



# IMF Working Paper

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Resource Windfalls and Emerging Market  
Sovereign Bond Spreads:  
The Role of Political Institutions

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**Resource Windfalls and Emerging Market Sovereign Bond Spreads: The Role of Political Institutions**

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**Abstract**

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We examine the effect that revenue windfalls from international commodity price shocks have on sovereign bond spreads using panel data for 30 emerging market economies during the period 1997-2007. Our main finding is that positive commodity price shocks lead to a significant reduction in the sovereign bond spread in democracies, but to a significant increase in the spread in autocracies. To explain our finding we show that, consistent with the political economy literature on the resource curse, revenue windfalls from international commodity price shocks significantly increased real per capita GDP growth in democracies, while in autocracies GDP per capita growth decreased.

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## I. INTRODUCTION

Some researchers have argued that international commodity price booms may spawn an over-accumulation of external debt in commodity exporting countries that increases the risk of external debt default (e.g. Krueger, 1987; Berg and Sachs, 1988).<sup>2</sup> We examine this hypothesis empirically by analyzing how the spread on sovereign bonds reacted in these countries to the booms and slumps of the export-relevant commodity prices. Changes in the spread on sovereign bonds reflect changes in investors' beliefs of the risk that a country defaults on its external debt. An increase in the spread on sovereign bonds is in turn a cost for the bond issuing country that may trigger in a self-fulfilling way the default on its external debt. Both for investors and policy makers, it is therefore important to have knowledge about how international commodity price shocks, which induce large upturns and downturns in foreign currency revenues in emerging market economies, affect the spread on sovereign bonds.

We find that increases in international commodity prices for exported commodity goods are associated with a significant reduction in sovereign bond spreads on average. However, the reduction in the spread on sovereign bonds is particularly large in countries with sound democratic institutions and strong political checks and balances. In autocratic regimes and countries where the political rule is characterized by weak checks and balances, windfalls from international commodity prices lead to a significant increase in the spread on sovereign bonds.

The heterogeneous response of sovereign bond spreads to international commodity price shocks sheds new light on the resource curse literature, that has argued for the importance of political institutions in determining whether windfalls from natural resources are a curse or a blessing for the economic development of resource exporting countries (e.g. Melhum et al., 2006; Robinson et al., 2006). We provide further evidence in this direction by showing that, consistent with the political economy model developed in Mehlum et al. (2006), positive international commodity price shocks significantly increased real per capita GDP growth in countries with sound democratic institutions. In countries with autocratic institutions, revenue windfalls from international commodity price shocks led to a significant decrease in output growth. Hence, while our empirical results are consistent with general equilibrium models that predict a countercyclical relationship between sovereign bond spreads and the business cycle in emerging market economies (e.g. Arellano, 2008), our results highlight the

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<sup>2</sup> The recent concern that Dubai may default on its external debt is an example par excellence that higher commodity prices may be associated with a higher risk of external debt default.

importance of political economy factors in shaping the relationship between commodity price shocks and sovereign bond spreads in these countries.

The remainder of our paper is organized as follows. Section 2 describes the data. Section 3 discusses the estimation strategy. Section 4 presents the main results. Section 5 concludes.

## II. DATA

We constructed a country-specific international commodity price index that captures revenue windfalls from international prices of exported commodities as:

$$ComPriceShock_{i,t} = \sum_{c \in C} \theta_{i,c} \Delta \log(ComPrice_{c,t})$$

where  $ComPrice_{c,t}$  is the international price of commodity  $c$  in year  $t$ , and  $\theta_{i,c}$  is the average (time-invariant) value of exports of commodity  $c$  in the GDP of country  $i$ . Annual international commodity price data are from UNCTAD Commodity Statistics, and data on the value of commodity exports are from the NBER-United Nations Trade Database.<sup>3</sup>

The data on the spread on sovereign bonds are from the Emerging Markets Bond Index Global (EMBI Global) that is available for 30 emerging market economies for the period 1997-2007.<sup>4</sup> Bond spreads are measured against a comparable US government bond and are period averages for the whole year. Our two main measures of political institutions are the average (time-invariant) Polity2 score from the Polity IV database (Marshall and Jaggers, 2009) and the average (time-invariant) checks and balance score from the Database of Political Institutions (Keefer and Stasavage, 2003). The real per capita GDP data are from the Penn World Tables, version 6.3 (Heston et al., 2009). Descriptive statistics of these variables are provided in Table 1.

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3 The commodities included in our index are: aluminum, beef, coffee, cocoa, copper, cotton, gold, iron, maize, oil, rice, rubber, sugar, tea, tobacco, wheat, and wood. In case there were multiple prices listed for the same commodity we used a simple average of all the relevant prices. The functional form of the commodity price shock variable is motivated by taking logs and derivatives of output with respect to the commodity export prices.

4 The availability of the sovereign bond spread data limit are sample size to the following countries: Argentina, Bolivia, Brazil, Chile, China, Colombia, Czech Republic, Ecuador, Egypt, Hungary, India, Indonesia, Jordan, Lebanon, Malaysia, Mexico, Nigeria, Pakistan, Peru, Philippines, Poland, Russia, South Africa, South Korea, Thailand, Turkey, Ukraine, Uruguay, Venezuela, and Vietnam.

### III. ESTIMATION STRATEGY

To examine the effects that international commodity price shocks have on sovereign bond spreads, we estimate the following econometric model:

$$\Delta \log(\text{Spread})_{i,t} = \alpha_i + \beta_t + \eta(\text{Com Price Shock}_{i,t}) + u_{i,t}$$

where  $\alpha_i$  are country fixed effects and  $\beta_t$  are year fixed effects.  $u_{i,t}$  is an error term that is clustered at the country level. As a baseline regression, we estimate the average marginal effect  $\eta$  that commodity price shocks have on sovereign spreads. We then examine how this marginal effect varies as function of countries' political institutions by estimating:

$$\Delta \log(\text{Spread})_{i,t} = a_i + b_t + c(\text{Com Price Shock}_{i,t}) + d(\text{Com Price Shock}_{i,t}) * Pol_i + u_{i,t}$$

where  $Pol_i$  is a measure of cross-country differences in political institutions.

### IV. MAIN RESULTS

Table 2 presents our estimates of the average marginal effect that commodity price shocks have on sovereign bond spreads using our sample of emerging market economies. The main finding from the fixed effects estimates is that positive international commodity price shocks lead on average to a significant reduction in commodity exporting countries' spread on sovereign bonds. Panel A presents the estimates of the link between international commodity price shocks and the spread on sovereign bonds when controlling for country fixed effects; Panel B presents corresponding estimates when controlling in addition to the country fixed effects for year fixed effects. The fixed effects estimates yield that a positive commodity price shock of size 1 standard deviation significantly reduced the spread on sovereign bonds on average by over 0.1 standard deviations.

Column (2) shows that the marginal effect of international commodity price shocks on the spread on sovereign bonds significantly varies across countries as function of cross-country differences in political institutions. The estimated interaction effect between international commodity price shocks and the Polity2 score is negative and statistically significant at the 5% level. The point estimate on the interaction term implies that at the sample maximum Polity2 score (democracies), a positive commodity price shock of size 1 standard deviation significantly reduced the spread on sovereign bonds by over 0.4 standard deviations. On the other hand, at the sample minimum Polity2 score (autocracies), a shock of similar magnitude was associated with a significant increase in the spread on sovereign bonds by 0.3 standard deviations.

Column (3) shows that we obtain similar heterogeneity in the marginal effect of international commodity price shocks on sovereign bond spreads when discretizing the Polity2 score into an indicator function that is 1 for strictly positive Polity2 scores and zero else.<sup>5</sup> Column (4) shows that windfalls from international commodity price shocks significantly decrease sovereign bond spreads in countries with strong checks and balances, while they lead to a significant increase in the sovereign bond spread in countries with weak checks and balances.

To explain the heterogeneity in the marginal effect that international commodity price shocks have on sovereign bond spreads, we show in Table 3 the effect that international commodity price shocks have on countries' real per capita GDP growth. Not surprising, we find that higher international prices for exported commodity goods were associated with a significant increase in real per capita GDP growth on average (the “terms of trade effect”). However, the positive effect of international commodity price shocks on growth was particularly large for countries with strong democratic institutions. In countries with deep autocratic regimes, windfalls from international commodity prices were a curse as they were associated with a significantly lower per capita GDP growth rate. The results in Table 3 therefore show that while in democracies plausibly exogenous windfalls from international commodity price shocks were significantly positively associated with real per capita GDP growth, in autocracies they were associated with a significant decrease in real per capita GDP growth.

The political economy model developed in Mehlum et al. (2006) can provide an explanation for this heterogeneous response in real per capita GDP growth: in countries with grabber friendly political institutions, revenue windfalls from international commodity price shocks increase rent-seeking activity and lead to a crowding out of production activity. Democratic institutions, in particular, stronger checks and balances constrain politicians in their policy space. Relative to an autocratic regime, politicians are also held more accountable to the public. Hence, in a more democratic regime the expected returns to rent-seeking activities are lower. This in turn means that production activity will remain strong in the democratic regime despite the high rents that are realized in the commodity exporting sector when international commodity prices are booming. In the autocratic regime, on the other hand, where there are relatively high gains from specializing in grabbing activities, production activity will be crowded out in the presence of a revenue windfall. Thus, revenue windfalls from international commodity prices may be associated with lower per capita GDP growth in more autocratic regimes.

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<sup>5</sup> The binary democracy indicator has been frequently used in the political economy literature. See, for example, Persson and Tabellini (2006).

## V. CONCLUSION

We investigated in this paper the effects that international commodity price shocks have on sovereign bond spreads using panel data for 30 emerging market economies during the period 1997-2007. Our main finding is that revenue windfalls from international commodity price shocks lead to a significant reduction in sovereign bond spreads in emerging market economies with sound democratic institutions. In countries with more autocratic institutions revenue windfalls lead on the other hand to a significant increase in the sovereign bond spread.

To explain this heterogeneity in the marginal effect that international commodity price shocks have on sovereign bond spreads, we showed that revenue windfalls from international commodity price booms lead to a significant increase in real per capita GDP growth in countries with sound democratic institutions. In countries with deep autocratic regimes, revenue windfalls lead to a decrease in real per capita GDP growth. Our empirical results are consistent therefore with general equilibrium models that predict a countercyclical relationship between sovereign bond spreads and the business cycle in debtor countries (e.g. Arellano, 2008). However, our empirical results also highlight the importance of political economy factors in shaping the relationship between commodity price shocks and sovereign bond spreads. Further research, in particular, theoretical contributions along the lines of Cuadra and Saprinza (2008) may therefore be of interest in advancing our understanding of the relationship between revenue windfalls from international commodity price shocks, economic growth, and the spread on sovereign bonds in emerging market economies.



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**Table 1. Descriptive Statistics**

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	Mean	Std. Dev.	Min	Max	Obs.
$\Delta$ (Log) Spread on Sovereign Debt	-0.11	0.39	-2.02	1.32	291
Commodity Export Price Shock (Index)	0.002	0.006	-0.02	0.04	291
Polity2 Score	1.19	4.34	-7.74	8	291
Autocracy Indicator	0.33	0.47	0	1	291
Checks and Balance Score	2.64	0.96	1	4.6	291

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**Table 2. Commodity Price Shocks, Political Institutions, and the Spread on Sovereign Bonds**

<u><math>\Delta</math>Sovereign Spread</u>				
Panel A: Controlling for Country Fixed Effects				
	(1)	(2)	(3)	(4)
	LS	LS	LS	LS
Commodity Price Shock	-10.95*** (-3.03)	-5.22 (-1.49)	-36.87*** (-5.08)	48.96*** (2.98)
Commodity Price Shock * Polity2 Score		-3.80*** (-2.65)		
Commodity Price Shock* Autocracy Indicator			47.75*** (3.94)	
Commodity Export Shock* Checks and Balance Score				-23.21*** (-3.46)
Observations	291	291	291	291
Panel B: Controlling for Country and Year Fixed Effects				
	(1)	(2)	(3)	(4)
	LS	LS	LS	LS
Commodity Price Shock	-6.13* (-1.72)	-1.34 (-0.29)	-28.03*** (-3.13)	32.97 (1.62)
Commodity Price Shock * Polity2 Score		-3.07** (-2.15)		
Commodity Price Shock* Autocracy Indicator			38.22*** (2.76)	
Commodity Export Shock* Checks and Balance Score				-15.338* (-1.91)
Observations	291	291	291	291

Note: The method of estimation is least squares. t-values (in brackets) are based on Huber robust standard errors that are clustered at the country level. In Panel A the regressions control for country fixed effects; Panel B for country fixed effects and year fixed effects. The dependent variable is the log-change in the spread on sovereign bonds. \*Significantly different from zero at 90 percent confidence, \*\* 95 percent confidence, \*\*\* 99 percent confidence.

**Table 3. Commodity Price Shocks, Political Institutions, and Economic Growth**

<u><math>\Delta</math>GDP</u>				
Panel A: Controlling for Country Fixed Effects				
	(1)	(2)	(3)	(4)
	LS	LS	LS	LS
Commodity Price Shock	1.77*** (2.88)	1.10*** (3.49)	4.65*** (5.67)	-4.42*** (-3.02)
Commodity Price Shock * Polity2 Score		0.45*** (3.96)		
Commodity Price Shock* Autocracy Indicator			-5.28*** (-3.84)	
Commodity Export Shock* Checks and Balance Score				2.40*** (4.41)
Observations	291	291	291	291
Panel B: Controlling for Country and Year Fixed Effects				
	(1)	(2)	(3)	(4)
	LS	LS	LS	LS
Commodity Price Shock	0.86 (1.49)	0.25 (0.75)	2.86*** (3.56)	-3.42** (-3.23)
Commodity Price Shock * Polity2 Score		0.41*** (3.78)		
Commodity Price Shock* Autocracy Indicator			-3.43*** (-3.27)	
Commodity Export Shock* Checks and Balance Score				1.69*** (3.42)
Commodity Export Shock* Country Income Indicator		2.15** (2.15)	2.05* (1.76)	1.45* (1.76)
Observations	291	291	291	291

Note: The method of estimation is least squares. t-values (in brackets) are based on Huber robust standard errors that are clustered at the country level. In Panel A the regressions control for country fixed effects; Panel B for country fixed effects and year fixed effects. The dependent variable is the log-change in real per capita GDP. \*Significantly different from zero at 90 percent confidence, \*\* 95 percent confidence, \*\*\* 99 percent confidence.