



WP/05/106

IMF Working Paper

Underlying Factors Driving Fiscal Effort in Emerging Market Economies

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IMF Working Paper

Fiscal Affairs Department

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June 2005

Abstract

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Using a panel dataset of 34 emerging market countries for the period 1990–2002, we examine the roles of various economic, political, and institutional variables in determining fiscal effort, as proxied by the primary surplus. We find that while fiscal effort increases, as expected, with the level of lagged debt, this effect tapers off beyond a certain threshold. We also find an inverse U-shaped relationship between the primary balance and revenue. Fiscal effort rises with positive shocks to oil prices (for oil exporters), when the economy grows above its potential, and in the presence of an IMF-supported program. In contrast, high democratic accountability and strong and impartial bureaucracies help lower market risk and hence lower the relative need for fiscal adjustment. Finally, fiscal effort tends to decline when too many constraints are faced by the executive.

JEL Classification Numbers: E62; H39; H63

Keywords: Public debt, fiscal balance, fiscal sustainability

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¹ The European Department and the Fiscal Affairs Department, respectively. We thank Manmohan Singh Kumar and Jonathan Ostry for providing the initial motivation and guidance for this paper, as well as Fabrizio Balassone, Alfredo Baldini, Stephan Danninger, Xavier Debrun, Paolo Manasse, and Ranil Salgado for insightful comments and suggestions.

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I. INTRODUCTION

What determines a country's fiscal effort? Why are some countries, at certain points in time, willing to bear the costs of large fiscal adjustment, while others are not? What roles do economic, political, and institutional factors play in determining fiscal outcomes? These issues have critical policy implications, as countries in general, and emerging market economies in particular, continue to grapple with bringing their debt down to levels that can be considered prudent.

Many emerging market economies are concerned about high debt levels, with a large number of countries in this group facing debt levels higher than industrial countries. High debt and associated interest costs not only crowd out private investment, but take away resources from development and poverty-related spending. Economies constrained by debt also have less policy flexibility, making it more difficult to run countercyclical policy. The rationale for reducing debt burdens expeditiously is thus well understood.

Perhaps of most visible importance is the fact that by establishing a track record of strong fiscal effort, a country signals its ability and willingness to service and sustain a certain level of debt. The market tends to assign a substantial weight to primary surplus—the clearest proxy of fiscal effort—in assessing public debt sustainability and sovereign risk.

But understanding the underlying factors that determine that effort is complicated. The primary surplus achieved at a given point in time is determined by a complex combination of factors reflecting both needs (e.g., to service existing debt, to smooth out fluctuations) and abilities (e.g., available revenues, expenditures that cannot be rationalized, as well as economic, political, and institutional constraints, both secular and cyclical).

This paper attempts to empirically investigate the testable implications from a variety of theoretical models of fiscal effort. The core of the work involves estimating a reduced form specification, incorporating both factors reflecting the debt service needs and variables unrelated to the long-run solvency requirement. The role of a rich array of economic, political, and institutional variables in determining fiscal effort is examined.

This paper presents a number of interesting results, corroborating previous findings and unearthing new ones. While fiscal effort, as expected, is found to be a function of the lagged debt stock, it tends to weaken after a debt threshold of 50 percent of GDP is breached. An inverted U-shaped relationship is seen between primary surplus and revenues, indicating that fiscal effort is constrained both at very low and high levels of revenue. Also, the primary balance rises when oil exporters enjoy positive price shocks, when the economy grows above its potential, and in the presence of an IMF-supported program. In contrast, countries with high democratic accountability, as well as strong and impartial bureaucracies are seen to have lower market risk and the relative need for fiscal adjustment is thus lowered. Finally, fiscal effort tends to decline when too many constraints are faced by the executive.

The rest of the paper is organized as follows. The relevant theoretical and empirical literature are discussed in Sections II and III. Section IV describes the methodology and dataset. Section V contains an analysis of the results. Some policy implications and concluding remarks are in Section VI.

II. THEORETICAL BASIS

The literature has approached the determinants of fiscal effort from a number of angles.² The first strand views the government as an optimizing agent, making intertemporal choices on taxation and spending on behalf of the population, based on economic and cyclical factors. One example of this approach is Barro's (1979) tax smoothing model, where the government minimizes the cost of financing public expenditures by smoothing tax rates over time in response to exogenous shocks. The model implies that deficits will be affected by shocks to government expenditures and income. Although the tax-smoothing model implies that deficits are independent of the debt level, Bohn (1998) finds that empirically this is not the case, and also notes that debt is sustainable if primary surpluses are a strictly positive function of the debt-to-income ratio. Other macroeconomic variables that can potentially influence the primary surplus include inflation, and variables capturing the commodity price cycle (for commodity exporters).

A second approach views governments as being run by self-interested politicians, who are motivated by reelection prospects or by their own ideological preferences. Thus politicians loosen the government purse as elections approach. Although originally motivated by adaptive expectations and voter myopia, Rogoff and Sibert (1988), among others, have demonstrated that political business cycles can occur even with rational expectations.³ These theories also suggest that during the postelection "honeymoon period," more decisive actions can be explained to the public and undertaken with less likelihood of impacting distant elections. The prospect of being replaced can also lead incumbents to incur higher-than-optimal deficits and debt levels, that "tie the hands" of possible successors who may have different preferences (Persson and Svensson, 1989). Politicians are also likely to be driven by their ideological preferences in an even more rudimentary fashion—a conservative party could be expected to cut taxes and government size, whereas a liberal party could be associated with providing greater entitlements and preferring to carry out more activities geared toward redistribution of wealth. Such expectations, however, could very well be the opposite of the actual outcome. Right leaning politicians, known to advocate fiscal prudence, may very well only focus on cutting taxes, pushing the deficit and debt ever higher, making it imperative for subsequent elected bodies to reduce expenditure (the "starve the beast" approach). Left-leaning governments, expected to push for populist programs, may in fact be

² For comprehensive reviews of the literature on the political economy of fiscal policy, see Alesina and Perrotti (1995); Alesina and others (1997); Persson and Tabellini (2000); and Drazen (2000).

³ Specifically, Rogoff and Sibert model political business cycles as an equilibrium signaling process in the presence of temporary information asymmetries. Administrative performance is correlated over time, and prior to elections the incumbent has an incentive to "signal" that the government is doing well.

more likely to be able to rationalize spending, as their call for fiscal prudence may be seen by the public and the legislature as the final, sobering warning.⁴

A third strand of the literature looks at fiscal policy being shaped by institutional characteristics and constraints.⁵ Institutions are viewed in a broad sense, encompassing both formal rules and processes that shape fiscal policy making, and “informal” concepts of institutional quality such as corruption and the rule of law. Between presidential and parliamentary systems of governments, the former might be considered to be more effective in delivering fiscal effort, given that generally presidential systems have relatively fewer blocking authorities in passing budgets. Similarly, systems with too many veto wielding participants may be susceptible to policy paralysis, especially when it comes to taking difficult fiscal adjustment decisions.⁶

Other institutional factors could also play into determining an economy’s perception of mobilizing resources to sustain debt. An economy characterized by strong institutions, such as sound law and order situation, low corruption, high levels of democratic accountability, bureaucratic quality, and a stable government would likely be rewarded by markets through lower spreads, and thus necessitate a smaller magnitude of fiscal adjustment for the same level of debt.

In sum, the literature suggests that a wide variety of economic, political and institutional factors are likely to influence both the ability and desire of governments to exert fiscal effort. This paper attempts to combine all of the three approaches discussed above to examine the key factors associated with fiscal effort.

III. RECENT EMPIRICAL WORK

Until a few years ago, most empirical studies of fiscal behavior were constrained to industrial countries, for which data were available. In the past few years, however, a number of empirical studies on fiscal policy have emerged, and we review a few of them here. Kaminsky, Reinhart, and Vegh (2004), based on a sample of 103 countries, find that fiscal policy, in particular expenditure, is procyclical in most developing countries (especially middle and high income countries). In a forthcoming paper by the IMF (2005), structural fiscal balances are divided into positive and negative output gap cohorts, and it is also found that fiscal policy is pro-cyclical, in both industrial and developing economies.

⁴ Cukiermann and Tommasi (1998) refer to this as the “Nixon goes to China” phenomenon.

⁵ See, for example, Persson (2002); and Persson and Tabellini (2002).

⁶ More specific budgetary institutions, including quantitative limits on fiscal variables (e.g., balanced budget rules and debt ceilings) and procedural rules, have been discussed in the literature, but available panel data on these are scarce.

Baldacci and others (2004) focus specifically on “successful fiscal adjustments,” and examine the political and economic determinants of these episodes. They find that the probability of an economy running sustained primary surpluses is diminished if there is a high degree of fiscal decentralization, governments face imminent elections and do not enjoy parliamentary majority. In contrast, fiscal adjustment is likely to be more successful under IMF-supported programs, and when revenue reforms are put in place.

The IMF’s *World Economic Outlook* (2003) examines fiscal policy reaction functions for a group of emerging market economies. A key finding is that primary surpluses respond to increasing debt levels, and this response is stronger at high debt levels for industrial countries (confirming Bohn’s (1998) finding for the United States). But the opposite is true for emerging markets—the response of fiscal policy weakens as the debt-to-GDP ratio increases. They also find that trade openness and institutional quality tend to be associated with stronger countercyclical fiscal policy response. Good institutions are associated with a better ability to raise revenues, more fiscal policy credibility, and looser resource constraint.

This paper builds on these recent works (especially on the latter), but departs from them in a number of ways. A wider array of variables’ roles in determining fiscal effort are examined in general, with a particular focus on political and institutional variables that have not been used in this line of study. Also, instead of focusing only on fiscal adjustment episodes (and defining these in an ad hoc manner), we simply use the primary surplus as a proxy of fiscal effort in our regression model. We consider fiscal effort to reflect the resources that the government is diverting from private use without giving a counterpart in terms of services, and hence the primary surplus becomes the variable of our prime interest.

IV. METHODOLOGY AND DATA

We first examine the role of individual variables in determining fiscal effort in a bivariate setup. We do this both by examining scatter plots of primary surplus against the variables and by analyzing, for a select group of variables with binary outcomes, the association with various levels of fiscal effort.

We then move on to the regression estimation, where we consider a range of variables to evaluate the contribution of economic, political, and institutional factors in fiscal effort. We use a dataset of 34 emerging market economies, spanning the period 1990–2002.

The dependent variable is the primary balance. Our reduced form specification follows Bohn (1998) and IMF (2003):

$$p_{i,t} = \alpha_i + \sum_{j=1}^J \beta_j X_{j,i,t} + \rho b_{i,t-1} + \varepsilon_{i,t}$$

where $p_{i,t}$ is the primary balance to GDP ratio in country i at time t ; α_i is a country-specific intercept (fixed effect); $b_{i,t-1}$ is the debt to GDP ratio at the end of the previous period; X_j is a

vector of other covariates explaining changes in the primary balance unrelated to the long-run solvency requirement; and $\varepsilon_{i,t}$ is an error term.

On the right hand side, we first introduce a set of variables to take into account macroeconomic factors that directly impact fiscal performance. First of these is one-period lagged debt to GDP ratio, which determine the interest payments in the current period. In order to take into a possible kink in the relationship between debt and fiscal effort, a spline variable is added for a debt threshold of 50 percent of GDP.⁷ The main argument for adding this variable is that while primary surpluses respond positively to increases in debt at low to moderate levels, reflecting an effort to satisfy the intertemporal budget constraint, this effect diminishes once debt levels cross a relatively high threshold.⁸

A number of variables are introduced to incorporate cyclical and one-off factors. These are output gap (deviation of GDP from trend using a Hodrick-Prescott filter), deviation from trend of oil and non-oil commodity prices (to control for the impact of commodity price movements on the fiscal position of commodity exporting countries), and log of CPI inflation. The inflation variable potentially captures the effect described by Patinkin (1993), when money printing lowers real expenditure and thus improves fiscal balances.

Fiscal effort also is reflective of the quality of the fiscal regime. Countries with high resource generating capacity would likely be able to meet its expenditure needs without resorting to deficit spending. We try to capture this by the government revenue-to-GDP ratio. Since fiscal effort is also likely to be influenced by a country entering into a program with the IMF, we add a dummy variable that takes on the value of 1 for the years under a program.

Finally, we examine a range of institutional variables.⁹ A parliamentary and presidential election dummy variable captures possible political pressure on expenditure during election years, leading to worsening fiscal performance. The *International Country Risk Guide's* (2003) 100-point political risk rating index is used, as well as a number of the subcomponents of the index that could likely explain fiscal effort. These subcomponents capture ratings on corruption, government stability, bureaucracy quality, law and order, and democratic accountability. The executive constraint variable prepared for the Polity IV database (Marshall and Jaggers, 2003) is used to examine the impact of checks and balances in the decision making process in the government. Henisz's (2000) variable on political

⁷ The spline regression works better than adding various powers of the debt-to-GDP variable on the right hand side.

⁸ The ratio of external debt to GDP is added as well, to account for the fact that external debt service tends entail a more stringent set of rules for the debtor country, which can, at least in the short run, be less sensitive to the implications of domestic debt accumulation. Due to data limitations, however, we lose a large number of observations (over 100) in the regressions when external debt is as added to the panel dataset. We therefore refrain from presenting those results, although all key variables are estimated with the right sign and significance in that setup, including the external debt-to-GDP variable.

⁹ For greater detail on the construction and sources of the institutional variables, see the data appendix.

constraint, created using the Polity IV data, and rates the feasibility of policy change, is added as an independent variable as well. In all cases, an increase in the value of the institutional variable denotes an improvement. Two additional variables are obtained for the Database of Political Institutions of the World Bank. One measures legislative fractionalization, while the other reflects the political ideology of the party in power. All institutional variables are scaled uniformly (from 0 to 1) to assist comparability among parameter estimates.

The panel data regressions are estimated with fixed effects.¹⁰ Other than the controls, variables are introduced one by one to examine their marginal impact on the regression output. Regressions with a larger set of variables in various permutations are subsequently carried out.

V. ANALYSIS OF RESULTS

Bivariate Figures

The basic bivariate results offer useful insight in setting up the panel regression specification, as well as confirming some priors.

The selected figures in the following pages are instructive.¹¹ Primary surpluses are seen to be an increasing function of debt, but the relationship appears to change at higher levels of debt (we test this further in the regressions). A linear fit seems to explain that higher revenue-to-GDP ratios are associated with improved primary balances, but an inverted U-shaped quadratic relationship seems to explain the relationship better, i.e. countries with very low or very high revenue-to-GDP ratios find it relatively more difficult to raise their primary surpluses. This interesting finding is rather intuitive, as it is in line with the notion that when the size of the government is very small, governments have little maneuvering room to deliver fiscal effort, whereas on the other end governments can become so large that extracting additional resources to improve balances may become next to impossible.¹²

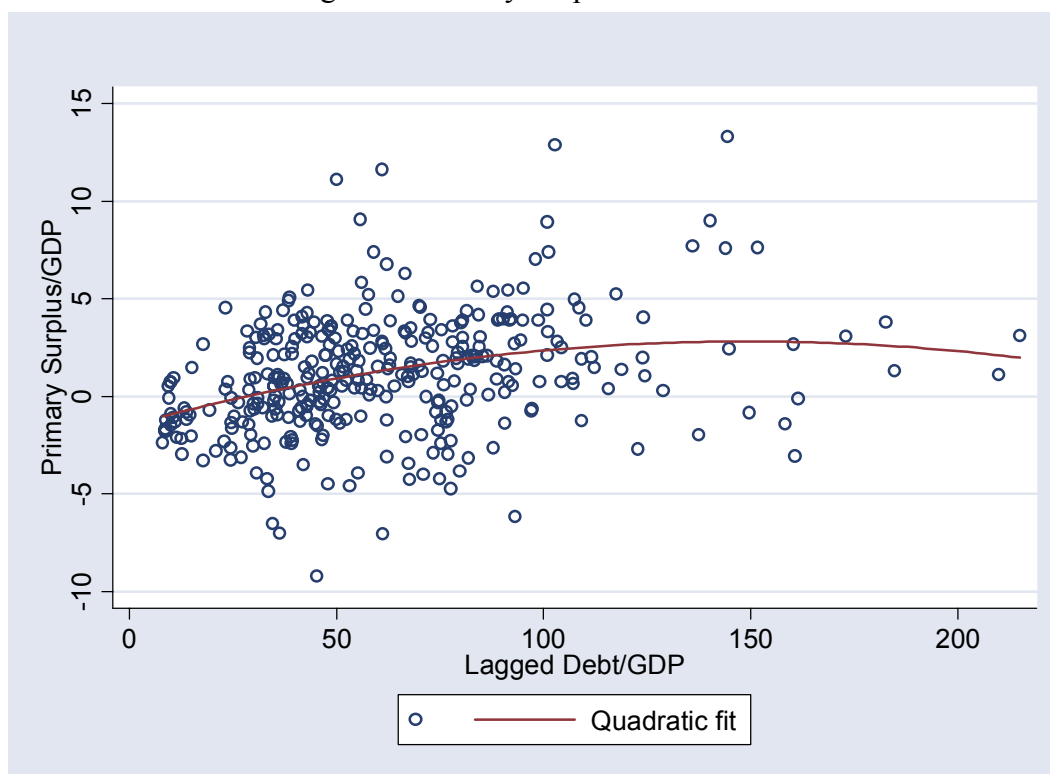
The figure between primary surplus and output gap shows a positive relationship, suggesting countercyclical policies being pursued by the countries in the sample. A less clear-cut, but still positive, relationship is seen between primary surplus and inflation.

¹⁰ As a robustness check, we also re-estimate the panel regression model applying the Generalized Least Squares (GLS) methodology (using cross section weights).

¹¹ Additional bivariate figures are provided at the back of the paper.

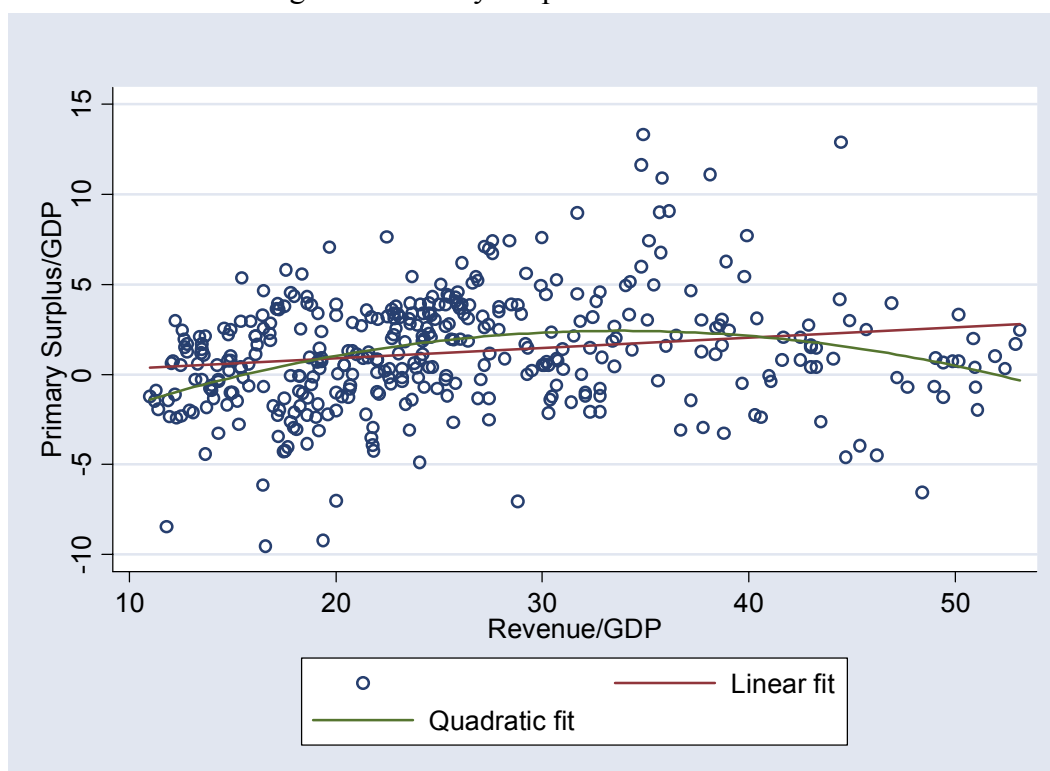
¹² Large governments could also reflect a national choice for the government to deliver extensive entitlements to the population, which makes the expenditure side rigid.

Figure 1. Primary Surpluses and Debt



Sources: IMF and staff estimates.

Figure 2. Primary Surpluses and Revenues



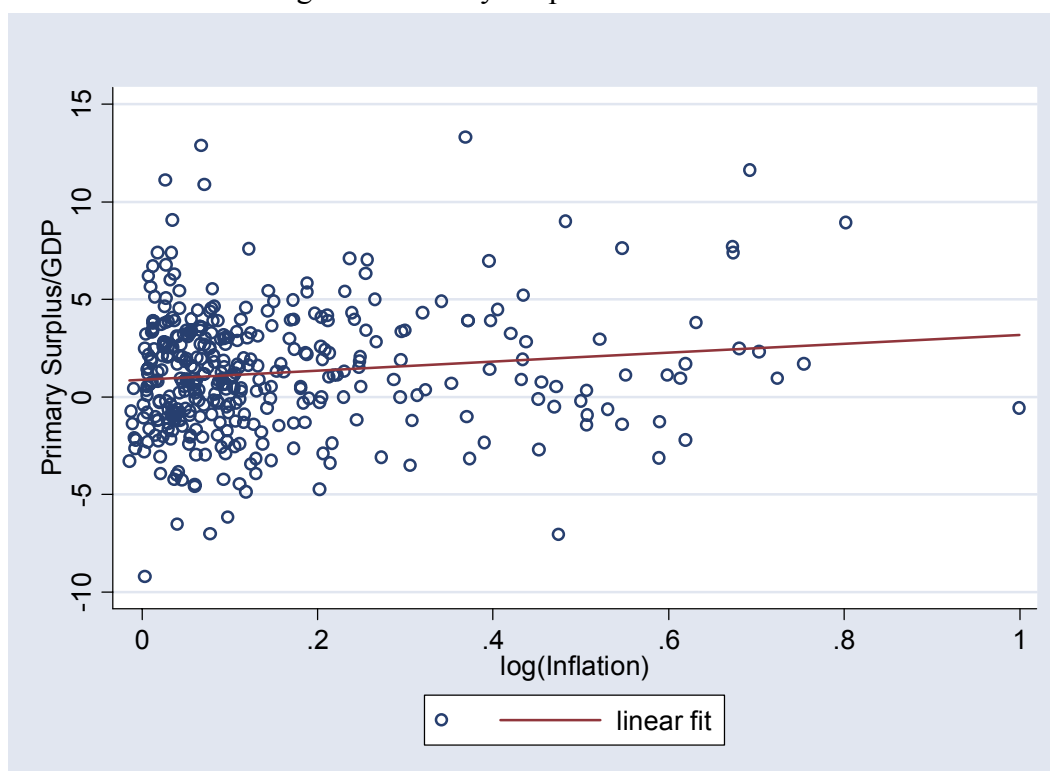
Sources: IMF and staff estimates.

Figure 3. Primary Surpluses and the Output Gap



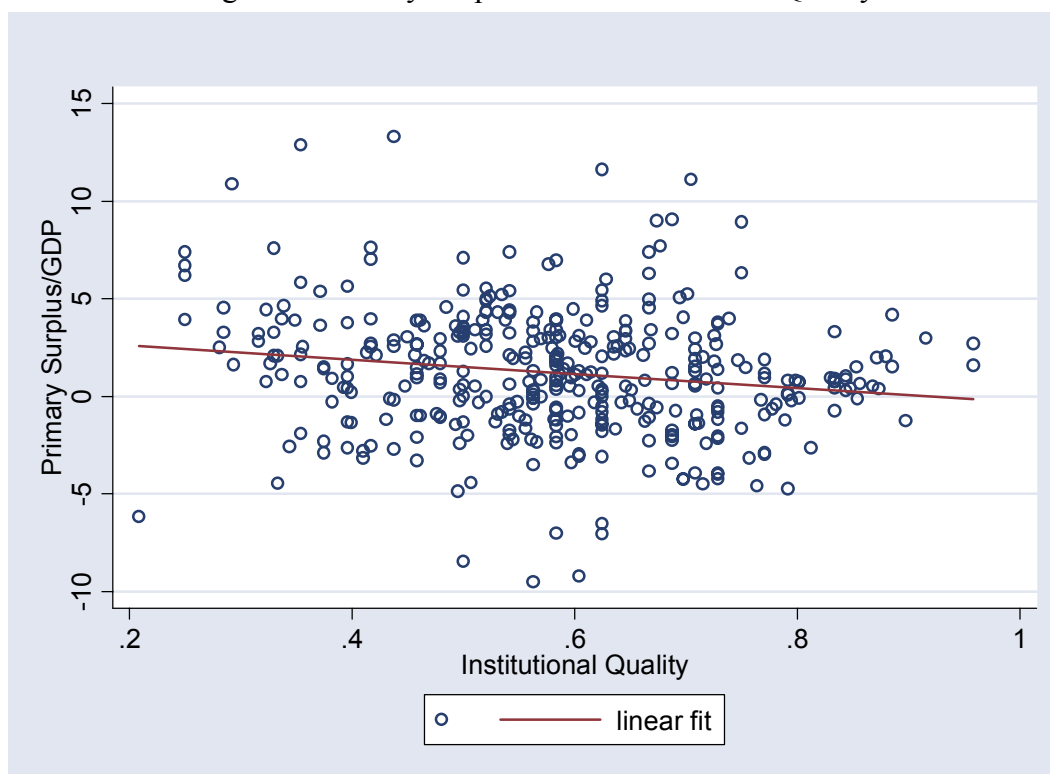
Sources: IMF and staff estimates.

Figure 4. Primary Surpluses and Inflation



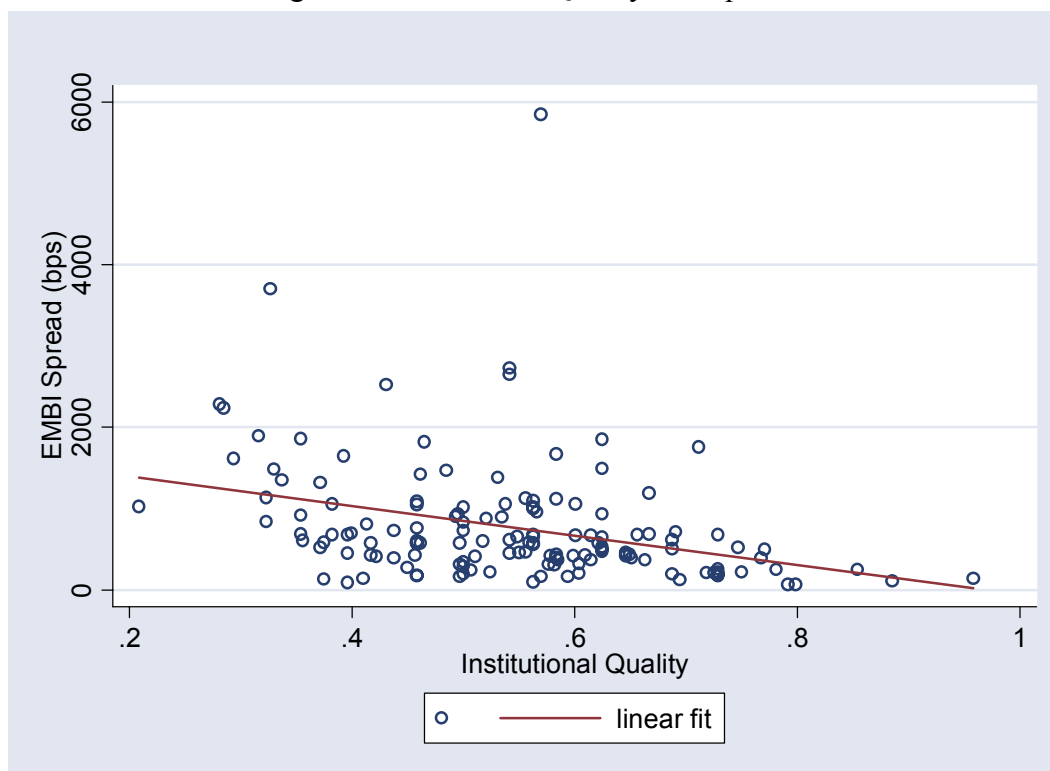
Sources: IMF and staff estimates.

Figure 5. Primary Surpluses and Institutional Quality



Sources: IMF, ICRG, and staff estimates.

Figure 6. Institutional Quality and Spreads



Sources: IMF, ICRG, Morgan Stanley, and staff estimates.

The last two of the selected figures examine the institutional aspects of fiscal effort. Plotting the institutional quality index of the *International Country Risk Guide* (the index is the average of three indicators: democratic accountability, bureaucracy quality, and government stability), we find it to be negatively correlated with fiscal effort. This seems counterintuitive initially, as one would expect countries with stronger institutions to be characterized by prudent fiscal management. This could however be readily explained by considering a third variable—spreads on government debt. As the final figure shows, countries with better institutions are rewarded by the market's favorable perception of its sovereign risk, thus lowering its spreads. As a result, relatively less fiscal effort is needed for a given debt level.

Fiscal Effort Under Different Conditions

For variables with binary outcomes, we apply a different approach, examining how the outturns are under various levels of fiscal effort. This approach allows us to obtain a number of interesting stylized facts. For this purpose, fiscal effort is ranked as follows:

- Very poor: if primary surplus is less than -1 percentage point of GDP;
- Poor: if primary surplus is between -1 and 1 percentage point of GDP;
- Good: if primary surplus is between 1 and 3 percentage points of GDP;
- Very good: if primary surplus is more than 3 percentage points of GDP.

Table 1 summarizes the results:

Table 1. Fiscal Effort Under Different Conditions
(Relative frequency)

Fiscal Effort	IMF Program?		Fiscal Effort	System of Government	
	No	Yes		Presidential	Parliamentary
Very Poor	28.0	17.8	Very Poor	19.6	38.1
Poor	27.7	20.0	Poor	27.3	19.1
Good	19.7	29.6	Good	24.1	22.2
Very Good	24.6	32.6	Very Good	29.1	20.6
TOTAL	100.0	100.0	TOTAL	100.0	100.0
Pearson chi-sq:	11.81		Pearson chi-sq:	9.78	
P-value:	0.01		P-value:	0.02	
Fiscal Effort	Election Year?		Fiscal Effort	Ideology of Executive	
	No	Yes		Left-wing	Right-wing
Very Poor	23.2	25.5	Very Poor	32.5	32.6
Poor	25.4	28.7	Poor	18.2	33.3
Good	24.6	19.2	Good	23.4	17.0
Very Good	26.8	26.6	Very Good	26.0	17.0
TOTAL	100.0	100.0	TOTAL	100.0	100.0
Pearson chi-sq:	1.38		Pearson chi-sq:	6.99	
P-value:	0.71		P-value:	0.07	
Fiscal Effort	First Year in Office?		Fiscal Effort	Party of Executive Controls Legislature?	
	No	Yes		No	Yes
Very Poor	26.6	26.4	Very Poor	31.2	19.5
Poor	22.8	27.8	Poor	23.6	26.4
Good	22.8	22.2	Good	21.0	26.4
Very Good	27.8	23.6	Very Good	24.2	27.7
TOTAL	100.0	100.0	TOTAL	100.0	100.0
Pearson chi-sq:	0.95		Pearson chi-sq:	5.87	
P-value:	0.81		P-value:	0.12	

Of the six variables examined, two offer no statistically significant differences among the sample cohorts. Countries in an election year appear to be no more likely to deliver poor fiscal effort than countries that are not. Similarly, the first year in office appears to be a poor predictor of fiscal effort.

Statistically significant association is seen between an IMF program and strong fiscal effort, whereas a parliamentary system of government appears to yield substantially poorer fiscal effort than a presidential system. As expected, fiscal prudence is a casualty when the party of the executive loses control of the legislature. Finally, left leaning governments are associated with significantly more instances of good or very good levels of fiscal effort than their right leaning counterparts.

Core Regression Results

The panel regression results are presented in Tables 2, 3, and 4. Table 2 contains the core macrovariables, Table 3 adds the political and institutional variables one by one, and Table 4 puts together the entire set of variables. The results from Table 2 are as follows:

- As expected, as debt rises, increased financing needs force countries to exert greater fiscal effort. Primary balances however do not rise commensurately at high levels of debt. Indeed the spline regression coefficient is estimated negatively and significantly, indicating that the reaction of the primary surplus to debt is contingent on the debt level itself.¹³ Fiscal effort actually flattens once debt levels become too high. Thus countries who have more than 50 percent of debt appear to be responding in a manner inconsistent with ensuring fiscal sustainability.
- A one-percentage point increase in the revenue-to-GDP ratio leads to more than 0.6 percentage point improvement in the primary surplus. To explore deeper this relationship, motivated by the scatter plot seen earlier, we add a quadratic term of the variable in the regression, and find that the associated parameter estimate is statistically significant with a negative sign. The coefficients of revenue-to-GDP and its quadratic term are combined to obtain the revenue level at which primary surplus peaks.¹⁴ That level appears to be when revenues reach around 45 percent of GDP.

¹³ See WEO (2003) for results that show that in contrast to emerging economies, advanced economies yield the opposite spline regression results, i.e. their primary surpluses' response to higher level debt is stronger than at moderate levels.

¹⁴ This is simply obtained by $(\beta_1 / 2\beta_2)$, where β_1 is the coefficient of revenue/GDP and β_2 is the coefficient of the revenue/GDP squared.

Table 2. Primary Surplus Regressions (Core Variables)

Lagged Debt/GDP	0.034 [4.62]***	0.086 [3.75]***	0.086 [3.75]***	0.055 [2.48]**	0.067 [3.16]***
Spline at 50 percent of debt/GDP		-0.061 [2.40]**	-0.061 [2.40]**	-0.041 [1.70]*	-0.060 [2.58]**
Revenue/GDP				0.723 [3.89]***	0.633 [3.37]***
Revenue/GDP squared				-0.008 [2.38]**	-0.007 [2.15]**
Output Gap					0.169 [2.24]**
Spline on positive output gap					-0.079 [0.60]
Commodity Prices					0.091 [1.62]
Oil Prices					0.089 [4.24]***
log (inflation)					1.857 [4.13]***
Observations	365	365	365	361	355
Number of IFS Code	34	34	34	34	34
R-squared	0.06	0.08	0.08	0.2	0.29

Absolute value of t statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

- The output gap coefficient, which is calculated to denote a positive number when actual output is *above* potential, is estimated with a positive sign and is statistically significant. The positive coefficient is supportive of counter-cyclical fiscal policy, i.e. when the economy improves, countries run larger primary surpluses. This could be owing to the business cycle impacting revenues and expenditures favorably, which in turn have a positive impact on the primary balance. The result stands somewhat in contrast to the findings of Kaminsky, Reinhart, and Vegh (2004), who find that fiscal policy is pro-cyclical in middle and high income countries, but is similar to the findings of IMF (2003). We also check if there is an asymmetry between periods of positive and negative output gaps by adding a spline, but find no statistical significance in the test.
- Oil prices (but not non-oil commodity prices) are estimated positively and significantly, as expected. Primary balances improve when oil exporters benefit from positive price shocks.

- Primary surplus responds positively to inflation. As noted in the previous section, Patinkin (1993) provides an explanation for this finding. Finance officials who cannot force individual ministries to make adequate spending reductions may seemingly accept these demands, and then finance the budget deficit by printing money and letting the resulting inflation enforce the a reduction in real government expenditures.

Note that in these regressions fixed effects explain about 40 percent of the total variation, i.e., 40 percent of variation is within-country and 60 percent is between-country. Also, examining the covariances among the variables, we find that in almost all cases intertemporal variation is substantial.¹⁵

Adding Institutional Variables

The basic regression setup is then augmented by adding the political and institutional variables one at a time (Table 3).¹⁶ In virtually all cases, the core variables maintain broadly their respective magnitude, sign and statistical significance. Additionally, the coefficient estimate on commodity prices becomes significant in a number of specifications.

Three institutional variables are found to be statistically significant—bureaucracy quality, democratic accountability, and executive constraints, and they are all negatively associated with fiscal effort. The negative signs on the first two variables likely reflect the fact that countries with better institutions tend to have on average lower debt and sovereign risk, and thus need to exert lower fiscal effort. Bureaucracy quality, reflecting well-established best practices by civil servant and autonomy from political pressure, tends to be high in low risk countries, which need lower fiscal effort. The democratic accountability variable reflects the quality of democratic institutions and practices, which is once again associated with low country risk. The negative sign on the executive constraints variable is as expected, as governments with too many veto yielding players could in fact face policy paralysis, leading to weaker fiscal effort. Finally, while the higher ratings on the executive constraint variable reflect greater degree of checks and balances, and thus could be expected to correlate positively with fiscal effort, it should be noted that the highest rating in this variable reflects accountability groups having de facto veto power over the executive. The negative sign of this variable thus likely indicates that excessive limits on the executive could lead to decision-making paralysis, leading to weaker fiscal effort.

¹⁵ This is true for the institutional variables incorporated subsequently as well.

¹⁶ Note that all control variables consistently retain their signs and significance, and to a very large extent, their magnitudes while institutional variables are added one at a time.

Table 3. Primary Surplus Regressions (Core and Institutional Variables)

Lagged Debt/GDP	0.079 [3.71]***	0.073 [3.28]***	0.074 [3.25]***	0.075 [3.38]***	0.066 [3.05]***	0.076 [3.40]***	0.072 [3.27]***	0.067 [3.15]***	0.063 [2.90]***	0.064 [2.55]**	0.081 [3.80]***	0.089 [4.16]***
Spline at 50 percent of debt/GDP	-0.066 [2.79]***	-0.068 [2.81]***	-0.067 [2.74]***	-0.070 [2.89]***	-0.051 [2.15]**	-0.070 [2.89]***	-0.067 [2.81]***	-0.060 [2.60]***	-0.056 [2.38]**	-0.082 [2.87]***	-0.084 [3.53]***	-0.090 [3.72]***
Revenue/GDP	0.615 [3.18]***	0.689 [3.62]***	0.646 [3.39]***	0.657 [3.50]***	0.646 [3.54]***	0.640 [3.42]***	0.689 [3.68]***	0.648 [3.44]***	0.577 [3.00]***	0.532 [2.17]**	0.514 [2.76]***	0.560 [2.87]***
Revenue/GDP squared	-0.007 [2.00]**	-0.008 [2.57]**	-0.007 [2.20]**	-0.007 [2.27]**	-0.007 [2.43]**	-0.007 [2.19]**	-0.008 [2.43]**	-0.007 [2.22]**	-0.006 [1.83]*	-0.005 [1.12]	-0.005 [1.53]	-0.006 [1.72]*
Output Gap	0.143 [1.90]*	0.202 [2.64]***	0.146 [1.87]*	0.154 [1.97]*	0.153 [2.02]**	0.137 [1.74]*	0.145 [1.88]*	0.173 [2.30]**	0.175 [2.33]**	0.218 [2.58]**	0.169 [2.35]**	0.138 [1.87]*
Spline on positive output gap	-0.058 [0.44]	-0.142 [1.06]	-0.067 [0.51]	-0.076 [0.57]	-0.057 [0.45]	-0.059 [0.45]	-0.082 [0.63]	-0.088 [0.67]	-0.084 [0.64]	-0.199 [1.34]	-0.088 [0.68]	-0.034 [0.27]
Commodity Prices	0.089 [1.63]	0.090 [1.62]	0.094 [1.68]*	0.090 [1.61]	0.085 [1.57]	0.091 [1.63]	0.101 [1.82]*	0.085 [1.52]	0.085 [1.51]	0.106 [1.95]*	0.077 [1.34]	0.101 [1.89]*
Oil Prices	0.090 [4.40]***	0.089 [4.24]***	0.090 [4.28]***	0.089 [4.24]***	0.096 [4.70]***	0.090 [4.30]***	0.090 [4.34]***	0.089 [4.25]***	0.092 [4.36]***	0.053 [2.24]**	0.081 [3.94]***	0.095 [4.66]***
log (inflation)	1.667 [3.51]***	1.965 [4.36]***	1.845 [4.11]***	1.763 [3.83]***	1.892 [4.33]***	1.816 [4.04]***	1.791 [4.02]***	1.957 [4.31]***	2.004 [4.34]***	1.928 [4.14]***	1.876 [4.36]***	1.722 [3.68]***
Election Year	-0.198 [0.72]											
IMF-supported Program		0.506 [1.50]										
Corruption			0.045 [0.04]									
Government Stability				-0.700 [0.76]								
Bureaucracy Quality					-3.643 [4.01]***	0.806 [0.74]						
Law and Order							-1.689 [2.05]**					
Democratic Accountability								0.629 [1.46]				
Ideology (Left)												
Ideology (Right)												
Legislative Fractionalization									-0.526 [1.37]			
Executive Constraint										-1.072 [0.59]		
Checks and Balances											-0.361 [2.51]**	-0.013 [0.02]
Observations	335	348	351	351	351	351	351	351	355	265	335	329
Number of IFS Code	32	33	34	34	34	34	34	34	34	34	33	32
R-squared	0.32	0.31	0.29	0.29	0.33	0.29	0.3	0.29	0.29	0.2	0.27	0.32

Absolute value of t statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4. Primary Surplus Regressions (Core and Institutional Variables)

Lagged Debt/GDP	0.072 [3.27]***	0.072 [3.34]***	0.072 [3.22]***	0.049 [1.94]*	0.048 [1.90]*
Spline at 50 percent of debt/GDP	-0.061 [2.36]**	-0.062 [2.44]**	-0.067 [2.59]**	-0.059 [1.81]*	-0.058 [1.80]*
Revenue/GDP	0.497 [2.59]**	0.507 [2.69]***	0.626 [3.24]***	0.253 [0.96]	0.248 [0.94]
Revenue/GDP squared	-0.005 [1.68]*	-0.006 [1.76]*	-0.007 [2.25]**	0.000 [0.01]	0.000 [0.01]
Output Gap	0.146 [1.92]*	0.140 [1.86]*	0.158 [2.04]**	0.175 [2.01]**	0.179 [2.05]**
Spline on positive output gap	-0.028 [0.22]	-0.026 [0.20]	-0.057 [0.44]	-0.108 [0.74]	-0.113 [0.77]
Commodity Prices	0.065 [1.20]	0.065 [1.21]	0.075 [1.44]	0.083 [1.58]	0.084 [1.60]
Oil Prices	0.083 [4.27]***	0.080 [4.22]***	0.098 [4.99]***	0.047 [2.25]**	0.049 [2.31]**
log (inflation)	1.593 [3.42]***	1.597 [3.44]***	1.609 [3.36]***	1.690 [3.32]***	1.689 [3.32]***
Election Year	-0.176 [0.68]	-0.179 [0.70]	-0.185 [0.70]	0.000 [0.00]	0.020 [0.07]
IMF-supported Program	0.711 [2.26]**	0.734 [2.36]**	0.709 [2.22]**	1.082 [3.03]***	1.063 [2.96]***
Corruption	1.415 [1.21]	1.353 [1.17]	1.526 [1.28]	-0.082 [0.05]	0.007 [0.00]
Government Stability	-0.520 [0.55]	-0.479 [0.51]	-1.095 [1.18]	-1.639 [1.53]	-1.653 [1.54]
Bureaucracy Quality	-4.294 [4.28]***	-4.264 [4.30]***	-3.951 [3.97]***	-3.071 [2.47]**	-3.134 [2.51]**
Law and Order	0.726 [0.60]	1.033 [0.92]	1.067 [0.90]	0.468 [0.38]	0.065 [0.05]
Democratic Accountability	-1.715 [1.75]*	-1.615 [1.67]*	-1.577 [1.68]*	-2.153 [1.89]*	-2.335 [1.98]**
Ideology (Left)				-0.024 [0.04]	-0.049 [0.08]
Ideology (Right)				-0.315 [0.57]	-0.323 [0.58]
Legislative Fractionalization				1.201 [0.67]	1.071 [0.59]
Executive Constraint	-0.157 [0.95]	-0.110 [0.71]		-0.378 [1.70]*	-0.399 [1.77]*
Checks and Balances	0.636 [0.67]		0.872 [0.99]		0.771 [0.61]
Observations	313	314	327	236	236
Number of IFS Code	31	31	32	31	31
R-squared	0.38	0.37	0.39	0.33	0.33

Absolute value of t statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

After examining the impact of the institutional variables one by one, we re-run the panel regressions by adding them all together. The IMF variable is significant across all specifications and appear to be a major factor in improving primary surpluses, accounting for an improvement in fiscal effort of nearly a percentage point of GDP. All other variables macroeconomic and institutional variables estimated in the previous regressions maintain their signs and statistical significances.

Robustness Check

We test the robustness of our results in several ways. First, we replace our pooled least squares fixed effects estimation technique with Generalized Least Squares (GLS) methodology using cross section weights. The results from these regressions are similar to the ones discussed above; in fact, a few other institutional variables are estimated significantly. Improvements in law and order and corruption are associated with improved fiscal effort, and the dummy variable of left leaning governments is estimated with a positive sign, corroborating the bivariate results.

Second, we replace the left hand side variable to be the *change* in primary surplus. The institutional variables that were found to be statistically significant remain so in this setup, but only some of the economic variables (debt, spline on debt, and inflation) remain unchanged. Both revenue-to-GDP and oil price variables lose their significance, whereas the output gap variable is now estimated with the *opposite* sign, i.e., suggesting a procyclical response seen through changes in primary surplus.

Third, we replace the revenue-to-GDP variable on the right hand side with an *average* of past two years' values of the same variable. This is done to check if the likely simultaneity between primary surplus and revenue-to-GDP is driving the results. We find no appreciable change in the results by running this alternative specification.

Finally, instead of estimating a panel with fixed effects, we try random effects regression. No major changes in the results are seen.

VI. POLICY IMPLICATIONS AND CONCLUDING REMARKS

This paper finds robust evidence for a number of economic and institutional variables' association with fiscal effort. Fiscal effort increases with debt, but after debt crosses 50 percent of GDP, the responsiveness declines. Economies appear to struggle to deliver enhanced fiscal effort at very low and high levels of revenue.¹⁷ Primary balances are also seen to rise with positive price shocks for exporting economies; when the economy grows above its potential; and, with an IMF program. In contrast, countries with high democratic accountability, as well as strong and impartial bureaucracies, are seen to have lower market

¹⁷ This suggests a "golden mean" for revenue-to-GDP that maximizes fiscal effort.

risk, and the relative need for fiscal adjustment is thus lowered. Finally, fiscal effort tends to decline when too many constraints are faced by the executive.

Understanding and analyzing the factors that are associated with strong fiscal effort can offer interesting policy lessons. In debt sustainability analyses or designing a consolidation path for an economy under stress, it is critical to assess the ability of the economy to undertake the needed adjustment. While there is little controversy over what could allow a country to exert more fiscal effort (e.g., higher revenue and/or lower expenditure), clearer ideas about improvements in which factor can yield the most “bang for the buck” could be useful in preparing a consolidation strategy.

The primary surplus regressions themselves, in addition to yielding insights into the key determining factors underlying fiscal effort, can provide a useful benchmark for assessing countries’ fiscal performance. Predicted fiscal effort can be compared to actual fiscal effort to get a sense of whether countries are doing as well as they can, given their prevailing circumstances.

One of the findings of the paper highlights the peculiarities of high debt economies. The non-responsiveness of fiscal effort to debt levels higher than 50 percent of GDP is worrisome with regard to the dynamics of debt sustainability. Finally, a key policy lesson from this paper is that stronger institutions can allow countries to sustain higher levels of debt, and thus resort to a relatively more gradual fiscal adjustment path.

Description of Institutional Variables

Year of Parliamentary & Presidential Elections: This is a dummy variable that takes on the value of 1 during the election year. *Source: Institute for Democracy and Electoral Assistance (IDEA), 2003.*

IMF-supported Program: *IMF Survey (various issues),*

Political Risk: *The International Country Risk Guide (2003)* creates a 100-point political risk rating. The rating is prepared by summing a number of sub-ratings, in the areas of government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability, and bureaucracy quality. In addition to using the composite ratings, we also examine some of the subcomponents discussed below.

- **Corruption:** This is an assessment of corruption within the political system, including financial corruption, excessive patronage, nepotism, close ties between politics and business, etc. A 6-point rating system assigns higher values to denote lower levels of corruption.
- **Government Stability:** This is an assessment of the government's ability to carry out its declared program and its ability to stay in office. The rating is the sum of three components: government unity, legislative strength, popular support. Each component has a maximum score of 4 and a minimum of 0. A score of 4 points equates to very low risk and a score of 0 points to very high risk.
- **Bureaucracy Quality:** A 4-point scale, with high points given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training. Countries that lack the cushioning effect of a strong bureaucracy receive low points because a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions.
- **Law and Order:** Law and Order are assessed separately, with each sub-component comprising 0 to 3 points. The Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law.
- **Democratic Accountability:** This is 6-point scale to measure of how responsive government is to its people. This is done by assessing the quality of democratic institutions and practices.

Executive constraint: This variable is concerned with the checks and balances between the various parts of the decision-making process in a government. A seven-category scale is used, with 1 denoting unlimited authority, with no regular limitations on the executive's actions, and 7 denoting executive parity or subordination, where accountability groups have

effective authority equal to or greater than the executive in most areas of activity. *Source: Polity IV Project, Political Regime Characteristics and Transitions, 1800-2002, Center for International Development and Conflict Management University of Maryland, College Park.*

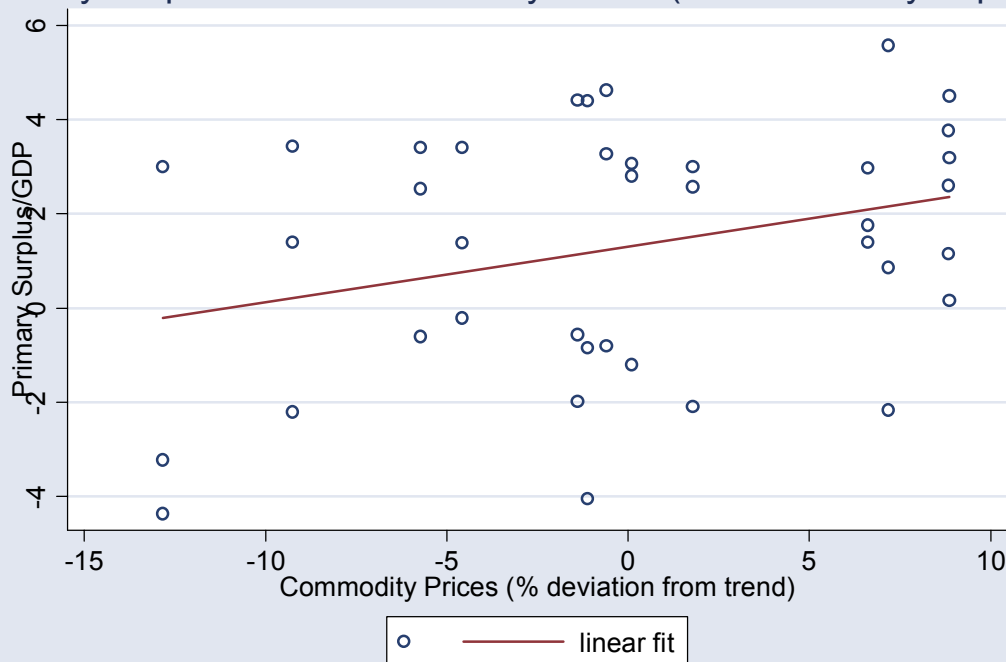
Legislative fractionalization: This index measures the probability that two deputies picked at random from the legislature will be of different parties. *Source: Database of Political Institutions, Development Research Group, The World Bank.*

Ideology: Left leaning parties are those that are defined as communist, socialist, social democratic, or left-wing. Right leaning parties are defined as conservative, Christian democratic, or right-wing. *Source: Database of Political Institutions, Development Research Group, The World Bank.*

Political Constraint (checks and balances): This index measures the feasibility of change in policy given the structure of a nation's institutions and the preferences of the political actors. The index takes into account the number of actors with veto power, as well as the partisan alignment of the key political actors and the homogeneity or heterogeneity of preferences within each branch of the government. Possible scores range from 0 (most hazardous) to 1 (most constrained). *Source: Henisz (2000).*

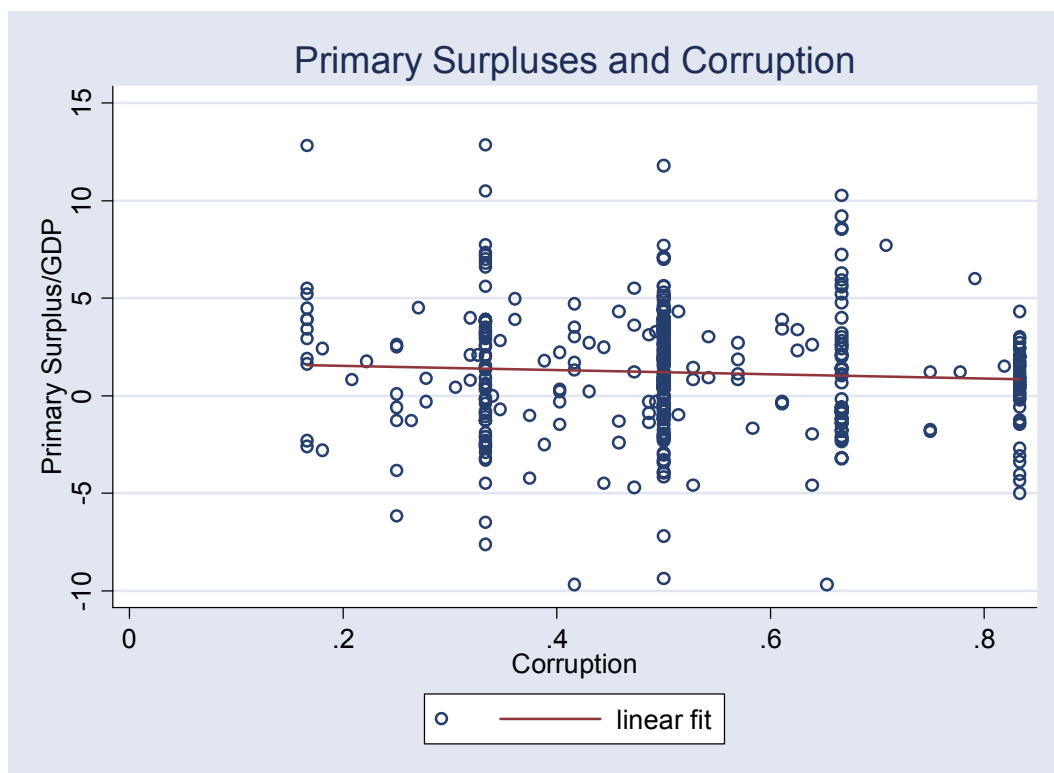
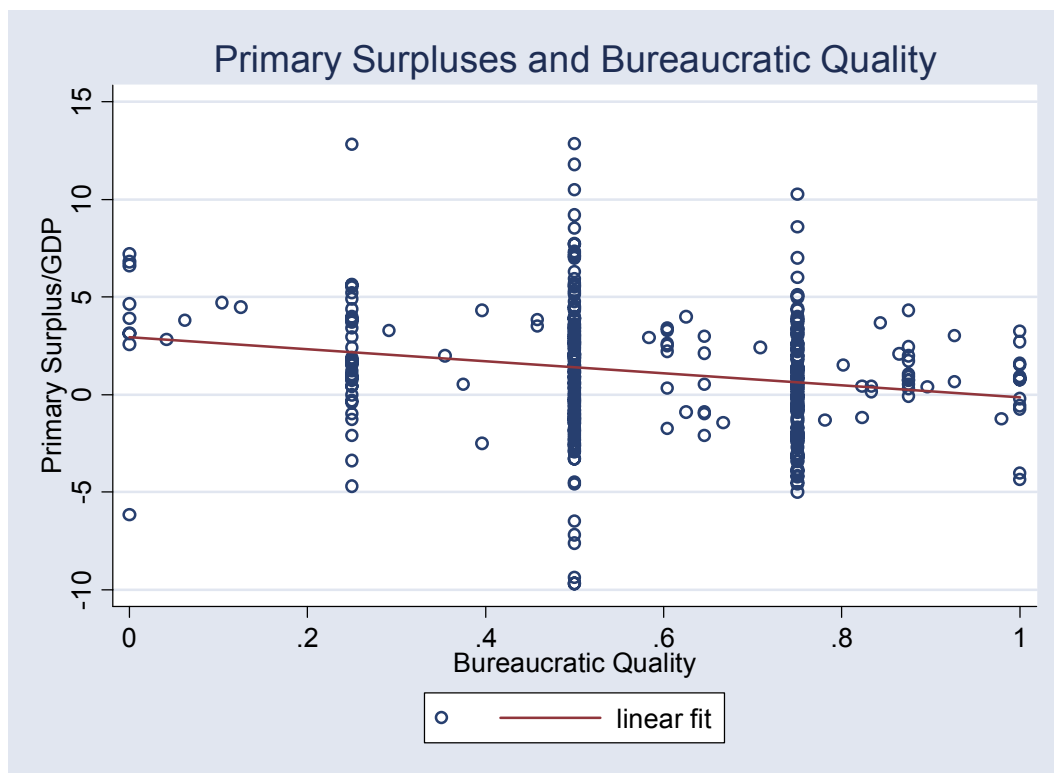
Additional Figures

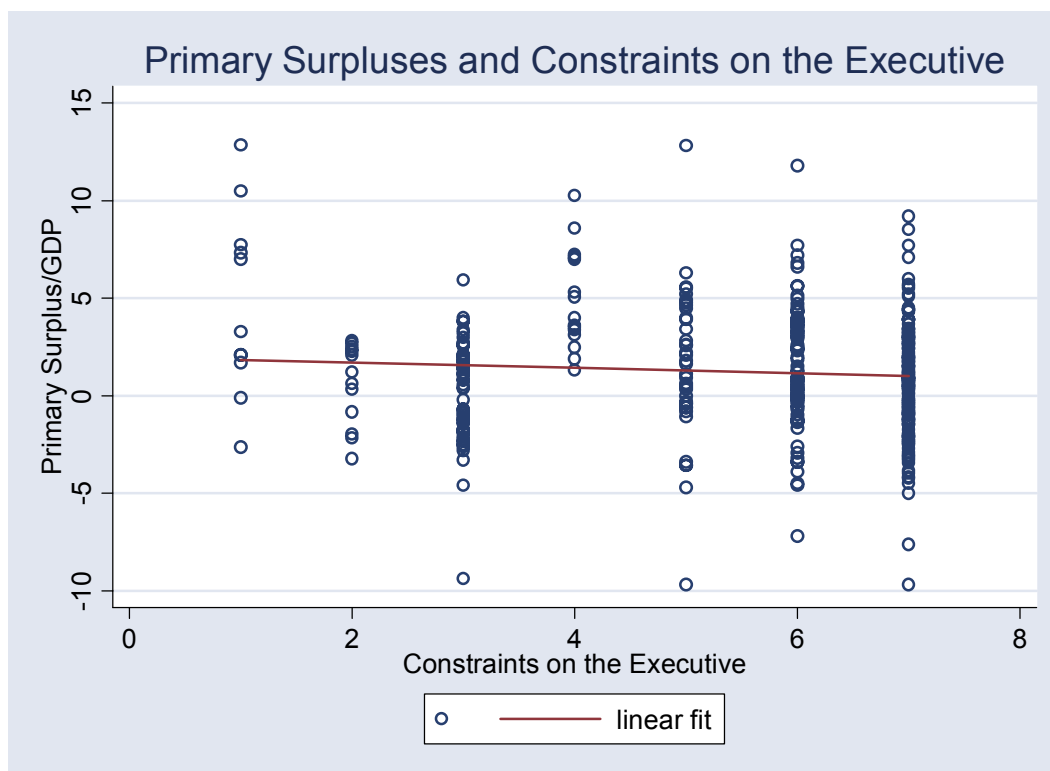
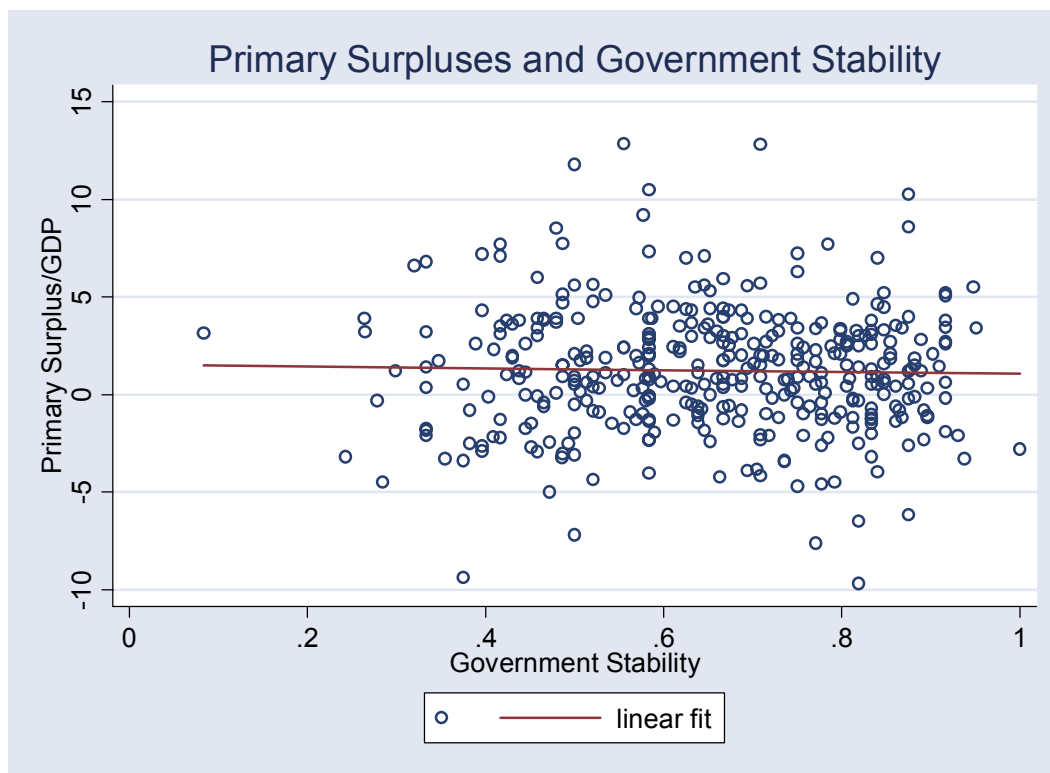
Primary Surpluses and Commodity Prices (for Commodity Exporters)

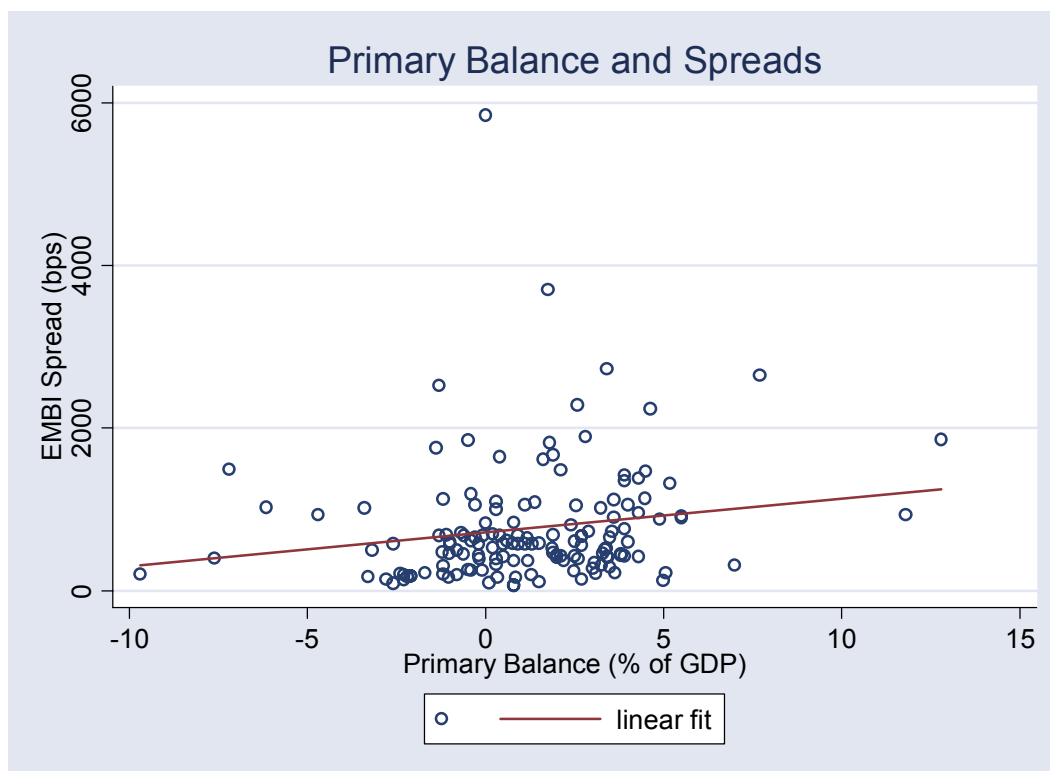
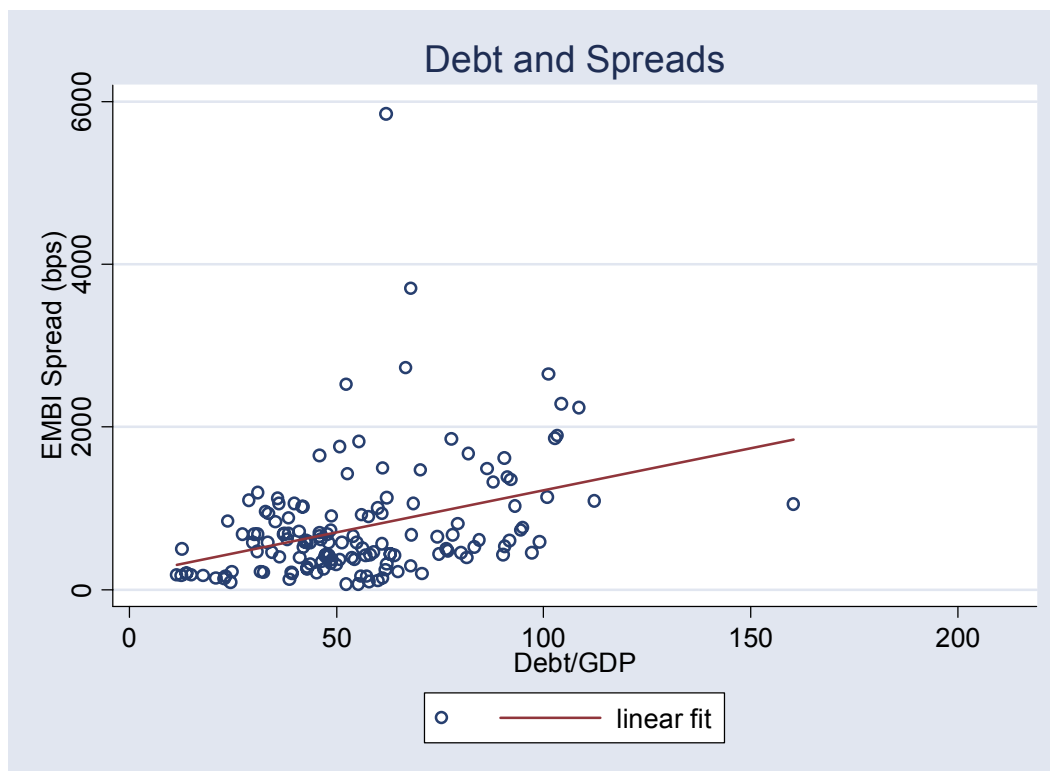


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Sources: IMF and staff estimates.

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