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Institutions, Program Implementation, and Macroeconomic Performance

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Abstract

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

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This paper assesses empirically the links among a country's institutions and political environment, its implementation of IMF-supported programs, and macroeconomic performance in a sample of 197 programs approved between 1992 and 2002. We find that a stronger institutional and political environment is associated with better macroeconomic outcomes, especially at longer time horizons. This direct beneficial effect of institutions on macroeconomic outcomes is in addition to their indirect effect through better program implementation. We also find that program implementation exerts an independent influence on macroeconomic outcomes, especially over shorter time horizons of up to two years. Better-implemented programs are associated with lower inflation and with initially weaker but ultimately stronger external and fiscal outcomes, but with a statistically insignificant impact on economic growth.

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I. INTRODUCTION

The quality of a country's institutions—broadly defined to include the formal and informal rules of economic and political interactions—is a key determinant of sustainable economic progress. Weak institutions are behind many development failures (IMF, 2003; Rodrik, Subramanian, and Trebbi, 2002; North, 1997). Institutional failings are also responsible for the lackluster implementation of some IMF-supported programs. Some developing and transition economies participating in IMF-supported reforms are bedeviled by corruption, weak and uneven enforcement of property rights, and other institutional flaws. These institutional drawbacks have increasingly become the focus of concern for the IMF and other international financial and development organizations. These institutions have made structural reform a key component of their conditionality.

Despite the significance of a country's institutions for its macroeconomic performance, the empirical literature on IMF-supported reforms lacks a systematic quantitative assessment of their importance. Most evaluations of IMF-supported programs ignore the effect on macroeconomic performance of variation in institutions, either across countries or over time within a country. These evaluations are also generally inconclusive: although inflation, the balance of payments, and the public finances seem to improve in countries that adopt IMF-supported programs, the effect on economic growth is ambiguous.²

The quality of a country's institutions also shapes the extent to which it succeeds in implementing its IMF-supported programs. Program implementation, in turn, is a key determinant of program success or failure. Yet, until recently, most studies simply captured countries' participation (or time spent) in programs and did not consider how variation in program implementation affects macroeconomic outcomes. This is an important omission, because a large proportion of IMF-supported programs are known to experience major interruptions (see Ivanova, Mayer, Mourmouras, and Anayiotos [IMMA], 2003; Mecagni, 1999). Recently, the literature has begun to investigate the incidence and determinants of program implementation and their macroeconomic consequences (IMMA, Joyce, 2003, and Dreher, 2004).

This paper sets out to measure the effect of variation in institutional quality on the macroeconomic performance of countries implementing IMF-supported programs. Building on the recent literature, it develops a quantitative framework to assess empirically the links among a country's institutions and political environment, its implementation of IMF-supported programs, and macroeconomic performance. We first update the results on program implementation reported in IMMA. When the outcomes of 25 additional programs are added to the IMMA sample, the rate of program interruption continues to be high, exceeding 40 percent. We then assess the effect of institutions on program implementation and

² This is understandable, given the econometric difficulties of constructing counterfactuals and the long and variable lags between progress in microeconomic and structural policies and improvements in economic performance. Haque and Khan (1998) discuss the problem of the counterfactual and the stylized facts of Fund-supported programs.

macroeconomic performance using four indicators of performance: inflation, economic growth, the balance of payments, and the fiscal balance. Our measures of program implementation come from the Fund's Monitoring of Fund Arrangements (MONA) database, which contains detailed information on a large number of IMF-supported programs approved since the early 1990s. Information on borrowing countries' institutions and domestic politics comes from the International Country Risk Guide (ICRG).

Our empirical framework is flexible, designed to take into account the time series properties of macroeconomic variables and the endogeneity of program implementation. In the data, inflation, growth, and most other macroeconomic indicators tend to be highly serially correlated and mean-reverting. We therefore examine the impact of institutions, politics, and program implementation taking into account the autoregressive structure of most macroeconomic and institutional variables, using a methodology suggested by the literature on the error correction mechanism. Instrumental variables are used to deal with the endogeneity bias that exists because macroeconomic shocks also impact program performance.

Our findings are mixed. When the endogeneity of program implementation is properly accounted for, we find that institutions and program implementation both matter for macroeconomic performance. The response of macroeconomic variables to programs is often nonmonotonic, however. For example, although better-implemented programs are associated with lower inflation rates, the fiscal and external current account balances typically deteriorate for two years after program approval before they turn around. And, as in previous work, we could not detect statistically significant associations between program implementation and economic growth at any time during the three years following program approval.

The paper is structured as follows. Section II sets the stage for the empirical analysis. It describes the measures of program implementation and institutional development used and presents descriptive statistics. Section III describes the econometric methodology and main results. Section IV concludes.

II. MEASURING PROGRAM IMPLEMENTATION AND INSTITUTIONAL DEVELOPMENT

A. Overview

Disbursements of IMF loans are tied to prior actions by the recipient country, the observance of performance criteria, and the completion of program reviews, and thus to fulfillment of conditionality. Breaches of conditionality can lead to program interruptions unless the Fund issues waivers. Such waivers are issued when the Fund judges the breach to be minor or temporary, or if the authorities and the Fund agree on corrective action to keep the program on track. Following IMMA (2003), we use two complementary measures of program implementation. The first measure captures the premature "cancellation" of an IMF-supported program. This index is a binary variable indicating whether a program experienced a major and irreversible interruption. An "irreversible" interruption occurs when either the last scheduled program review was not completed, or all scheduled reviews were completed but the subsequent annual arrangement was not approved. For the empirical analysis, the irreversible interruption index was updated by incorporating information from MONA on the

implementation of several recent programs. The second implementation measure is the ratio of disbursements to commitments. It is a continuous variable indicating the share of available IMF credit actually drawn. This measure contains information on actual program duration and the extent to which the IMF's financial commitments under the program were fulfilled.³

A variety of indicators can be used to assess the institutional and political setting in countries participating in IMF-supported programs. The choice of indicators depends on a variety of considerations, including country and time coverage and the ability of different measures to capture various aspects of governance. We focus on the ICRG political risk indicators, which allow us to ascertain the short- and medium-term impacts of the political and institutional environment on economic performance and program implementation. Somewhat arbitrarily, we divide the 12 ICRG components into two groups. The first group proxies for basic institutional quality, protection of property rights, and contract enforcement. It includes indices for the Investment Profile, Corruption in Government, Law and Order, and the Quality of the Bureaucracy. The second group serves as a proxy for political outcomes. It is captured by the following variables: Government Stability, Socioeconomic Conditions, Internal Conflict, External Conflict, Military in Politics, Religious Tensions, Ethnic Tensions, and Democratic Accountability. These variables provide useful information about the internal and external political factors influencing program implementation and economic performance.⁴

B. Descriptive Statistics

Table 1 updates the results on program implementation presented in IMMA (2003). In our sample of 197 IMF programs approved between 1992 and 2002, 41 percent of all programs (including precautionary arrangements) experienced an irreversible interruption, compared with about 44 percent reported in IMMA (2003). Countries with fewer program interruptions tend to have higher disbursement rates: the correlation coefficient between program interruptions and the disbursement share is -0.7 (Table 2). When precautionary arrangements are excluded, the average disbursement share is approximately 75 percent, compared with 71 percent in the sample examined by IMMA (2003). The improvement in implementation reflects the fact that our sample contains more Stand-by Arrangements, which tend to have fewer interruptions than programs supported under the Extended Fund Facility and the Poverty Reduction and Growth Facility.

Improvements in the institutional climate, as reflected in higher ICRG indicators, are generally positively correlated with better program implementation, as measured by higher disbursement shares and fewer program interruptions. As in earlier studies (Dollar and Svensson, 2000; IMMA, 2003), greater government stability and a stronger investment profile in the year immediately preceding program approval are both associated with fewer interruptions (Table 3). On average, the risk of program interruption is much lower in

³ Killick (1995) introduced this measure as a proxy for compliance. It is subject to some well known deficiencies, including the fact that it does not adequately capture economic performance under precautionary programs.

⁴ See the ICRG Guide to the Rating System for details (www.prsonline.com).

environments in which governments are friendlier to inward foreign investment and are better able to carry out their program, as measured by ICRG scores. Improvements in the investment profile over a horizon of approximately two years after the beginning of a program lead to significantly fewer interruptions. Lower corruption (strictly speaking, lower political risk associated with corruption, as indicated by a higher ICRG score) and improvements in socioeconomic conditions in the year after program approval are also associated with better implementation of conditionality as measured by the quantitative implementation index.

The political and institutional climate in countries in which programs are interrupted varies systematically from that in countries in which programs are completed. Figure 1 plots the average change in each of the ICRG variables during the program relative to the last preprogram year, distinguishing between interrupted and uninterrupted programs. Program interruptions are associated with less progress in improving the investment climate and in the quality of the bureaucracy, and with intensified internal conflict: countries that suffer sharp increases in political violence tend to see their IMF-supported programs interrupted within two years after program initiation. Successful program implementation is associated with greater initial influence of the military, followed by a significant reduction in subsequent years. Program interruptions tend to be accompanied by sharp increases in the military's involvement in the third and fourth year after program approval.

Countries completing IMF programs appear to be more successful in reducing inflation than countries that experience program interruptions, as reflected in mean changes in macroeconomic outcomes between period $T - 1$ and five different horizons (Figure 2). Uninterrupted programs are also associated with sharp improvements in fiscal balances in the first year of the program, followed by a gradual deterioration in subsequent years. On the other hand, countries whose programs are interrupted register very modest improvements in fiscal balances initially but then catch up with the others. The external current account balance improves in countries whose programs do not get interrupted. Interrupted programs are associated with slight improvements in the current account in the year immediately following program approval, followed by steady deterioration.

Correlation analysis and comparisons of macroeconomic performance in completed versus interrupted programs, although suggestive, mask a great deal of variability in the data. Each country starts from different initial economic, institutional, and political conditions. While they are engaged in IMF-supported programs, countries are subject to a variety of external and internal shocks that influence macroeconomic outcomes and program implementation. We now turn to a more rigorous econometric methodology to properly take into account this broad spectrum of country-specific effects.

III. ECONOMETRIC METHODOLOGY AND RESULTS

A. Methodology

Most empirical research on the macroeconomic effects of IMF-supported programs relies on panel data. Our framework, by contrast, relies on a pooled dataset in which each program is treated as an independent observation in the context of a statistical model that takes into account the short-run autoregressive, mean-reverting nature of macroeconomic variables. We

assess the impact of program implementation on growth, inflation, and the fiscal and external balances once country-specific institutional and political effects are taken into account. Similar to the “before-and-after approach,” our approach compares macroeconomic outcomes under the program with those in the last preprogram year for a sample of countries that chose to participate in such programs. We do not address issues related to sample selection bias, i.e., the systematic differences between countries that agree to participate in IMF-supported programs and those that do not. Our focus is on a narrower question. Given that certain countries do self-select into the “treatment” of IMF-supported programs, we ascertain the relative effect of program implementation and institutions on macroeconomic outcomes.

Consider $M_{i,T}$, a macroeconomic variable observed at time T in country i . Since we consider macroeconomic development only in countries implementing IMF-supported programs, the index i is also a unique country-program identifier. Following Atoian, Conway, Selowsky, and Tsikata (ACST, 2003), the evolution of $M_{i,T}$ can be represented by

$$\Delta M_{i,T} = f(X_{i,T-1}, IMPL_i, INST_{i,T-1}, \Delta INST_{i,T}), \quad (1)$$

where $X_{i,T-1}$ is a vector of non-institutional forcing variables at time $T - 1$ that also includes a random term in time T , $IMPL_i$ is the measure of program implementation in country i , $INST_{i,T-1}$ is a vector of domestic political and institutional initial conditions, $\Delta INST_{i,T}$ is a vector of contemporaneous changes in country i 's political and institutional environment, and $f(.)$ is the reduced-form data-generating process.⁵

A simple example may be useful in illustrating equation (1). Assume that macroeconomic variables are influenced by their own values in previous periods, because of institutional or psychological inertia.⁶ In particular, for purposes of this example, assume that growth, inflation, and the current account and fiscal balances follow second-order autoregressive, or AR(2), processes:

$$M_{i,T} = \beta_0 + \beta_1 M_{i,T-1} + \beta_2 M_{i,T-2} + \beta_3 IMPL_i + \beta_4 INST_{i,T-1} + \beta_5 \Delta INST_{i,T} + \varepsilon_{i,T}^M, \quad (2)$$

where $\varepsilon_{i,T}^M$ is a stochastic disturbance to M . This specification is preferred as longer lag structures proved to be statistically unnecessary (see Atoian, Conway, Tsikata, and Selowsky (ACST), 2003). Subtracting $M_{i,T-1}$ from both sides yields

⁵ Because the institutional and political variables capture all country-specific effects, we do not include country dummies in our specification. This conserves degrees of freedom.

⁶ Kennedy (1998, Chapter 9) provides a detailed discussion and clear derivation of autoregressive representation from the partial adjustment model setup.

$$M_{i,T} - M_{i,T-1} = \beta_0 + \beta_1 M_{i,T-1} - (\beta_2 - \beta_2 + 1)M_{i,T-1} + \beta_2 M_{i,T-2} + \beta_3 IMPL_i + \beta_4 INST_{i,T-1} + \beta_5 \Delta INST_{i,T} + \varepsilon_{i,T}^M \quad (3)$$

The last equation can be written as

$$\Delta M_{i,T} = \gamma_0 + \gamma_1 \Delta M_{i,T-1} + \gamma_2 M_{i,T-1} + \gamma_3 IMPL_i + \gamma_4 INST_{i,T-1} + \gamma_5 \Delta INST_{i,T} + \varepsilon_{i,T}^M \quad (4)$$

where $\gamma_0 = \beta_0$, $\gamma_1 = -\beta_2$, $\gamma_2 = (\beta_1 + \beta_2 - 1)$, $\gamma_3 = \beta_3$, $\gamma_4 = \beta_4$, and $\gamma_5 = \beta_5$. Equation (4) is the “autoregressive and mean-reversion form,” as it includes both lagged differences and the lagged level as the regressors for the current first-difference of variable M . It captures the autoregressive structure of M via the first-difference term $\Delta M_{i,T-1}$. The adjustment of M in response to deviations from its “normal” historical value is captured via the mean-reversion term $M_{i,T-1}$. The coefficient γ_2 is a partial adjustment coefficient. It shows what percentage of the deviation from the long-run equilibrium will be covered each year following the deviation. Note that because $\gamma_2 = (\beta_1 + \beta_2 - 1)$, small negative values of the coefficient are consistent with M being highly persistent.⁷

Equation (4) holds for all T and i , including periods when IMF-supported programs are in effect. As these programs are designed to improve macroeconomic performance, equation (4) incorporates their effect into the model. Equation (4) also captures the impact of institutional and political conditions on the macroeconomy. In implementing equation (4) we treat institutional and political developments during the IMF-supported program as exogenous and mean-reverting. Including first differences and lagged levels of institutional variables in the regressions assumes that there are long-run levels of institutional development and that deviations from these levels are temporary.⁸ This view of institutions is certainly valid in analyzing short-term programs such as Stand-by Arrangements. It is probably less appropriate for programs with greater structural orientations, such as those supported under the Extended Fund Facility and the Poverty Reduction and Growth Facility, which aim to improve the supply response of the economy. The nature of institutional change that takes place in the context of IMF-supported programs is ultimately an empirical question. In the event, there is

⁷ Despite being quite persistent processes, the macroeconomic variables used in our regressions are stationary or mean-reverting—that is, $\beta(1) = 1 - \beta_1 - \beta_2$ is significantly different from zero. Our results do not change significantly if we fit a model that contains only autoregressive terms.

⁸ Note that excluding contemporaneous changes in institutions from the model addresses a potential endogeneity problem that is present if the error term affecting macroeconomic variables also affects institutional developments during the program period.

little correlation in the data between program implementation and institutional development (bottom panel of Table 3, first two columns).⁹

We estimate the following system of equations, one for each macroeconomic outcome variable (inflation, economic growth, the fiscal balance, and the current account balance):

$$\begin{aligned}
 \Delta INFL_{i,T} &= \gamma_0^I + \gamma_1^I \Delta INFL_{i,T-1} + \gamma_2^I INFL_{i,T-1} + \gamma_3^I IMPL_i + \gamma_4^I INST_{i,T-1} + \gamma_5^I \Delta INST_{i,T} + \varepsilon_{i,T}^I \\
 \Delta GROWTH_{i,T} &= \gamma_0^G + \gamma_1^G \Delta GROWTH_{i,T-1} + \gamma_2^G GROWTH_{i,T-1} + \gamma_3^G IMPL_i + \gamma_4^G INST_{i,T-1} + \gamma_5^G \Delta INST_{i,T} + \varepsilon_{i,T}^G \\
 \Delta BB_{i,T} &= \gamma_0^B + \gamma_1^B \Delta BB_{i,T-1} + \gamma_2^B BB_{i,T-1} + \gamma_3^B IMPL_i + \gamma_4^B INST_{i,T-1} + \gamma_5^B \Delta INST_{i,T} + \varepsilon_{i,T}^B \\
 \Delta CA_{i,T} &= \gamma_0^C + \gamma_1^C \Delta CA_{i,T-1} + \gamma_2^C CA_{i,T-1} + \gamma_3^C IMPL_i + \gamma_4^C INST_{i,T-1} + \gamma_5^C \Delta INST_{i,T} + \varepsilon_{i,T}^C
 \end{aligned} \tag{5}$$

Note that, in equations (5), monetary and fiscal policies are kept in the background. Program implementation serves as a proxy for the impact of macroeconomic policies on macroeconomic outcomes. As in IMMA (2003) and Dollar and Svensson (2000), the probability of implementation of an IMF-supported program is related to the underlying political and institutional factors in the borrowing country, to the Fund's financial and human resource effort into the program, and to initial economic conditions in the country. Although the probability of program implementation is unobservable, it is related to the observable implementation index:

$$IMPL_i = \theta_0 + \theta_1 INST_{i,T-1} + \theta_2 INITIAL_i + \theta_3 FUND_i + \varepsilon_i^{IMPL} \tag{6}$$

In equation (6) the θ s are vectors of coefficients. $INITIAL_i$ is a vector of initial conditions represented by the preprogram values of real GDP per capita, inflation, the GDP growth rate, the current account balance, and the fiscal balance. $FUND_i$ is a vector of program-specific variables that are important in determining program outcomes. These variables are either directly under the IMF's control or provide information about the nature of the relationship between the country and the Fund. Our regression approach in equation (6) is similar to that used in IMMA (2003).¹⁰

Since we are interested in several potentially mean-reverting macroeconomic indicators, a vector error correction model (VECM) could be considered. In equation (5), M would then represent a 4×1 vector of variables (inflation, growth rate, fiscal balance, and current account balance). We pursued this approach by estimating the augmented version of the VECM and comparing results with the ones obtained from estimating equations (5). The results confirm

⁹ An alternative approach would be to run regressions with only first differences of institutional variables. The qualitative results remained unchanged when we reestimated our regressions in this manner. This makes us confident that our results are robust.

¹⁰ The RESET test rejects adding higher-degree polynomials or interaction terms to the model.

the existence of a long-run relationship among some of the macroeconomic variables.¹¹ On the other hand, the marginal benefit of incorporating this information into our analysis, which focuses on the relative importance of program implementation and institutional factors for macroeconomic outcomes, seems small. If a VECM representation is adopted, the testing down approach on the institutional and political factors yields identical model specification to the one we already have. The estimated coefficients and their significance levels change only marginally relative to those obtained by considering only a variable's own autoregressive and mean-reversion terms. To simplify the presentation and economize on degrees of freedom, we do not present VECM results.¹² These are available from the authors.

The properties of the ordinary least squares (OLS) estimator in equations (5) depend on the stochastic properties of the explanatory variables, and in particular on whether or not they are distributed independently of the disturbance term. In addition, shocks to macroeconomic outcomes are likely to impact program implementation, implying that $Corr(IMPL_i, \varepsilon_{i,T}^M) \neq 0$. Consequently, the OLS estimator is likely to be biased. This can be seen by considering the case of a drought that lowers agricultural production and tax revenue and raises the budget deficit. The Fund could decide to issue waivers for the breaches in performance criteria and continue disbursements. A decision not to issue waivers, on the other hand, would result in a negative correlation between implementation and the error term.¹³

We employ two related instrumental variables (IV) techniques to correct for potential endogeneity bias. One is the two-stage least squares (2SLS) procedure, where we first regress the program implementation measure on the exogenous variables and a set of instruments that are correlated with the implementation measure but are not related to the error terms in equations (5). In the second stage we estimate the system of equations (5) by OLS using the predicted values of the implementation measures instead of the actual ones.¹⁴

¹¹ The coefficient on the lagged fiscal balance term is significant in the inflation equation. The lagged first difference and the lagged level of inflation are significant in the growth equation. The lagged first difference and the lagged level of the fiscal balance significantly influence the evolution of the current account.

¹² We formally tested a set of restrictions that turns VECM into the AR model. With the exception of the growth equation, we could not reject the null hypothesis that the data-generating process was indeed just an autoregression (the p-values were 0.15, 0.02, 0.15, and 0.40 for inflation, growth, fiscal balance, and current account balance, respectively).

¹³ The OLS estimator is still useful in model selection because it is less sensitive than the alternatives to the presence of multicollinearity, errors in variables, or misspecification, particularly in small samples. After relying on OLS to choose an appropriate model, we compare its predictions with those from the same model estimated by alternative means.

¹⁴ We use probit and tobit techniques, respectively, when estimating regressions in which the left-hand-side variables are the program interruption dummy and the disbursement share.

In general, it is difficult to find instruments that are related to program implementation but do not systematically affect economic performance. The best candidates are variables that describe the nature of the relationship between member countries and the IMF: a country's quota in the Fund; the cumulative time spent in an IMF-supported program (number of months in program mode since 1980); the amount approved in relation to the country's IMF quota; and the dollar cost of the program starting six months before program approval.¹⁵

Our second IV procedure is 3SLS. This has the advantage of incorporating information from the cross-correlations of the error terms in equations (5) and producing sharper (more efficient) parameter estimates.¹⁶ To arrive at 3SLS estimates, we use the 2SLS estimates to obtain an estimate of the contemporaneous variance-covariance matrix of the errors in equations (5). Applying the generalized least squares method to the transformed single-equation representation of the system yields 3SLS estimates. 3SLS estimates are consistent and asymptotically more efficient than 2SLS estimates.¹⁷

B. Model Specification

There is a broad consensus that domestic institutions and politics are key determinants of economic performance in countries borrowing from international financial institutions. There is less agreement on precisely which aspects of the institutional and political environment are especially important. Although all the ICRG indices could be included in the regression analysis, this would lead to collinearity problems and a loss of precision. On the other hand, omitting relevant institutional and political variables would lead to biased estimates.

This dilemma dictates a parsimonious approach to model specification. We use changes in macroeconomic variables over a one-year horizon following program approval as a testing horizon. This implicitly assumes that if a certain institution or political feature is important at high frequencies, it will also be influential over longer horizons. This strategy produces results that are robust with respect to the choice of program implementation measure.

Our model specification technology is described as a "testing down" approach. We start with an unrestricted model that includes all ICRG indices as regressors and then simplify it in light of sample evidence. Specifically, we estimate each of the equations in (5) separately while

¹⁵ An overidentifying restrictions test could not reject the null hypothesis of overidentified restrictions for either implementation measure.

¹⁶ A shock that affects economic growth has informational content for inflation, the fiscal deficit, and the external current account.

¹⁷ Although 3SLS is less robust to misspecification than 2SLS, the two approaches yield similar estimates. This provides some evidence that our reduced-form model is correctly specified.

systematically dropping regressors with low t -statistics. The adjusted R^2 is used as an additional consideration in model selection.¹⁸

Our results indicate that inflation in program countries is influenced considerably by such institutional factors as law and order, the quality of the bureaucracy, and the country's investment climate. On the political side, only variations in ethnic tension and internal conflict appear to matter for inflation. Economic growth is affected by the investment profile, government stability, and initial socioeconomic conditions.¹⁹ Corruption in the political system, democratic accountability, ethnic tension, external conflict, and military involvement in politics are important for the evolution of fiscal balances. Finally, corruption, ethnic tension and external conflict, government stability, the investment climate, and military participation in the country's political life have significant impact on the evolution of the current account.

C. Main Findings

What Determines Program Outcomes?

Table 4 presents first-stage regressions of the implementation measures on initial economic conditions, ICRG indicators during the year preceding program approval, and our instruments. To obtain the predicted values used in the second-stage regressions, we employ the complete model (columns 1 and 3). However, to overcome the collinearity problem discussed above, the discussion in the rest of this section relies on estimates (columns 2 and 4 of Table 4) that drop some of the ICRG indices that appear to be insignificant.

When the share of committed funds disbursed is used as a measure of program implementation, none of the variables reflecting initial economic conditions is significantly different from zero. This could suggest that programs are tailored to participating countries' circumstances or that their outcomes are independent of initial economic conditions (see IMMA, 2003).

Reduced ethnic tension and greater government stability before program approval improve program implementation. Coefficients on the ICRG ratings of ethnic tensions and government stability in the year preceding program approval are positive and significant. In addition to a larger proportion of funds being disbursed in countries where racial and ethnic tensions are less pronounced, better program implementation is positively correlated with the general public's perception of a government's ability to carry out its declared programs. *Ceteris paribus*, a one-point increase in either rating raises disbursements by about 8 percent.

¹⁸ The results of our "testing down" approach are available from the authors upon request.

¹⁹ Contemporaneous change in socioeconomic conditions is excluded from the analysis to avoid problems of having dependent variables on the right-hand side of the equation (inflation, taxation, and unemployment are all part of this index).

Reductions in internal conflict and improvements in law and order in the year before program approval are associated with lower disbursements. The coefficient on the initial level of the internal conflict index is negative and significant at the 1 percent level. The magnitude of the effect is rather large: a one-point increase in the rating would lower disbursements by just over 6 percent. The coefficient on the initial level of the law and order rating is also negative and significant at the 10 percent level. These results may reflect the IMF's financial involvement in countries where observance of the law is not very good initially, often because they are recovering from conflict.

There is some evidence that greater initial involvement by the military in politics is associated with lower disbursements of IMF financing. The coefficient on the corresponding ICRG index is positive and significant at the 10 percent level.

Countries with a history of IMF-supported programs seem to have higher disbursement shares. Every additional month spent in IMF-supported programs translates into 0.2 percent more funds disbursed. Taken literally, higher disbursement ratios could manifest better program design and implementation, and the length of the Fund's engagement simply reflects the long-term nature of the needs of these low- and middle-income countries. But the reasons for – and results of – prolonged financial association between member countries and the Fund are complex (see IMF, 2002, for a recent evaluation).

The size of programs, as measured by the amount of IMF financing committed in relation to a country's quota, appears to be important in determining program outcomes. Countries with larger programs tend to have higher disbursement shares. These packages are often provided in response to capital account emergencies. They require not only more financing but also greater front-loading of assistance than suggested by the Fund's usual phasing rules.

The IMF's effort at program design and implementation, as measured by staff hours and the dollar cost of staff resources, is only marginally important in raising a program's prospects of success. Although larger quotas have an ambiguous net effect on program implementation a priori (see Box 1), the coefficient on the country's IMF quota is negative, suggesting that the implementation of IMF-supported programs could be weaker in countries with larger Fund quotas.

Our findings are broadly similar when the interruption index is used as the measure of program implementation. Almost all the variables describing the initial economic conditions of participating countries have insignificant coefficients. The only exception is the lagged level of a country's growth rate, which has a significant coefficient. This can be interpreted as evidence that countries that were growing relatively fast before program initiation are less likely to have an irreversible interruption of the program.

Reduced government corruption has a strikingly positive impact on the probability of successful program implementation. The coefficient on the preprogram level of corruption is positive and significant, and its magnitude is impressive. On average, a one-point improvement in the ICRG corruption index, all other determinants of program success held constant, coincides with a 35.8 percent better chance of having no program interruption.

As in the regressions using the disbursement share as the measure of program implementation, the coefficient on the initial level of internal conflict is negative and significant, and for similar reasons. The coefficient on the preprogram level of political violence is negative: an improvement in this rating by one point is associated with a 21.7 percent higher chance of an irreversible interruption.

With the exception of the coefficient on the number of months spent in program mode, the variables characterizing the relationship between a country and the Fund enter the regression with the expected signs. However, none of the coefficients is significantly different from zero. As in IMMA (2003), this result suggests that the implementation of Fund-supported programs is largely determined by the country's domestic political economy and institutions, with Fund-controlled variables having only a marginal impact on program outcomes.

What Determines Macroeconomic Outcomes?

This section summarizes the empirical links among macroeconomic performance, the institutional and political environment, and program implementation (Tables 5 through 12). In all the regressions in these tables, the dependent variable is the change in the macroeconomic variable between period $T - 1$ (the preprogram year) and the end of the first, second, or third years after program approval (T , $T + 1$, or $T + 2$). Each table reports OLS, 2SLS, and 3SLS estimates, using the disbursement share or lack of program interruptions as the measure of program performance. As already discussed, although the OLS estimates are based on a slightly larger sample, they are subject to endogeneity bias. The 2SLS and 3SLS estimates are free of this bias, and the 3SLS estimators are more precise. Unless otherwise noted, in what follows we will refer to results obtained using the 3SLS procedure and the disbursement share as the measure of program implementation.

Inflation

Inflation is highly persistent in program countries. The coefficients on lagged inflation are highly significant for all horizons (Tables 5 and 6). For the average program, about three quarters of any deviation from "normal" inflation after a program is approved is reversed within a year. Deviations of inflation from its long-run equilibrium are erased almost completely in three years.

In contrast to many other studies, which were unable to link IMF-supported programs with price stability, our findings represent reasonable evidence that better program implementation leads to lower inflation. After correcting for endogeneity bias, the coefficients on the disbursement share have a negative sign and are declining in absolute value for each of the three years following program approval, although only the result for the first year is statistically significant.²⁰ A similar pattern is observed when the lack of program interruptions

²⁰ The inflation dynamics reported here are similar to those in Conway (1994). Killick (1995) finds reduction in inflation to be significant. Barro and Lee (2002) report coefficients on contemporaneous and lagged IMF loans that are similar in sign but insignificant.

is considered as the measure of program implementation. The absence of program interruptions is correlated with greater price stability in the year following program approval, followed by slightly higher inflation rates over longer horizons.

Better institutions also lead to lower inflation in countries implementing IMF-supported programs.²¹ Inflation is lower the better is the government bureaucracy at the start of the program and the more it improves subsequently. The importance of the quality of the bureaucracy is especially important in year one of the program and declines afterward. Inflation is also lower the more the legal system improves and the more the public observes the law. Interestingly, better law and order before the start of the program and improvements in it during the program are associated with slightly higher inflation at horizon $T + 2$.

The role of political factors in inflation performance in countries under IMF-supported programs is more difficult to interpret. Lower inflation is associated with increased political violence (as proxied by the change in the ICRG Internal Conflict rating) in the first two years of the program. Tight demand-side policies that succeed in reducing inflation could also trigger public protests against austerity, as has occasionally been the case in countries implementing IMF-supported programs.²²

Recognizing that cross-country inflation regressions are dominated by outliers, we also examine whether ethnic tensions and internal conflicts are still the primary determinants of inflation when such observations are excluded from the sample. We re-estimate the model on a sample that excludes all observations with annual change in inflation greater than 50 percent, which cuts the sample size by approximately 30 percent. The results are somewhat reassuring. In the inflation equation, ethnic tensions still play an important role in determining inflation dynamics. However, internal conflicts become insignificant while, on the other hand, government stability turns out to be significant. This is not very surprising since the two indices are highly correlated in our sample.

Growth

Economic growth is highly serially correlated and mean-reverting during the course of IMF-supported programs (Tables 7 and 8). As in the case of inflation, deviations of the growth rate from long-run equilibrium are very short lived. Approximately 90 percent of any deviation in growth rates from the country's "normal" growth pattern is made up within three years. The largest adjustment, 83-84 percent, occurs within one year after the realization of the shock.

At first glance, better program implementation appears to be associated with more rapid economic growth, as suggested by positive and significant estimated coefficients in OLS

²¹ Our findings on the impact of institutions on macroeconomic performance in program countries are robust to the choice of implementation measure.

²² This cannot be formally tested in our model, because we treat political variables as exogenous.

regressions of the disbursement share. Unfortunately, this result is not robust—it appears to be driven by the endogeneity of program implementation. The corresponding 2SLS and 3SLS estimates are positive at all horizons, but the parameters are not significantly different from zero. In addition, the impact of program performance on economic growth is fragile to the choice of implementation measure. Although fewer program interruptions appear to be associated with higher growth rates, the OLS results are not significant, and the coefficients turn negative when IV techniques are used.

These mixed findings are consistent with those reported in the literature. Recovery of growth rates from the initial drop was reported by Conway (1994). Khan (1990) and Przeworski and Vreeland (2000) find significantly negative effects of IMF program participation on economic growth. At the same time, Killick (1995), Bagci and Perraudin (1997), and Dicks-Mireaux, Mecagni, and Schadler (2000) report positive and significant effects. Dreher (2004) finds some positive impact of compliance with conditionality on growth but this is not robust. One possibility is that the extent of program implementation does matter for economic growth, but that the leads are greater than three years and therefore we have been unable to capture them. Certainly the structural reforms of many programs in the 1990s took a long time to come to fruition. Many countries—including transition economies—began to experience faster growth only in the late 1990s; such a delayed response would not be captured in our methodology.

Not surprisingly, improvements in institutions during the course of program implementation are associated with better growth performance. This is most evident in the case of the investment profile, which measures the risk to foreign business operations in the country, including risk of repatriation of profits. A one-point increase in the ICRG Investment Profile rating is associated with roughly a 1 percent increase in the growth rate, and this result is robust to the length of the horizon and the choice of estimation technique. Improvements in the ability of the government to stay in office, which are influenced by the cohesion of the government and by the extent of the public's approval of its policies, appear to have a significant positive impact on growth, at least in the first year of a program. These findings are robust to the choice of implementation measure and to omitting outliers.²³

Public Finances

The fiscal balance (in relation to GDP) is persistent and mean-reverting, but less so than inflation and growth. Improvements in the fiscal balance persist for two years but are then reversed (Tables 9 and 10). This pattern could be consistent with governments implementing IMF-supported reforms aiming to balance their budgets over a four-year horizon. The mean-reversion term is highly significant. Approximately 45 percent of any deviation of the fiscal balance from long-run average is offset within a year. The speed of adjustment is much slower than for inflation or growth.

As in the regressions explaining growth, program implementation appears to be associated with improvements in the public finances when simultaneity bias issues are ignored, but these

²³ We define outliers as countries growing or shrinking by more than 10 percent per annum.

results are reversed in the regressions using IV approaches. Regardless of the choice of implementation measure, the OLS estimates are positive and significant for the first two years, whereas the 2SLS and 3SLS estimates are negative. If anything, better program implementation seems to be associated with larger fiscal deficits: IV estimates of the coefficient on the disbursement share two years after program approval are significant.²⁴ The results are similar when the lack of program interruptions measure is considered. They suggest that fiscal deficits in countries with completed programs are about 3 percent larger than in countries whose programs were interrupted.

This finding and our similar finding for the current account balance (see below) likely reflect the impact of additional financial resources flowing into countries that are successful in implementing IMF-supported reforms. Better program implementation makes more financing available to countries participating in IMF-supported programs, which allows more gradual adjustment and larger fiscal and external deficits.

The most important institutional factor influencing fiscal outcomes is the initial level of corruption, but its effect is anomalous. Lower corruption is associated with weaker fiscal outcomes over time. We do not have a good explanation for this result.

Several aspects of the political environment play an important role in determining fiscal outcomes in countries with Fund-supported programs. First, improvements in the government's responsiveness to its people (as measured by changes in the ICRG's Democratic Accountability index) are associated with larger deficits. This could be evidence that democratic incumbents tend to postpone fiscal consolidation. Second, declines in ethnic tension are contemporaneously correlated with improved fiscal balances. This could reflect a country's return to normalcy, which is associated with improved revenue collection and lower military spending. Third, less military involvement in politics in the preprogram year, as well as declines in the risk of external conflict (ranging from trade restrictions to full-scale warfare) are positively and significantly associated with lower fiscal deficits.

Current Account

Shocks to the current account are longer lived and have larger permanent components than other macroeconomic outcomes (Tables 11 and 12). Only about 10 percent of any deviation from a country's "normal" ratio of the current account to GDP is made up for in one year.

Most studies find that participation in IMF-supported programs helps improve the current account. Our results on the impact of program implementation on the current account are more nuanced. Countries that do a better job at implementing programs experience a deterioration of the current account for about two years, but this is followed by a sharp improvement in the trade balance for the third year. Disbursement of 100 percent of committed funds is accompanied by an 8 percent deterioration of the current account in the

²⁴ Schadler and others (1993) also find some evidence of negative effects of IMF lending on the fiscal balance. By contrast, Conway (1994) finds significant fiscal deficit reduction.

first year (relative to the preprogram year), followed by a 2 percent improvement in the third year. Our mixed results are similar to Barro and Lee's (2002). By contrast, Conway (1994) finds evidence of improvement in the current account in countries participating in IMF-supported programs, but he does not correct for the extent of program implementation.

The only institutional variables that matter for the current account are the initial investment profile and its change during the program period. Both are highly significant and enter the regressions with negative signs. Not surprisingly, the better a government's attitude toward inward investment, the larger the current account deterioration during the period considered.

Of the political variables, the ones relevant for the evolution of the external current account are external conflict, government stability, and military involvement in politics. The coefficient on the change in the ICRG External Conflict index is negative and highly significant for the $T + 2$ horizon. Improvements in the index are associated with elimination of embargos and trade restrictions and are correlated with a worsening of the current account. A one-point increase in this rating is correlated with a 1.2 percent deterioration of the current account over three years. Governments that are more stable in the preprogram year tend to have better current account performance. Similar positive effects on the current account appear to result from less military involvement in politics before the program initiation (as reflected by higher values of the ICRG Military in Politics index). These results are robust to the choice of program implementation measure.

The Relative Impact of Institutions and Program Implementation at Different Horizons

An empirical decomposition of mean changes in macroeconomic variables, discussed in detail in the Annex, suggests that the relative contribution of program implementation and institutional and political factors to the dynamics of macroeconomic variables critically depends on the length of the considered horizon. More specifically, our findings indicate that program implementation drives inflation in the first and second year of a program while institutional and political factors are especially important over the two-year horizon. Although institutional factors and program implementation are both important determinants of growth over one- and three-year horizons, institutional and political conditions have a quantitatively greater impact. Institutional factors are crucial in determining the evolution of the fiscal balance over one- and three-year horizons, while program implementation is very important over the two-year horizon. Finally, we find that while program implementation is the major influence on the current account in the first year of a program, institutional factors have a stronger impact over longer horizons.

IV. CONCLUSION

This paper has examined the nexus among institutions, policy implementation, and economic performance in countries undertaking IMF-supported reforms. We employed a short-run statistical model that treats institutions and politics as exogenous and mean-reverting, takes into account the autoregressive and mean-reverting nature of macroeconomic outcomes, and corrects for the endogeneity of program implementation with respect to macroeconomic performance.

Our main findings are fourfold. First, the quality of institutions and the domestic political environment matter for macroeconomic outcomes in countries implementing IMF-supported programs, especially at longer horizons of up to three years. This direct beneficial impact of institutions on the macroeconomic variables is in addition to their indirect impact through better program implementation. As expected, improvements in the government bureaucracy and better enforcement of law and order are associated with lower inflation. However, declines in internal conflict are associated with higher inflation. Improvements in a program country's investment profile and in government stability lead to faster economic growth. Easing of external conflict and lower military involvement in politics before program approval are associated with stronger fiscal outcomes as military expenditure declines. On the other hand, reductions in ethnic tension and improvements in government accountability are associated with weaker fiscal outcomes, perhaps because programs may provide for higher targeted expenditure. Greater government stability and reductions in the military's involvement in politics before the program starts are associated with a strengthening of the external current account. However, lower ethnic tension and improvements in a program country's investment profile lead to a deterioration of the current account.

Second, the institutional and political environment is quantitatively important for the implementation of IMF-supported programs. Rates of disbursement of IMF financing are higher and program interruptions less frequent in countries where ethnic tensions are low, where governments are stable and less corrupt, and where the military is less involved in politics. In addition, more IMF financing is disbursed and fewer interruptions are experienced in countries in which internal conflict was intense and law enforcement weak before program approval. Arguably, this reflects the IMF's role, as lender and policy adviser, in facilitating the return to normalcy of countries experiencing natural or political shocks.

Third, program implementation varies systematically with the duration of a country's financial engagement with the Fund and the size of its quota. More funds are disbursed and fewer program interruptions experienced in countries that have spent more time in previous IMF-supported programs. Implementation is also better for larger programs (as measured by the amount of program financing approved in relation to the country's IMF quota).

Fourth, after the impact of institutions on the macroeconomic situation is taken into account, the extent of program implementation exerts an independent influence on macroeconomic outcomes, especially over shorter horizons of up to two years. Better-implemented programs are associated with lower inflation, with initially weaker but ultimately stronger external and fiscal outcomes, and with a statistically insignificant impact on economic growth. These results are to be contrasted with those of studies that do not correct for program implementation; these studies conclude that program participation has ambiguous effects on inflation. Correcting for differences in implementation thus provides some evidence linking successful implementation of IMF-supported reforms to more progress in achieving price stability.

What, then, are the policy implications for the IMF from this analysis? The first issue is the lack of clear-cut results linking program implementation to the resumption of economic growth in countries implementing IMF-supported reforms. One possibility is that successful program implementation has a favorable effect on growth that is only felt beyond the three-

year horizon captured in our model. The length of lags in the operation of IMF-supported structural reforms should be a topic of future research. Further, the lack of conclusive links between program implementation and growth suggests that it might be useful for the IMF to seek to identify structural reforms that could pay off quickly in terms of economic growth, both at the program design stage and at the implementation stage. At the program design stage, the Fund could monitor regularly published institutional and political indicators relevant to economic growth—such as the ICRG ratings of the level of ethnic tension, government accountability, and the investment climate. These indicators would also need to be carefully monitored during program implementation to ascertain whether IMF-supported reforms are on track toward meeting their growth objectives. Information on the determinants of the investment profile—viability of contracts, threat of expropriation, ease of profit repatriation, and payment delays—could provide high-frequency feedback concerning the extent to which programs are on track in implementing investment-friendly reforms.

Second, due attention to relevant political and institutional developments is critical to the successful design and implementation of IMF-supported programs. Quantitative information and analysis could be a useful complement to information from Fund missions and resident representatives in assessing rapidly changing political environments, giving indications about the potential for successful program implementation. A decline in political indicators below thresholds historically associated with inadequate program implementation could provide the Fund an early warning signal, much as financial vulnerability indicators provide useful signals of impending financial crisis. The Fund has on occasion responded to heightened political uncertainty by requiring the major political forces in a country—the government and the main opposition parties in parliament—to endorse a program at an early stage. Systematizing these efforts, as the Fund has been doing by increasing the emphasis on ownership, could yield dividends in terms of improved program design, implementation, and macroeconomic performance. It would enable the Fund to avoid situations in which, having designed and implemented first-best programs that failed to fully take into account relevant political and institutional factors, one ends up in a third-best world when these “ideal” programs are not properly executed. In econometric terms, one would ideally want initial ($T - 1$) institutional and political variables to enter implementation regressions (such as those in Table 4) with insignificant coefficients. That would provide evidence that IMF-supported programs are well tailored to the specifics of the politico-institutional climate of each country and that the success or failure of a program is independent of initial political conditions. Unfortunately, we have such neutrality only for the initial economic conditions. More generally, it might be useful to consider incorporating quantitative political and institutional indicators and analysis in the Fund’s surveillance work.

Third, we have treated institutions as exogenous and mean-reverting processes, yet institutional development is an important objective of IMF-supported programs with a structural orientation. It would be useful to assess systematically the impact of better implementation of IMF-supported programs on the dynamics of institutional and political factors. In such a model, the evolution of formal and informal institutions would be endogenous to the politico-economic process, including participation in IMF-supported programs. To the extent that IMF-supported programs promote welfare-improving institutional change, their beneficial effects are going to be larger than suggested by models, such as ours, that treat institutions as exogenous.

Box 1. List of Instrumental Variables

The outcomes of IMF-supported programs are endogenous. Instrumental variables help us obtain unbiased estimates of the impact of IMF-supported programs on the economic performance of participating countries. The instruments must be correlated with program implementation (lack of program interruptions and the share of committed funds disbursed) and not be direct determinants of the economic policy outcomes (inflation, economic growth, fiscal balance, and current account). The following IVs are used in the analysis:

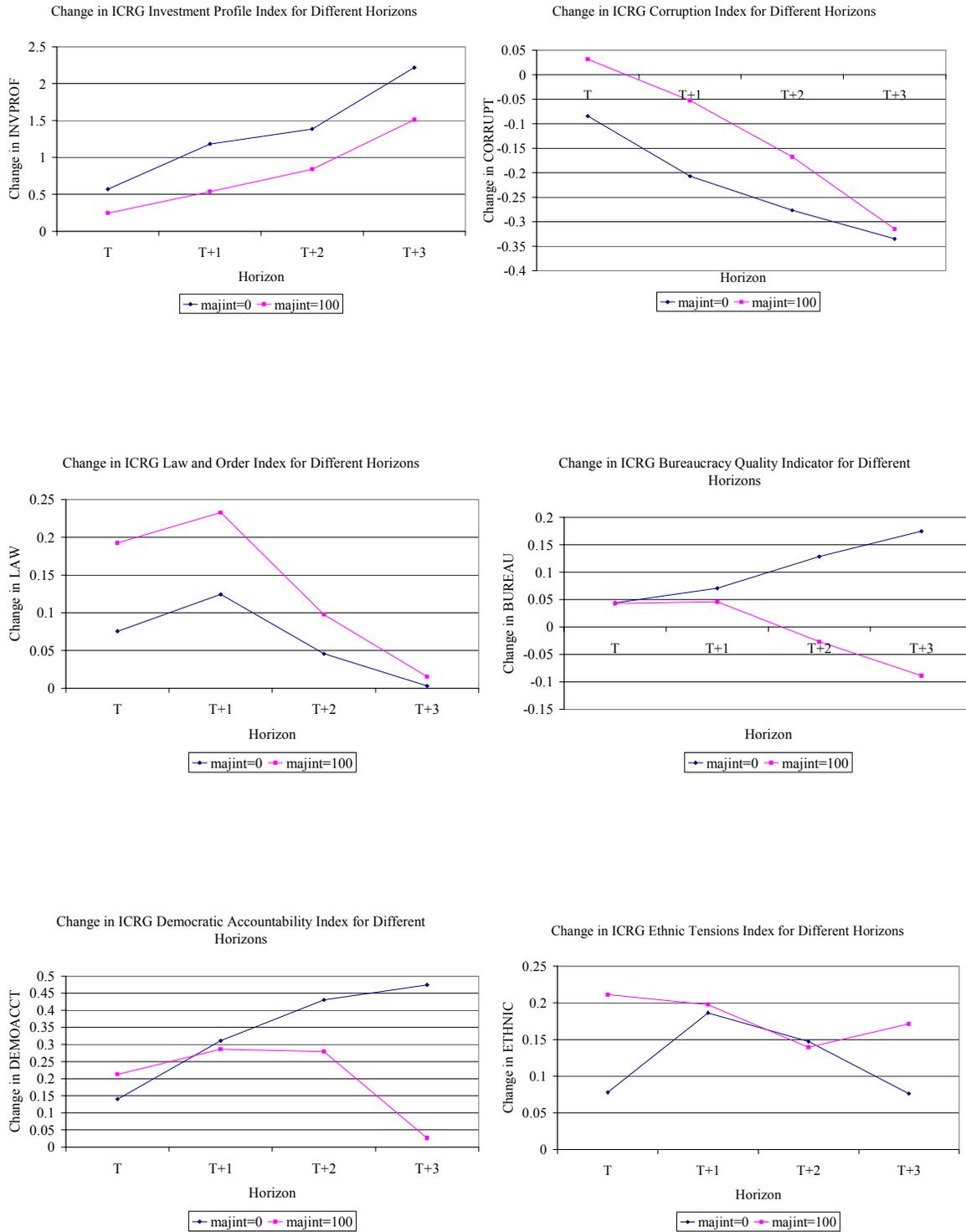
IMF quota (log). A country's quota determines the member's voting power in the IMF. Countries with larger quotas have more bargaining power and systemic importance in the world economy. Greater bargaining power could allow countries to extract more concessions from the IMF, leading to less conditionality and more lenient treatment by the Fund. The coefficient on the IMF quota in the implementation measure regressions would then be positive. On the other hand, the size of the quota also reflects a country's systemic importance in the world economy and its access to international capital markets. Governments of large countries might be less cooperative with IMF conditionality if the perceived political costs are too high. In that case, the parameter estimate could have a negative sign.

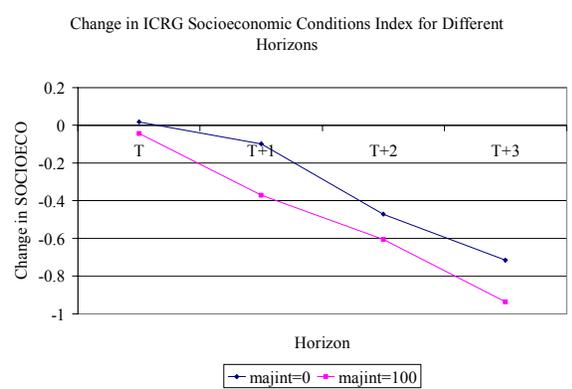
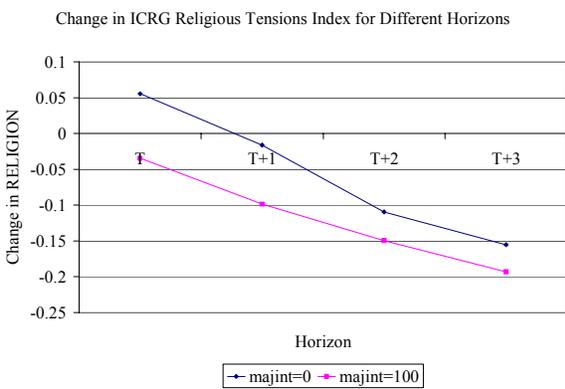
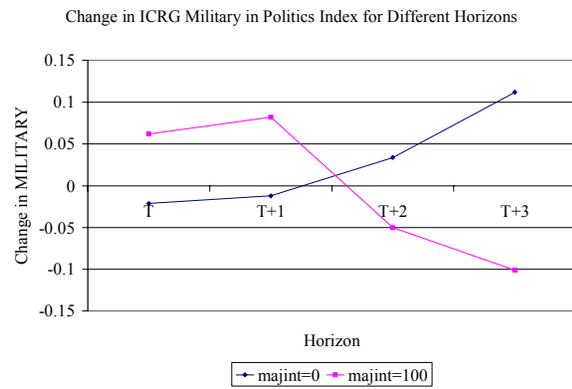
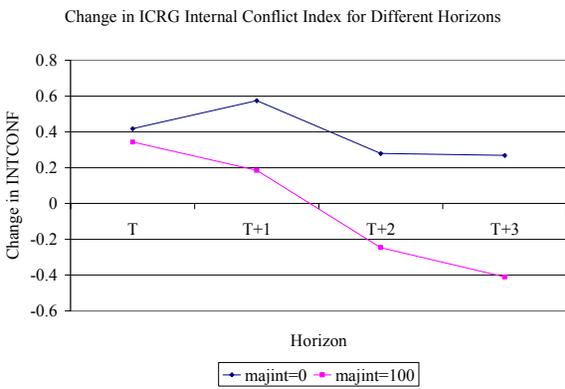
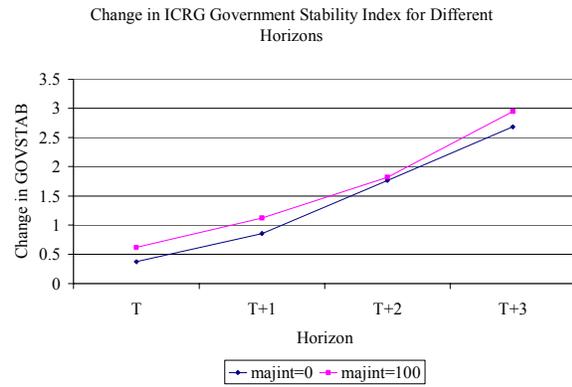
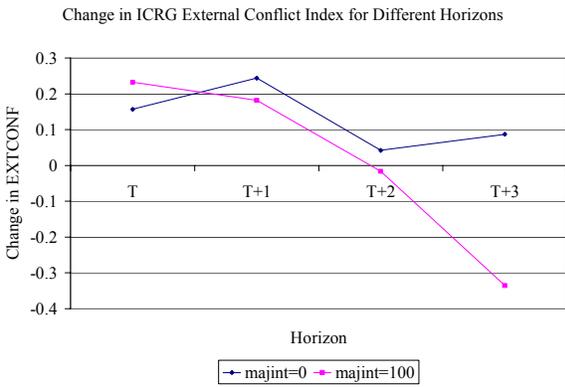
Number of months spent in IMF-supported programs since 1980. This variable captures the extent of a country's financial involvement with the IMF. The length of the country's history under Fund-supported programs could lead, through learning-by-doing, to better program design and higher implementation rates as government officials and IMF staff gain more experience and knowledge of country-specific factors and IMF procedures.

Amount approved as a fraction of IMF quota. This variable is expected to capture the financial importance of a particular program. Large values would be positively correlated with the severity of crises and the willingness of the authorities to implement Fund-supported reforms.

IMF effort per program year, including six months prior to program approval. This is a direct measure of the dollar cost of IMF-supported programs. It is computed from Budget Reporting System data on hours spent by staff on program implementation and estimated average staff salaries by grade. More effort invested in program implementation is expected to be positively correlated with program implementation.

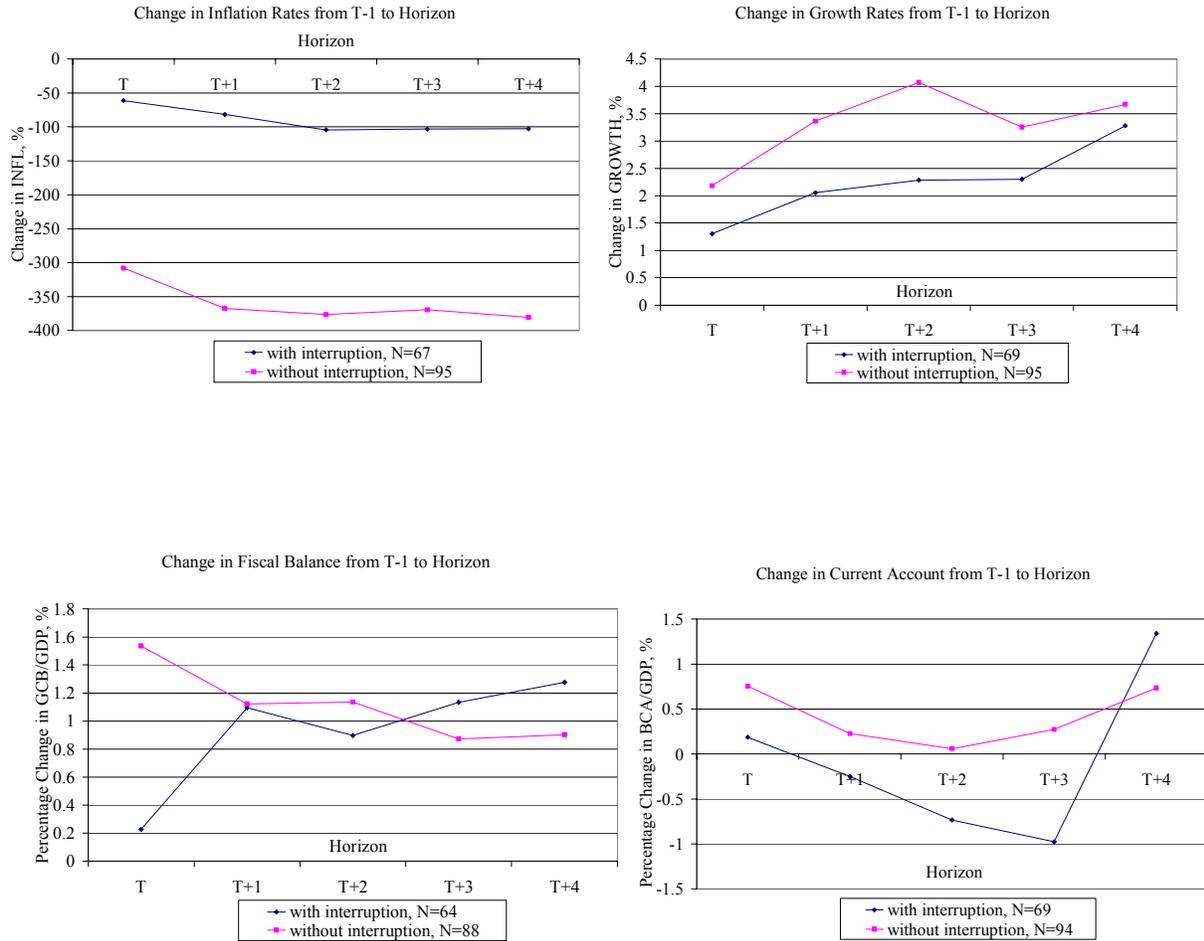
Figure 1. The Quality of Institutions in Interrupted and Completed Programs





Source : Authors' calculations.

Figure 2. Macroeconomic Performance in Interrupted and Completed Programs



Source : Authors' calculations.

Table 1. Success of Program Implementation by Type of Arrangement¹

Index	Including Precautionary Arrangements				Excluding Precautionary Arrangements			
	All	EFF	ESAF/ PRGF	SBA	All	EFF	ESAF/ PRGF	SBA
Programs with irreversible interruptions ²								
Percent of total	41.12	40.00	45.31	38.89	42.77	34.78	45.31	43.06
No. of observations	197	25	64	108	159	23	64	72
Quantitative Implementation Index ³								
Percent of total	79.18	87.21	77.09	78.52	79.36	86.95	77.09	78.85
No. of observations	182	24	62	96	151	23	62	66
Structural Implementation Index ⁴								
Percent of total	66.37	73.98	70.97	60.54	68.41	76.54	70.97	62.44
No. of observations	168	24	63	81	142	22	63	57
Overall Implementation Index ⁵								
Percent of total	74.29	83.27	72.91	72.81	74.81	83.71	72.91	73.45
No. of observations	166	23	62	81	141	22	62	57
Committed funds disbursed ²								
Percent of total	62.05	72.56	80.02	48.47	74.54	78.87	80.02	68.02
No. of observations	193	25	64	104	156	23	64	69

Source: Authors' calculations using data from the Monitoring of Fund Arrangements (MONA) database.

¹ Table updates Table 1 in IMMA (2003). Multiyear arrangements are treated as one program. Data are averages for a sample of programs approved between 1992 and 2002. EFF, Extended Fund Facility; ESAF, Enhanced Structural Adjustment Facility; PRGF, Poverty Reduction and Growth Facility; SBA, Stand-by Arrangement.

² Calculated as described in the text.

³ Average of indices across all macroeconomic performance criteria for the program, where the index for a given criterion equals 100 percent if the criterion was met before or after modification, and zero if the criterion was not met before or after modification or was waived before or after modification.

⁴ Average of indices across all structural conditions for the program, where the index for a given structural condition equals 100 percent if the condition was met with or without a small delay for structural benchmarks, equals 50 percent if the condition was partially met or delayed for performance criteria, and equals zero if the condition was not met.

⁵ Average of Quantitative and Structural Implementation indices.

Table 2. Correlations Between Implementation Indices¹

Index	Programs with Irreversible Interruptions	Quantitative Implementation Index	Structural Implementation Index	Overall Implementation Index	Share of Committed Funds Disbursed
Programs with irreversible interruptions					
Pearson correlation coefficient ρ	1.00				
Probability that true $\rho = 0$	—				
No. of observations	159				
Quantitative Implementation Index					
Pearson correlation coefficient ρ	-0.312	1.00			
Probability that true $\rho = 0$	<.0001	—			
No. of observations	151	151			
Structural Implementation Index					
Pearson correlation coefficient ρ	-0.286	0.293	1.00		
Probability that true $\rho = 0$	0.0006	0.0004	—		
No. of observations	142	141	142		
Overall Implementation Index					
Pearson correlation coefficient ρ	-0.403	0.823	0.682	1.00	
Probability that true $\rho = 0$	<.0001	<.0001	<.0001	—	
No. of observations	141	141	141	141	
Share of committed funds disbursed					
Pearson correlation coefficient ρ	-0.699	0.303	0.350	0.416	1.00
Probability that true $\rho = 0$	<.0001	0.0002	<.0001	<.0001	—
No. of observations	156	151	142	141	156

Source: Authors' calculations using data from the MONA database.

¹ Data for a sample of programs approved between 1992 and 2002. Multiyear arrangements are treated as one program. Precautionary arrangements are excluded.

Table 3. Correlations of Implementation Indices with ICRG Risk Ratings at Different Horizons

ICRG Risk Rating	Programs with Irreversible Interruptions	Share of Committed Funds Disbursed ¹	Quantitative Implementation Index	Structural Implementation Index	Overall Implementation Index
<i>Correlation with ICRG rating at T - 1</i>					
Bureaucracy Quality	-0.026	-0.127	0.128	-0.055	0.126
Corruption	-0.090	0.027	0.102	0.015	0.157
Democratic Accountability	-0.045	-0.089	0.026	-0.091	0.025
Ethnic Tensions	-0.004	0.050	-0.030	-0.088	-0.065
External Conflict	0.047	-0.183*	-0.109	-0.044	-0.054
Government Stability	-0.191**	-0.033	-0.211**	-0.012	-0.167*
Internal Conflict	0.093	-0.160	-0.146	-0.077	-0.131
Investment Profile	-0.199**	0.045	-0.144	-0.046	-0.136
Law and Order	-0.025	-0.167*	-0.040	-0.113	-0.043
Military in Politics	-0.065	-0.059	-0.085	-0.211**	-0.121
Religious Tensions	-0.090	0.028	-0.037	-0.081	-0.093
Socioeconomic Conditions	-0.032	0.162*	0.135	0.051	0.163*
<i>Correlation with ICRG rating at T + 1</i>					
Bureaucracy Quality	-0.016	-0.072	0.143	-0.125	0.080
Corruption	-0.006	-0.028	0.231**	-0.016	0.210**
Democratic Accountability	-0.038	-0.062	0.081	-0.096	0.067
Ethnic Tensions	-0.024	0.101	0.089	-0.038	0.041
External Conflict	0.025	-0.032	-0.011	-0.038	-0.018
Government Stability	-0.067	0.011	-0.081	0.102	-0.062
Internal Conflict	0.025	0.006	0.089	-0.053	0.006
Investment Profile	-0.274***	0.167*	0.008	0.081	0.012
Law and Order	0.034	-0.054	0.127	-0.085	0.065
Military in Politics	-0.019	-0.035	-0.048	-0.237**	-0.140
Religious Tensions	-0.115	0.097	0.030	-0.057	-0.040
Socioeconomic Conditions	-0.124	0.187	0.301***	0.015	0.239**
<i>Correlation with change in ICRG rating from T - 1 to T - 1</i>					
Bureaucracy Quality	-0.026	0.042	-0.009	-0.075	-0.059
Corruption	0.119	-0.078	0.167*	-0.013	0.094
Democratic Accountability	-0.014	-0.034	0.052	0.002	0.062
Ethnic Tensions	0.008	0.038	0.201**	0.122	0.205**
External Conflict	-0.020	0.143	0.084	0.042	0.048
Government Stability	0.076	0.008	0.198**	0.155	0.181*
Internal Conflict	-0.098	0.142	0.208**	0.078	0.162*
Investment Profile	-0.185**	0.058	0.149	0.174*	0.171*
Law and Order	0.072	0.102	0.165*	0.069	0.131
Military in Politics	0.067	-0.047	-0.023	0.012	-0.052
Religious Tensions	-0.068	0.102	0.114	0.022	0.077
Socioeconomic Conditions	-0.093	0.049	0.169*	-0.007	0.114

Source: Authors' calculations.

***Statistically significant at the 1 percent level.

**Statistically significant at the 5 percent level.

*Statistically significant at the 10 percent level.

¹Precautionary arrangements are excluded.

Table 4. First-Stage Regressions of Implementation Measures on Initial Economic Conditions, ICRG Indicators, and Instruments¹

Independent variable	Dependent Variable			
	Share of committed funds disbursed ²		Irreversible interruption index ³	
	(1)	(2)	(3)	(4)
Intercept	0.680**	0.848***	-0.397	-0.085
Initial real GDP per capita	-0.012	-0.013	-0.066	-0.072
Inflation at $T-1$	0.0002	0.0002	0.002	0.002
Ratio of fiscal balance to GDP at $T-1$	0.116	0.209	-3.509	-3.230
Ratio of current account balance to GDP at $T-1$	0.091	0.049	-0.753	-1.198
Economic growth rate at $T-1$	-0.002	-0.003	0.046	0.056*
ICRG Bureaucracy Quality rating at $T-1$	-0.017		-0.070	
ICRG Corruption rating at $T-1$	0.006		0.322*	0.358**
ICRG Democratic Accountability rating at $T-1$	-0.019		-0.104	
ICRG Ethnic Tensions rating at $T-1$	0.073**	0.076**	0.097	
ICRG External Conflict rating at $T-1$	0.006		-0.034	
ICRG Government Stability rating at $T-1$	0.071*	0.078**	0.044	
ICRG Internal Conflict rating at $T-1$	-0.061**	-0.062***	-0.221*	-0.217**
ICRG Investment Profile rating at $T-1$	0.021		0.090	
ICRG Military in Politics rating at $T-1$	0.041	0.044*	0.101	
ICRG Religion Tensions rating at $T-1$	0.019		0.144	0.189
ICRG Socioeconomic Conditions rating at $T-1$	-0.008		0.040	
ICRG Law and Order rating at $T-1$	-0.066	-0.069*	-0.092	
Fund effort per program year	0.041	0.043*	0.036	0.050
Fund quota (in logarithms)	-0.034	-0.046	0.095	0.052
Number of months spent in Fund programs	0.002**	0.002**	-0.002	-0.0003
Amount approved as a fraction of quota	0.024**	0.025**	0.088	0.094
Dummy for precautionary arrangement	-1.121***	-1.109***		
Summary statistics:				
No. of observations	115	115	115	115
Log-likelihood	-14.695	-15.676	-61.998	-63.251
Correlation coefficient or percent correctly predicted	0.807	0.803	75.66	75.66

Source: Authors' regressions.

¹ χ^2 statistics for the estimated parameters are available from the authors upon request. Year dummy variables are included in all regressions.

² Results obtained using tobit model where $y = \max(X'\beta + \varepsilon, 0)$. Last row reports correlation coefficient

³ Results obtained using probit model; parameter estimates are computed to reflect the probability of no irreversible interruption: $p(\text{Interruption} = 0) = F(X'\beta)$ where F is the normal cumulative distribution function. Last row reports percent correctly predicted.

Table 5. Regressions of the Change in Inflation on the Share of Committed Funds Disbursed¹

Independent variable	OLS estimates			2SLS estimates			3SLS estimates		
	T	T + 1	T + 2	T	(4)	(5)	(6)	(7)	(8)
Disbursement share	13.862	-55.659	2.778	-140.87	-90.624	-9.000	-150.828*	-103.740	-12.621
Initial real GDP per capita	-8.361**	-6.406*	-0.277	-10.622***	-7.222*	-0.643	-10.602***	-7.013*	-0.474
First lagged difference in inflation	-0.158	0.0003	-0.001	-0.214**	-0.002	-0.001	-0.180*	-0.004	-0.002
Inflation at $T - 1$	-0.731***	-0.958***	-0.976***	-0.682***	-0.950***	-0.977***	-0.739***	-0.954***	-0.975***
ICRG Bureaucracy Quality rating at $T - 1$	-26.488**	-12.571	-4.100	-27.744**	-13.581	-4.317*	-27.964**	-12.012	-5.537***
Change in Bureaucracy Quality from $T - 1$ to horizon	-46.700	-11.681	-2.909	-73.494*	-14.381	-4.211	-74.746**	-14.256	-3.954
ICRG Ethnic Conflict rating at $T - 1$	-15.834	-5.164	-1.969	-6.632	-4.066	-1.299	-4.275	-2.152	-1.034
Change in Ethnic Conflict from $T - 1$ to horizon	-5.246	-12.083	-3.455	-11.568	-12.110	-4.060	-12.868	-12.904	-4.606*
ICRG Internal Conflict rating at $T - 1$	13.151**	7.478	1.033	6.974	6.149	0.061	6.605	7.658	0.330
Change in Internal Conflict from $T - 1$ to horizon	17.336*	11.734	-0.425	23.794**	12.419	-0.154	24.206**	13.982*	-0.461
ICRG Investment Profile rating at $T - 1$	-9.834	3.493	-0.809	-2.854	3.715	-0.110	-2.784	3.456	0.487
Change in Investment Profile from $T - 1$ to horizon	-17.426	-3.723	-1.623	-19.212	-7.275	-1.851	-19.558	-9.327	-1.566
ICRG Law and Order rating at $T - 1$	12.738	5.862	5.700**	14.470	8.730	7.348***	12.342	5.639	6.603***
Change in Law and Order from $T - 1$ to horizon	-87.059***	-34.277	1.430	-86.529***	-30.469	2.516	-84.579***	-22.859	4.800*
Dummy for precautionary arrangement	28.111	-52.327	3.459	-91.169	-78.257	-5.359	-102.715	-90.626	-9.017
Summary statistics:									
No. of observations	123	122	116	115	115	109	115	115	109
R^2	0.586	0.596	0.982	0.626	0.592	0.983	0.625	0.590	0.983
Adjusted R^2	0.485	0.502	0.977	0.532	0.489	0.979	0.530	0.487	0.978

Source: Authors' regressions.

¹ The dependent variable is the change in inflation from horizon $T - 1$ to the indicated horizon. Intercepts and year dummy variables are included in all regressions. Standard deviations and t -statistics for the estimated parameters are available from the authors upon request.

Table 6. Regressions of the Change in Inflation on the Irreversible Interruption Index¹

Independent variable	OLS estimates			2SLS estimates			3SLS estimates		
	T	T + 1	T + 2	T	T + 1	T + 2	T	T + 1	T + 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Noninterruption dummy variable	1.364	-18.019	3.400	-38.409	28.532	16.575*	-32.152	29.726	13.730
Initial real GDP per capita	-7.688**	-6.026*	-0.262	-10.512***	-6.447	-0.329	-10.182***	-6.241	-0.195
First lagged difference in inflation	-0.165	-0.002	-0.001	-0.207*	-0.001	0.001	-0.172	-0.003	-0.001
Inflation at $T - 1$	-0.724***	-0.957***	-0.977***	-0.706***	-0.986***	-0.991***	-0.769***	-0.992***	-0.984***
ICRG Bureaucracy Quality rating at $T - 1$	-25.676**	-14.196	-4.103	-25.351*	-13.776	-4.125*	-25.928**	-12.195	-5.463**
Change in Bureaucracy Quality from $T - 1$ to horizon	-38.449	-13.225	-2.957	-63.094*	-13.866	-3.911	-66.295*	-14.974	-4.020
ICRG Ethnic Conflict rating at $T - 1$	-12.467	-8.963	-1.694	-10.522	-11.185	-2.043	-7.869	-10.586	-2.102
Change in Ethnic Conflict from $T - 1$ to horizon	-5.445	-12.690	-3.344	-7.393	-10.723	-3.092	-8.472	-12.180	-3.885
ICRG Internal Conflict rating at $T - 1$	12.615**	8.928	1.082	8.375	10.639	1.211	8.677	12.822	1.279
Change in Internal Conflict from $T - 1$ to horizon	17.151*	12.357*	-0.481	19.309*	12.131	-0.501	20.607**	14.480*	-0.637
ICRG Investment Profile rating at $T - 1$	-8.569	1.037	-0.842	-4.825	-1.951	-1.231	-6.345	-2.885	-0.315
Change in Investment Profile from $T - 1$ to horizon	-16.780	-4.559	-1.737	-17.045	-7.490	-1.706	-18.050	-9.764	-1.355
ICRG Law and Order rating at $T - 1$	11.033	8.005	2.480**	18.171	9.767	6.592**	15.386	6.772	6.285***
Change in Law and Order from $T - 1$ to horizon	-85.731***	-36.979	1.589	-83.905***	-34.745	2.187	-82.277***	-28.345	4.010
Summary statistics:									
No. of observations	126	123	116	115	115	109	115	115	109
R^2	0.582	0.589	0.982	0.617	0.589	0.984	0.614	0.587	0.983
Adjusted R^2	0.489	0.500	0.978	0.525	0.491	0.980	0.522	0.488	0.979

Source: Authors' regressions.

¹ The dependent variable is the change in inflation from horizon $T - 1$ to the indicated horizon. Intercepts and year dummy variables are included in all regressions. Standard deviations and t -statistics for the estimated parameters are available from the authors upon request.

Table 7. Regressions of Economic Growth on the Share of Committed Funds Disbursed¹

Independent variable	OLS estimates			2SLS estimates			3SLS estimates		
	T (1)	$T + 1$ (2)	$T + 2$ (3)	T (4)	$T + 1$ (5)	$T + 2$ (6)	T (7)	$T + 1$ (8)	$T + 2$ (9)
Disbursement share	2.814*	2.331*	1.412	2.607	0.484	2.921	2.579	0.639	2.309
Initial real GDP per capita	0.209	0.169	0.551***	0.277*	0.077	0.515***	0.266*	0.072	0.534***
First lagged difference in growth rate	-0.205**	-0.203***	-0.017	-0.249***	-0.248***	-0.023	-0.210***	-0.212***	-0.033
Growth rate at $T - 1$	-0.850***	-0.785***	-0.946***	-0.829***	-0.758***	-0.931***	-0.840***	-0.753***	-0.896***
ICRG Government Stability rating at $T - 1$	0.471	0.463	0.049	0.163	0.369	0.097	-0.025	0.299	-0.076
Change in Government Stability from $T - 1$ to horizon	1.185**	0.364	0.025	1.022*	0.339	0.062	1.117**	0.305	-0.250
ICRG Investment Profile rating at $T - 1$	-0.578	0.216	0.634	-0.623	-0.049	0.463	-0.568	-0.042	0.462
Change in Investment Profile from $T - 1$ to horizon	0.963*	1.079***	0.841***	1.228**	0.764**	0.849**	1.029**	0.678**	0.857**
ICRG Socioeconomic Conditions rating at $T - 1$	-0.536	-0.607	-0.013	-0.525	-0.467	0.019	-0.420	-0.529	-0.036
Dummy variable for precautionary arrangement	4.053**	0.395	-1.085	4.184	-0.727	0.353	4.234	-0.460	-0.121
Summary statistics:									
No. of observations	125	124	118	115	115	109	115	115	109
R^2	0.687	0.744	0.660	0.704	0.744	0.641	0.701	0.743	0.638
Adjusted R^2	0.631	0.701	0.603	0.648	0.696	0.573	0.646	0.694	0.570

Source: Authors' regressions.

¹ The dependent variable is the change in the rate of economic growth from horizon $T - 1$ to the indicated horizon. Intercepts and year dummy variables are included in all regressions. Standard deviations and t -statistics for the estimated parameters are available from the authors upon request.

Table 8. Regressions of Economic Growth on the Irreversible Interruption Index¹

Independent variable	OLS estimates			2SLS estimates			3SLS estimates		
	T (1)	$T + 1$ (2)	$T + 2$ (3)	T (4)	$T + 1$ (5)	$T + 2$ (6)	T (7)	$T + 1$ (8)	$T + 2$ (9)
Noninterruption dummy variable	0.555	0.825	0.195	-0.443	-0.388	-0.321	-0.544	-0.529	-0.268
Initial real GDP per capita	0.144	0.177	0.566***	0.204	0.081	0.536***	0.190	0.070	0.525***
First lagged difference in growth rate	-0.199**	-0.208***	-0.039	-0.250***	-0.242***	-0.035	-0.211**	-0.208***	-0.050
Growth rate at $T - 1$	-0.857***	-0.789***	-0.931***	-0.829***	-0.757***	-0.920***	-0.842***	-0.759***	-0.898***
ICRG Government Stability rating at $T - 1$	0.354	0.483	0.095	0.094	0.369	0.091	-0.103	0.300	-0.058
Change in Government Stability from $T - 1$ to horizon	0.894*	0.400	0.080	0.873	0.350	0.063	0.992*	0.326	-0.210
ICRG Investment Profile rating at $T - 1$	-0.378	0.137	0.480	-0.335	-0.127	0.374	-0.306	-0.085	0.334
Change in Investment Profile from $T - 1$ to horizon	1.120**	1.013***	0.784***	1.372**	0.700**	0.736**	1.143**	0.620**	0.738**
ICRG Socioeconomic Conditions rating at $T - 1$	-0.398	-0.639*	-0.078	-0.481	-0.494	-0.049	-0.370	-0.543	-0.107
Summary statistics:									
No. of observations	128	125	118	115	115	109	115	115	109
R^2	0.677	0.736	0.649	0.692	0.742	0.631	0.690	0.740	0.629
Adjusted R^2	0.624	0.694	0.594	0.638	0.696	0.567	0.635	0.695	0.565

Source: Authors' regressions.

¹ The dependent variable is the change in the rate of economic growth from horizon $T - 1$ to the indicated horizon. Intercepts and year dummy variables are included in all regressions. Standard deviations and t -statistics for the estimated parameters are available from the authors upon request.

Table 9. Regressions of the Fiscal Balance-to-GDP Ratio on the Share of Committed Funds Disbursed¹

Independent variable	OLS estimates			2SLS estimates			3SLS estimates		
	T (1)	$T + 1$ (2)	$T + 2$ (3)	T (4)	$T + 1$ (5)	$T + 2$ (6)	T (7)	$T + 1$ (8)	$T + 2$ (9)
Disbursement share	0.024**	0.020**	0.013	-0.013	-0.039**	-0.021	-0.024	-0.038*	-0.019
Initial real GDP per capita	0.002**	0.0003	-0.0006	0.002**	-0.001	-0.001	0.002*	-0.001	-0.001
First lagged difference in fiscal balance-to-GDP ratio	0.156*	0.349***	-0.131	0.161**	-0.323***	-0.096	0.100	-0.321***	-0.059
Fiscal balance-to-GDP ratio at $T - 1$	-0.623***	0.523***	-0.434***	-0.651***	-0.497***	-0.527***	-0.451***	-0.472***	-0.558***
ICRG Corruption rating at $T - 1$	-0.010***	-0.005	-0.006	-0.009**	-0.006	-0.006	-0.006*	-0.006*	-0.006
Change in Corruption from $T - 1$ to horizon	-0.008	0.005	0.002	-0.008	0.003	0.003	-0.003	0.002	-0.001
ICRG Democratic Accountability rating at $T - 1$	0.001	0.002	0.007	0.002	-0.003	-0.001	-0.002	-0.002	0.002
Change in Democratic Accountability from $T - 1$ to horizon	-0.008	-0.007*	0.0007	-0.009*	-0.008**	-0.004	-0.008*	-0.008**	0.0004
ICRG Ethnic Conflict rating at $T - 1$	0.001	-0.005*	-0.004	0.001	-0.002	-0.001	0.001	-0.002	-0.002
Change in Ethnic Conflict from $T - 1$ to horizon	-0.015**	0.0006	-0.005	-0.016**	-0.003	-0.006	-0.015**	-0.004	-0.007
ICRG External Conflict rating at $T - 1$	0.004*	0.005*	0.004	0.002	0.003	0.003	0.003	0.003	0.004
Change in External Conflict from $T - 1$ to horizon	0.009***	0.004	0.005	0.006*	0.002	0.001	0.006**	0.003	0.003
ICRG Military in Politics rating at $T - 1$	0.004**	0.003	0.002	0.003	0.005**	0.003	0.003	0.004*	0.003
Change in Military in Politics from $T - 1$ to horizon	0.006	0.0007	-0.005	0.008	-0.001	-0.006	0.001	-0.001	-0.005
Dummy for precautionary arrangement	0.027**	0.016	0.009	0.004	-0.028*	-0.014	-0.006	-0.027	-0.013
Summary statistics:									
No. of observations	119	118	112	115	115	109	115	115	109
R^2	0.510	0.603	0.392	0.505	0.639	0.456	0.472	0.637	0.443
Adjusted R^2	0.386	0.507	0.243	0.379	0.407	0.316	0.338	0.545	0.300

Source: Authors' regressions.

¹ The dependent variable is the change in the fiscal balance-to-GDP ratio from horizon $T - 1$ to the indicated horizon. Intercepts and year dummy variables are included in all regressions. Standard deviations and t -statistics for the estimated parameters are available from the authors upon request.

Table 10. Regressions of the Fiscal Balance-to-GDP Ratio on the Irreversible Interruption Index¹

Independent variable	OLS estimates		2SLS estimates		3SLS estimates				
	T (1)	T + 1 (2)	T + 1 (3)	T (4)	T + 1 (5)	T (6)	T (7)	T + 1 (8)	T + 2 (9)
Noninterruption dummy variable	0.016***	0.014**	0.008	-0.010	-0.023	-0.035*	-0.022	-0.020	-0.032*
Initial real GDP per capita	0.002*	0.001	-0.001	0.002*	-0.001	-0.001	0.002	-0.001	-0.001
First lagged difference in fiscal balance-to-GDP ratio	0.190**	-0.354***	-0.141	0.168**	-0.308***	-0.089	0.099	-0.310***	-0.057
Fiscal balance-to-GDP ratio at T - 1	-0.576***	-0.534***	-0.433***	-0.632***	-0.508***	-0.522***	-0.436***	-0.484***	-0.558***
ICRG Corruption rating at T - 1	-0.012***	-0.007*	-0.007	-0.008*	-0.003	-0.002	-0.004	-0.004	-0.004
Change in Corruption from T - 1 to horizon	-0.008	0.003	0.001	-0.007	0.003	0.004	-0.002	0.001	-0.0003
ICRG Democratic Accountability rating at T - 1	0.002	0.003	0.007	0.002	-0.003	-0.002	-0.002	-0.002	0.002
Change in Democratic Accountability from T - 1 to horizon	-0.006	-0.008*	0.0002	-0.008	-0.008**	-0.003	-0.007*	-0.008**	0.00003
ICRG Ethnic Conflict rating at T - 1	0.002	-0.004	-0.004	0.002	-0.003	-0.002	0.001	-0.003	-0.002
Change in Ethnic Conflict from T - 1 to horizon	-0.014**	0.001	-0.005	-0.016**	-0.004	-0.006	-0.015**	-0.004	-0.007
ICRG External Conflict rating at T - 1	0.003*	0.005**	0.005	0.002	0.003	0.002	0.003	0.003	0.004
Change in External Conflict from T - 1 to horizon	0.008***	0.005*	0.005	0.007**	0.002	0.001	0.007**	0.003	0.003
ICRG Military in Politics rating at T - 1	0.005***	0.003	0.002	0.003	0.004**	0.003	0.004*	0.004*	0.002
Change in Military in Politics from T - 1 to horizon	0.008	0.003	-0.004	0.008	-0.002	-0.006	0.001	-0.001	-0.005
Summary statistics:									
No. of observations	122	119	112	115	115	109	115	115	109
R ²	0.499	0.609	0.392	0.492	0.634	0.471	0.458	0.631	0.459
Adjusted R ²	0.383	0.520	0.252	0.371	0.546	0.344	0.329	0.543	0.329

Source: Authors' regressions.

¹ The dependent variable is the change in the fiscal balance-to-GDP ratio from horizon T - 1 to the indicated horizon. Intercepts and year dummy variables are included in all regressions. Standard deviations and t-statistics for the estimated parameters are available from the authors upon request.

Table 11. Regressions of the Current Account-to-GDP Ratio on the Share of Committed Funds Disbursed¹

Independent variable	OLS estimates			2SLS estimates			3SLS estimates				
	T	T + 1	T + 2	T	(4)	(5)	(6)	T	(7)	(8)	T + 2
Disbursement share	0.008	0.022	0.060***	-0.082**	-0.039	0.024	-0.080**	-0.038	0.020	-0.038	0.020
Initial real GDP per capita	-0.0008	-0.001	0.0006	-0.002	-0.003	-0.0001	-0.002	-0.003	-0.0001	-0.003	-0.0001
First lagged difference in current account balance-to-GDP ratio	-0.145	-0.172*	-0.118	-0.215**	-0.195*	-0.155	-0.160*	-0.190*	-0.157	-0.190*	-0.157
Current account balance-to-GDP ratio at $T-1$	-0.157**	-0.217**	-0.371***	-0.149**	-0.125	-0.394***	-0.114*	-0.143*	-0.435***	-0.143*	-0.435***
ICRG Corruption rating at $T-1$	-0.011	-0.005	-0.014*	-0.007	-0.002	-0.016**	-0.006	-0.002	-0.017**	-0.002	-0.017**
Change in Corruption from $T-1$ to horizon	-0.002	-0.005	0.009	0.002	-0.001	-0.002	0.002	-0.003	-0.002	-0.003	-0.002
ICRG Ethnic Conflict rating at $T-1$	-0.008*	-0.008	-0.002	-0.006	-0.007	0.001	-0.006	-0.007	0.001	-0.007	0.001
Change in Ethnic Conflict from $T-1$ to horizon	-0.010	-0.002	-0.008	-0.016*	-0.016*	-0.006	-0.016*	-0.015	-0.006	-0.015	-0.006
ICRG External Conflict rating at $T-1$	0.003	0.0001	-0.0001	0.001	-0.003	-0.003	0.001	-0.002	-0.003	-0.002	-0.003
Change in External Conflict from $T-1$ to horizon	0.008	-0.0008	-0.005	0.003	-0.002	-0.010**	0.004	-0.002	-0.012**	-0.002	-0.012**
ICRG Government Stability rating at $T-1$	0.014***	0.013*	0.010	0.009*	0.010	0.002	0.008*	0.010	0.002	0.010	0.002
Change in Government Stability from $T-1$ to horizon	-0.004	0.005	-0.002	-0.005	0.005	-0.007	-0.003	0.004	-0.007	0.004	-0.007
ICRG Investment Profile rating at $T-1$	-0.014***	-0.013**	-0.009*	-0.009**	-0.010*	-0.006	-0.008**	-0.011**	-0.006**	-0.011**	-0.006**
Change in Investment Profile from $T-1$ to horizon	-0.016***	-0.018***	-0.007*	-0.016***	-0.015***	-0.003	-0.019***	-0.016***	-0.003	-0.016***	-0.003
ICRG Military in Politics rating at $T-1$	0.011***	0.012***	0.010**	0.007**	0.010**	0.008*	0.007**	0.010**	0.008*	0.010**	0.008*
Change in Military in Politics from $T-1$ to horizon	0.004	0.003	-0.002	0.006	0.003	-0.001	0.005	0.004	-0.001	0.004	-0.001
Dummy for precautionary arrangement	0.017	0.036	0.061**	-0.048	-0.011	0.039	-0.047	-0.008	0.038	-0.008	0.038
Summary statistics:											
No. of observations	124	123	117	115	115	109	115	115	109	115	109
R^2	0.392	0.379	0.443	0.460	0.407	0.451	0.460	0.406	0.449	0.406	0.449
Adjusted R^2	0.230	0.220	0.300	0.309	0.241	0.295	0.309	0.238	0.291	0.238	0.291

Source: Authors' regressions.

¹ The dependent variable is the change in the current account balance-to-GDP ratio from horizon $T-1$ to the indicated horizon. Intercepts and year dummy variables are included in all regressions. Standard deviations and t -statistics for the estimated parameters are available from the authors upon request.

Table 12. Regressions of the Current Account-to-GDP Ratio on the Irreversible Interruption Index¹

Independent variable	Estimated Impact on Change in Current Account Balance-to-GDP Ratio from Horizon $T-1$ to Indicated Horizon								
	OLS estimates			3SLS estimates					
	T	$T+1$	$T+2$	T	$T+1$	$T+2$			
Noninterruption dummy variable	0.002	0.010	0.024**	-0.037	-0.024	0.032	-0.032	-0.024	0.030
Initial real GDP per capita	-0.001	-0.001	0.0008	-0.002	-0.003	0.001	-0.002	-0.003	0.001
First lagged difference in current account balance-to-GDP ratio	-0.133	-0.172*	-0.105	-0.235**	-0.197*	-0.180	-0.173*	-0.192*	-0.180*
Current account balance-to-GDP ratio at $T-1$	-0.158**	-0.208**	-0.366***	-0.136**	-0.115	-0.365***	-0.105*	-0.135*	-0.399***
ICRG Corruption rating at $T-1$	-0.012*	-0.007	-0.019**	-0.004	0.0004	-0.019**	-0.003	-0.0001	-0.020**
Change in Corruption from $T-1$ to horizon	0.0002	-0.005	0.007	0.0004	-0.0004	0.0001	-0.0005	-0.002	0.0002
ICRG Ethnic Conflict rating at $T-1$	-0.006	-0.005	0.002	-0.006	-0.006	0.003	-0.006*	-0.006	0.003
Change in Ethnic Conflict from $T-1$ to horizon	-0.011	-0.002	-0.007	-0.015	-0.016*	-0.004	-0.015	-0.014	-0.004
ICRG External Conflict rating at $T-1$	0.003	0.0003	0.0006	0.002	-0.002	-0.002	0.002	-0.002	-0.002
Change in External Conflict from $T-1$ to horizon	0.008*	0.0004	-0.003	0.005	-0.001	-0.009**	0.006	-0.001	-0.010**
ICRG Government Stability rating at $T-1$	0.013**	0.014**	0.010	0.009*	0.010	0.001	0.008*	0.010	0.001
Change in Government Stability from $T-1$ to horizon	-0.003	0.006	-0.003	-0.006	0.005	-0.007	-0.003	0.005	-0.008
ICRG Investment Profile rating at $T-1$	-0.011***	-0.011**	-0.005	-0.009**	-0.008*	-0.005	-0.009***	-0.009*	-0.005
Change in Investment Profile from $T-1$ to horizon	-0.016***	-0.018***	-0.006	-0.014***	-0.014***	-0.002	-0.019***	-0.015***	-0.002
ICRG Military in Politics rating at $T-1$	0.011***	0.012***	0.010**	0.006*	0.010**	0.008*	0.007**	0.010**	0.008**
Change in Military in Politics from $T-1$ to horizon	0.004	0.005	0.0001	0.006	0.003	-0.001	0.006	0.004	-0.0003
Summary statistics:									
No. of observations	127	124	117	115	115	109	115	115	109
R^2	0.385	0.368	0.416	0.443	0.395	0.448	0.430	0.393	0.447
Adjusted R^2	0.235	0.217	0.273	0.294	0.234	0.299	0.279	0.231	0.297

Source: Authors' regressions.

¹ The dependent variable is the change in the current account balance-to-GDP ratio from horizon $T-1$ to the indicated horizon. Intercepts and year dummy variables are included in all regressions. Standard deviations and t -statistics for the estimated parameters are available from the authors upon request.

An Empirical Decomposition of Mean Changes in Macroeconomic Variables

This annex describes the empirical methodology used in the decomposition of the mean changes of macroeconomic variables. Macroeconomic outcomes depend on program implementation, institutional and political factors, the autoregressive and mean-reverting dynamics of the right-hand-side variables, and other factors. The magnitude and significance of the regression coefficients reported in Tables 5 through 12 shed some light on the relative importance of each source. The relative contribution of each factor is ascertained as follows. We set variables used in the 3SLS regressions of Tables 5, 7, 9, and 11 to their mean values and use estimated coefficients to compute the contribution of each variable to the changes in inflation, economic growth, the current account balance, and the fiscal balance. Using the means of actual changes in those variables as anchors, we can draw the following conclusions.

For all four variables, autoregressive and (in most cases) mean-reversion terms are responsible for a large portion of the variation in the explanatory variable at all horizons. Initial real GDP per capita is also very important for the determination of variation in macroeconomic variables, but the size of this effect declines with the length of the horizon (the only exception is the change in growth rates). The marginal impact of political and institutional factors and of program implementation on macroeconomic outcomes varies over time. Ratios of the percentage contribution of each of these factors to the contribution of the autoregressive and mean-reversion terms are plotted for inflation, growth, and the fiscal and current account balance in Figure A1).²⁵ We highlight several facts:

- Program implementation drives inflation dynamics in the first and second year of a program. Although it works in the same direction as the variable’s autoregressive and mean-reversion dynamics, the impact of program implementation is roughly 3½ and 2 times greater for horizons T and $T + 1$, respectively. When combined, institutional and political factors push inflation upward and are especially important over the two-year horizon (twice the size of the mean-reversion terms).
- Although institutional factors and program implementation are both important for growth rates over one- and three-year horizons, institutional and political conditions have a quantitatively greater impact. Program effects are growth-stimulating at all horizons (contributing positively to the mean change in growth). Institutional and political factors tend to reduce growth in the short run, but raise it in the long run (with a negative contribution to the mean change in growth rates at T , and a positive contribution at $T + 2$).

²⁵ More specifically, we compute the following ratios:

$$\frac{\text{IMF Program Implementation Effect, \%}}{\text{Autoregressive and Error – Correction Dynamics, \%}} \text{ and } \frac{\text{Political and Institutional Effects, \%}}{\text{Autoregressive and Error – Correction Dynamics, \%}}$$

- The influences of institutional factors and program implementation are very similar but work in the opposite direction for the fiscal balance. Institutional factors are especially important in determining the evolution of the fiscal balance over one- and three-year horizons. IMF program implementation is very important over the two-year horizon.
- Program implementation is the major factor influencing the current account in the first year of a program. The impact is very large, more than seven times greater than the impacts of the autoregressive and mean-reversion factors. It appears that program implementation worsens the current account in the short run but improves it in the long run. Although institutional factors have a strong impact on current account dynamic over all horizons, their relative importance increases with the length of the horizon.

Figure A.1

Different Factors in Inflation Determination

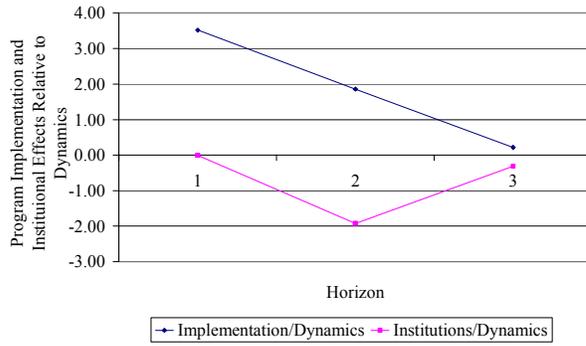


Figure A.2

Different Factors in Growth Determination

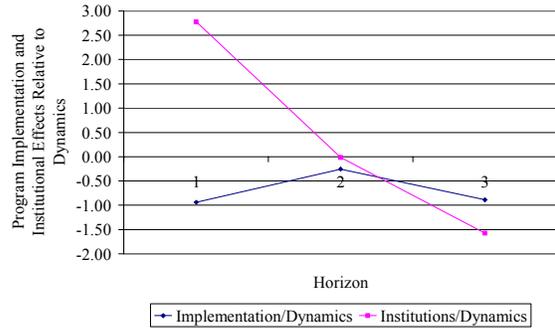


Figure A.3

Different Factors in Fiscal Balance Determination

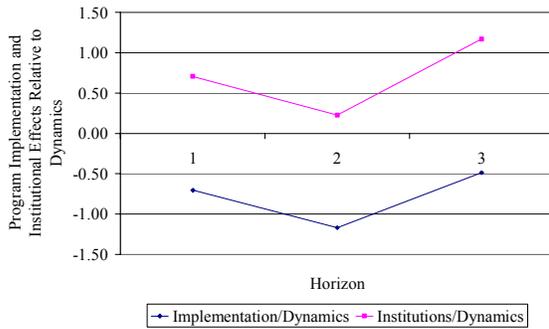
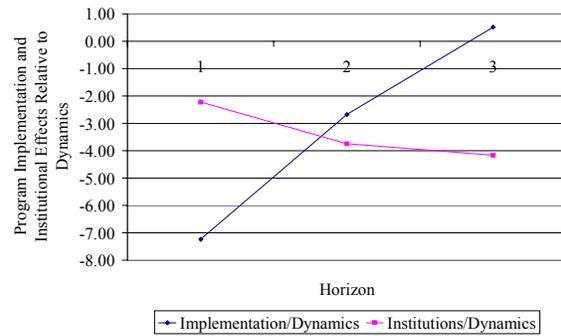


Figure A.4

Different Factors In Current Account Determination



Source : Authors' calculations.

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