We examine the effect of fiscal policy on sovereign risk spreads and investigate whether the interaction of fiscal variables with political institutions affect financial markets. Using panel data from emerging market countries, we find that revenue-based adjustment lowers spreads more than spending-based adjustment. Financial markets also react to the composition of spending. Cuts in current spending lower spreads more than cuts in investment. We show that debt-financed spending increases sovereign risk, while tax-financed spending lowers spreads, suggesting that international investors prefer the latter. Further, we find evidence that financial markets’ reaction to fiscal policy depends on political institutions.

How do financial markets react to fiscal policy decisions of sovereign borrowers? To our knowledge, relatively few studies have focused on the effects of fiscal policies on sovereign bond spreads. None of them has covered emerging markets, where the issue is particularly relevant. To empirically examine the effect of fiscal policies, it is of obvious importance to have the correct measurement for these policies. Most empirical studies have included some measure of the fiscal deficit in the macroeconomic fundamentals affecting spreads. However, the fiscal deficit can be a misleading indicator. For example, if the fiscal deficit increases because of public investment activities that promise high returns in the future, spreads may decrease in the short run. Alternatively, if the fiscal deficit increases because of higher government wage expenditures, spreads may increase.

This article contributes to the existing literature in three ways. First, it introduces fiscal policy into an empirical model of spreads, using a set of countries not previously studied for the link between fiscal adjustments and financial markets. This allows us to analyse the effects of changes in public expenditure and revenue on spreads, and to ascertain how tax-financed and debt-financed increases in public expenditure influence sovereign risk. Second, we investigate whether the composition of the fiscal adjustment matters for financial markets: do financial markets care about how the adjustment is brought about or only look at the size of the consolidation effort? Do they differentiate between current-expenditure-based and revenue-based adjustments? Third, to the extent that political institutions shape fiscal outcomes, a critical question is whether fiscal variables interact with the political institutions to affect financial markets. For example, for the same fiscal outcome, do market participants differentiate...
between presidential and parliamentary regimes? We also investigate this question by examining majoritarian and proportional electoral systems, right and left wing governments, and election years as opposed to off-election years.

The main results of the article can be summarised as follows: financial markets

1. value a reduction in current spending – largely dominated by transfers, social security, and wages – more than investment cuts,
2. favour revenue-driven adjustments more than current-spending-driven adjustments and
3. prefer revenue-financed spending as opposed to debt-financed spending.

We also find strong evidence that fiscal variables interact with the political institutions to affect financial markets. In particular, financial markets give a premium to right wing regimes (with their preference for a smaller government and fiscal conservatism), while penalising left wing regimes that undertake current-spending-driven expansion. Finally, we find evidence that the effect of fiscal variables on spreads depends on the electoral system, with governments under a proportional system receiving a premium when they undertake fiscal expansion.

The article is organised as follows. Section 1 presents the analytical framework. Section 2 discusses the empirical strategy. Section 3 describes the data and presents the results. Section 4 highlights the main conclusions and their policy implications.

1. Analytical Framework

Our conceptual framework is motivated by the theory of sovereign risk pricing and the theoretical debate on whether the private sector’s response to fiscal adjustment depends on the size or the composition of fiscal adjustment. Alesina and Perotti (1997), using a sample of OECD countries, suggest that the driving force is the composition, rather than the size, of the fiscal adjustment. They distinguish between two types of fiscal adjustments based on the composition: Type I, which is largely expenditure-based, with the brunt of the adjustment falling on current expenditures; Type II, which relies mostly on tax increases and drastic cuts of public investment. Alesina and Perotti argue that Type I fiscal adjustments are the most successful and expansionary. This finding is predicated on three main channels:

1. labour markets,
2. expectation effects2 and
3. credibility effects.

Whether these channels are present in emerging markets economies,3 where the Ricardian equivalence may not hold, is an empirical issue. In contrast to Alesina and Perotti (1997), Giavazzi et al. (2000, 2005) argue that the size rather than the composition matters for expansionary fiscal adjustment.

2 While some studies of developed countries tend to support the labour market channel, the evidence on the expectation channel is inconclusive; see Ardagna (2004).
3 For example, the Ricardian equivalence may not hold because of a larger share of rule of thumb consumers. Moreover, the social returns on spending in emerging countries differ from those in developed countries.

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To test these two competing hypotheses, we decompose how fiscal variables affect spreads, by introducing government revenue, current expenditure and government investment in the empirical model of sovereign risk pricing. In addition, we draw on the political economy literature which relates political institutions to government size and the composition of fiscal variables.\(^4\) This work suggests that political institutions influence government spending. We therefore investigate whether the effect of fiscal variables on spreads differs by political institutions. We first derive the empirical model and present the key hypothesis to be tested.

1.1. The Empirical Model

The empirical model is derived from a model developed by Edwards (1984, 1986). Like Edwards, we assume that a risk-neutral investor lends to a given country that is a price-taker in the world capital market. The equilibrium condition for the optimal allocation of the investor’s portfolio is expressed as

\[
(1 + r^*) = pd\omega_0 + (1 - pd)(1 + r^L).
\]

Where \(r^*\) is the risk-free world interest rate; \(pd\) is the probability of default; \(\omega_0\) is the payment made by the borrower to the lender in the default state and \(r^L\) is the lending rate.

It is straightforward to derive the equilibrium condition for the spread from (1)

\[
s = \frac{pd}{1 - pd} (1 + r^* - \omega_0)
\]

where \(s\) is the spread over the risk-free world interest rate (\(r^*\)). According to standard practice, we specify a logistic form for the probability of default

\[
pd = \frac{\exp \left( \sum_{k=1}^{n} \beta_k Z_k \right)}{1 + \exp \left( \sum_{k=1}^{n} \beta_k Z_k \right)}
\]

where the \(Z_k\) are determinants of the probability of default that are elaborated below, and the \(\beta_k\) are the corresponding coefficients. By combining equations (2) and (3), and taking the natural logarithm, the resulting equation is written as

\[
\ln s = \ln(1 + r^*) + \sum_{k=1}^{n} \beta_k Z_k.
\]

By adding the country and time dimensions, and allowing for the time and fixed effects, the stochastic model to be estimated is given by

\[
\ln s_{it} = \alpha_i + \beta Z_{it} + \lambda_t + \eta_{it}
\]

where \(s_{it}\) is the secondary market spread over the risk-free world interest rate in country \(i\) in year \(t\); \(\alpha_i\) is a country fixed effect; \(\lambda_t\) is the time fixed effect and \(\eta_{it}\) is a Gaussian error term. In this framework \(r^*\) is absorbed in the time fixed effect \(\lambda_t\).

\(^4\) See, for example, Persson and Tabellini (2000).

\(^5\) Without loss of generality, \(\omega_0\) is assumed to be zero.
1.2. Testing the Impact of Fiscal Variables on Spreads

The basic formulation used to test the impact of fiscal variables on spreads is

\[
\log s_{it} = \alpha_i + \delta \text{debt}_{it} + \sum \beta_j Q_{it} + \gamma_1 \text{Rev}_{it} + \gamma_2 \text{Curex}_{it} + \gamma_3 \text{Ginv}_{it} + \lambda_t + \eta_{it}
\]

(6)

where \( \text{debt}_{it} \) is the ratio of total debt outstanding to Gross National Income, \( Q_{it} \) is a vector of control variables, \( \text{Rev}_{it} \) is the total revenue-to-GDP ratio, \( \text{Curex}_{it} \) is government current spending-to-GDP, and \( \text{Ginv}_{it} \) is the public investment-to-GDP ratio. The ratio of total debt outstanding to Gross National Income (GNI)\(^6\) is a key indicator of a country’s long-run solvency. A higher debt-to-GNI increases the default probability and hence the sovereign risk. Thus, this variable is predicted to be positively associated with the spread. Total revenue-to-GDP is predicted to have a negative sign because higher revenue leads to the improved primary balance, everything else being equal. The sign of the public investment-to-GDP ratio is ambiguous. On the one hand, its coefficient could be negative, because higher investment improves growth prospects. On the other hand, its coefficient could also be negative, as low-quality public investment can hurt growth by crowding out private investment. The ratio of government current spending to GDP is expected to have a positive sign, because higher current spending adds to the deficit often without improving growth prospects.

With regard to the control variables, previous studies point to a large number of variables as possible determinants of sovereign risk. We aim for a parsimonious empirical model, while capturing the key indicators of liquidity, solvency and macroeconomic fundamentals. The control variables include the ratio of foreign exchange reserves to GDP, the inflation rate, the output gap, the default history and the regional spread index. The ratio of foreign exchange reserves to GDP is expected to reduce spreads, because it is a measure of a country’s capacity to service its external debt. The inflation rate is a key indicator of macroeconomic stability. Monetisation of fiscal deficits can lead to high inflation rates, which reduces growth by raising the cost of acquiring capital. It has also been shown that a higher degree of political instability is associated with higher inflation, e.g., Aisen and Veiga (2005). For all these reasons, higher inflation will tend to increase sovereign risk. Because studies have documented that the timing and type of fiscal adjustment depends on the economic cycle (Mulas-Granados, 2003; von Hagen and Strauch, 2001), we include the output gap as a control for the economic cycle and monetary conditions. The default history is expected to have a positive coefficient as defaults increase sovereign risk. We include a regional spread index\(^7\) to capture regional contagion. The reason why we use a regional index is that many authors have suggested that contagion is a more regional than global phenomenon; see, for example, Kaminsky and Reinhart (2000). To compute the regional spread index we group the sample

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\(^6\) We use Gross National Income instead of Gross Domestic Product (GDP) because the former, which captures the net factor income and current transfers, is a better measure of the ability of a country to pay and, therefore, it is often considered a more appropriate measure of a country’s solvency.

\(^7\) The regional spread (excluding a country) is calculated as the weighted average of all other countries in the same region for the same year. The weight used was total EMBI market value (MV). E.g., the regional spread (RS) excluding country \(i\) in year \(t\): \( RS_{it} = \sum (S_j MV_j) / \sum_j MV_j \), where \(j\) represents all other countries in the same geographic region as country \(i\) and \(j \neq i\). The regions are Africa, Asia, Europe, and Latin America.
countries into four regions: Europe, Latin America, Africa and Asia. We expect the contagion variable to have a positive coefficient.

We test three main hypotheses. The first is whether fiscal variables affect directly financial markets. The corresponding null hypothesis is formulated as

$$H_0^F : \gamma_k = 0; k = 1, 2, 3.$$  \hspace{1cm} (7)

In (7) we test whether each of the variables that determine the primary deficit, namely current government spending, government investment, and revenues have an independent effect on sovereign spreads.

The second hypothesis is whether only the size of the fiscal adjustment or expansion matters:

$$H_0^S : -\gamma_1 = \gamma_2 = \gamma_3.$$  \hspace{1cm} (8)

In (8) we test whether it is justified simply to include deficits in an equation explaining sovereign spreads, which is the case when the coefficients on government investment ($\gamma_3$) or current spending ($\gamma_2$) have the same marginal effect and when each of those coefficients has the same magnitude but with opposite sign as the coefficient on government revenues ($\gamma_1$). Equation (8) also tests whether the effect of revenue-based consolidations is equal to the effect of spending-based consolidations, which is the case if decreases in spending lower spreads as much as increases in revenues.

The third hypothesis is whether debt-financed current spending is equivalent to tax-financed current spending:

$$H_0^R : \gamma_1 = \delta.$$  \hspace{1cm} (9)

This hypothesis examines whether it is irrelevant for countries regardless of if they finance increases in spending by increases in taxes or an increase in debt. If financial markets do not distinguish between these two types of financing, the null hypothesis of equality of coefficients on government revenues and government debt will not be rejected.

1.3. Testing the Interactions Between Fiscal Variables and Institutional Variables

The empirical framework for testing the interactions between fiscal policy and political institutions is

$$\log s_{it} = \alpha + \delta \text{debt}_{it} + \sum \beta^i \mathbf{Q}_{it} + \sum \gamma^i \mathbf{F}_{it} + \varphi \text{Pol}_{it} + \sum \theta^i (\mathbf{F}_{it} \text{Pol}_{it}) + \lambda_i + \eta_{it}$$  \hspace{1cm} (10)

where the vector $\mathbf{F}_{it}$ contains government revenues, current spending and investment spending, and $\text{Pol}_{it}$ captures the political institutions variables. For political institutions, we include indicators for the political system (presidential versus parliamentary), the electoral system (proportional versus majoritarian), the election year and for whether the country has a right wing government (as opposed to left wing government).

The justification of these political institutions variables is based on the vast literature showing how political institutions shape the use of discretionary fiscal policy. Using a model of legislative bargaining and backward-looking voting, Persson and Tabellini (1999) argue that presidential regimes, in contrast to parliamentary regimes, lead to
less redistribution and smaller government. Therefore, fiscal expansion undertaken by presidential regimes may have less impact on spreads, as presidential regimes do not favour social transfers and redistribution spending that financial markets may dislike. The indicator variable for the political system takes the value of 1 for presidential and 0 for parliamentary systems.

Based on a Downsian model of electoral competition and forward-looking voting, Persson and Tabellini (1999) also argue that majoritarian, as opposed to proportional, elections are associated with more redistribution and larger government. Hence financial markets may penalise majoritarian regimes when it comes to fiscal expansion. We use an indicator variable for the electoral system, which takes the value of 1 for proportional, and 0 for majoritarian systems. Another institutional variable relates to the literature on political budget cycles, which suggest that policy makers face incentives to alter fiscal variables in an election year to improve their re-election chances (Brender and Drazen, 2005). Hence, the regression also includes an election indicator to capture electoral effects. This variable takes the value of 1 in an election year and 0 otherwise. Finally, the ideology of the party can also matter to financial markets. Mulas-Granados (2003) shows that in the European Union countries during the 1990s, the ideology of party in government was the most important determinant of fiscal adjustment strategies. Therefore, we include a right wing government indicator variable, which takes the value of 1 for a right wing government and 0 otherwise.

We test whether the effect of fiscal policy differs by political institutions. The corresponding null hypothesis is

\[ H_0^P : \theta' = 0. \]  

(11)

2. Empirical Strategy

In our specifications, fiscal variables are likely to be correlated with the disturbance term and fiscal adjustment will not be exogenous to changes in spreads. There are three potential sources of endogeneity in the fiscal variables: interest payments, automatic stabilisers and the timing of discretionary fiscal consolidations. To address these issues, we construct a measure of discretion and changes in fiscal variables. It is important to use discretionary fiscal policy variables to neutralise the effect of automatic stabilisers that may bias the evidence in favour of current spending-based adjustment. Moreover, the use of discretionary fiscal variables is motivated by the evidence that the economic cycle does matter for the timing and type of fiscal adjustments (Mulas-Granados, 2003; von Hagen and Strauch, 2001). To derive the discretionary fiscal policy variables, we estimate the following equation

\[ F_{it} = a_i + \psi \text{outgap}_{it} + \text{inf}_{it} + (\text{inf}_{it})^2 + \xi_{it} \]  

(12)

where \( F_{it} \) is the above fiscal variables, \( \text{outgap}_{it} \) is a measure of the output gap, defined as the difference between real GDP and its country-specific Hodrick-Prescott trend, in

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8 Countries may react to increasing spreads by adjusting their fiscal policy. Our estimates do not suffer from reverse causality if countries react in time period \( t + 1 \) or thereafter to changes in spreads in time period \( t \), because fiscal policy and spreads enter our model contemporaneously.

9 We thank an anonymous referee for pointing out these sources of endogeneity.

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percentage of the trend GDP, and $inf_t$ is the inflation rate. In deriving a measure for discretionary fiscal policy, Fatás and Mihov (2003) suggest including the inflation rate to ensure that the results are not driven by high-inflation episodes. We also add the square of the inflation rate to account for a possible non-linear relation between inflation and the fiscal variables. We instrument all right-hand side variables in (12), using lagged output gap, lagged inflation, and lagged inflation squared as instruments. From these regressions we compute the residuals $\xi_t$ which are our measure of discretionary fiscal policy.\footnote{A similar method has been used by Fatás and Mihov (2003), Blanchard and Perotti (2002), and Alesina et al. (2002).} As argued by Alesina et al. (2002), these cyclically adjusted discretionary fiscal variables may not fully eliminate endogeneity. Accordingly, we address any remaining endogeneity by using as instruments for discretionary fiscal variables the following variables: a dummy for the political system (presidential versus parliamentary), a dummy for the electoral system (proportional versus majoritarian), an electoral indicator, a right wing government indicator variable, the indicator of political constraints constructed by Henisz (2000), the dependency ratio, the urbanisation rate, the log of real GDP per capita and the openness (measured by total trade in per cent of GDP).\footnote{The use of the political institutional variables is motivated by the political economy frameworks of Alesina and Wacziarg (1998) and Persson and Tabellini (2000, 2003). The use of these instruments for fiscal variables is fairly standard in the literature. For their justification, please see Fatás and Mihov (2001, 2003).}

In the second stage, we estimate the original specifications, (6) and (10), using country and year fixed effects (FE), with the three fiscal variables replaced with their corresponding fitted values from the aforementioned regression. Moreover, to take into account the possible short-term dynamics in spreads, a dynamic specification is estimated using a standard IV (Anderson and Hsiao, 1982), with the second lag of the spread as an instrument.

3. Data Description and Results\footnote{More details on the data can be found in the working paper version of this article (Akitoby and Stratmann, 2006).}

3.1. Data Description

The data set for the dependent variable is the stripped spread obtained from the Emerging Markets Bond Index Global (EMBI Global). The EMBI Global, which is widely used, tracks total returns for traded external debt instrument in emerging markets issued by sovereign and quasi-sovereign entities. These instruments include US dollar-denominated Brady bonds, loans, and Eurobonds. Bonds included in the index must have a face value of over US$500 million (with maturity of more than 2 years and 6 months) verifiable daily prices and cash flows. The EMBI Global, which currently covers 32 countries, is a market-capitalisation weighted index, with the country’s spread computed as the weighted average of the spreads of the included bonds.\footnote{An alternative data source for spreads is the EMBI+ index, which covers 19 countries. We choose the EMBI Global because it covers more countries and has more observations than the EMBI+.} Like any other financial data, the EMBI Global index exhibits high volatility and heteroscedasticity. While these problems are less severe in the annual data than in the daily ones,
we do correct for heteroscedasticity in the computation of the covariance matrix of the estimated coefficients. The bond spread is measured against a comparable US government bond.

The data sources of our right-hand side economic variables are from the World Bank’s World Development Indicators, and the IMF’s World Economic Outlook (WEO) and International Financial Statistics (IFS) database. The variable measuring whether a country is in default is based on the classification by Manasse and Roubini (2005, p. 9, Table 1), and Gelos et al. (2004, p. 36, Table A7). The indicator variable is set to 1 if the country in a specific year is classified by either of the papers to be in a default period. The political and institutional variables are taken from Persson and Tabellini (2001) and the World Bank’s Database of Political Institutions (DPI).

3.2. Results

3.2.1. Impact of fiscal variables on spreads

Table 1 reports the panel regression results that include fiscal policy variables. These specifications are particularly suitable for studying the effects of fiscal adjustment. For

![Table 1: Effects of Fiscal Policy on Spreads](image-url)

Robust standard errors in parentheses. All columns include year and country fixed effects. Applying a two-tailed test, * indicates statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level. The list of the 25 countries included in the sample and the number of annual observations are as follows: Argentina (10), Brazil (10), Bulgaria (10), Chile (5), Colombia (7), Côte-d’Ivoire (6), Croatia (5), Ecuador (9), Egypt (3), El Salvador (2), Malaysia (8), Mexico (10), Morocco (6), Pakistan (1), Panama (8), Peru (7), Philippines (6), Russia (6), South Africa (9), Thailand (7), Tunisia (2), Turkey (8), Ukraine (4), Uruguay (3), Venezuela (10).

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example, Alesina et al. (2002) also use a similar regression analysis to study the effects of fiscal adjustment on private investment. We begin with the panel regressions testing $H_0^F$ for the impact of fiscal variables on spreads. Both government revenue and current expenditure always enter with the expected sign and are statistically significant. Revenue increases and current spending cuts reduce spreads. The coefficient of government investment is not statistically significant. The size of public investment, as opposed to its quality, may not matter to investors. Overall, these findings support the hypothesis that government revenues and current spending decisions affect financial markets.

Next, we test the hypothesis $H_0^S$ that only the size of the fiscal adjustment matters. We reject the null hypothesis that the estimated coefficients of government revenue and current spending are statistically equal at 1% critical value, irrespective of the specification. These findings suggest that financial markets do differentiate between revenue-based and current spending-based consolidations. We find that revenue-based adjustment lowers spreads more than spending-based adjustment does. The results suggest that in emerging market economies financial markets do consider revenue-based fiscal adjustments to be more successful for reducing sovereign risk than current spending-based adjustments.14

The results also allow us to examine whether financial markets treat reduction in current spending and cuts in investment differently. Since the coefficient of government investment is not statistically significant, while that of current spending is strongly significant, the findings tend to support the hypothesis that the composition of spending does matter for financial markets.

The result on the merits of spending vs. revenue fiscal adjustments suggests that the three channels – labour markets, expectation and credibility – on which the success of spending-based fiscal adjustments rests, may not work well in emerging market economies. First, in emerging market economies the transmission through labour markets may be hampered by labour market segmentation, the dominant role of government employment and regulation, and the low degree of labour mobility across sectors. Moreover, wage earners in emerging market countries represent a smaller proportion of total employment than in industrialised countries. Second, the expectation channel may be ineffective as liquidity constraints inhibit consumption smoothing. Finally, the credibility channel may not be effective if the social returns on government spending in developing countries are perceived to be higher than in developed countries.

Using the estimation results of (10) reported in Table 1, we test $H_0^R$, which allows drawing conclusions on whether financial markets prefer expenditures financed from debt or expenditures financed out of revenues. If a country finances current spending by raising revenue, the increase in revenue would reduce the spread, thereby offsetting the impact of increasing current spending on spreads; whereas, in the case of the debt-financed current spending, the increase in the country’s indebtedness will further heighten the country risk. Put differently, tax-financed current spending is not

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14 When the non-adjusted fiscal variables are used in the estimation, the evidence is in favour of current spending-based adjustment, which suggests that this simply stemmed from automatic stabilisers. Hence the importance of using the cyclically-adjusted fiscal variables.
equivalent to debt-financed current spending, as far as the impact on spreads is concerned. For example, based on the IV specification in Table 1, a one percentage point increase in current spending lowers spreads by 9.5% if financed by taxes, but will raise spreads by about 8.5% if financed by debt.

3.2.2. Interactions between fiscal variables and institutional variables

Table 2 shows how the interaction between fiscal variables and political institutions affect financial markets (testing of $H_0^0$). The regressions on which Table 2 is based include the same control variables as Table 1 (debt to GNI, reserves to GDP, log inflation, output gap, the three fiscal variables, whether a country is in default, and the regional contagion measure) and also the level of the political institution itself. Since the estimates for the control variables are very similar to those in Table 1, we do not report these results in Table 2. Also, the estimates on the levels of the political institution variables are not reported, as they are all, with one exception, statistically insignificant and we discuss this below.

In all four specifications, the coefficients on government revenues (Table 2, row 1) and current spending (Table 2, row 2) continue to be statistically significant, as they were in Table 1. The point estimates on the interaction effects between the fiscal variables and the political variables measure whether these point estimates differ from the main effect on the fiscal variables in the first three rows of Table 2.

The results from interacting fiscal policy variables with government ideology show that the effect of fiscal variables on spreads differs by whether the government is right wing or left wing (Table 2, column 1). Financial markets give a premium to right wing governments when they undertake fiscal expansion (increasing current expenditures), as shown by the negative and statistically significant sign on the interaction between current spending on the right wing government variable. Put differently, financial markets penalise left wing regimes that undertake spending-driven expansion. This may be because right wing governments are often associated with fiscal conservatism and a smaller government size while left wing governments are often associated with a larger government and broader social transfer programmes. The findings also show that financial markets reward left wing governments by more than right wing governments when government revenues increase, i.e. right wing governments get lower benefits from a revenue-based consolidation. One reason for this could be that government spending is already low when the government is conservative; so that the marginal benefit from consolidation is less than if government spending is high.

The estimate on the interaction term between proportional representation countries and investment expenditures is negative (Table 2, column 2). This point estimate is

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15 We re-estimate (6) using government revenue and the change in the debt level as right hand side variables, while dropping spending. The finding that financial markets prefer revenue-financed spending as opposed to debt-financed spending remains robust in this specification. All results can be obtained from the authors upon request.

16 This number is obtained by adding the estimated coefficients of government revenue to GDP and current expenditure to GDP.

17 With fixed effects specifications, the coefficients on the levels of the political institution variables may not be estimated precisely, due to the low variation in these variables.

18 The interaction effect between current government spending and investment are jointly statistically significant.

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The interaction between proportional representation countries and current expenditures is also negative but not statistically significant. However, interaction terms are jointly significant at the 2% level. This shows that an increase in spending-driven fiscal expansion leads to higher spreads in countries with majoritarian elections than those with proportional representation. Financial markets penalise majoritarian regimes that undertake spending-driven expansion, presumably because these regimes are often associated with larger government and broader social transfer programmes. This finding is also consistent with the view that the majority-rule countries tend to have what is called in the US ‘pork barrel’ spending,

19 One cannot reject the null hypothesis that the sum of the point estimates on $Ginv \times Prop$ and on public investment ($Ginv$) equals zero. Thus, in a statistical sense, in proportional representation systems the effect of investment spending on spreads is zero.
which is spending targeted to electoral districts. Financial markets may believe that ’pork barrel’ spending increases when current expenditures and government investment rise. Much of what may be contained in the category of government investment (building roads and bridges) may have low returns under a majoritarian system if it is spending targeted to districts or swing states.

With respect to the interaction between fiscal variables and presidential regime the estimates point to lower spreads when spending increases in presidential, as opposed to parliamentary regimes, although the point estimates are not statistically significant at conventional levels (Table 2, column 3). However, the negative signs suggest that financial markets give a premium to presidential regimes, where ‘checks and balances’ are more effective due to a strict separation of powers. The point estimate on the interaction effect with government revenues is negative, although not statistically significant.

Finally, for the electoral cycles, the signs on the interaction terms are the same as on the levels of the fiscal variables but are not statistically significant (Table 2, column 4). The positive sign on the interaction between the election year and current spending indicates that financial markets penalise fiscal expansion in election years by more than in off-election years. The interaction with government investment has a negative sign. These estimates are also not jointly statistically significant and, given this, no strong conclusions can be drawn from them. Although each of the point estimates on the interaction variables is not statistically significant, the sign on the indicator variable for the election year (not reported) is positive and statistically significant, showing that spreads increase in election years. The fact that spreads increase in election years may reflect uncertainty about future government policies, as well as spending promises during the election campaign.

3.3. Sensitivity and Robustness

We checked the sensitivity and the robustness of the results with respect to alternative specifications and conclude that our findings are robust to a variety of different specifications. First, we estimate the model with alternative measures of solvency and liquidity. The results obtained are very similar to those reported. Second, we also test whether currency crises are important in explaining the changes in spreads but our measures of currency crises are not statistically significant. Third, given the important role played by the world interest rate in the pricing of sovereign risk, we include the world interest rate separately. This point estimate is not statistically significant, while the results on our fiscal variables hold. Fourth, in addition to the fixed effect and Anderson-Hsiao instrumental variable estimators reported, we also use the GMM estimator proposed by Arellano and Bond (1991). This yields similar results to those

20 We do not report the results for the sensitivity analysis but all results can be obtained from the authors upon request.

21 Since the world interest rate is the same for each country in a given year, it is perfectly collinear with the year dummy. Therefore, we had to drop the year dummies in order to estimate the coefficient on the world interest rate. We measure the world interest rate as the average interest rate on US treasury bills.

22 The computer program used is xtabond2 developed by Roodman (2005). More details on the GMM estimation can be found in Akitoby and Stratmann (2006), the working paper version of this article.
reported in Table 1. Finally, we examine the sensitivity of our findings with respect to outliers by dropping them from the sample. We find that the results are not driven by outliers.

4. Conclusions

This article contributes to the empirical literature on the determinants of spreads by introducing fiscal policy in an empirical model of sovereign spreads. Using panel data from emerging market countries, we examine whether the composition of fiscal adjustment matters for the pricing of sovereign risk and whether fiscal variables interact with the political institutions to affect financial markets. We find that revenue-based adjustments lower spreads more than spending-based adjustments do. Financial markets also react to the composition of spending, with cuts in current spending lowering spreads more than cuts in investment. We also show that debt-financed current spending increases sovereign risk, while tax-financed current spending lowers spreads, suggesting that international investors prefer the latter.

We find strong evidence that fiscal variables interact with the political institutions to affect financial markets. Financial markets give a premium to right wing regimes (with their association with fiscal conservatism and smaller government), while penalising left wing regimes that undertake current-spending-driven expansion. Moreover, the increase in spreads induced by spending-driven fiscal expansion is lower under proportional elections than under majoritarian elections. Finally, we find increases in spreads in election years.

This study suggests a number of policy implications for countries seeking to lower their borrowing cost on international capital markets. First, a country can pursue either revenue-based or expenditure-based fiscal adjustments, when fiscal adjustment is needed to reassure financial markets. However, a country would be better off pursuing revenue-driven fiscal adjustments whenever the labour markets, the expectation and the credibility channels are not present. Second, a country would be better in cutting current spending instead of public investment, because financial markets pay attention to the composition of fiscal consolidation. Third, given the importance that the capital market attaches to the reserves-to-GDP ratio, government can aim at increasing their foreign reserves position through appropriate macroeconomic and structural policies. Fourth, since financial markets view high-debt ratios negatively, reductions of debt through appropriate fiscal policy and debt management can lower spreads.

For future research, a number of open questions could be addressed. First, government revenue and expenditure could be disaggregated further. For instance, government revenue could be broken down into taxes on households, taxes on business, indirect taxes and social security contributions. Similarly, current spending could be further disaggregated into different types of transfers, wages and nonwage consumption. Second, it would be useful to deepen the empirical analysis by introducing the country’s own history of failed or successful fiscal adjustments. Finally, there are reasons for believing that the financial market’s treatment of spending and revenue

23 For example, we dropped the largest and smallest five observations of the spread variable.

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decisions would be influenced by the initial conditions of fiscal and debt variables. Data that have a larger number of countries with a longer time series than those used in this article would make these enquiries promising.

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