclusively on the role of trade openness in determining inflation. Cukierman, Edwards, and Tabellini (1992) emphasize the role of political instability as do Campillo and Miron (1996). Cukierman, Webb, and Neyapti (1992) are concerned with the impact of central bank independence. While Desai et. al. (2003) study the effects of democracy on inflation, their analysis does not use state of the art instruments to address the endogeneity of institutions to poor macroeconomic performance.

Our explicitly distributional perspective on instability helps identify a variety of plausible deep determinants. Furthermore, our decision to build on the recent instrumental variables based literature on openness and institutions helps us better address issues of endogeneity.<sup>7</sup> The strategy that we have adopted for this paper is related to work on the institutional determinants of *real* instability (especially the papers by Rodrik (1999) and Acemoglu et al. (2003a)). Rodrik (1999), for example, examines what happens to growth rates in response to shocks. Acemoglu et. al. (2003a) analyzes the variability of output—normal and large—in the context of a model with explicitly distributional elements. We break new ground with respect to this literature by considering the determinants of nominal instability, and by examining the importance of political institutions relative to other deep determinants.

Our main conclusions are as follows. There is a strong causal relationship between the deep determinants—conflict, institutions, and openness—and macroeconomic stability. Conflict is detrimental to stability; democratic political institutions help attain stability as does openness. The most strong, statistically significant, and robust of these determinants is democratic political institutions. For example, a one standard deviation improvement in democracy leads to a 3.6-fold decline in nominal instability. The t-values for the coefficient on democracy often exceed 4 and the relationship is robust to alternative measures of democracy, samples, covariates, measures of conflict, and definitions of instability.

In relation to the roles of macroeconomic policies and the deep determinants, we find that macroeconomic policies, especially monetary policies, are also causally affected by democracy. And when policies and the deep determinants are entered jointly, the evidence points toward a robust independent role for democracy.

Finally, our tentative effort at exploiting the time series variation in the data suggests an important role for openness in influencing stability outcomes, although we would caution that much more work is required to disentangle the relative importance of the deep determinants. We take this as supportive of the Rogoff (2003) proposition that globalization, which accelerated during the last two decades, has had an important impact on nominal stability.

---

<sup>7</sup> As explained below, we also have a better measure of nominal instability.

The structure of the paper is as follows. In Section II we lay out the causal relationships between three deep determinants—distributive conflicts, democratic political institutions, and economic openness—and macroeconomic instability, providing some illustrative examples. Section III describes our empirical strategy. In Section IV, we address some issues of measurement and estimation. In Section V, we present our core results and the implied causal relationships between democracy, policies, and macroeconomic outcomes. Section VI describes the robustness checks, and Section VII concludes.

## II. THE DEEP DETERMINANTS OF STABILITY

### A. Distributive Conflicts

There is a long intellectual tradition going back to Marx and Kalecki, and more recently to Rowthorn (1977), Lindberg and Maier (1986), Hirschman (1985), Dornbusch and Edwards (1991) and Sachs (1989), which traces nominal instability to conflict and the institutions for managing it.<sup>8</sup> This view is captured in the two quotes from Hirschman and Sachs cited above. In this view, nominal instability is ultimately a distributional and therefore political issue.

There are a number of different ways in which macroeconomic instability can be consequence of distributionally-motivated actions by governments or others in power.

First, in early (Marxian) analyses of business cycles, the expansion of bank credit during booms was seen as providing extra purchasing power for business to finance investments beyond that would have been possible without inflation. This inflationary financing of an investment boom is made possible by implicitly depressing private consumption (consequent upon the real wage decline that accompanies inflation) and thereby increasing savings.

Second, inflation is an instrument par excellence for redistributing wealth: for example, from creditors to debtors and away from those that hold money and other assets (unskilled human capital) that cannot be hedged against inflation. For example, in Chile in the 1870s, land owners were accused of orchestrating inflation to permit them to repay their loans in depreciated paper money.

Third, while Marxian analyses of inflation tend to stress the conflict between wage-earners and capitalists, in many developing countries, particularly in Latin America and Africa, the fissures run as much between sectors as classes. The cleavage is often between urban wage earners employed in nontradables and those that derive income from resource-intensive export sectors.<sup>9</sup> Any loosening of monetary and fiscal policies has inevitable and intended

---

<sup>8</sup> Even Milton Friedman, who famously described inflation as always and everywhere a monetary phenomenon, is reported to have distinguished the proximate causes (excessive increase in money supply) and the “deeper” social causes in a seminar (Seldon, 1975).

<sup>9</sup> Bates (1981) provides an insightful analysis of these fissures in Africa.



redistributional effects. Often fiscal expansion takes the form of wage increases granted to public sector employees in the urban sector. The rise in urban real wages consequent upon these policies squeezes profits in the primary sector. Macroeconomic expansion thus has distributional intent and consequences. Occasionally, inflation through selective credit expansion serves to favor some industries over others (in Brazil in the mid-1960s, this was deployed to favor the automobile sector at the expense of basic and consumer goods).<sup>10</sup>

A fourth example relates to borrowing and rising government indebtedness, which often substitutes for inflation as a means of financing unsustainable spending plans and hence promoting the interests of a particular group in society. As Sachs (1989) rightly asserts, “much of the reason for high inflation and external instability results from the vast overhang of external debt. The reasons for this debt accumulation are complex, but include both domestic factors (including populist policies....)” Thus, borrowing and indebtedness are simply another manifestation of nominal instability and hence related to the same underlying causes.

Finally, another adverse impact of polarization within society on macroeconomic stabilization has been analyzed by Alesina and Drazen (1991). If countries need to pursue costly stabilization in the wake of shocks and different interest groups disagree on the allocation of the burden of adjustment, a struggle ensues between them, with each trying to make other groups pay for the adjustment. Successful stabilizations are then delayed until one group consolidates its position and prevents the others from vetoing the stabilization plan. Thus, latent conflict in society leads to greater macroeconomic instability.

A few historical examples serve to illustrate some of these effects. To help his political base that comprised the labor unions, Juan Peron raised real wages by 25 percent in 1947 and 24 percent in 1948 which led to a rise in labor’s share of national income from 40 percent in 1946 to 49 percent in 1949 (Cardoso and Helwege, 1991). The post-war boom in Argentina’s commodity prices allowed such populism to be sustained temporarily. But in 1949, when prices declined, the specter of macroeconomic instability raised its head and inflation accelerated to 31 percent in 1949.

This pattern of pandering to urban interest groups through wage increases and budget deficits with the same inflationary consequences was repeated in other times and by other leaders in

---

<sup>10</sup> It should be stressed, however, that the identity of actors engaged in struggle for the size of the economic pie is not time invariant. Hirschman, for example, discusses how the industrial bourgeoisie in Argentina tend to make common cause with the urban masses during a recession in demanding expansionary economic policies. But when the resulting squeeze on exportables (which is also the wage good) leads to difficulty in importing basic and intermediate inputs, the industrialists distance themselves from the wage demands of the urban masses.

Latin America, including Allende in Chile (1970–73), Peron in Argentina (1973–76), Garcia in Peru (1985–90), and Sarney in Brazil (1985–90).<sup>11</sup>

But these experiences are not unique to Latin America. In Nigeria, for example, the windfalls from oil prices were used for explicitly redistributive purposes: in the aftermath of the oil shocks in the 1970s, the Nigerian rulers, who were predominantly from the poorer, northern part of the country used the oil revenues to finance a massive expansion of the civil service staffed by northerners (Bevan et. al., 1999). The subsequent decline in revenues led to borrowing by the rulers and to subsequent macroeconomic instability. The parallel market exchange rate which *appreciated* on average by 0.4 percent in the 1970s depreciated on average by nearly 43 percent in the 1980s. Similarly, in Ghana, inflation was part of the arsenal of policy tools deployed by the ruling elite under Nkrumah (who was a member of the coastal Akan group), and later under Rawlings, to redistribute income away from the Ashanti-dominated export sector.

## **B. Democratic Political Institutions**

Irrespective of the level of potential conflict in society—and the associated pressures to pursue redistributive policies—macroeconomic outcomes can be influenced by the political mechanisms—institutions—in place for handling conflict. The literature suggests two mechanisms through which political institutions can contribute to macroeconomic stability. One is through checks on the power of politicians, and the second is through greater accountability of politicians. We examine both of these chains of causation below.

On checks, Rodrik (1999) argues that institutions that place constraints on “opportunistic grabs” for resources help a country to better adjust domestically (in the sense of acceptable burden sharing between groups in society) in the face of external shocks. If these adjustments could be handled well—in terms of minimizing the distributional conflict that adjustment entailed—the long-run effect of the shocks could be minimized. On the other hand, if prevailing institutional constraints are inadequate, the distributional conflicts could amplify the effect of the initial shocks severely affecting long-run growth performance. The argument in Acemoglu et. al. (2003a) is similar and is framed in terms of constraints on the executive helping mitigate the variability of output growth. The arguments of both of these papers imply that we should also expect less by way of distributionally motivated efforts to manipulate nominal variables where there are more checks on the power of politicians.

---

<sup>11</sup> In Peru, the public sector deficit doubled from 4.4 percent of GDP in 1985 to 9.9 percent of GDP in 1987 thanks to large wage increases. In Chile, Allende announced a real wage increase of 37–41 percent for blue collar workers in 1971, resulting in an increase in the deficit from 3 percent to 10 percent of GDP. Even the collapse of the Argentine currency board arrangement can be seen through the lens of distributional conflict between the politically important “periphery” and the “core,” comprising the middle classes in Buenos Aires (see Acemoglu et al., 2003a).

On accountability, political scientists have developed the concept of the winning coalition, the group whose support is essential for a chief executive to survive in office. Bueno de Mesquita et al., (2003) have formally shown that as the ratio of the winning coalition to the group that selects the leader (the selectorate) increases it becomes increasingly inefficient for the chief executive to focus on diverting resources to the winning coalition to the exclusion of other members of society. The key assumption here is that politicians seek to maximize their probability of political survival. Politicians allocate their resources between goods that can exclusively be consumed by members of the winning coalition (private goods) and goods that serve the public at large (public goods) with the goal of maximizing this probability. As the winning coalition becomes larger, the amount of private goods received by each member of the winning coalition becomes smaller, rendering private goods a less and less efficient way of ensuring political survival. Consequently, as the ratio of the winning coalition to the selectorate increases, the chief executive focuses more on providing public goods while limiting attempts to corner private goods for political insiders. Since macroeconomic stability can be considered to be a public good we should expect greater stability in environments with a high winning coalition/selectorate ratio.

Persson et al. (1997) combine the checks and accountability streams in the literature in an interesting way. They show that with appropriate checks and balances, separation of powers between executive and legislative bodies helps prevent the abuse of power by politicians. In effect, under these conditions the two branches discipline each other, and become more accountable to citizens in their choice of policies. Since macroeconomic instability imposes costs on citizens, the Persson et al., (1997) argument implies that measures of division of power should be associated with less instability in macroeconomic policies and outcomes.

Note that greater checks on politicians and greater accountability to citizens are both indicators by which we can distinguish democratic regimes from authoritarian regimes. Thus, any claim that greater checks and greater accountability should be associated with greater macroeconomic stability is also implicitly a claim that democracies are likely to be more macroeconomically stable. In sum, as Rodrik (1999) has pointed out, democracy imposes mechanisms of participation, consultation, and bargaining which enables policymakers to forge a consensus needed to undertake policy adjustments. In addition, democracy facilitates a smooth transfer of power from incumbents who have chosen policies that are costly to citizens, and this serves to constrain leaders to adopt policies that benefit society at large.<sup>12</sup> It follows that we should expect greater macroeconomic stability in democratic than in authoritarian regimes.

---

<sup>12</sup> Even if consensus is not reached, the sense that groups can express themselves—be given a voice—is a major feature of democracy. This obviates the need and incentives for more disruptive and costly modes of expressing discontent such as riots and protests. Also, participatory institutions reduce incentives for noncooperative behavior by making it harder for social groups to shift the burden of adjustment disproportionately on to others.

Of course, an alternative view of political institutions, and democracy in particular, is that pluralism is detrimental to macroeconomic stability. In this view, pluralism gives rise to a competitive populism and demand for public goods, which together with coordination problems, lead to a spiral of spending and inflation. Even in Latin America, many of the episodes of unsustainable populism such as Peron in Argentina and Vargas in Brazil were associated with leaders acceding to power through electoral competition. But Kaufman and Stallings (1991) argue that the populism practiced by rulers in these nascent democracies was itself a consequence of a prior history of excluding their constituencies from political participation as in Argentina and Peru. Which of these two views about democracy is right is an empirical question that we let the data resolve.

That distributive pressures and the mechanisms for mediating them can be crucial for macroeconomic stability is suggested by the performance of developing country regions in the cross-section and over time. Latin America and Africa have a high latent potential for distributive conflict, stemming from income inequality in Latin America and ethnic fragmentation in Africa. These regions were also heavily populated with authoritarian regimes for much of 1960-2000. Inflation has correspondingly been relatively high in these regions (93 percent in Latin America and 62 percent in Africa over 1960-2000). India (“an ungainly, unlikely, inelegant combination of differences,” Sen (1999)), on the other hand, is both linguistically and economically prone to division. However, India has been a democracy for all but a brief period, and the outcome has been remarkable macroeconomic stability. Amongst resource-rich countries that are especially prone to redistributive plundering, Botswana stands out as an example of having avoided this adverse outcome. It is notable that Botswana has a long history of political participation prior to independence which transitioned easily into uninterrupted democracy after independence (Acemoglu et al., 2003b).

The basic time series evidence is also suggestive. Between the 1980s and 1990s, Africa’s mean rating on the democracy index went up from 1.5 to 2.8<sup>13</sup> while the average annual rate of currency depreciation declined from nearly 50 percent to 17 percent. Over the same period, Latin America’s mean democracy score increased from 4.8 to 7.3, while the nominal instability measure came down from 334 percent to 124 percent.

---

<sup>13</sup> The democracy index is measured on a 0–10 scale with higher values indicating greater democracy.

### C. Openness as an Institution

Openness is another deep determinant of nominal instability.<sup>14</sup> Romer (1993), and most recently, Rogoff (2003) have argued that openness affects not just price levels but the rate of inflation. In Romer, the impact occurs via unanticipated changes in the exchange rate. An unanticipated monetary expansion leads to real exchange rate depreciation, which has a greater impact on prices in more open economies. In the absence of precommitment to monetary targets, openness acts as the disciplining device on the monetary authorities. Rogoff argues, based on modern new open economy models, that monopoly in the product and labor markets creates a wedge between optimal and monopoly levels of employment. This wedge creates a motivation for central banks to inflate in order to drive employment above its “natural” market determined rate. To quote Rogoff: “As the wedge becomes smaller, there is less to gain from unanticipated inflation. Central bank anti-inflation credibility is enhanced, even without any institutional change. As a consequence, average inflation falls.” Thus, openness not only affects the level of prices but also the equilibrium inflation rate.

Openness also renders product markets more competitive. With greater price flexibility, the impact of monetary policy on the real economy becomes less potent. Thus, the lower gains from unanticipated inflation make the monetary authorities’ commitment to price stability more credible.

At first blush, the Romer and Rogoff explanations of openness as a determinant of macroeconomic instability do not fall neatly into a view of nominal instability as a distributional issue. There is little political economy flavor to them. They smack of social welfare planners optimizing some objective function that has no distributional elements. But, there is a body of literature (Rajan and Zingales (2003)) that views trade openness, like strong political institutions, as a mechanism for limiting the extent to which the elites can redistribute wealth toward themselves. One way to view the Romer and Rogoff explanations is that openness simply raises the costs to the elites that determine monetary policies of attempting to redistribute wealth toward themselves through inflation. In this view, openness is an economic constraint on elites and is part of the broader set of institutions that determines macroeconomic outcomes.<sup>15</sup>

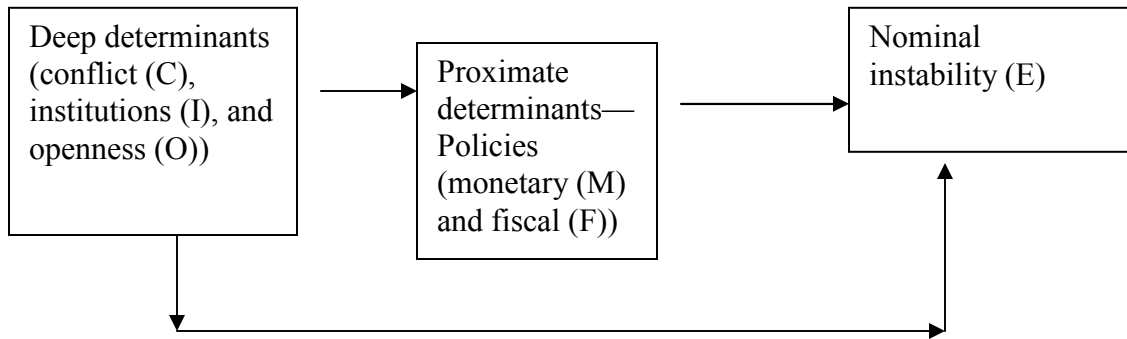
---

<sup>14</sup> There is a large and growing body of literature that has examined the impact of financial and trade openness on real instability including the volatility in income and consumption (see Kose et. al., 2003, and the references cited therein).

<sup>15</sup> Note how the effects of openness from this perspective are analogous to an increase in the ratio of the winning coalition to the selectorate.

### III. EMPIRICAL STRATEGY

The above discussion suggests that three *deep* determinants of nominal macroeconomic stability are conflict (C), institutions to mediate them (I), and the level of openness of the economy (O). The aim of the paper is to test whether these determinants are important from a long-run perspective and also to examine the relationships between the deep determinants (D), the proximate determinants (monetary policies, M, and fiscal policies F) and stability outcomes (E). Schematically, these can be represented as follows:



In this paper, since we are concerned with long-run effects, our approach will rely on exploiting the cross-country variation in the data rather than the time-series variation. Thus, we will rely predominantly on cross-country regressions, with all variables measured as averages over the period 1960-2000.

Ignoring nonlinearities, the economic relationship we are most interested in identifying is:

$$E_i = \phi + \alpha C_i + \beta I_i + \gamma O_i + \varepsilon_i \quad (1)$$

where  $E_i$  is a measure of nominal instability in country  $i$ ,  $C_i$ ,  $I_i$ , and  $O_i$  are respectively measures for conflict, institutions, and trade openness, and  $\varepsilon_i$  is the random error term.<sup>16</sup> Throughout the paper, we will be interested in the size, sign, and significance of the three coefficients  $\alpha$ ,  $\beta$ , and  $\gamma$ . We will use normalized measures of  $C_i$ ,  $I_i$ , and  $O_i$  in our core regressions, so that the estimated coefficients can be directly compared.<sup>17</sup>

---

<sup>16</sup> Unless otherwise noted, all the right hand side variables are averages over the period for which instability (the left hand side variable) is measured.

<sup>17</sup> That is, all regressors are expressed as deviations from the mean divided by the standard deviation.

In order to understand the manner in which institutions affect stability outcomes, we will also be interested in the relationship between the deep determinants and policies (the proximate determinants) and any mediating role that the latter might play between the deep determinants and outcomes:

$$M_i = \varpi + \rho C_i + \sigma I_i + \kappa O_i + \mu_i \quad (2)$$

$$F_i = \varsigma + \xi C_i + \psi I_i + \zeta O_i + \nu_i \quad (3)$$

Further light on the relationship between the deep and proximate determinants will be shed by equation (4) below that include both determinants as potential regressors.

$$E_i = \mu' + \alpha' C_i + \beta' I_i + \gamma' O_i + \tau' M_i + \varphi' F_i + \varepsilon'_i \quad (4)$$

The data and its sources are described in Appendix Table 13. Appendix Tables 14a and 14b provides the summary statistics for the major variables of interest in this paper. Appendix Tables 15a and 15b list the countries that are included in the analysis in this paper.

#### IV. MEASUREMENT AND ESTIMATION ISSUES

A number of measurement and estimation issues arise in this study to which we now turn.

##### A. Measuring Nominal Instability

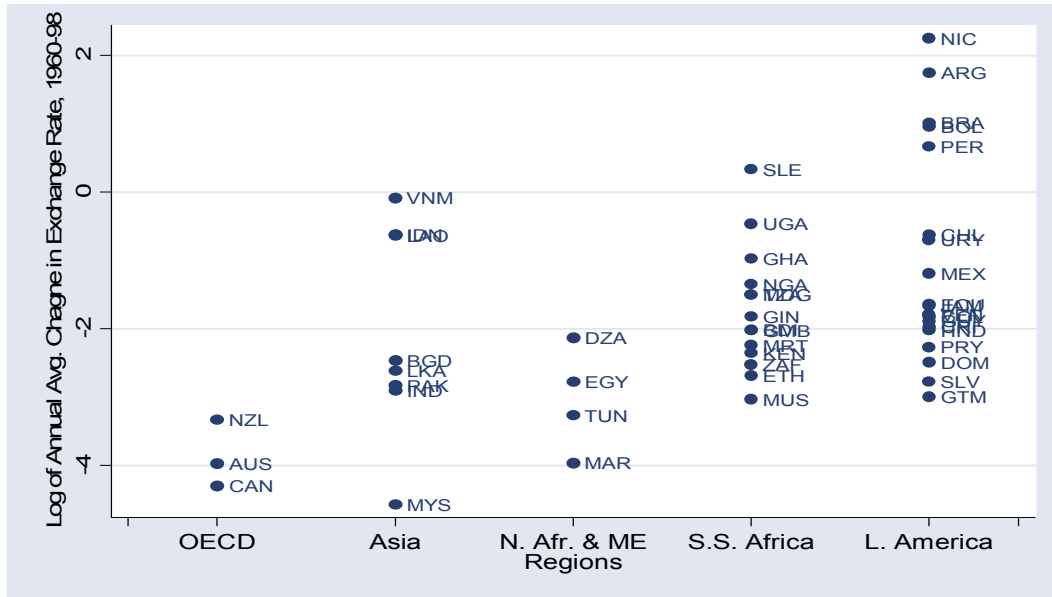
First, how should nominal macroeconomic instability be measured or proxied? The most obvious one, of course, is inflation. Because prices perform the basic information-signaling function in a market economy, fluctuations in prices distort producer and consumer decisions, leading to instability. While we do conduct regressions using inflation in our robustness checks we chose, in our core specifications, to use an alternative measure, namely the change in the nominal parallel market exchange rate, compiled by Reinhart and Rogoff (2004). The advantages of this measure are twofold. First, it is a clear market-based measure. As such it responds more clearly to underlying macroeconomic conditions than prices. In many developing countries, for long periods of time in the post-war period, prices have been controlled and/or fixed. Even with a turn toward liberalization since the mid-to-late 1980s, prices of nontradables, especially utilities, remain regulated, and hence may not convey all the information about underlying macroeconomic disequilibria. Figure 1 present the performance of the different countries (grouped by regions) on our core measure of nominal instability.<sup>18</sup>

---

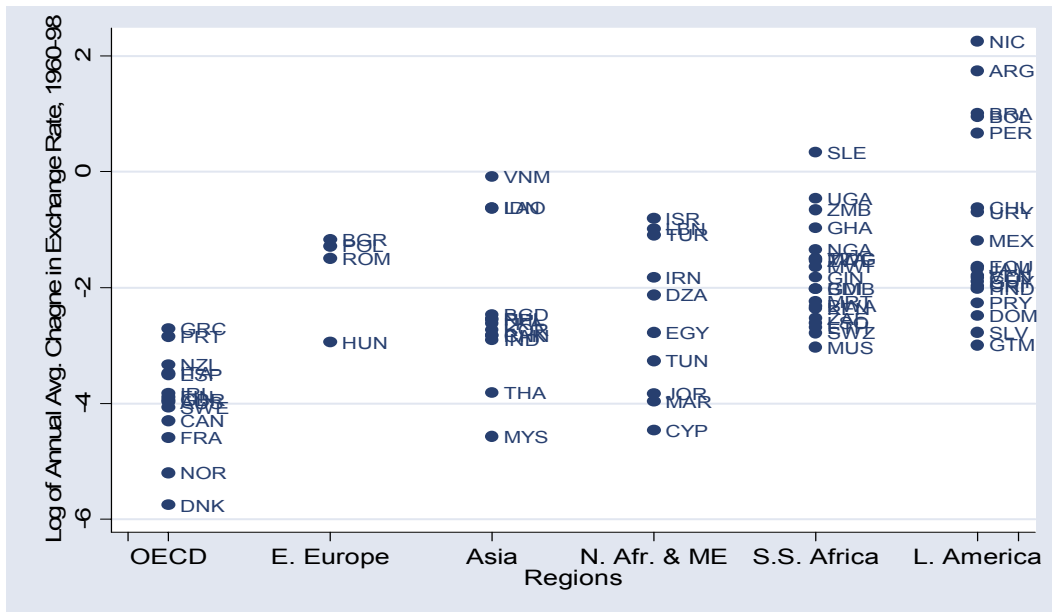
<sup>18</sup> Appendix Figure 1 depicts the performance of countries on inflation.

Figure 1. Nominal Instability by Region<sup>1/</sup>

**A. (Small Sample)**



**B. Large Sample**



<sup>1/</sup> Measured as log of annual average percent change in the nominal parallel market exchange rate.



Second, any measure of nominal instability should reflect problems stemming from debt accumulation, rescheduling or accumulation of arrears, and other external pathologies. As argued earlier, these are, and also reflect, macroeconomic disequilibria. From this perspective, the market or parallel exchange rates is better suited to capturing these pathologies than prices.<sup>19</sup> Nevertheless, to ensure that our results are not driven by our measure, we show that alternative measures of instability based on consumer prices and GDP deflators also yield very similar results (see the discussion below).<sup>20</sup> Thus we measure nominal stability as the log of the average annual change (in percent) of the nominal parallel (black) market exchange rate for the period 1960–2000.<sup>21</sup>

### **B. Estimation Method: OLS, IV, Instrumentation, and Sample**

The parameters of interest in equation (1) can be most simply estimated using ordinary least squares. Typically, this gives rise to three problems: endogeneity, measurement error, and omitted variables bias. In our basic specification, at least two of the three variables— institutions and openness—are subject to endogeneity. Clearly, nominal instability can affect institutional development: the more unstable the macroeconomic environment, the greater the risk of survival to the regime in power—autocratic or democratic. This reverse causation is accurately captured in the statement that Keynes famously (but erroneously as it turns out) attributed to Lenin that there was no better way to revolutionize a society than to debauch its currency. That high levels of inflation have had an impact on political events is illustrated by events such as the seizure of power by Hitler, and the changes in regimes in Brazil in 1964, Ghana and Indonesia in 1966, Chile in 1973 and Argentina in 1975.

Similarly, nominal instability can also affect trade openness through a variety of channels. Most obviously, inflation leads to a real depreciation of the currency and via a number of different channels can reduce the amount of a country's trade.

Measurement error afflicts in particular the institutional variable because available measures only imperfectly capture the functions that institutions are meant to serve. For instance, when it comes to democracy, an ideal measure would both capture checks on the power of the executive as well as accountability/breadth of participation. As Gleditsch and Ward (1997)

---

<sup>19</sup> Of course, if purchasing power parity holds, exchange rate changes should manifest themselves in domestic price changes; but insofar as they do not, the use of the exchange rate measure leads to the more general specification.

<sup>20</sup> In our small sample, the simple correlation between exchange rate and inflation (cpi) measures is 0.94.

<sup>21</sup> The Reinhart and Rogoff (2004) data on parallel market exchange rates do not cover the entire post-war period for all countries. We use countries for which at least 10 years of data are available.

have pointed out, even the widely used democracy measure developed by Polity takes inadequate consideration of participation.

To address endogeneity and measurement error, we resort to a two-stage least squares methodology with instruments that have been widely accepted as plausible in the recent literature. For democracy, we use the settler mortality instrument identified by Acemoglu et al., (2001). For trade openness, we use the Frankel and Romer (FR, 1999) instrument that is derived from underlying geographic characteristics of countries involved in trade. The FR instrument has been used in a wide variety of empirical applications from growth (Rodrik et al., (2004)) to financial development (Rajan and Zingales, 2003).

It is true that the identifying assumptions used in these papers for the instrumentation strategy do not strictly carry over because the outcome of interest for us is nominal instability compared with income in previous work. We would maintain that, nevertheless, the instrumentation strategy remains valid for our purposes as well. First, it can be reasonably argued that these essentially historical (settler mortality) and geographic (Frankel-Romer, 1999) instruments are exogenous to current instability. The real difference relates to the exclusion restrictions: settler mortality and trade can plausibly affect instability through channels other than political institutions and trade, respectively. For example, settler mortality can affect income and hence instability (richer countries do display lower levels of instability); similarly commodity-rich countries are more prone to terms of trade shocks and hence greater instability.

Our strategy to test these violations of the exclusion restrictions is essentially through a variety of robustness checks, which also serve to address the omitted variables bias. For example, we control for income to ensure that settler mortality does not operate through channels other than institutions. Similarly, we control for terms-of-trade shocks to ensure that there are no independent effects of geography on instability.

There is also a potential concern relating to the endogeneity of inequality. We could instrument for inequality but this creates two problems. First, the most plausible instruments are land or some other geographic variable which already feature in the instrument set for openness. Further, if we treat inequality as endogenous, we could easily run into the problem of weak instruments in the presence of multiple endogenous regressors, especially if there are similarities in the instruments for the different regressors. Thus, for practical reasons we treat inequality as exogenous and address endogeneity concerns by using initial period values for this variable in some of the specifications.<sup>22</sup>

While the FR instrument is available for a wide variety of countries, the settler mortality instrument restricts our sample to 48 countries. In principle, this sample is large enough to warrant inference and is also reasonably representative for the universe of countries.

---

<sup>22</sup> As we report below, we do find it heartening that the coefficient estimates for inequality are very close to those for ethnic fragmentation, which is clearly exogenous to nominal instability.

For example, the mean and standard deviation in the AJR-based sample of 48 countries are very similar to those in the sample of all countries for which the exchange rate data are available.<sup>23</sup> However, to reassure ourselves that our results apply more broadly we use a larger sample of 80 countries for which we use the FR instrument for openness and use the initial value of the institutional measure instead of the average value for the entire time period. This generates a sample of 80 countries.<sup>24</sup>

So throughout the paper, we will present results for both samples separately. For presentational simplicity, the discussion will focus on the small sample (for which both institutions and openness are instrumented) with references to the large sample (for which only openness is instrumented) where they are different or otherwise noteworthy.

## V. RESULTS

### A. Core Results

In Table 1a we present our basic results relating the three deep determinants to exchange rate instability. The regressions in this table are based on our smaller sample, which uses the settler mortality instrument for democracy. Note that, unless specifically mentioned, when we refer to democracy below we refer to the measure of constraints on the chief executive developed by Polity (XCONST). As Gleditsch and Ward (1997, p. 380) have found, “this variable virtually determines the democracy and autocracy score values” in Polity’s ratings. Later in the paper we report robustness checks with alternative measures of democracy, and the results are unchanged. Likewise, unless specifically mentioned, our measure of inequality is from the WIDER dataset.

In column 1, we estimate the reduced form in which the right hand side variables are the exogenous variable (inequality) and the instruments for the two endogenous variables. All three explanatory variables are highly significant and are correctly signed.<sup>25</sup>

Column 2 in Table 1a contains the core specification corresponding to equation (1). In this specification, all the deep determinants have the expected sign and are statistically significant with democracy significant at the 1 percent level. The signs on the coefficients indicate that greater trade openness and more democratic political institutions contribute to less macroeconomic instability, while inequality contributes to greater instability.

---

<sup>23</sup> The mean and standard deviation for the two samples are, respectively, 1.75 and 1.5, and 1.95 and 1.6.

<sup>24</sup> As further cross-checks, we try different combinations of variables and instruments with no discernible impact on the results.

<sup>25</sup> Note that higher settler mortality is associated with worse institutions.

Table 1a. Deep Determinants of Macroeconomic Instability: Core Specifications (Small Sample) 1/  
*(Panel A. Dependent variable is log of annual average percent change in nominal parallel exchange rate)*

|  | (1)                | (2)                 | (3)                 | (4)                 | (5)                | (6)                 | (7)                 |
|--|--------------------|---------------------|---------------------|---------------------|--------------------|---------------------|---------------------|
| Trade openness                               |                    | -0.608<br>(2.07)**  | -0.607<br>(2.12)**  | -0.522<br>(1.81)*   | -0.612<br>(2.02)** | -0.580<br>(2.04)**  | -0.414<br>(1.04)    |
| Democratic political institutions            |                    | -1.269<br>(4.46)*** | -1.354<br>(4.42)*** | -1.418<br>(4.21)*** | -1.403<br>(1.42)   | -1.162<br>(3.13)*** | -2.377<br>(2.73)*** |
| Inequality                                   | 0.416<br>(1.85)*   | 0.421<br>(1.77)*    |                     | 0.417<br>(1.67)     | 0.362<br>(0.74)    | 0.419<br>(1.80)*    | 0.359<br>(1.09)     |
| Initial inequality                           |                    |                     | 0.676<br>(2.77)***  |                     |                    |                     |                     |
| Predicted openness (instrument)              | -0.562<br>(2.15)** |                     |                     |                     |                    |                     |                     |
| Settler mortality (instrument)               | 0.798<br>(4.11)*** |                     |                     |                     |                    |                     |                     |
| Democratic political institutions*inequality |                    |                     |                     |                     | 0.122<br>(0.14)    |                     |                     |
| Log initial per capita (PPP) income          |                    |                     |                     |                     |                    |                     | 1.184<br>(2.28)**   |
| Estimation method                            | OLS                | IV                  | IV                  | IV                  | IV                 | IV                  | IV                  |
| Whether regressor is instrumented            |                    |                     |                     |                     |                    |                     |                     |
| Openness                                     | no                 | yes                 | yes                 | yes                 | yes                | yes                 | yes                 |
| Democratic political institutions            | no                 | yes                 | yes                 | yes                 | yes                | yes                 | yes                 |
| Inequality                                   | no                 | no                  | no                  | no                  | no                 | no                  | no                  |
| R-squared                                    | 0.29               | 0.29                | 0.26                | 0.3                 | 0.29               | 0.19                | 0.33                |
| Observations                                 | 48                 | 48                  | 48                  | 43                  | 48                 | 48                  | 44                  |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In columns 2-5 and column 7, democratic political institutions are instrumented by settler mortality from AJR( 2001); and in columns 2-7, openness is instrumented by fitted openness from FR, (1999). In column 6, the settler mortality instrument is from Albouy (2004). In all columns, inequality is measured according to the Gini index. The data are from WIDER, except in column 4, where the data are from Deininger and Squire (1996). Initial per capita income (in PPP terms) is for 1960 and is from the Penn World Tables, 6.1.

Table 1a. Deep Determinants of Macroeconomic Instability: Core Specifications (Small Sample)  
*(Panel B. First Stage Regression Results)*

| Dependent variable                              | (1)                | (2)                 | (3)                | (4)                 |
|---|--------------------|---------------------|--------------------|---------------------|
|   | Openness           | Dem. institutions   | Openness           | Dem. institutions   |
| Inequality                                      | -0.155<br>(0.12)   | 0.011<br>(0.08)     | -0.030<br>(0.24)   | -0.013<br>(0.09)    |
| Openness instrument (predicted openness)        | 0.881<br>(6.65)*** | 0.021<br>(0.14)     | 0.881<br>(6.60)*** | -0.021<br>(0.14)    |
| Instrument for institutions (settler mortality) | -0.240<br>(2.13)** | -0.514<br>(4.12)*** | -0.233<br>(2.06)** | -0.406<br>(3.03)*** |
| R-squared                                       | 0.50               | 0.30                | 0.50               | 0.20                |
| Observations                                    | 48                 | 48                  | 48                 | 48                  |
| Correlation between fitted instruments          |                    | -0.0234             |                    | -0.116              |
| Minimum Eigenvalue Stock-Yogo statistic         |                    | 9.52                |                    | 5.42                |
| Critical value (5 percent significance, r=0.1)  |                    | 7.03                |                    | 7.03                |
| Critical value (5 percent significance, r=0.15) |                    | 4.58                |                    | 4.58                |
| F-value   | 14.85              | 6.42                | 14.68              | 3.71                |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. Columns 1 and 2 correspond to the second-stage equation in column 2 of Table 2a, where openness is instrumented by fitted openness and institutions by settler mortality. Columns 3 and 4 correspond to the second-stage in column 6 of Table 2a.

Since all right hand side variables are expressed in normalized form, the coefficients can be directly compared. The magnitudes of the coefficients indicate that democratic institutions exert the greatest impact on macroeconomic outcomes, nearly twice as large as openness and about three times as large as inequality (Figures 2a and 2b display the results for the core specifications for the small and large samples, respectively).

The results indicate that a one standard deviation increase in openness (about 1.7 percentage points of GDP) reduces the log of average annual exchange rate depreciation by 0.67 log points. In other words, a country that is more open by 1.7 percentage points of GDP will on this account experience a level of instability that is 2.2 times less than the less open country. Similarly, a one standard deviation improvement in democracy reduces the extent of instability by 1.3 log points. Take two countries such as Ghana and Honduras that have democracy ratings of 2 and 5, respectively, which represent a difference of about 1.5 times the standard deviation. The results predict that because of this difference in institutions, Ghana will experience a depreciation of the currency that is about 6 times greater than that of Honduras.<sup>26</sup> And finally, a one standard deviation in the extent of inequality (about 7.9) will change the instability outcome by 0.4 log points.

In the remaining columns of Table 1a, the combination of instruments and measurement of the right hand side variables is altered. In column 3, inequality is not measured by its average value over the sample period but by its initial period value to take account of possible endogeneity concerns.<sup>27</sup> In column 4, the WIDER inequality measure is replaced by that due to Deininger and Squire (1996). In both these specifications, openness and democracy are statistically significant, with democracy significant at the 1 percent confidence level, and the coefficient values remain stable.

An important question is whether political institutions have a direct independent effect on exchange rate instability or if its effects are interactive with income inequality (a proxy for social conflict). In column 5, we investigate this question. When the interaction term is introduced, all variables become insignificant, but the F-test indicates that they are jointly significant. One difficulty in distinguishing between independent and interactive effects is simply the high correlation: for example, the correlation coefficient between democracy and the interaction term is 0.92, making inference difficult.

---

<sup>26</sup> This is derived in the following manner: the difference in log points of the instability measure is 1.5 times 1.269 (the latter being the coefficient on institutions) equal to about 1.9. This translates into a difference in the level of instability measure of  $\exp(1.9)$ , which is about 6.

<sup>27</sup> We also tried a specification in which inequality is instrumented by its initial period value and obtained similar results.

Figure 2a. Deep Determinants of Nominal Instability (Small Sample)  
(Conditional correlations)

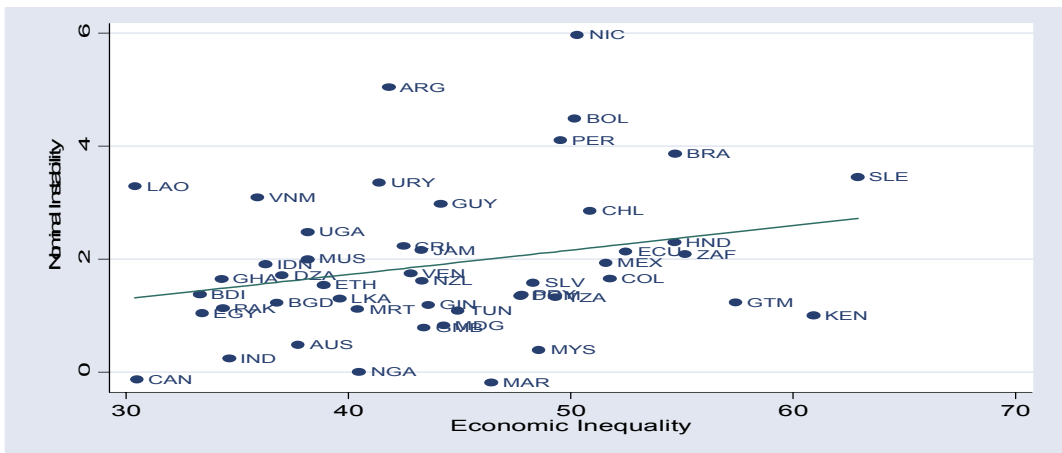
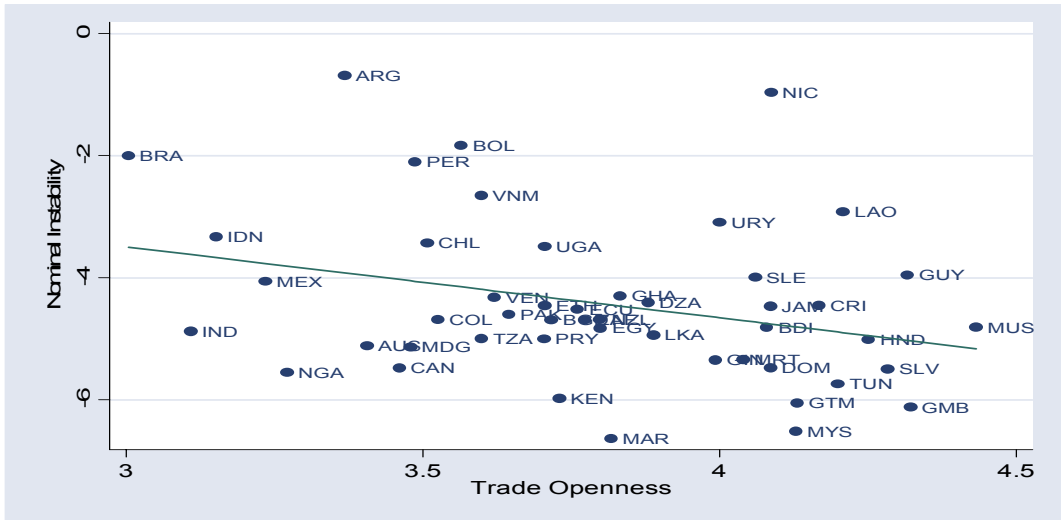
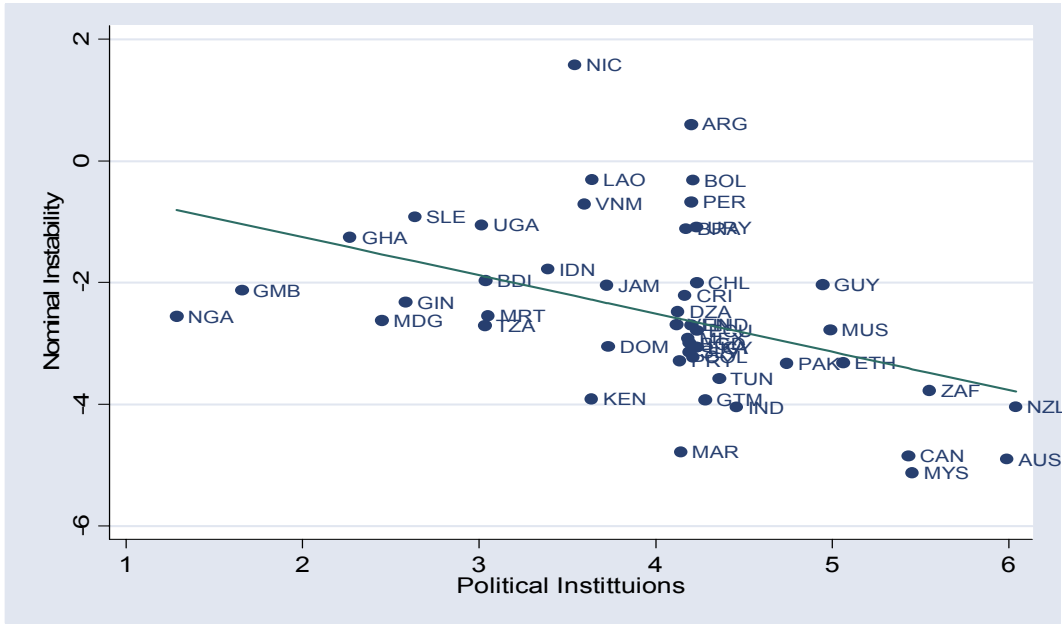
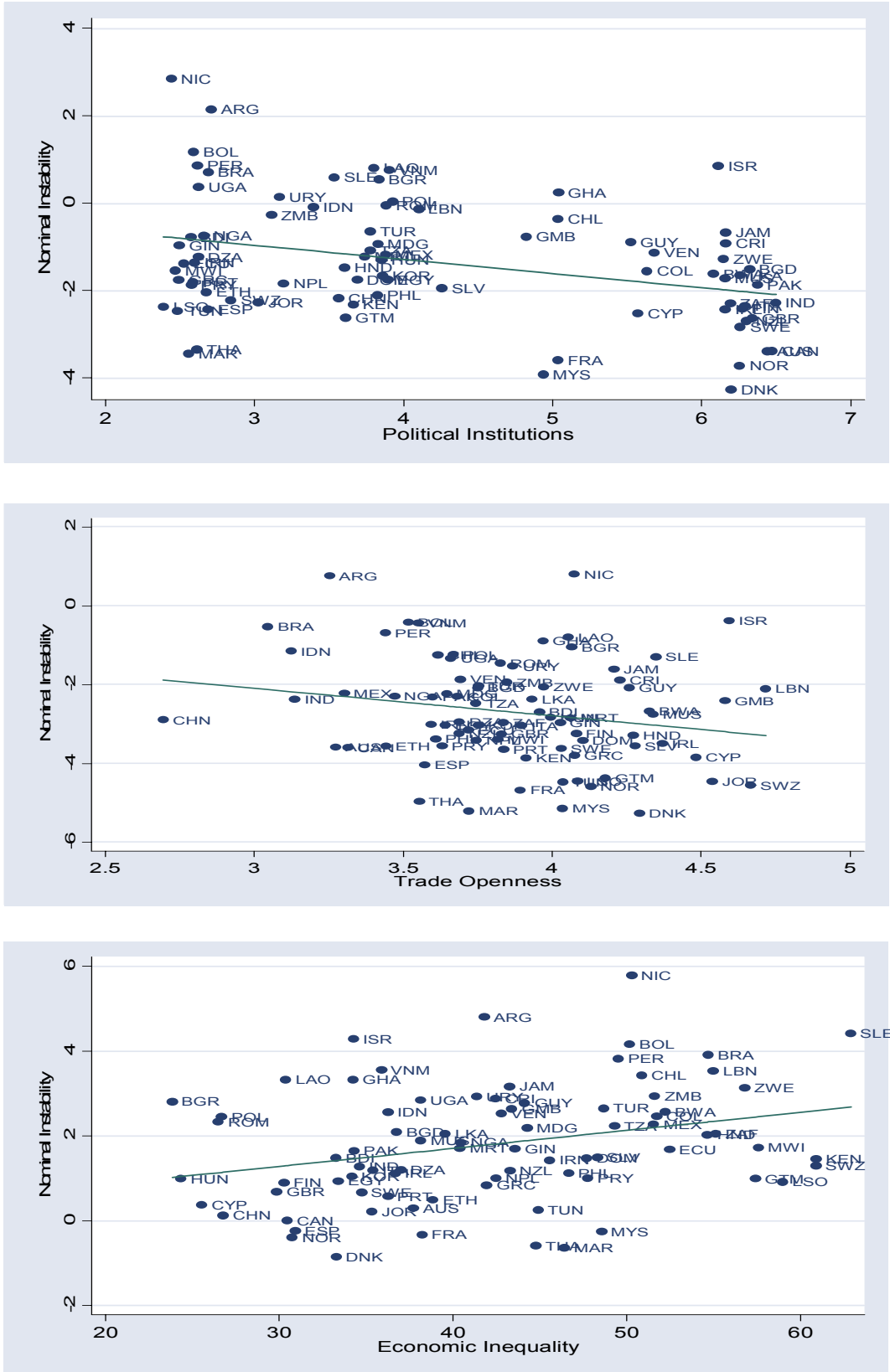


Figure 2b. Deep Determinants of Nominal Instability (Large Sample)  
(Conditional correlations)



In column 6, we check robustness in relation to settler mortality data. Albouy (2004) has recently revised these data to take into account his argument that some of the data in Acemoglu et. al (2001) were inaccurately measured. The results remain the same.

We then check indirectly for the exclusion restriction that settler mortality does not affect instability through its impact on income levels. We do this, which also addresses a potentially important omitted variable bias, by adding a country's income level as an additional control. The rationale for including income as a control is that political institutions could be proxying for income levels, with the results of the core specification merely suggesting that richer countries are less prone to instability. To ensure that this is not the case, we introduce in column 7, the level of per capita GDP (measured in PPP terms) on the right hand side. Surprisingly, not only is the significance of institutions unaffected, its magnitude nearly doubles from about -1.2 to -2.4. That is, controlling for income levels, the impact of institutions on macroeconomic stability is magnified.<sup>28</sup>

In the lower panel of Table 1a, we report the first stage regression results for two specifications: our core presented in column 2 of the top panel and the specification using the Albouy (2004) data for settler mortality. The instruments are highly significant, the F-values are reasonable, and the correlation between the fitted values of the first-stage equations (which is a diagnostic for the problem of weak instruments) is reassuringly low. A formal test for weak instruments in the presence of multiple endogenous regressors is due to Stock and Yogo (2004). The minimum Eigenvalue Stock-Yogo statistic for the null hypothesis of weak instruments at the 5 percent significance level is rejected for two key specifications.<sup>29</sup> The result in column 4 is important because of Albouy's (2004) claim that settler mortality loses significance in the first-stage equation for institutions in the Acemoglu et. al. (2001) regressions, and is hence a weak instrument. This does not appear to hold in our case.

In Table 1b we replace the settler mortality instrument with the initial period value of democracy and examine specifications identical to those displayed in Table 1a. The strong results for democracy parallel those we observe in Table 1a.<sup>30</sup> Democracy is more robust to the change of sample than openness as well as inequality.

---

<sup>28</sup> It is true that the standard error of the coefficient on political institutions increases with the introduction of income but it remains significant at the 1 percent level.

<sup>29</sup> For the core specification, it is rejected for the desired maximal size ( $\alpha$ ) of a Wald test of 0.1 and for the specification with Albouy (2004) data at the size of 0.15.

<sup>30</sup> The coefficients on openness and institutions are reduced in the larger sample. Also, when the interaction term is introduced, the coefficient on institutions remains significant, while that on the interaction term is not.



Table 1b. Deep Determinants of Macroeconomic Instability: Core Specifications (Large Sample) 1/  
*(Panel A. Dependent variable is log of annual average percent change in nominal parallel exchange rate)*

|  | (1)                 | (2)                 | (3)                 | (4)                 | (5)                | (6)                |
|--|---------------------|---------------------|---------------------|---------------------|--------------------|--------------------|
| Trade openness                               | -0.354<br>(2.15)**  | -0.333<br>(1.51)    | -0.380<br>(1.64)    | -0.384<br>(1.56)    | -0.321<br>(1.43)   | -0.387<br>(1.65)   |
| Democratic political institutions            | -0.526<br>(3.54)*** | -0.475<br>(3.31)*** | -0.658<br>(3.30)*** | -0.523<br>(3.37)*** | -1.267<br>(2.00)** | -0.388<br>(2.41)** |
| Inequality                                   | 0.433<br>(3.02)***  | 0.428<br>(2.91)***  | 0.409<br>(2.86)***  | 0.358<br>(2.29)**   | 0.147<br>(0.49)    | 0.607<br>(3.79)*** |
| Democratic political institutions*inequality |                     |                     |                     |                     | 0.761<br>(1.28)    |                    |
| Log initial per capita (PPP) income          |                     |                     |                     |                     |                    | -0.073<br>(0.45)   |
| Estimation method                            | OLS                 | IV                  | IV                  | IV                  | IV                 | IV                 |
| Whether regressor is instrumented:           |                     |                     |                     |                     |                    |                    |
| Openness                                     | no                  | yes                 | yes                 | yes                 | yes                | yes                |
| Democratic political institutions            | no                  | no                  | yes                 | no                  | no                 | no                 |
| Inequality                                   | no                  | no                  | no                  | no                  | no                 | no                 |
| R-squared                                    | 0.27                | 0.26                | 0.26                | 0.26                | 0.27               | 0.32               |
| Observations                                 | 80                  | 80                  | 80                  | 72                  | 80                 | 71                 |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all columns, except column 5, openness is instrumented by fitted openness from FR, (1999). Democratic political institutions are entered as the initial period value, except in column 3 where it is entered as the average value and instrumented by the initial period value. In all columns, inequality is measured according to the Gini index, except in column 4, where the data are from Deininger and Squire (1996). Initial per capita income (in PPP terms) is for 1960 and is from the Penn World Tables, 6.1.

Table 1b. Deep Determinants of Macroeconomic Instability: Core Specifications (Large Sample)  
*(Panel B. First Stage Regression Results)*

| Dependent variable                     | Openness           | Openness           | Institutions        |
|--|--------------------|--------------------|---------------------|
| Democratic political institutions      | 0.154<br>(2.06)**  |                    |                     |
| Inequality                             | 0.144<br>(1.89)**  | 0.144<br>(1.89)*   | -0.039<br>(0.57)    |
| Openness instrument                    | 0.773<br>(9.19)*** | 0.773<br>(9.19)*** | -0.055<br>(0.73)    |
| Initial Inequality                     |                    |                    |                     |
| Initial political institutions         |                    | 0.154<br>(2.06)**  | 0.711<br>(10.60)*** |
| R-squared                              | 0.55               | 0.55               | 0.61                |
| Observations                           | 80                 | 80                 | 80                  |
| Correlation between fitted instruments |                    |                    | 0.1895              |
| F                                      | 31.39              | 31.39              | 40.45               |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. Column 1 corresponds to the second-stage equation in column 2 of the top panel where only openness is instrumented. Columns 2 and 3 correspond to the second-stage equation in column 3 of Table 2b, where openness is instrumented by fitted openness and institutions by their initial-period value.

## **B. A Causal Story: Institutions, Monetary Policy, and Macroeconomic Instability**

We have established thus far that the deep determinants matter significantly for macroeconomic stability. The question then is, how do they do so?

We first look at the conventional relationship between macroeconomic policies—the proximate determinants—and outcomes related to stability. Table 2 displays the effects of the usual proximate determinants of nominal exchange rate instability. Money growth has a clear and unambiguous impact on instability in the large and the small sample. On fiscal policy, the picture is less clear. We experimented with alternative measures of fiscal policy, including the general government budget balance and government consumption both expressed as a percent of GDP. Neither fiscal policy variable is significant in either sample, although both are correctly signed.

We then examine whether policies are endogenous in the sense of being causally affected by the deep determinants: thus, we estimate the specifications described in equations 2 and 3. The results are depicted in Table 3. Of all the deep determinants only democracy emerges as a significant determinant of monetary policy across the small as well as the large sample. In relation to fiscal policies, the relationship is less clear cut with significant coefficients obtained only in the large sample. Thus, the policy variable which does significantly affect instability, money supply, is itself significantly affected by democracy.

The final step in the analysis of the inter-relationships is to include deep and proximate determinants in the same specification (Table 4). In the small sample when policies and democracy are entered simultaneously, democracy always remains significant (all the columns in Table 4a) and, remarkably, the coefficient value remains stable.<sup>31</sup> This is not the case for the other deep determinants. Democracy is significant in five out of six specifications in the large panel too. Monetary policy is significant in the small and large sample. However, measures of fiscal policy do not display a robust relationship with instability.

In sum, democracy is not only the most robust deep determinant of the policy variable that has a significant impact on instability, monetary policy, but also has an independently significant effect when this policy variable is added as a control. As for what this independent effect may be, we can only speculate that democracy may also contribute to macroeconomic stability by stabilizing citizens' expectations of money supply growth. We now seek to establish the robustness of our results.

---

<sup>31</sup> Compare the results in Table 4 with those in Table 1.

Table 2a. Monetary and Fiscal Policies and Macroeconomic Instability (Small Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|                       | (1)                 | (2)                | (3)              | (4)              | (5)             | (6)             |
|-----------------------|---------------------|--------------------|------------------|------------------|-----------------|-----------------|
| Log money growth      | 1.225<br>(13.59)*** | 1.314<br>(9.32)*** |                  |                  |                 |                 |
| Budget Balance/GDP    |                     |                    | -0.009<br>(0.03) | -0.729<br>(0.68) |                 |                 |
| Govt. Consumption/GDP |                     |                    |                  |                  | 0.283<br>(0.97) | 0.219<br>(0.63) |
| Estimation method     | OLS                 | IV                 | OLS              | IV               | OLS             | IV              |
| R-squared             | 0.78                | 0.27               | 0.00             | 0.04             | 0.02            | 0.01            |
| Observations          | 42                  | 42                 | 42               | 42               | 42              | 42              |

Table 2b. Monetary and Fiscal Policies and Macroeconomic Instability (Large Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|                       | (1)                 | (2)                | (3)              | (4)              | (5)             | (6)             |
|-----------------------|---------------------|--------------------|------------------|------------------|-----------------|-----------------|
| Log money growth      | 1.371<br>(13.83)*** | 1.524<br>(9.69)*** |                  |                  |                 |                 |
| Budget Balance/GDP    |                     |                    | -0.247<br>(1.48) | -0.808<br>(1.63) |                 |                 |
| Govt. Consumption/GDP |                     |                    |                  |                  | 0.267<br>(1.11) | 0.089<br>(0.37) |
| Estimation method     | OLS                 | IV                 | OLS              | IV               | OLS             | IV              |
| R-squared             | 0.74                | 0.28               | 0.02             | 0.10             | 0.02            | 0.00            |
| Observations          | 66                  | 66                 | 66               | 66               | 66              | 66              |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In column 2, instrument is money growth in the 1960s; in column 4, the instrument is budget balance in 1970; in column 6, the instrument is government consumption in 1970.

Table 3a. Deep Determinants of Policies (Small Sample)

| Dependent Variable                | Money Growth<br>(1) | Budget Balance/GDP<br>(2) | Government Consumption/GDP<br>(3) |
|-----------------------------------|---------------------|---------------------------|-----------------------------------|
| Openness                          | -0.365<br>(1.82)*   | 0.000<br>(0.01)           | 0.174<br>(0.11)                   |
| Democratic political institutions | -0.450<br>(1.86)*   | 0.008<br>(0.60)           | -2.787<br>(0.95)                  |
| Inequality                        | 0.314<br>(1.66)     | 0.003<br>(0.47)           | -1.043<br>(0.68)                  |
| Estimation method                 | IV                  | IV                        | IV                                |
| R-squared                         | 0.16                | 0.01                      | 0.05                              |
| Observations                      | 43                  | 43                        | 43                                |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns institutions and openness are instrumented by settler mortality and fitted openness, respectively.

Table 3b. Deep Determinants of Policies (Large Sample)

| Dependent Variable                | Money Growth<br>(1) | Budget Balance/GDP<br>(2) | Government Consumption/GDP<br>(3) |
|-----------------------------------|---------------------|---------------------------|-----------------------------------|
| Openness                          | -0.193<br>(1.36)    | -0.001<br>(0.22)          | 2.105<br>(1.16)                   |
| Democratic political institutions | -0.374<br>(3.37)*** | 0.007<br>(1.48)           | -2.467<br>(2.46)**                |
| Inequality                        | 0.105<br>(1.01)     | -0.001<br>(0.33)          | 0.186<br>(0.17)                   |
| Estimation method                 | IV                  | IV                        | IV                                |
| R-squared                         | 0.22                | 0.04                      | 0.12                              |
| Observations                      | 68                  | 68                        | 68                                |

Robust t statistics in parentheses. \* Significant at 10 percent \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns, only openness is instrumented, while institutions refer to their respective initial-period value.

Table 4a. Policies Versus Deep Determinants (Small Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|                                   | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 | (6)                 |
|-----------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Openness                          | -0.112<br>(0.55)    | -0.080<br>(0.29)    | -0.658<br>(2.00)*   | -0.819<br>(2.06)**  | -0.710<br>(2.28)**  | -0.665<br>(2.12)**  |
| Democratic political institutions | -1.059<br>(4.31)*** | -1.044<br>(3.82)*** | -1.306<br>(4.18)*** | -1.376<br>(3.77)*** | -1.208<br>(4.26)*** | -1.234<br>(4.32)*** |
| Inequality                        | 0.088<br>(0.48)     | 0.059<br>(0.27)     | 0.351<br>(1.36)     | 0.465<br>(1.40)     | 0.513<br>(2.19)**   | 0.473<br>(2.03)**   |
| Log money growth                  | 1.024<br>(8.33)***  | 1.090<br>(3.71)***  |                     |                     |                     |                     |
| Budget balance/GDP                |                     |                     | -0.206<br>(0.69)    | -0.767<br>(0.90)    |                     |                     |
| Government consumption/GDP        |                     |                     |                     |                     | 0.496<br>(1.90)*    | 0.280<br>(1.11)     |
| Estimation method                 | IV                  | IV                  | IV                  | IV                  | IV                  | IV                  |
| R-squared                         | 0.88                | 0.42                | 0.32                | 0.14                | 0.34                | 0.15                |
| Observations                      | 45                  | 45                  | 45                  | 45                  | 48                  | 48                  |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns institutions and openness are instrumented by settler mortality and fitted openness, respectively. In column 2, money growth is instrumented by its value in the 1970s; in columns 4 and 6, the fiscal variables are instrumented by their initial period value.

Table 4b. Policies Versus Deep Determinants (Large Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|                                   | (1)                 | (2)                | (3)                 | (4)                | (5)                 | (6)                 |
|-----------------------------------|---------------------|--------------------|---------------------|--------------------|---------------------|---------------------|
| Openness                          | -0.050<br>(0.40)    | -0.019<br>(0.14)   | -0.418<br>(1.87)*   | -0.584<br>(2.22)** | -0.464<br>(1.93)*   | -0.490<br>(1.86)*   |
| Democratic political institutions | -0.183<br>(1.87)*   | -0.167<br>(1.27)   | -0.456<br>(3.01)*** | -0.539<br>(2.37)** | -0.421<br>(2.95)*** | -0.592<br>(2.87)*** |
| Inequality                        | 0.278<br>(2.77)***  | 0.235<br>(2.31)**  | 0.436<br>(2.89)***  | 0.401<br>(2.40)**  | 0.413<br>(2.80)***  | 0.398<br>(2.74)***  |
| Log money growth                  | 1.212<br>(12.07)*** | 1.417<br>(8.88)*** |                     |                    |                     |                     |
| Budget balance/GDP                |                     |                    | -0.268<br>(2.02)**  | -0.678<br>(1.65)   |                     |                     |
| Government consumption/GDP        |                     |                    |                     |                    | 0.335<br>(1.80)*    | 0.293<br>(1.40)     |
| Estimation method                 | IV                  | IV                 | IV                  | IV                 | IV                  | IV                  |
| R-squared                         | 0.78                | 0.47               | 0.30                | 0.29               | 0.28                | 0.21                |
| Observations                      | 70                  | 70                 | 76                  | 76                 | 80                  | 80                  |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns, only openness is instrumented, while institutions refer to their respective initial-period value. In column 2, money growth is instrumented by its value in the 1970s; in columns 4 and 6, the fiscal variables are instrumented by their initial period value.

## VI. ROBUSTNESS

### A. Alternative Definitions of Instability

We have measured instability in terms of the changes in the parallel market exchange rate. Although, for reasons explained earlier, we believe this is the best measure, there are other ways of capturing instability. Tables 5a and 5b check whether our results are robust if instability is measured differently. The most standard measure of instability, of course, is inflation. In columns 1 and 2 we take as the dependent variable the log of average annual inflation (CPI and GDP deflator, respectively). Openness is only significant in the small sample, while democracy is significant in both samples. We reproduce in Appendix Tables 17-23, all the robustness checks when we substitute the inflation measure for our exchange rate measure.<sup>32</sup> The results are broadly identical, which makes clear that our results are not driven by our chosen measure of nominal instability.<sup>33</sup>

But instability could also be defined in terms of the second moment. In column 3, we revert to our core exchange rate-based definition of instability and use its standard deviation as the measure of instability (i.e. as the dependent variable). Openness only displays a strong and statistically significant impact in the small sample, while democracy and inequality are significant in both samples

In column 4, we measure instability in its most extreme variant, reflected for example in a sharp decline in the exchange rate with attendant loss of monetary control. The Reinhart-Rogoff classification of exchange rate regimes provides a simple and intuitive proxy for such extreme instability. In their classification scheme, exchange rate regimes are categorized as freely falling when inflation exceeds 40 percent and the market exchange rate undergoes a sharp decline. We define our measure as the percentage of time that a country (based on monthly data) falls into this category. When this is used as the dependent variable, we find that openness has a significant impact only in the small sample, while democracy once again has a significant impact in both samples. Thus, our claims with respect to democracy in particular are robust to alternative definitions of macroeconomic instability.

In columns 5-7, we test for other types of nominal pathologies. Kaminsky et. al. (2004) have shown that instability arises in part from the procyclicality of capital flows which is aggravated by a procyclical fiscal policy stance. In column 5, we test if their index of fiscal policy procyclicality is explained by the deep determinants. In both samples, democratic political institutions moderate the procyclicality of policy, thereby reducing instability.

---

<sup>32</sup> To avoid informational overload, we present only the results for the small sample. The results for the large sample, which are also very similar, are available from the authors upon request.

<sup>33</sup> The only exception is described in footnote 35.

Table 5a. Robustness to Alternative Definitions of Nominal Instability (Small Sample)

| Dependent variable                | Inflation<br>(CPI)<br>(1) | Inflation<br>(GDP defl.)<br>(2) | Variability<br>in Instability<br>(3) | Extreme<br>Intsability<br>(4) | Fiscal policy<br>Procyclicality<br>(5) | Original<br>Sin<br>(6) | External<br>Rating<br>(7) |
|-----------------------------------|---------------------------|---------------------------------|--------------------------------------|-------------------------------|--|------------------------|---------------------------|
| Openness                          | -0.701<br>(2.15)**        | -0.746<br>(2.40)**              | -0.103<br>(2.16)**                   | -0.071<br>(2.21)**            | 0.014<br>(0.33)                        | 0.057<br>(1.05)        | -10.667<br>(1.59)         |
| Democratic political institutions | -0.624<br>(2.52)**        | -0.670<br>(2.49)**              | -0.165<br>(4.12)***                  | -0.050<br>(1.78)*             | -0.150<br>(3.53)***                    | -0.208<br>(3.28)***    | 20.332<br>(2.56)**        |
| Inequality                        | 0.570<br>(2.43)**         | 0.387<br>(1.63)                 | 0.085<br>(2.03)**                    | 0.039<br>(1.43)               | 0.033<br>(1.30)                        | -0.024<br>(0.47)       | -0.097<br>(0.02)          |
| Estimation method                 | IV                        | IV                              | IV                                   | IV                            | IV                                     | IV                     | IV                        |
| R-squared                         | 0.23                      | 0.20                            | 0.22                                 | 0.16                          | 0.25                                   | 0.52                   | 0.54                      |
| Observations                      | 46                        | 46                              | 48                                   | 44                            | 43                                     | 31                     | 26                        |

Table 5b. Robustness to Alternative Definitions of Nominal Instability (Large Sample)

| Dependent variable                | Inflation<br>(CPI)<br>(1) | Inflation<br>(GDP defl.)<br>(2) | Variability<br>in Instability<br>(3) | Extreme<br>Intsability<br>(4) | Fiscal policy<br>Procyclicality<br>(5) | Original<br>Sin<br>(6) | External<br>Rating<br>(7) |
|-----------------------------------|---------------------------|---------------------------------|--------------------------------------|-------------------------------|--|------------------------|---------------------------|
| Openness                          | -0.254<br>(1.20)          | -0.270<br>(1.20)                | -0.050<br>(1.42)                     | -0.027<br>(1.03)              | -0.017<br>(0.51)                       | 0.058<br>(1.57)        | -4.940<br>(1.07)          |
| Democratic political institutions | -0.383<br>(3.27)***       | -0.297<br>(2.55)**              | -0.070<br>(3.12)***                  | -0.032<br>(2.04)**            | -0.055<br>(2.12)**                     | -0.064<br>(1.78)*      | 4.318<br>(1.53)           |
| Inequality                        | 0.175<br>(1.43)           | 0.143<br>(1.22)                 | 0.043<br>(1.84)*                     | 0.012<br>(0.51)               | 0.093<br>(3.27)***                     | 0.039<br>(1.36)        | -9.221<br>(3.17)***       |
| Estimation method                 | IV                        | IV                              | IV                                   | IV                            | IV                                     | IV                     | IV                        |
| R-squared                         | 0.18                      | 0.14                            | 0.20                                 | 0.08                          | 0.25                                   | 0.12                   | 0.27                      |
| Observations                      | 77                        | 77                              | 80                                   | 76                            | 65                                     | 55                     | 43                        |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns institutions and openness are instrumented by settler mortality and fitted openness, respectively. The definitions of the dependent variables are as follows: columns 1 and 2, the log of the annual average change in inflation; column 3, the standard deviation of the annual average change in the nominal parallel market exchange rate; column 4, the percent of time that the exchange rate regime is classified as “freely falling” by Reinhart and Rogoff (2004); column 5, the index of procyclicality of fiscal policy due to Kaminsky et al., (2004) combines two measures of correlations between real government expenditure and inflation tax on the one hand and real GDP on the other and a measure of the difference between real government expenditure in “good” and “bad times,” column 6, securities issued in home currency as a share of total securities issued from Eichengreen et. al. (2003); column 7, country rating by institutional investors from Reinhart et. al. (2003).

Eichengreen et. al. (2003) implicitly make a case for another deep determinant—original sin—some underlying pathology that makes it difficult for developing countries to borrow in their own currency. In column 6, we see if their measure of original sin is really original or actually derives from the deeper determinants that we have posited. Again, in both samples, poor democratic institutions seem to be the significant meta-original determinant of original sin. Finally, column 7 checks for the deep determinants of the Reinhart et. al. (2004) measure of a country's currency rating. The more democratic the institutions the better the perception of institutional investors as to the riskiness of lending to that country. Thus, it appears that all nominal pathologies have some common origin in weak political institutions.

## **B. Alternative Measures of Political Institutions**

So far we have used Polity's measure of constraints on the executive (XCONST) as our measure of democracy. (Recall that this is the variable that drives Polity's democracy rating.) We check for the robustness of our results to alternative measures of democracy in Tables 6a and 6b.

We use two alternative measures to capture constraints on the chief executive; Checks (due to Beck et al., 2001) and Polcon3 (due to Henisz, 2000). Both are counts of the number of veto players, actors whose approval is necessary for a shift in policy from the status quo. The higher the score, the greater the constraints. In general, authoritarian regimes receive low scores on these variables.

We also display the results for two overall measures of democracy that are driven significantly by the XCONST measure, namely, "democ" and "polity" both from the Polity IV project. Polity is an alternative measure of democracy provided by the Polity IV project and is obtained by subtracting a measure of the extent of authoritarianism in a political system from the democracy measure above. We also report the behavioral measure of democracy (REG) developed by Alvarez, Cheibub, Limongi, and Przeworski (2000) which considers democracy to be present when there has been turnover in government.

Finally, Tables 6a and 6b also include two variables that capture a critical characteristic of democracy that is not directly taken into account by the Polity measures, accountability. The measures of accountability that we use are "WoverS" (Bueno de Mesquita et. al. 2003), which measures the ratio of the size of the winning coalition to the selectorate described earlier, and "voice" (Kaufman et. al., 2002), which is a perception-based measure of the extent of say that the average person has in a political system.

It is remarkable that irrespective of the measure chosen to measure the democratic character of political institutions democracy displays a strong negative relationship with exchange rate instability, with significance obtained at the 1 percent level. This holds for the smaller and the larger sample (Tables 6a and 6b). It is also reassuring that the magnitude of the coefficient is similar across most measures of democracy (xconst, polcon3, democ, voice,

Table 6a. Robustness to Alternative Measures of Political Institutions (Small Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|                   | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 | (6)                 | (7)                 |
|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Openness          | -0.617<br>(2.14)**  | -1.138<br>(2.45)**  | -0.561<br>(1.77)*   | -0.511<br>(1.64)    | -0.712<br>(1.79)*   | -0.754<br>(1.91)*   | -0.376<br>(1.29)    |
| Inequality        | 0.611<br>(2.40)**   | 0.399<br>(1.27)     | 0.419<br>(1.71)*    | 0.456<br>(1.83)*    | -1.612<br>(2.98)*** | 0.504<br>(1.65)     | 0.547<br>(2.55)**   |
| Polcon3           | -1.372<br>(4.34)*** |                     |                     |                     |                     |                     |                     |
| Checks            |                     | -1.868<br>(3.11)*** |                     |                     |                     |                     |                     |
| Democ             |                     |                     | -1.291<br>(4.37)*** |                     |                     |                     |                     |
| Polity            |                     |                     |                     | -1.374<br>(4.38)*** |                     |                     |                     |
| Reg               |                     |                     |                     |                     | -0.456<br>(1.51)    |                     |                     |
| Voice             |                     |                     |                     |                     |                     | -1.398<br>(3.48)*** |                     |
| WoverS            |                     |                     |                     |                     |                     |                     | -1.067<br>(4.49)*** |
| Estimation method | IV                  | IV                  | IV                  | IV                  | IV                  | IV                  | IV                  |
| R-squared         | 0.29                | 0.29                | 0.29                | 0.29                | 0.29                | 0.29                | 0.29                |
| Observations      | 48                  | 48                  | 48                  | 48                  | 48                  | 48                  | 47                  |

In all the columns institutions and openness are instrumented by settler mortality and fitted openness, respectively. Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. Polcon3 and checks are measures of fragmentation of the political system (scales 1 to 7.3 and 0 to 1, respectively), Democ is a general measure of the openness of political institutions (scale 0 to 10); polity is computed by subtracting a measure of how closed is the political institutions from the democ measure (range -10 to 10); REG is a measure of democracy from Alvarez et. al. (2000) which is a dummy variable that takes on a value of 1 to denote a democracy; voice is a measure of the extent of say that the average person has in a political system. WoverS is a measure of the proportion of the population which has a say in choosing the leader whom the leader must please in order to survive in office (scale 0 to 1).

Table 6b. Robustness to Alternative Measures of Political Institutions (Large Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|                   | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 | (6)                 | (7)                 |
|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Openness          | -0.379<br>(1.61)    | -0.464<br>(1.86)*   | -0.344<br>(1.48)    | -0.356<br>(1.51)    | -0.385<br>(1.74)*   | -0.355<br>(1.48)    | -0.338<br>(1.52)    |
| Inequality        | 0.486<br>(3.35)***  | 0.437<br>(2.77)***  | 0.448<br>(3.14)***  | 0.468<br>(3.21)***  | 0.479<br>(3.25)***  | 0.403<br>(2.38)**   | 0.428<br>(2.99)***  |
| Polcon3           | -0.570<br>(3.64)*** |                     |                     |                     |                     |                     |                     |
| Checks            |                     | -0.528<br>(3.29)*** |                     |                     |                     |                     |                     |
| Democ             |                     |                     | -0.554<br>(3.88)*** |                     |                     |                     |                     |
| Polity            |                     |                     |                     | -0.517<br>(3.41)*** |                     |                     |                     |
| Reg               |                     |                     |                     |                     | -0.405<br>(2.77)*** |                     |                     |
| Voice             |                     |                     |                     |                     |                     | -0.427<br>(2.68)*** |                     |
| WoverS            |                     |                     |                     |                     |                     |                     | -0.627<br>(4.29)*** |
| Estimation method | IV                  | IV                  | IV                  | IV                  | IV                  | IV                  | IV                  |
| R-squared         | 0.26                | 0.24                | 0.27                | 0.25                | 0.21                | 0.21                | 0.31                |
| Observations      | 80                  | 80                  | 80                  | 80                  | 80                  | 80                  | 79                  |

In all the columns, only openness is instrumented, while institutions refer to their respective initial-period value. Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. Polcon3 and checks are measures of fragmentation of the political system (scales 1 to 7.3 and 0 to 1, respectively); Democ is a general measure of the openness of political institutions (scale 0 to 10); polity is computed by subtracting a measure of the closedness of political institutions from the democ measure (range -10 to 10); REG is a measure of democracy from Alvarez et. al. (2000) which is a dummy variable that takes on a value of 1 to denote a democracy; voice is a measure of the extent of say that the average person has in a political system. WoverS is a measure of the proportion of the population which has a say in choosing the leader whom the leader must please in order to survive in office (scale 0 to 1)



polity, and WoverS), with coefficient values varying between -1.1 and -1.4. Of course, it is true that the various measures of democracy are highly correlated but in some cases this is far from perfect. (See Appendix Tables 16a and 16b).<sup>34</sup>

### C. Additional Controls

Omitted variables are a common problem in cross-section regressions. So we consider in Table 7 the possible controls that we might have left out of our core specification. This exercise is also an implicit test of the validity for our 2SLS procedure which depends on the assumptions that settler mortality in the past and geographic factors captured by the Frankel and Romer (1999) instrument have no direct effect on nominal stability.<sup>35</sup> The robustness checks that we reported below thus also go toward substantiating this claim because we directly control for many of the variables that could plausibly be correlated with settler mortality/Frankel-Romer instrument and macroeconomic instability.

One concern is whether we are actually picking up the effects on real rather than nominal instability. For example, if there are real shocks, and macroeconomic policies are not countercyclical, nominal instability could merely be the consequence of real instability. To address this concern, we introduce two measures of real instability from Acemoglu et al., (2003a). The first is the standard deviation of real growth rates and the second is the worst output drop between any two years. In both cases (Table 7a, columns 1 and 2), all three deep determinants are significant, suggesting that the relationship between the deep determinants and nominal instability is not a consequence of real shocks.<sup>36</sup>

Columns 3 and 4 address the question of whether instability is determined by terms of trade changes or their variability rather than the by the deep determinants. The answer is negative. In column 5, we control for extreme political instability proxied by revolutions and coups and in column 6 we ask whether the deep determinants are picking up the effects due to the legal origin of countries. In all these cases, the deep determinants remain significant.

Our findings for the larger sample differ in that the results for openness are considerably weaker (Table 7b). However, inequality is significant in all six specifications while democracy is significant in five out of six specifications.

---

<sup>34</sup> An interesting question is whether we can identify which functions of political institutions—checks versus accountability—are more important. Unfortunately, the very high correlation between measures of political institutions (Appendix Tables 16a and 16b) and the lack of multiple instruments for institutions militate against such an exercise.

<sup>35</sup> In other words, the exclusion restriction that we are testing is that the instruments effect instability only via the endogenous regressor and exert no independent effect on instability.

<sup>36</sup> Controlling for real instability renders the political institutions coefficient insignificant in the specification with inflation as the measure of nominal instability (columns 2 and 3 in Appendix Table 20), but in these cases the real instability measure is itself insignificant.

Table 7a. Robustness to Covariates (Small Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|                                   | (1)                | (2)                 | (3)                 | (4)                 | (5)                 | (6)                 |
|-----------------------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Openness                          | -0.694<br>(2.55)** | -0.757<br>(2.74)*** | -0.684<br>(1.92)*   | -0.762<br>(1.89)*   | -0.636<br>(2.14)**  | -0.658<br>(2.18)**  |
| Democratic political institutions | -1.083<br>(2.43)** | -0.927<br>(2.34)**  | -1.232<br>(4.06)*** | -1.489<br>(2.78)*** | -1.180<br>(3.09)*** | -1.207<br>(4.27)*** |
| Inequality                        | 0.496<br>(1.93)*   | 0.458<br>(1.86)*    | 0.512<br>(2.06)**   | 0.463<br>(1.72)*    | 0.559<br>(2.32)**   | 0.560<br>(2.25)**   |
| Standard deviation of real growth | 0.140<br>(0.56)    |                     |                     |                     |                     |                     |
| Worst output drop                 |                    | 0.077<br>(1.44)     |                     |                     |                     |                     |
| Terms of Trade (TOT) Growth       |                    |                     | 0.189<br>(0.75)     |                     |                     |                     |
| Standard Deviation of TOT Growth  |                    |                     |                     | -0.321<br>(0.52)    |                     |                     |
| Revolutions & Coups               |                    |                     |                     |                     | 0.055<br>(0.17)     |                     |
| French Legal Origin               |                    |                     |                     |                     |                     | 0.033<br>(0.14)     |
| Socialist Legal Origin            |                    |                     |                     |                     |                     | 0.549<br>(3.92)***  |
| Estimation method                 | IV                 | IV                  | IV                  | IV                  | IV                  | IV                  |
| R-squared                         | 0.45               | 0.49                | 0.35                | 0.39                | 0.42                | 0.41                |
| Observations                      | 42                 | 42                  | 46                  | 46                  | 46                  | 48                  |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns institutions and openness are instrumented by settler mortality and fitted openness, respectively. The standard deviation of growth (70-97) and the worst output drop between any two years over the period 1970-97 are from Acemoglu et. al. (2003a). The legal origin variables are dummies.

Table 7b. Robustness to Covariates (Large Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|                                   | (1)                | (2)                | (3)                 | (4)                | (5)                | (6)                |
|-----------------------------------|--------------------|--------------------|---------------------|--------------------|--------------------|--------------------|
| Openness                          | -0.475<br>(1.77)*  | -0.485<br>(1.75)*  | -0.331<br>(1.29)    | -0.262<br>(1.08)   | -0.381<br>(1.77)*  | -0.324<br>(1.39)   |
| Democratic political institutions | -0.199<br>(1.42)   | -0.241<br>(1.87)*  | -0.452<br>(3.18)*** | -0.315<br>(2.34)** | -0.285<br>(2.08)** | -0.301<br>(2.05)** |
| Inequality                        | 0.449<br>(2.93)*** | 0.471<br>(3.36)*** | 0.447<br>(2.80)***  | 0.373<br>(2.39)**  | 0.573<br>(4.11)*** | 0.692<br>(4.63)*** |
| Standard deviation of real growth | 0.391<br>(3.02)*** |                    |                     |                    |                    |                    |
| Worst output drop                 |                    | 0.119<br>(4.09)*** |                     |                    |                    |                    |
| Terms of Trade (TOT) Growth       |                    |                    | 0.124<br>(0.65)     |                    |                    |                    |
| Standard Deviation of TOT Growth  |                    |                    |                     | 0.557<br>(2.77)*** |                    |                    |
| Revolutions & Coups               |                    |                    |                     |                    | 0.347<br>(2.04)**  |                    |
| French Legal Origin               |                    |                    |                     |                    |                    | 0.151<br>(0.98)    |
| Socialist Legal Origin            |                    |                    |                     |                    |                    | 0.525<br>(3.39)*** |
| Estimation method                 | IV                 | IV                 | IV                  | IV                 | IV                 | IV                 |
| R-squared                         | 0.41               | 0.47               | 0.26                | 0.34               | 0.37               | 0.33               |
| Observations                      | 66                 | 66                 | 77                  | 77                 | 75                 | 79                 |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns, only openness is instrumented, while institutions refer to their respective initial-period value. The standard deviation of growth (70-97) and the worst output drop between any two years over the period 1970-97 are from Acemoglu et. al. (2003a). The legal origin variables are dummies.

#### D. Samples

Are our results robust to changes in the sample that we are working with? In Table 8, we address this question. In column 1, we exclude five highest inflation countries (Argentina, Bolivia, Brazil, Nicaragua, and Peru) and find that the effect of democracy is robust. In column 2, we drop Nigeria because it is identified by the Belsey-Kuh-Welsch test as an influential observation. Column 3 includes regional dummies,<sup>37</sup> while in columns 4–6, we drop, respectively, Latin American, sub-Saharan African, and Organization for Economic Cooperation and Development (OECD) countries from our sample. In the small sample (Table 8a) our core result relating to democracy is significant in all specifications, while openness is significant in three out of six specifications. In the large sample, democracy is significant in all cases except in the last column where it falls narrowly short of significance. Note that neither openness nor inequality is as robust as democracy to the addition of regional dummies or to several changes of sample.

#### E. Measuring Conflict

Underlying our approach is the view that, *ceteris paribus*, greater social conflict implies greater macroeconomic instability. Nothing in our approach identifies which particular type of conflict—economic, ethnic, religious—should matter. Accordingly, we use different measures available in the literature for these types of conflict and allow the data to determine which of them is important. Our strongest results are with a measure of economic conflict captured by the Gini measure of inequality. But it is plausible that other kinds of conflict, especially ethnic conflict, can also be a factor in determining instability. To test this, we introduced different measures of ethnic and religious fractionalization in the core specification (presented in tables 9a and 9b). In columns 1-2 these measures were introduced in addition to inequality, and in columns 3 and 4 instead of it. In the small sample (Table 9a), the measures of ethnic and religious conflict were of the right sign but insignificant. They also did not alter the significance of the inequality measure.

In the large sample (Table 6b), however, there is some evidence that ethnic conflict has a significant impact on macroeconomic stability.<sup>38</sup> Interestingly, the magnitude of the effect that ethnic conflict has on stability is very close to that of inequality, suggesting similarities in the transmission mechanism from the different sources of conflict. That the coefficient estimates using what are clearly exogenous measures of fragmentation (ethnic fragmentation) are similar to that for inequality is reassuring regarding the potential endogeneity concern with the latter. Note that democracy remains significant in all specifications in the table.

---

<sup>37</sup> Our result is also robust to the inclusion of a dummy for East Asian countries (not shown).

<sup>38</sup> Easterly and Levine (1997) obtain similar results for Africa.

Table 8a. Robustness to Regional Dummies, Influential and Extreme Observations (Small Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

| Omitted Observations              | BRA, ARG, NIC       | NGA                 | None               | Latin               | sub-Saharan         | OECD               |
|-----------------------------------|---------------------|---------------------|--------------------|---------------------|---------------------|--------------------|
|                                   | BOL, PER            |                     |                    | America             | Africa              |                    |
|                                   | (1)                 | (2)                 | (3)                | (4)                 | (5)                 | (6)                |
| Openness                          | -0.327<br>(1.09)    | -0.637<br>(2.18)**  | -0.453<br>(1.67)   | -0.543<br>(1.05)    | -0.766<br>(1.94)*   | -0.669<br>(2.23)** |
| Democratic political institutions | -1.287<br>(4.85)*** | -1.342<br>(4.18)*** | -1.467<br>(2.50)** | -1.380<br>(4.02)*** | -2.174<br>(3.47)*** | -1.253<br>(2.52)** |
| Inequality                        | 0.195<br>(0.89)     | 0.415<br>(1.70)*    | -0.045<br>(0.15)   | 0.170<br>(0.53)     | 0.297<br>(0.78)     | 0.433<br>(1.54)    |
| Latin America dummy               |                     |                     | 1.204<br>(1.87)*   |                     |                     |                    |
| Sub-Saharan Africa dummy          |                     |                     | -0.261<br>(0.28)   |                     |                     |                    |
| North Africa/Middle East dummy    |                     |                     | -2.459<br>(2.27)** |                     |                     |                    |
| Estimation method                 | IV                  | IV                  | IV                 | IV                  | IV                  | IV                 |
| R-squared                         | 0.39                | 0.32                | 0.46               | 0.50                | 0.45                | 0.22               |
| Observations                      | 43                  | 47                  | 48                 | 29                  | 34                  | 44                 |

Robust t statistics in parentheses. \* significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns institutions and openness are instrumented by settler mortality and fitted openness, respectively. In column 1, 5 of the highest instability observations (Argentina, Bolivia, Brazil, Nicaragua, and Peru) are omitted. In column 2, the Belsey-Kuh test for influential observations is applied which leads to the omission of Nigeria from the sample. Columns 4, 5, and 6, omit, respectively, observations relating to Latin America, sub-Saharan Africa, and the OECD countries.

Table 8b. Robustness to Regional Dummies, Influential and Extreme Observations (Large Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

| Omitted Observations              | BRA, ARG, NIC      | NGA                 | None                | Latin               | sub-Saharan         | OECD             |
|-----------------------------------|--------------------|---------------------|---------------------|---------------------|---------------------|------------------|
|                                   | BOL, PER           |                     |                     | America             | Africa              |                  |
|                                   | (1)                | (2)                 | (3)                 | (4)                 | (5)                 | (6)              |
| Openness                          | -0.133<br>(0.62)   | -0.329<br>(1.49)    | -0.342<br>(1.61)    | -0.051<br>(0.21)    | -0.368<br>(1.34)    | -0.345<br>(1.38) |
| Democratic political institutions | -0.325<br>(2.61)** | -0.470<br>(3.22)*** | -0.414<br>(3.03)*** | -0.430<br>(3.18)*** | -0.547<br>(2.86)*** | -0.265<br>(1.58) |
| Inequality                        | 0.311<br>(2.11)**  | 0.429<br>(2.91)***  | -0.035<br>(0.19)    | 0.263<br>(1.55)     | 0.461<br>(2.21)**   | 0.227<br>(1.31)  |
| Latin America dummy               |                    |                     | 1.819<br>(4.42)***  |                     |                     |                  |
| Sub-Saharan Africa dummy          |                    |                     | 1.181<br>(3.14)***  |                     |                     |                  |
| North Africa/Middle East dummy    |                    |                     | 0.335<br>(0.63)     |                     |                     |                  |
| Estimation method                 | IV                 | IV                  | IV                  | IV                  | IV                  | IV               |
| R-squared                         | 0.16               | 0.25                | 0.41                | 0.18                | 0.29                | 0.11             |
| Observations                      | 75                 | 79                  | 80                  | 61                  | 60                  | 61               |

Robust t statistics in parentheses. \* Significant at 10 percent \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns, only openness is instrumented, while institutions refer to their respective initial-period value. In column 1, 5 of the highest instability observations (Argentina, Bolivia, Brazil, Nicaragua, and Peru) are omitted. In column 2, the Belsey-Kuh test for influential observations is applied which leads to the omission of Nigeria from the sample. Columns 4, 5, and 6, omit, respectively, observations relating to Latin America, sub-Saharan Africa, and the OECD countries.

Table 9a. Alternative Sources of Conflict (Small Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|  | (1)                 | (2)                 | (3)                | (4)                 |
|--|---------------------|---------------------|--------------------|---------------------|
| Openness                                     | -0.594<br>(2.14)**  | -0.608<br>(2.12)**  | -0.531<br>(1.95)*  | -0.539<br>(1.96)*   |
| Democratic political institutions            | -1.336<br>(2.83)*** | -1.270<br>(3.62)*** | -1.260<br>(2.52)** | -1.235<br>(3.37)*** |
| Inequality                                   | 0.429<br>(1.77)*    | 0.421<br>(1.75)*    |                    |                     |
| Ethnic Fractionalization (Alesina et. al.)   | 0.006<br>(0.02)     |                     | 0.099<br>(0.33)    |                     |
| Religion Fractionalization (Alesina et. al.) | 0.211<br>(0.74)     |                     | 0.154<br>(0.54)    |                     |
| Ethnic Fractionalization (Fearon)            |                     | -0.002<br>(0.01)    |                    | 0.067<br>(0.26)     |
| Estimation method                            | IV                  | IV                  | IV                 | IV                  |
| R-squared                                    | 0.30                | 0.30                | 0.24               | 0.24                |
| Observations                                 | 48                  | 48                  | 48                 | 48                  |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns institutions and openness are instrumented by settler mortality and fitted openness, respectively.

Table 9b. Alternative Sources of Conflict (Large Sample)  
(Dependent variable is log of annual average percent change in nominal parallel exchange rate)

|  | (1)                 | (2)                 | (3)                 | (4)                 |
|--|---------------------|---------------------|---------------------|---------------------|
| Openness                                     | -0.227<br>(1.01)    | -0.266<br>(1.21)    | -0.203<br>(0.85)    | -0.247<br>(1.06)    |
| Democratic political institutions            | -0.477<br>(3.32)*** | -0.471<br>(3.26)*** | -0.534<br>(3.52)*** | -0.529<br>(3.47)*** |
| Inequality                                   | 0.301<br>(1.98)*    | 0.311<br>(1.97)*    |                     |                     |
| Ethnic Fractionalization (Alesina et. al.)   | 0.293<br>(2.20)**   |                     | 0.374<br>(2.81)***  |                     |
| Religion Fractionalization (Alesina et. al.) | 0.122<br>(0.94)     |                     | 0.151<br>(1.12)     |                     |
| Ethnic Fractionalization (Fearon)            |                     | 0.314<br>(2.44)**   |                     | 0.417<br>(3.54)***  |
| Estimation method                            | IV                  | IV                  | IV                  | IV                  |
| R-squared                                    | 0.29                | 0.29                | 0.27                | 0.27                |
| Observations                                 | 80                  | 80                  | 80                  | 80                  |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns, only openness is instrumented, while institutions refer to their respective initial-period value.

## F. Central Bank Independence as Institutional Reform

The role of independent central banks as an institutional mechanism for maintaining nominal stability has been widely debated (Cukierman, Webb, and Neyapti (1992)). In one view, an independent central bank acts as a precommitment device by policy makers to overcome a time inconsistency problem that leads to pressures for greater inflation. But from another perspective, the institutional mechanism is itself endogenous to prior societal decisions about macroeconomic stability. In other words, independent central banks are created where there is already a prior consensus about the need for stability.<sup>39</sup>

We investigate these issues in Table 10. Panel A in the table shows that the measure of independence based on the central bank's legal status is not strongly associated with stability outcomes both when this measure is not instrumented (column 1) as well as when it is (column 3).<sup>40</sup> However, the measure based on turnover of the governor is significant (columns 2 and 4). (Note that higher turnover is considered to be indicative of less independence, so the sign is correct.) Panel B shows that democracy is a significant determinant of the central bank independence measure that is associated with greater stability, while openness and inequality are not. In Panel C measures of central bank independence are included in the core specification. In both the small sample (columns 1 and 2) as well as in the large sample (columns 3 and 4) both the independence measure and democracy are significant, while openness is not.

This parallels the results we obtained in relation to monetary policy. The central bank independence variable remains significant when included with political institutions, but independence is itself significantly determined by democracy (see Panel B). It is noteworthy too that the coefficient for democracy changes very little with the inclusion of the CBI variable (compare Panel C in Table 10 with Table 1).

## G. Time Series Variation

As discussed earlier, we are interested in the determinants of nominal stability from a long-run perspective and hence we have adopted a cross-section approach. This means of course that we do not exploit a lot of interesting time series variation in the data, especially in relation to openness and institutional change. One problem with relying on explicit panel methods in this context is the lack of time-varying instruments. Both settler mortality and the FR trade instrument are geography-based and hence time invariant.

Giavazzi and Tabellini (2004) use a more elaborate difference-in-difference approach to examine the role of economic and political changes on growth and inflation. But this approach too has limitations, as recognized by the authors, which stems in large part from the fact that the "treatment group" is not randomly determined.

---

<sup>39</sup> This is similar in spirit to the Calvo and Mishkin (2003) argument that the choice of exchange rate regimes are irrelevant to macroeconomic outcomes.

<sup>40</sup> The greater the measure the less independent the central bank.

Table 10. Central Bank Independence (CBI) as Institutional Reform

**Panel A. Is CBI a Proximate Determinants of Nominal Macroeconomic Instability?**

| Dependent variable is log of average annual percent change in nominal parallel market exchange rate |                 |                    |                 |                    |
|---|-----------------|--------------------|-----------------|--------------------|
|   | (1)             | (2)                | (3)             | (4)                |
| Central Bank Independence (Legal)   | 0.232<br>(0.79) |                    | 0.067<br>(0.22) |                    |
| Central Bank Independence (Turnover)  |                 | 1.009<br>(6.78)*** |                 | 0.911<br>(5.51)*** |
| Estimation method   | OLS             | OLS                | IV              | IV                 |
| R-squared   | 0.01            | 0.35               | 0.00            | 0.21               |
| Observations  | 56              | 55                 | 51              | 53                 |

**Panel B. Is CBI Endogenous to Deep Determinants?**

| Dependent variable                | Legal Independence<br>(1) | Turnover<br>(2)    |
|-----------------------------------|---------------------------|--------------------|
| Openness                          | 0.039<br>(1.99)*          | -0.039<br>(1.58)   |
| Democratic political institutions | 0.007<br>(0.37)           | -0.040<br>(2.16)** |
| Inequality                        | 0.000<br>(0.03)           | 0.030<br>(1.65)    |
| Estimation method                 | IV                        | IV                 |
| R-squared                         | 0.07                      | 0.16               |
| Observations                      | 60                        | 59                 |

**Panel C. Role of CBI Versus Deep Determinants**

| Dependent variable is log of average annual percent change in nominal parallel market exchange rate |                     |                     |                    |                    |
|---|---------------------|---------------------|--------------------|--------------------|
|   | Small Sample        |                     | Large Sample       |                    |
|   | (1)                 | (2)                 | (3)                | (4)                |
| Openness  | -0.280<br>(0.74)    | -0.284<br>(0.77)    | 0.085<br>(0.27)    | 0.055<br>(0.15)    |
| Democratic political institutions   | -1.103<br>(4.96)*** | -1.108<br>(5.09)*** | -0.433<br>(2.64)** | -0.435<br>(2.51)** |
| Inequality  | 0.554<br>(2.20)**   | 0.554<br>(2.21)**   | 0.464<br>(2.80)*** | 0.496<br>(3.07)*** |
| Central Bank Independence (Turnover)  | 0.758<br>(5.23)***  | 0.738<br>(6.69)***  | 0.874<br>(5.33)*** | 0.783<br>(4.47)*** |
| Estimation method   | IV                  | IV                  | IV                 | IV                 |
| R-squared   | 0.69                | 0.36                | 0.59               | 0.38               |
| Observations  | 27                  | 27                  | 52                 | 50                 |

Robust t statistics in parentheses. \* significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. Two measures of central bank independence due to Cukierman, Webb, and Neyapti (1992) are used in this table: the first is based on the law and the second on turnover of heads of central banks. In panel A, columns 2 and 4, the CBI measure is instrumented by its corresponding initial period (average for the 1960s) value.

(Nonrandomness in this area is, in fact, the subject of a major literature in political science.<sup>41</sup> We are thus obliged to defer a convincing causal analysis of panel data to a future time when we are either able to identify time-varying instruments for openness and institutions or able to find a random natural experiment that will help overcome the problem identified in the Giavazzi and Tabellini (2004) analysis.<sup>42</sup>

We report next the results of some preliminary work that seeks to exploit the “within” variation in the data. First, we run our core regressions separately for each of the 4 decades—1960, 70, 80, and 90—to see if interesting regularities emerge. The waves of democratization in the 1970s, 1980s and 1990s justify looking at each decade separately. So, in Tables 11a–11c, we make a preliminary attempt to exploit some of the time series variation in the data by running the core specifications for each of the 4 decades. In Tables 11a, 11b, and 11c, we display the results of decadal regressions for each type of political institutions: in Table 11a we use a measure of checks (XCONST), in Table 11b, Polity’s democracy rating (DEMOC), and finally in Table 11c, a measure of accountability (WoverS).<sup>43</sup>

The two interesting results pertain to the roles of openness and democracy. Democracy is insignificant in the 1960s but turns strongly significant thereafter. Openness, on the other hand, has the wrong sign (but statistically insignificant) for the 1960s and 1970s, but becomes correctly signed and significant for the 1980s and 1990s. We see this latter result as providing some support for the Rogoff (2003) hypothesis that the spread of globalization since the 1980s had a favorable impact on nominal outcomes.

Next we run a pooled cross-section OLS regression addressing endogeneity (albeit very imperfectly) by using the initial-period values for the right hand side variables. Column 1 in Table 12, which includes time effects, validates the core specification in the cross-section: all the deep determinants are significant and correctly signed. When we include fixed effects, (column 2), openness remains significant but not the coefficient on democracy. One possible explanation for the latter is that if institutions are relatively slow to change, the fixed effects absorb a lot of the impact of institutions. Suggestive evidence for this is reported in column 3, in which the fixed effects from the specification in column 2 is regressed on settler mortality: the coefficient is highly significant and accounts for a reasonable share of the variation (10 percent) in the fixed effects. Put differently, expecting institutions to survive a fixed effects estimation is a very demanding test.

---

<sup>41</sup> See Alvarez et. al. (2000).

<sup>42</sup> Another challenge that time series work has to contend with relates to the long lags between the external trappings or *forms* of democracy (elections, change of government, etc.), which get reflected in the quantitative measures of institutions, and the effective performance of the *functions* (conflict resolution, accountability, etc.). A cross-section approach overcomes this problem to some extent.

<sup>43</sup> We have repeated this exercise for all the measures of political institutions in Tables 6a and 6b. The results were all very similar.



Table 11. Decadal Regressions (Small Sample)  
(Dependent variable is log of average annual percent change in nominal parallel exchange rate)

**Panel A**

|  | 1960s<br>(1)     | 1970s<br>(2)       | 1980s<br>(3)       | 1990s<br>(4)      |
|--|------------------|--------------------|--------------------|-------------------|
| Openness                                   | 0.656<br>(0.40)  | 0.644<br>(0.54)    | -0.844<br>(2.03)*  | -0.816<br>(1.92)* |
| Democratic political institutions (XCONST) | -1.007<br>(0.95) | -1.767<br>(2.28)** | -1.039<br>(2.44)** | -0.661<br>(1.87)* |
| Inequality                                 | -1.747<br>(1.37) | -0.476<br>(0.76)   | 1.013<br>(3.06)*** | 0.568<br>(2.10)** |
| Estimation method                          | IV               | IV                 | IV                 | IV                |
| R-squared                                  | 0.16             | 0.36               | 0.38               | 0.16              |
| Observations                               | 20               | 22                 | 39                 | 46                |

**Panel B**

|   | 1960s<br>(1)     | 1970s<br>(2)       | 1980s<br>(3)       | 1990s<br>(4)      |
|---|------------------|--------------------|--------------------|-------------------|
| Openness                                  | 0.728<br>(0.42)  | 0.166<br>(0.15)    | -0.855<br>(1.98)*  | -0.788<br>(1.84)* |
| Democratic political institutions (DEMOC) | -0.976<br>(0.94) | -1.524<br>(2.20)** | -0.991<br>(2.33)** | -0.623<br>(1.82)* |
| Inequality                                | -1.790<br>(1.33) | -0.224<br>(0.47)   | 0.910<br>(2.58)**  | 0.590<br>(2.16)** |
| Estimation method                         | IV               | IV                 | IV                 | IV                |
| R-squared                                 | 0.16             | 0.36               | 0.38               | 0.16              |
| Observations                              | 20               | 22                 | 39                 | 46                |

**Panel C**

|  | 1960s<br>(1)     | 1970s<br>(2)       | 1980s<br>(3)       | 1990s<br>(4)      |
|--|------------------|--------------------|--------------------|-------------------|
| Openness                                   | 1.025<br>(0.57)  | 0.215<br>(0.20)    | -0.726<br>(1.59)   | -0.663<br>(1.59)  |
| Democratic political institutions (WoverS) | -1.490<br>(0.91) | -1.530<br>(2.38)** | -0.945<br>(2.55)** | -0.491<br>(1.95)* |
| Inequality                                 | -1.898<br>(1.41) | -0.271<br>(0.48)   | 1.083<br>(3.27)*** | 0.557<br>(2.17)** |
| Estimation method                          | IV               | IV                 | IV                 | IV                |
| R-squared                                  | 0.15             | 0.36               | 0.38               | 0.16              |
| Observations                               | 21               | 22                 | 39                 | 45                |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent. In all the columns institutions and openness are instrumented by settler mortality and fitted openness, respectively. The number of observations varies across decades because of the lack of data on one or more of the regressors.

Table 12. Pooled Cross-section and Panel Specifications

| Dependent variable                | Instability<br>(1)  | Instability<br>(2) | Fixed Effects from (col. 2)<br>(3) |
|-----------------------------------|---------------------|--------------------|------------------------------------|
| Trade openness                    | -0.625<br>(4.50)*** | -0.646<br>(2.08)** |                                    |
| Democratic political institutions | -0.299<br>(2.59)**  | 0.083<br>(0.53)    |                                    |
| Inequality                        | 0.297<br>(2.34)**   | -0.559<br>(1.80)*  |                                    |
| Settler mortality                 |                     |                    | 0.49<br>(2.35)***                  |
| Time Effects                      | yes                 | yes                | n.a.                               |
| Fixed Effects                     | no                  | yes                | n.a.                               |
| Observations                      | 215                 | 215                | 46                                 |
| R-squared                         | 0.26                | 0.69               | 0.09                               |

Robust t statistics in parentheses. \* Significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent.

## VII. CONCLUDING REMARKS

Democracy, according to Amartya Sen has both intrinsic and instrumental values. Some of these instrumental values—the impact on famines and on adjustment to real shocks—are accepted. But others—the impact on growth and on the provision of public goods—have long been debated (Barro, 1996 and Mulligan et. al., 2004), and the results have not always been incontrovertible. In this paper, we have established a strong empirical regularity in the cross-section evidence relating to another, less recognized, instrumental value of democracy: its strong and robust role in promoting long-run nominal macroeconomic stability. It turns out that even if democracy is not associated with higher levels of economic growth, it has a strong causal impact on stability. In this light, the growing democratization of large parts of the developing world, including Africa and Latin America, is a welcome development as it is likely to be the best guarantor of long-run stability.

A recognition of the impact of democracy on macroeconomic stability, however, does not necessarily indicate a precise and implementable short-term policy agenda to improve macroeconomic stability. For one institutions tend to change very slowly, and the determinants of shifts to democracy are complex and still not thoroughly understood. Furthermore, as far as the International Financial Institutions are concerned, even the IMF cannot do much to increase its influence over stability outcomes. IMF conditionality on policies is considered intrusive enough. It would be difficult to imagine any appetite for extending conditionality to a country's fundamental political institutions.

The dilemma is the same as the one that arises out of the broader view about the role of institutions in economic development. The instruments that can fundamentally help secure better stabilization and development outcomes, namely institutions, perhaps elude control. All of this raises the difficult question: should the policy community accept that it has perhaps only a modest role in trying to improve macroeconomic stability? To paraphrase Yeats, is it better to moderate the conviction that significant change from the outside is possible than to act with the passionate intensity that it is?

Table 13. Variables Description with Data Source

| Variable Name    | Variable Description  | Source                         |
|------------------|---|--------------------------------|
| logexchpar       | Log of annual average change in nominal parallel market exchange rate, 1960-98        | Reinhart and Rogoff, 2004      |
| lcopen           | Trade to GDP ratio. Average 1960-2000   | Penn World Tables, 6.1         |
| xconst           | Constraint on the executive. Average 1960 (or indep) to 2000                          | Polity IV                      |
| xconst70         | xconst for 1970 (or first non-missing observation)                                    | Polity IV                      |
| logfrankrom      | Fitted openness (instrument for openness)   | Rodrik et al., 2004            |
| logem4           | Settler mortality (instrument for institutions)                                       | AJR, 2001                      |
| gini_WIDER       | Economic inequality. Average 1960 (or indep) to 1999                                  | WIID, 2000                     |
| gini_DS          | Economic inequality. Average 1960 (or indep) to 1996                                  | Deninger and Squire, 1996      |
| lmoney70_00      | log Money Growth 1970_00  | IFS                            |
| lmoney70s        | Average of log (Money Growth) for 1970s   | IFS                            |
| logmgrowth       | Log (money_gwt)   | IFS                            |
| ggb_gdp60_00     | Budget Balance/GDP 1960_00 (WEO)  | WEO                            |
| ggb_gdp70_00     | Budget Balance/GDP 1970_00 (WEO)  | WEO                            |
| cg60_00          | Government Consumption/GDP 1960_00  | Penn World Tables, 6.1         |
| polcon3          | Measure of fragmentation of political system - Average 1960 (or indep) to 2001        | Henisz, 2000                   |
| checks           | Measure of fragmentation of political system. Average 1975 (or indep) to 2000         | Beck et al. 2001               |
| democ            | Measure of openness of political system.. Average 1960 (or indep) to 2000             | POLITY IV                      |
| reg              | Dummy that takes on a value of 1 if a country is a democracy                          | Alvarez, et al. 2000           |
| voice            | Measure of say in political system. Value in 2000                                     | Kaufman et al., 2002           |
| polariz          | Measure of fragmentation of political system. Average 1975 (or indep) to 2000         | Beck et al. 2001               |
| polity           | Openness of political system.- Average 1960 (or indep) to 2000                        | POLITY IV                      |
| WoverS           | Loyalty Norm (measure of say in electing leader). Average 1960 (or indep) to 1999     | Bueno de Mesquita et al., 2003 |
| stdgrowth7097    | Standard deviation of real per capita GDP growth between 1970 and 1997                | Acemoglu et al. (2003)         |
| worstoutdrop7097 | Worst drop in real GDP between any 2 successive years over the period 1970-97         | Acemoglu et al. (2003)         |
| totgav60_99      | Terms of Trade (goods and services) Growth  | WDI, World Bank                |
| totgstdev60_9    | Standard Deviation of TOT Growth  | WDI, World Bank                |
| revcoup          | Revolutions & Coups   | Barro and Lee, 1994            |
| lfr              | Dummy for country with French legal origin  | Rodrik et al., 2004            |
| lso              | Dummy for country with Socialist legal origin   | Rodrik et al., 2004            |
| lnrgdpch60       | Initial (1960) level of per capita PPP GDP  | Penn World Tables, 6.1         |
| ethnic           | Fractionalization - Ethnic  | Alesina et al., 2003           |
| religion         | Fractionalization - Religion  | Alesina et al., 2004           |
| ef               | Ethnic fractionalization  | Fearon, 2003                   |
| infl_cpi_log     | Log of Annual Average Inflation, 1960-2000  | IFS                            |
| infl_defl_log    | Log ( Annual Inflation, GDP Deflator ) - Average 1960 (or indep) to 2001              | IFS                            |
| exch_par_log     | Standard Deviation of annual growth in nominal parallel market exchange rate          | Reinhart and Rogoff, 2004      |
| infl_cpi_log     | Log ( Annual Inflation, CPI ) - Standard Deviation 1960 (or indep) to 2001            | IFS                            |
| sin_33a          | share of local currency in total securities issued                                    | Eichengreen, et al., 2003      |
| rating           | country's foreign currency rating   | Reinhart et al., 2003          |
| fiscycycl        | procyclicality of fiscal policy   | Kaminsky et al., 2004          |
| gcode5           | Percent of time (1960-98) that exchange rate regime is classified as "freely falling" | Reinhart and Rogoff, 2004      |

Table 14a. Summary Statistics (Small Sample)

| Variable    | Description                 | Observations | Mean  | Std. Dev. | Min   | Max   |
|-------------|-----------------------------|--------------|-------|-----------|-------|-------|
| logexchpar  | Log of exchange rate change | 48           | -1.75 | 1.50      | -4.58 | 2.25  |
| lcopen      | Openness                    | 48           | 3.83  | 0.54      | 2.58  | 5.20  |
| xconst      | Political Institutions      | 48           | 3.98  | 1.80      | 1.36  | 7.00  |
| gini_WIDER  | Inequality                  | 48           | 44.09 | 7.88      | 30.40 | 62.90 |
| logfrankrom | Fitted Openness             | 48           | 2.53  | 0.66      | 1.11  | 3.96  |
| logem4      | Settler Mortality           | 48           | 4.54  | 1.16      | 2.15  | 7.60  |
| lmoney70_00 | Log money growth            | 48           | -1.23 | 1.04      | -2.31 | 2.20  |
| cg60_00     | Government consumption/GDP  | 48           | 18.74 | 7.46      | 3.79  | 44.16 |
| ggb_gdp60   | Budget balance/GDP          | 45           | -0.04 | 0.04      | -0.16 | 0.01  |
| polcon3     | Political institutions      | 48           | 0.19  | 0.15      | 0.00  | 0.47  |
| checks      | Political institutions      | 48           | 2.35  | 1.08      | 1.00  | 5.67  |
| WoverS      | Political institutions      | 47           | 0.57  | 0.24      | 0.13  | 1.00  |
| polity      | Political institutions      | 48           | 0.49  | 5.85      | -7.56 | 10.00 |
| polariz     | Political institutions      | 48           | 0.23  | 0.36      | 0.00  | 1.50  |
| voice       | Political institutions      | 48           | -0.05 | 0.83      | -1.43 | 1.70  |
| democ       | Political institutions      | 48           | 3.85  | 3.42      | 0.00  | 10.00 |

Table 14b. Summary Statistics (Large Sample)

| Variable    | Description                 | Observations | Mean  | Std. Dev. | Min   | Max   |
|-------------|-----------------------------|--------------|-------|-----------|-------|-------|
| logexchpar  | Log of exchange rate change | 80           | -2.17 | 1.52      | -5.75 | 2.25  |
| lcopen      | Openness                    | 80           | 3.90  | 0.54      | 2.56  | 5.20  |
| xconst      | Political Institutions      | 80           | 4.22  | 1.87      | 1.00  | 7.00  |
| gini_WIDER  | Inequality                  | 80           | 42.17 | 9.58      | 23.85 | 62.90 |
| logfrankrom | Fitted Openness             | 80           | 2.70  | 0.70      | 0.83  | 4.22  |
| lmoney70_00 | Log money growth            | 76           | -1.34 | 0.93      | -2.54 | 2.20  |
| cg60_00     | Government consumption/GDP  | 80           | 18.90 | 9.26      | 3.79  | 53.17 |
| ggb_gdp60   | Budget balance/GDP          | 76           | -0.04 | 0.04      | -0.22 | 0.07  |
| polcon3     | Political institutions      | 80           | 0.21  | 0.16      | 0.00  | 0.54  |
| legral      | Political institutions      | 80           | 0.43  | 0.25      | 0.00  | 0.82  |
| WoverS      | Political institutions      | 79           | 0.62  | 0.25      | 0.13  | 1.00  |
| polity      | Political institutions      | 80           | 1.10  | 6.16      | -9.54 | 10.00 |
| polariz     | Political institutions      | 80           | 0.36  | 0.55      | 0.00  | 2.00  |
| voice       | Political institutions      | 80           | 0.21  | 0.89      | -1.43 | 1.70  |
| democ       | Political institutions      | 80           | 4.40  | 3.58      | 0.00  | 10.00 |

Note: For detailed description of variables, see Table 13.

Table 15a. List of Countries (Small Sample)

| S. No. | IFS Country Code | World Bank Country Code | Country Name   |
|--------|------------------|-------------------------|----------------|
| 1      | 612              | DZA                     | Algeria        |
| 2      | 213              | ARG                     | Argentina      |
| 3      | 193              | AUS                     | Australia      |
| 4      | 513              | BGD                     | Bangladesh     |
| 5      | 218              | BOL                     | Bolivia        |
| 6      | 223              | BRA                     | Brazil         |
| 7      | 618              | BDI                     | Burundi        |
| 8      | 156              | CAN                     | Canada         |
| 9      | 228              | CHL                     | Chile          |
| 10     | 233              | COL                     | Colombia       |
| 11     | 238              | CRI                     | Costa Rica     |
| 12     | 243              | DOM                     | Dominican Rep. |
| 13     | 248              | ECU                     | Ecuador        |
| 14     | 469              | EGY                     | Egypt          |
| 15     | 253              | SLV                     | El Salvador    |
| 16     | 644              | ETH                     | Ethiopia       |
| 17     | 648              | GMB                     | Gambia, The    |
| 18     | 652              | GHA                     | Ghana          |
| 19     | 258              | GTM                     | Guatemala      |
| 20     | 656              | GIN                     | Guinea         |
| 21     | 336              | GUY                     | Guyana         |
| 22     | 268              | HND                     | Honduras       |
| 23     | 534              | IND                     | India          |
| 24     | 536              | IDN                     | Indonesia      |
| 25     | 343              | JAM                     | Jamaica        |
| 26     | 664              | KEN                     | Kenya          |
| 27     | 544              | LAO                     | Lao P.D.R.     |
| 28     | 674              | MDG                     | Madagascar     |
| 29     | 548              | MYS                     | Malaysia       |
| 30     | 682              | MRT                     | Mauritania     |
| 31     | 684              | MUS                     | Mauritius      |
| 32     | 273              | MEX                     | Mexico         |
| 33     | 686              | MAR                     | Morocco        |
| 34     | 196              | NZL                     | New Zealand    |
| 35     | 278              | NIC                     | Nicaragua      |
| 36     | 694              | NGA                     | Nigeria        |
| 37     | 564              | PAK                     | Pakistan       |
| 38     | 288              | PRY                     | Paraguay       |
| 39     | 293              | PER                     | Peru           |
| 40     | 724              | SLE                     | Sierra Leone   |
| 41     | 199              | ZAF                     | South Africa   |
| 42     | 524              | LKA                     | Sri Lanka      |
| 43     | 738              | TZA                     | Tanzania       |
| 44     | 744              | TUN                     | Tunisia        |
| 45     | 746              | UGA                     | Uganda         |
| 46     | 298              | URY                     | Uruguay        |
| 47     | 299              | VEN                     | Venezuela      |
| 48     | 582              | VNM                     | Vietnam        |

Table 15b. List of Countries (Large Sample)

| S. No. | IFS Code | IBRD Code | Country Name   | S. No. | IFS Code | IBRD Code | Country Name   |
|--------|----------|-----------|----------------|--------|----------|-----------|----------------|
| 1      | 612      | DZA       | Algeria        | 44     | 674      | MDG       | Madagascar     |
| 2      | 213      | ARG       | Argentina      | 45     | 676      | MWI       | Malawi         |
| 3      | 193      | AUS       | Australia      | 46     | 548      | MYS       | Malaysia       |
| 4      | 513      | BGD       | Bangladesh     | 47     | 682      | MRT       | Mauritania     |
| 5      | 218      | BOL       | Bolivia        | 48     | 684      | MUS       | Mauritius      |
| 6      | 616      | BWA       | Botswana       | 49     | 273      | MEX       | Mexico         |
| 7      | 223      | BRA       | Brazil         | 50     | 686      | MAR       | Morocco        |
| 8      | 918      | BGR       | Bulgaria       | 51     | 558      | NPL       | Nepal          |
| 9      | 618      | BDI       | Burundi        | 52     | 196      | NZL       | New Zealand    |
| 10     | 156      | CAN       | Canada         | 53     | 278      | NIC       | Nicaragua      |
| 11     | 228      | CHL       | Chile          | 54     | 694      | NGA       | Nigeria        |
| 12     | 924      | CHN       | China          | 55     | 142      | NOR       | Norway         |
| 13     | 233      | COL       | Colombia       | 56     | 564      | PAK       | Pakistan       |
| 14     | 238      | CRI       | Costa Rica     | 57     | 288      | PRY       | Paraguay       |
| 15     | 423      | CYP       | Cyprus         | 58     | 293      | PER       | Peru           |
| 16     | 128      | DNK       | Denmark        | 59     | 566      | PHL       | Philippines    |
| 17     | 243      | DOM       | Dominican Rep. | 60     | 964      | POL       | Poland         |
| 18     | 248      | ECU       | Ecuador        | 61     | 182      | PRT       | Portugal       |
| 19     | 469      | EGY       | Egypt          | 62     | 968      | ROM       | Romania        |
| 20     | 253      | SLV       | El Salvador    | 63     | 724      | SLE       | Sierra Leone   |
| 21     | 644      | ETH       | Ethiopia       | 64     | 199      | ZAF       | South Africa   |
| 22     | 172      | FIN       | Finland        | 65     | 542      | KOR       | South Korea    |
| 23     | 132      | FRA       | France         | 66     | 184      | ESP       | Spain          |
| 24     | 648      | GMB       | Gambia, The    | 67     | 524      | LKA       | Sri Lanka      |
| 25     | 652      | GHA       | Ghana          | 68     | 734      | SWZ       | Swaziland      |
| 26     | 174      | GRC       | Greece         | 69     | 144      | SWE       | Sweden         |
| 27     | 258      | GTM       | Guatemala      | 70     | 738      | TZA       | Tanzania       |
| 28     | 656      | GIN       | Guinea         | 71     | 578      | THA       | Thailand       |
| 29     | 336      | GUY       | Guyana         | 72     | 744      | TUN       | Tunisia        |
| 30     | 268      | HND       | Honduras       | 73     | 186      | TUR       | Turkey         |
| 31     | 944      | HUN       | Hungary        | 74     | 746      | UGA       | Uganda         |
| 32     | 534      | IND       | India          | 75     | 112      | GBR       | United Kingdom |
| 33     | 536      | IDN       | Indonesia      | 76     | 298      | URY       | Uruguay        |
| 34     | 429      | IRN       | Iran, I.R. of  | 77     | 299      | VEN       | Venezuela      |
| 35     | 178      | IRL       | Ireland        | 78     | 582      | VNM       | Vietnam        |
| 36     | 436      | ISR       | Israel         | 79     | 754      | ZMB       | Zambia         |
| 37     | 136      | ITA       | Italy          | 80     | 698      | ZWE       | Zimbabwe       |
| 38     | 343      | JAM       | Jamaica        |        |          |           |                |
| 39     | 439      | JOR       | Jordan         |        |          |           |                |
| 40     | 664      | KEN       | Kenya          |        |          |           |                |
| 41     | 544      | LAO       | Lao P.D.R.     |        |          |           |                |
| 42     | 446      | LBN       | Lebanon        |        |          |           |                |
| 43     | 666      | LSO       | Lesotho        |        |          |           |                |

Table 16a. Correlation Between Measures of Political Institutions (Small Sample)

|         | xconst  | polcon3 | WoverS  | polity  | voice   | democ   | reg |
|---------|---------|---------|---------|---------|---------|---------|-----|
| xconst  | 1       |         |         |         |         |         |     |
| polcon3 | 0.8549* | 1       |         |         |         |         |     |
| WoverS  | 0.8919* | 0.8243* | 1       |         |         |         |     |
| polity  | 0.9406* | 0.9148* | 0.8688* | 1       |         |         |     |
| voice   | 0.7143* | 0.7371* | 0.6925* | 0.7074* | 1       |         |     |
| democ   | 0.9518* | 0.9006* | 0.8894* | 0.9869* | 0.7467* | 1       |     |
| reg     | 0.7603* | 0.8308* | 0.7278* | 0.8574* | 0.6134* | 0.8459* | 1   |

Table 16b. Correlation Between Measures of Political Institutions (Large Sample)

|         | xconst  | polcon3 | WoverS  | polity  | voice   | democ   | reg |
|---------|---------|---------|---------|---------|---------|---------|-----|
| xconst  | 1       |         |         |         |         |         |     |
| polcon3 | 0.8555* | 1       |         |         |         |         |     |
| WoverS  | 0.8920* | 0.8335* | 1       |         |         |         |     |
| polity  | 0.9506* | 0.9099* | 0.8748* | 1       |         |         |     |
| voice   | 0.7119* | 0.6945* | 0.7392* | 0.6999* | 1       |         |     |
| democ   | 0.9564* | 0.9025* | 0.8973* | 0.9872* | 0.7409* | 1       |     |
| reg     | 0.7922* | 0.8714* | 0.7819* | 0.8686* | 0.6342* | 0.8648* | 1   |

\* Significant at 1 percent, \*\* significant at 5 percent, \*\*\* significant at 10 percent.

Note: See Appendix Table 13 for a description of these different measures of institutions.

Table 17. Monetary and Fiscal Policies and Macroeconomic Instability (Small Sample) 1/  
(Dependent variable is log of annual average CPI Inflation)

|                       | (1)                 | (2)                 | (3)             | (4)              | (5)             | (6)             |
|-----------------------|---------------------|---------------------|-----------------|------------------|-----------------|-----------------|
| Log money growth      | 1.163<br>(28.38)*** | 1.228<br>(18.69)*** |                 |                  |                 |                 |
| Budget Balance/GDP    |                     |                     | 0.068<br>(0.29) | -0.423<br>(0.44) |                 |                 |
| Govt. Consumption/GDP |                     |                     |                 |                  | 0.459<br>(1.00) | 0.184<br>(0.26) |
| Estimation method     | OLS                 | IV                  | OLS             | IV               | OLS             | IV              |
| R-squared             | 0.92                | 0.31                | 0.00            | 0.02             | 0.04            | 0.00            |
| Observations          | 42                  | 42                  | 42              | 42               | 42              | 42              |

1/ Corresponds to Table 2a.

Table 18. Policies Versus Deep Determinants (Small Sample) 1/  
(Dependent variable is log of annual average CPI Inflation)

|                                   | (1)                 | (2)                 | (3)                | (4)                | (5)                | (6)                |
|-----------------------------------|---------------------|---------------------|--------------------|--------------------|--------------------|--------------------|
| Openness                          | -0.160<br>(1.38)    | -0.125<br>(1.07)    | -0.709<br>(2.22)** | -0.884<br>(2.23)** | -0.812<br>(2.60)** | -0.776<br>(2.25)** |
| Democratic political institutions | -0.323<br>(2.92)*** | -0.308<br>(2.68)**  | -0.592<br>(2.21)** | -0.590<br>(1.67)   | -0.490<br>(1.83)*  | -0.534<br>(1.98)*  |
| Inequality                        | 0.106<br>(1.14)     | 0.077<br>(0.91)     | 0.521<br>(2.07)**  | 0.642<br>(1.83)*   | 0.660<br>(3.07)*** | 0.630<br>(2.94)*** |
| Log money growth                  | 1.088<br>(15.87)*** | 1.148<br>(12.02)*** |                    |                    |                    |                    |
| Budget balance/GDP                |                     |                     | -0.030<br>(0.12)   | -0.812<br>(0.87)   |                    |                    |
| Government consumption/GDP        |                     |                     |                    |                    | 0.783<br>(2.02)**  | 0.525<br>(1.22)    |
| Estimation method                 | IV                  | IV                  | IV                 | IV                 | IV                 | IV                 |
| R-squared                         | 0.93                | 0.46                | 0.24               | 0.25               | 0.35               | 0.21               |
| Observations                      | 44                  | 44                  | 43                 | 43                 | 46                 | 46                 |

1/ Corresponds to Table 4a.

Table 19. Robustness to Alternative Measures of Political Institutions (Small Sample) 1/  
(Dependent variable is log of annual average CPI Inflation)

|                   | (1)                | (2)                | (3)                | (4)                | (5)                | (6)                |
|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Openness          | -0.738<br>(2.43)** | -0.932<br>(2.48)** | -0.704<br>(2.05)** | -0.683<br>(2.02)** | -0.807<br>(2.29)** | -0.637<br>(1.92)*  |
| Inequality        | 0.620<br>(2.56)**  | 0.510<br>(1.96)*   | 0.555<br>(2.27)**  | 0.592<br>(2.35)**  | 0.604<br>(2.23)**  | 0.539<br>(2.27)**  |
| Polcon3           | -0.682<br>(2.41)** |                    |                    |                    |                    |                    |
| Checks            |                    | -0.862<br>(1.96)*  |                    |                    |                    |                    |
| Democ             |                    |                    | -0.630<br>(2.33)** |                    |                    |                    |
| Polity            |                    |                    |                    | -0.685<br>(2.28)** |                    |                    |
| Voice             |                    |                    |                    |                    | -0.694<br>(2.21)** |                    |
| WoverS            |                    |                    |                    |                    |                    | -0.570<br>(2.31)** |
| Estimation method | IV                 | IV                 | IV                 | IV                 | IV                 | IV                 |
| R-squared         | 0.23               | 0.23               | 0.23               | 0.23               | 0.23               | 0.24               |
| Observations      | 46                 | 46                 | 46                 | 46                 | 46                 | 45                 |

1/ Corresponds to Table 6a.

Table 20. Robustness to Covariates (Small Sample) 1/  
(Dependent variable is log of annual average CPI Inflation)

|                                   | (1)                | (2)                 | (3)                 | (4)                | (5)                 | (6)                | (7)                |
|-----------------------------------|--------------------|---------------------|---------------------|--------------------|---------------------|--------------------|--------------------|
| Openness                          | -0.570<br>(1.06)   | -0.869<br>(3.02)*** | -0.897<br>(2.99)*** | -0.736<br>(2.19)** | -0.823<br>(2.78)*** | -0.781<br>(2.33)** | -0.741<br>(2.25)** |
| Democratic political institutions | -2.275<br>(2.43)** | -0.257<br>(0.60)    | -0.225<br>(0.58)    | -0.538<br>(2.03)** | -0.285<br>(0.64)    | -0.574<br>(1.57)   | -0.620<br>(2.42)** |
| Inequality                        | 0.547<br>(1.66)    | 0.566<br>(2.35)**   | 0.556<br>(2.35)**   | 0.718<br>(2.82)*** | 0.680<br>(2.97)***  | 0.645<br>(2.67)**  | 0.585<br>(2.49)**  |
| Initial per capita (PPP) income   | 1.358<br>(2.36)**  |                     |                     |                    |                     |                    |                    |
| Standard deviation of real growth |                    | 0.204<br>(0.84)     |                     |                    |                     |                    |                    |
| Worst output drop                 |                    |                     | 0.066<br>(1.03)     |                    |                     |                    |                    |
| Terms of Trade (TOT) Growth       |                    |                     |                     | 0.432<br>(1.03)    |                     |                    |                    |
| Standard Deviation of TOT Growth  |                    |                     |                     |                    | 0.509<br>(0.88)     |                    |                    |
| Revolutions & Coups               |                    |                     |                     |                    |                     | 0.056<br>(0.18)    |                    |
| French Legal Origin               |                    |                     |                     |                    |                     |                    | 0.193<br>(0.96)    |
| Socialist Legal Origin            |                    |                     |                     |                    |                     |                    | 0.228<br>(0.84)    |
| Estimation method                 | IV                 | IV                  | IV                  | IV                 | IV                  | IV                 | IV                 |
| R-squared                         | 0.33               | 0.38                | 0.41                | 0.31               | 0.43                | 0.35               | 0.32               |
| Observations                      | 42                 | 41                  | 41                  | 45                 | 45                  | 44                 | 46                 |

1/ Corresponds to Table 7a.

Table 21. Robustness to Sample Composition (Small Sample) 1/  
(Dependent variable is log of annual average CPI Inflation)

| Omitted Observations              | BRA, ARG, NIC       |                    |                   | Latin               | sub-Saharan        | OECD               |
|-----------------------------------|---------------------|--------------------|-------------------|---------------------|--------------------|--------------------|
|                                   | BOL, PER            | NGA                | None              | America             | Africa             |                    |
|                                   | (1)                 | (2)                | (3)               | (4)                 | (5)                | (6)                |
| Openness                          | -0.312<br>(1.24)    | -0.734<br>(2.23)** | -0.588<br>(1.78)* | -0.298<br>(0.95)    | -0.978<br>(2.52)** | -0.752<br>(2.19)** |
| Democratic political institutions | -0.635<br>(3.68)*** | -0.701<br>(2.56)** | -0.839<br>(1.60)  | -0.689<br>(3.38)*** | -1.304<br>(2.69)** | -0.666<br>(1.39)   |
| Inequality                        | 0.209<br>(1.45)     | 0.575<br>(2.40)**  | 0.193<br>(0.74)   | 0.114<br>(0.69)     | 0.741<br>(2.35)**  | 0.629<br>(2.07)**  |
| Latin America dummy               |                     |                    | 1.087<br>(1.89)*  |                     |                    |                    |
| Sub-Saharan Africa dummy          |                     |                    | -0.284<br>(0.33)  |                     |                    |                    |
| North Africa/Middle East dummy    |                     |                    | -1.127<br>(1.25)  |                     |                    |                    |
| Estimation method                 | IV                  | IV                 | IV                | IV                  | IV                 | IV                 |
| R-squared                         | 0.23                | 0.26               | 0.44              | 0.31                | 0.41               | 0.21               |
| Observations                      | 41                  | 45                 | 46                | 28                  | 33                 | 42                 |

1/ Corresponds to Table 8a.

In column 3, the political institutions variable becomes significant if either of the insignificant regional dummies is dropped.

Table 22. Alternative Sources of Conflict (Small Sample) 1/  
(Dependent variable is log of annual average CPI Inflation)

|  | (1)                | (2)                | (3)               | (4)               |
|--|--------------------|--------------------|-------------------|-------------------|
| Openness                                     | -0.671<br>(2.07)** | -0.723<br>(2.12)** | -0.564<br>(1.85)* | -0.584<br>(1.91)* |
| Democratic political institutions            | -0.552<br>(1.42)   | -0.654<br>(2.06)** | -0.437<br>(1.05)  | -0.558<br>(1.76)* |
| Inequality                                   | 0.542<br>(2.19)**  | 0.582<br>(2.30)**  |                   |                   |
| Ethnic Fractionalization (Alesina et. al.)   | 0.087<br>(0.38)    |                    | 0.224<br>(0.96)   |                   |
| Religion Fractionalization (Alesina et. al.) | -0.015<br>(0.07)   |                    | -0.051<br>(0.23)  |                   |
| Ethnic Fractionalization (Fearon)            |                    | -0.041<br>(0.21)   |                   | 0.092<br>(0.53)   |
| Estimation method                            | IV                 | IV                 | IV                | IV                |
| R-squared                                    | 0.24               | 0.24               | 0.16              | 0.15              |
| Observations                                 | 46                 | 46                 | 47                | 47                |

1/ Corresponds to Table 9a.

Table 23. Central Bank Independence (CBI) as Institutional Reform 1/

**Panel A. Is CBI a Proximate Determinants of Nominal Macroeconomic Instability?**  
(Dependent variable is log of annual average CPI Inflation)

|                                      | (1)             | (2)                | (3)              | (4)                |
|--------------------------------------|-----------------|--------------------|------------------|--------------------|
| Central Bank Independence (Legal)    | 0.018<br>(0.11) |                    | -0.053<br>(0.31) |                    |
| Central Bank Independence (Turnover) |                 | 0.727<br>(5.47)*** |                  | 0.669<br>(5.03)*** |
| Estimation method                    | OLS             | OLS                | IV               | IV                 |
| R-squared                            | 0.00            | 0.29               | 0.00             | 0.17               |
| Observations                         | 69              | 68                 | 58               | 61                 |

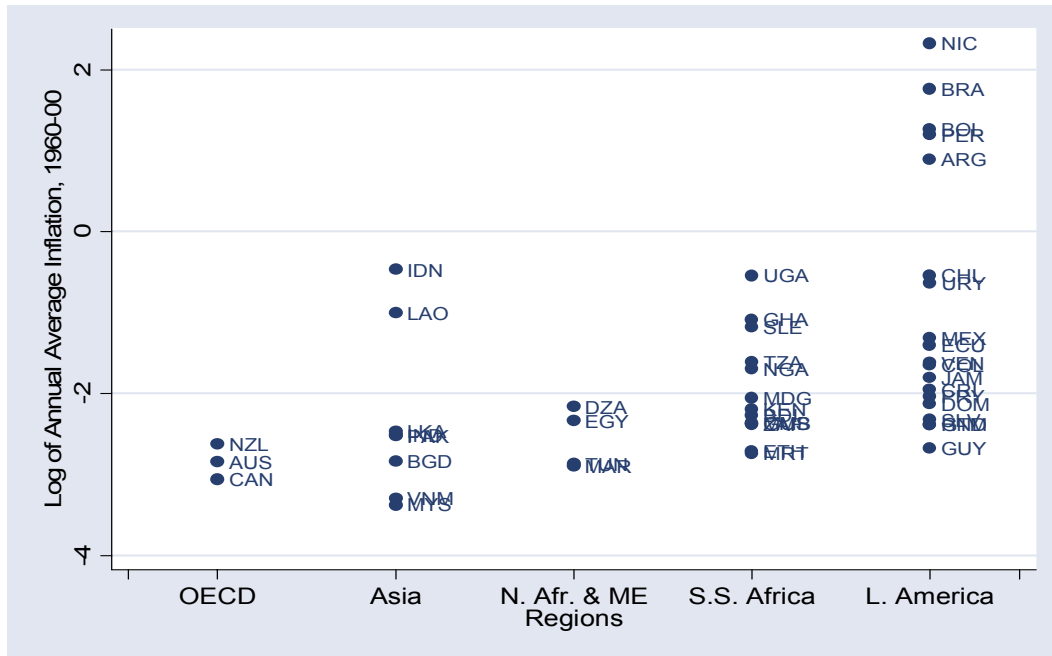
**Panel B. Role of CBI Versus Deep Determinants**  
(Dependent variable is log of annual average CPI Inflation)

|                                      | Small Sample       |                    | Large Sample       |                    |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|
|                                      | (1)                | (2)                | (3)                | (4)                |
| Openness                             | -0.495<br>(1.17)   | -0.509<br>(1.25)   | 0.145<br>(0.44)    | 0.041<br>(0.12)    |
| Democratic political institutions    | -0.685<br>(2.74)** | -0.699<br>(2.77)** | -0.342<br>(2.26)** | -0.357<br>(2.18)** |
| Inequality                           | 0.544<br>(2.61)**  | 0.546<br>(2.58)**  | 0.164<br>(1.23)    | 0.183<br>(1.31)    |
| Central Bank Independence (Turnover) | 0.620<br>(3.15)*** | 0.573<br>(3.59)*** | 0.660<br>(4.23)*** | 0.522<br>(3.24)*** |
| Estimation method                    | IV                 | IV                 | IV                 | IV                 |
| R-squared                            | 0.60               | 0.33               | 0.47               | 0.36               |
| Observations                         | 27                 | 27                 | 51                 | 49                 |

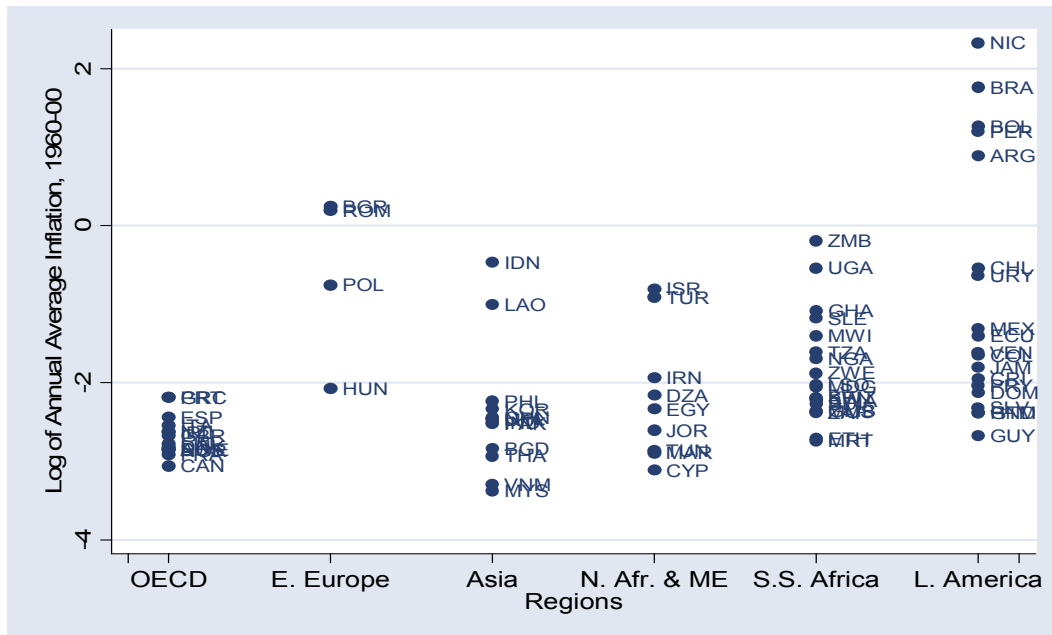
1/ Corresponds to Table 10.

**Figure 3. Inflation Performance by Region**  
(log of average annual inflation (CPI))

**Panel A. Small Sample**



**Panel B. Large Sample**





## References

- Acemoglu, Daron, Simon Johnson, and James Robinson, 2001, "The Colonial Origins of Comparative Development: An Empirical Investigation," *American Economic Review*, Vol. 91 (December), pp. 1369–1401.
- , and Yunyong Thaicharoen, 2003a, "Institutional Causes, Macroeconomic Symptoms: Volatility, Crises, and Growth," *Journal of Monetary Economics*, Vol. 50 (January), pp. 49–123.
- , and James Robinson, 2003b, "An African Success Story: Botswana" In *Search of Prosperity: Analytic Narratives on Economic Growth*, ed. by Dani Rodrik, (Princeton and Oxford: Princeton University Press).
- Albouy, David, 2004, "The Colonial Origins of Comparative Development: A Re-Investigation of the Data," (unpublished; Berkeley: University of California).
- Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, and Sergio Kurlat, 2003, "Fractionalization," *Journal of Economic Growth*, Vol. 8, No. 2, pp. 155–94.
- Alesina, Alberto, and Allan Drazen, 1991, "Why are Stabilizations Delayed," *American Economic Review*, LXXXI, pp. 1170-88.
- Alvarez, Michael, Jose Cheibub, Fernando Limongi, and Adam Przeworski, 2000, *Democracy and Development: Political Institutions and Material Well Being in the World*, (New York: Cambridge University Press).
- Barro, Robert, 1996, *Getting it Right: Markets and Choices in a Free Society*, (Cambridge, Massachusetts: MIT Press).
- , and Jong-Wha Lee, 1994, "Dataset for a Panel of 138 Countries," Available via the Internet: <http://www.nber.org/pub/barro.lee/readme.txt>.
- Barro, Robert and Xavier Sala-i-Martin, 2003, *Economic Growth*, (Cambridge, Massachusetts: MIT Press).
- Bates, Robert, 1981, *Markets and States in Tropical Africa*, (Berkeley: University of California Press).
- Belsey, D.A., E. Kuh, and R.E. Welsch, 1980, *Regression Diagnostics*, (New York: John Wiley and Sons).
- Bevan, D., P. Collier, J.W. Gunning, 1999, *The Political Economy of Poverty, Equity, and Growth: Nigeria and Indonesia*, (Oxford: Oxford University Press).
- Bueno de Mesquita, Bruce, Alastair Smith, Randolph M. Siverson and James D. Morrow, 2003, *The Logic of Political Survival*, (Cambridge, Massachusetts: MIT Press (NYU website)).
- Calvo, Guillermo and Frederic Mishkin, "The Mirage of Exchange Rate Regimes for Emerging Market Countries," (forthcoming) *Journal of Economic Perspectives*.

- Campillo, Marta and Jeffrey Miron, 1996, "Why Does Inflation Differ Across Countries?," NBER Studies of Business Cycle No. 30.
- Cardoso, E., and A. Helwege, 1991, "Populism, Profligacy, and Redistribution," in *The Macroeconomics of Populism in Latin America*, ed. by R. Dornbusch and S. Edwards, (Chicago and London: NBER Conference Report, Chicago University Press).
- Cukierman, Alex, Stephen Webb, and Bilin Neyapti, 1992, "Measuring Central Bank Independence and its Effects on Economic Outcomes," *World Bank Economic Review*, Vol. 6, No. 3 (September), pp. 353–98.
- Cukierman, Alex, Sebastian Edwards, and Guido Tabellini, 1992, "Seigniorage and Political Instability," *American Economic Review*, Vol. 82, No. 3, pp. 537-55.
- Deininger, Klaus, and Lyn Squire, 1996, "A New Dataset Measuring Income Inequality," *World Bank Economic Review*, Vol. 10, No. 3, pp. 565–91.
- Desai, Raj, Anders Olofsgard, and Tarik Yousef, 2003, "Democracy, Inequality, and Inflation," *American Political Science Review*, Vol. 97, No. 3, (August).
- Dornbusch, Rudiger and Sebastian Edwards, 1991, *The Macroeconomics of Populism in Latin America*, (Chicago and London: NBER Conference Report, University of Chicago Press).
- Easterly, William, and Ross Levine, 1997, "Africa's Growth Tragedy: Policies and Ethnic Divisions," *Quarterly Journal of Economics*, 112, No. 4, pp. 1203-50.
- Eichengreen, Barry, Ricardo Hausmann, and Ugo Panizza, 2003, "Currency Mismatches, Debt Intolerance, and Original Sin: Why they are not the Same and Why it Matters," NBER Working Paper No. 10036, (Cambridge, Massachusetts: National Bureau of Economic Research).
- Fearon, James, 2003, "Ethnic and Cultural Diversity by Country," *Journal of Economic Growth*, Vol. 8, No. 2, pp. 195–222.
- Fischer, S., Farewell Speech to the IMF's Executive Board, August 30, 2001. Available via the Internet: <http://www.imf.org/external/np/speeches/2001/sp01ind.htm>
- Frankel, Jeffrey, and David Romer, 1999, "Does Trade Cause Growth?," *American Economic Review*, Vol. 83, No. 3 (June), pp. 379–99.
- Giavazzi, Francesco, and Guido Tabellini, 2004, "Economic and Political Liberalizations," IGER Working Paper No. 264. Available via the Internet: [www.igier.uni-bocconi.it/en/who/tabellini.htm](http://www.igier.uni-bocconi.it/en/who/tabellini.htm)
- Gleditsch, Kristian, and Michael Ward, 1997, "Double Take: A Re-Examination of Democracy and Autocracy in Modern Polities." *Journal of Conflict Resolution* 41:361-383.

- Hall, Robert, and Charles Jones, 1999, "Why Do Some Countries Produce So Much More Output per Worker than Others?," *Quarterly Journal of Economics*, Vol. 114 (February) pp. 83–116.
- Henisz, Witold J., 2000, "The Institutional Environment for Economic Growth," *Economics and Politics*, Vol. 12, No. 1, pp. 1–31.
- Hirschman, A., 1985, "Reflections on the Latin American Experience," in *The Politics of Inflation and Economic Stagnation*, ed. by Lindberg. L.N., and C.S. Maier, (Washington: The Brookings Institution).
- Kaminsky, Graciela, Carmen Reinhart, and Carlos Végh, 2004, "When it Rains it Pours: Procyclical Capital Flows and Macroeconomic Policies," (forthcoming), National Bureau of Economic Research Working Paper.
- Kaufmann, Daniel, Art Kraay, and Pablo Zoido-Lobaton, 2002, "Governance Matters," Available via the Internet: [www.worldbank.org](http://www.worldbank.org)
- Kaufmann, R.R., and B. Stallings, 1991, "The Political Economy of Latin American Populism," in *The Macroeconomics of Populism in Latin America*, ed. by R. Dornbusch and S. Edwards, (Chicago and London: NBER Conference Report, Chicago University Press).
- Keefer, Philip, and David Stasavage, 2003, "The Limits of Delegation: Veto Players, Central Bank Independence and the Credibility of Monetary Policy," *American Political Science Review*, Vol. 98, No. 3 (August).
- Kose, Ayhan, Eswar Prasad, and Marco Terrones Silva, 2003, "Financial Integration and Macroeconomic Volatility," IMF Working Paper 3/50 (Washington: International Monetary Fund).
- Lindberg. L.N., and C.S. Maier, 1985, "The Politics of Inflation and Economic Stagnation," (Washington: The Brookings Institution).
- Mulligan, Casey, Ricard Gil, and Xavier Sala-i-Martin, 2004, "Do Democracies Have Different Public Policies than Non-Democracies," *Journal of Economic Perspectives*, Vol. 18, No. 1, pp. 51–74.
- Persson, Torsten, Gerard Roland, and Guido Tabellini, 1997, "Separation of Powers and Political Accountability," *The Quarterly Journal of Economics*, Vol. 112, No. 4 (November), pp. 1163–1202.
- Polity IV Project, Political Regime Characteristics and Transitions, 1800–2002, Monty G. Marshall and Keith Jagers, Principal Investigators, Monty G. Marshall, Project Director, Ted Robert Gurr, Founding Director, (Maryland: University of Maryland).
- Polity IV Project, 2004, Political Regime Characteristics and Transitions, 1800–2002. Available via the Internet: <http://www.cidcm.umd.edu/inscr/polity/>.
- Rajan, Raghuram, and Luigi Zingales, 2003, "The Great Reversals: The Politics of Financial Development in the Twentieth Century," *Journal of Financial Economics*, Vol. 69, No. 1, pp. 5-50.

- Reinhart, Carmen, Kenneth Rogoff, and Miguel Savastano, 2003, "Debt Intolerance," *Brookings Papers on Economic Activity*, 1, pp. 1-74.
- Reinhart, Carmen, and Kenneth Rogoff, 2004, "The Modern History of Exchange Rate Arrangements: A Reinterpretation," *Quarterly Journal of Economics*, Vol. 119, No. 1, pp.1-48.
- Rodrik, Dani, 1999, "Where Did All the Growth Go? External Shocks, Social Conflict and Growth Collapses," *Journal of Economic Growth*, (December).
- , and Arvind Subramanian, and Francesco Trebbi, 2004, "Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development," *Journal of Economic Growth*, Vol. 9, No. 2, pp.1-35.
- Rogoff, Kenneth, 2003, "Globalization and Global Disinflation," paper prepared for the Federal Reserve Bank of Kansas City conference on "Monetary Policy and Uncertainty: Adapting to a Changing Economy," Jackson Hole, Wyoming.
- Romer, David, 1993, "Openness and Inflation: Theory and Evidence," *Quarterly Journal of Economics*, Vol. 4, No.108, (November), pp. 869-903.
- Rowthorn, Robert, "Conflict, Inflation, and Money," 1977, *Cambridge Journal of Economics*, Vol. 1, No. 3, pp. 215-39.
- Sachs, Jeffrey, 1989, "Social Conflict and Populist Policies in Latin America," NBER Working Paper No. 2897 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Seldon, A., 1975, "Preface" in "F.A. Hayek, Full Employment at Any Price?," Occasional Paper No. 45, (London: Institute of Economic Affairs).
- Sen, Amartya, 1999, "Democracy as a Universal Value," *Journal of Democracy*, Vol. 10 No. 3, pp. 3-17.
- Stock, James, and Motohiro Yogo, 2004, "Testing for Weak Instruments in Linear IV Regressions," in D.W.K. Andrews and James Stock (eds.) *Festschrift in Honor of Thomas Rothenberg*, (Cambridge: Cambridge University Press).
- Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh, 2001, "New Tools and New Tests in Comparative Political Economy," The Database of Political Institutions, *World Bank Economic Review*, (September), Vol. 15, No. 1, pp. 165–76.
- World Income Inequality (WIDER) database, 2000. Available via the Internet: <http://www.wider.unu.edu/wiid/wiid-introduction.htm>