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Rabah Arezki and Markus Brückner

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Rabah Arezki and Markus Brückner*

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Abstract: We examine the effects that revenue windfalls from international commodity price booms have on external debt in a panel of 93 countries during the period 1970-2007. Our main finding is that increases in the international prices of exported commodity goods lead to a significant reduction in the level of external debt in democracies, but to no significant reduction in the level of external debt in autocracies. To explain this result, we show that in autocracies commodity windfalls lead to a statistically significant and quantitatively large increase in government expenditures. In democracies on the other hand government expenditures did not increase significantly. We also document that following commodity windfalls the risk of default on external debt decreased in democracies, but increased significantly in autocracies.

Key words: Commodity Windfalls, Debt, Political Institutions
JEL codes: F34, H63, O13, P16, Q33, Q38

* International Monetary Fund (Arezki) and University of Adelaide (Bruckner). Contact e-mail: rarezki@imf.org; markus.bruckner@adelaide.edu.au. We thank Ning Fu for excellent research assistance, Antonio Ciccone, Bertrand Candelon, Jiandong Ju, Gian Maria Milesi-Ferretti as well as participants at the INFINITI and Tsinghua-Columbia conference on international finance for helpful comments and suggestions, and Ali Alichi for providing us with his dataset on external debt default. The views in this paper are those of the author(s) alone and do not necessarily represent those of the IMF or IMF policy. All remaining errors are our own.

1. Introduction

Developing and emerging market economies are often faced with large international commodity price shocks that pose a number of serious challenges to their macroeconomic stability.[1] We examine in this paper empirically how these countries use external borrowing to shield themselves against these shocks. Recently, the concern that Dubai may default on the large external debt -- that it had accumulated over the past years when oil prices were booming -- has rekindled interest among policy makers and private investors in how international commodity price fluctuations are linked to external debt. We rigorously examine in this paper the link between revenue windfalls from international commodity price booms and external debt using panel data for a world sample of over 93 countries during the period 1970-2007. We apply panel data techniques that account for both unobservable cross-country heterogeneity and common year shocks and identify in our empirical analysis the effects that revenue windfalls have on external debt exclusively from the within-country variation of the data.

Our main finding is that increases in the international commodity prices for exported commodity goods are associated with a significant reduction in external debt in democracies. In autocracies on the other hand, windfalls from international commodity prices did not lead to a significant reduction in external debt. While in democracies external debt therefore moved countercyclically with revenue windfalls from international commodity prices, there was no systematic relationship in autocracies.

To explain the dichotomous response of external debt to revenue windfalls from international commodity price booms we examine the response of government spending. It is well known that higher international commodity prices are associated in developing and emerging market countries with higher revenues that accrue to the government sector. What is not so well

1 For example, international commodity price shocks may lead to a misalignment of the real exchange rate and a depletion of foreign reserves. For empirical analyses of the macroeconomic effects that international commodity price shocks have on economic growth see, for example, Deaton and Miller (1995), Collier and Goderis (2007), or Bruckner and Ciccone (2010).

known however is whether governments in these countries systematically use the additional revenues to increase primarily total government expenditures, or reduce the level of debt. We find that in autocracies, windfalls from international commodity prices lead to a statistically significant and quantitatively large increase in government spending. In democracies on the other hand, the response in government spending to windfalls from international commodity prices is quantitatively small and statistically not significant. Hence, an examination of movements in government expenditures shows a significant procyclicality of government spending in autocracies, while in democracies government spending was acyclical.

The strong procyclicality of government expenditures to commodity price windfalls in autocracies may explain why external debt was not significantly reduced in these countries: additional revenues accruing from international commodity price windfalls were directly spent by autocratic governments, with little to no savings left from which to finance a reduction in external debt. To examine this spending channel further, we document that while in democracies international commodity price windfalls were associated with a significant increase in real per capita GDP, in autocracies GDP per capita did not increase significantly despite the significant increase in total government expenditures.

Our paper is most closely related to the political economy literature on debt policy. Two key predictions from this literature are that more political uncertainty leads to a higher level of external debt, and that excessive corruption introduces procyclicality in government spending to revenue windfalls (Alesina and Tabellini, 1989; Alesina et al., 2008). To the extent that the severity of political uncertainty and corruption is higher in autocracies, the empirical results of our paper resonate these key predictions from the theoretical political economy literature on debt policy.

Our paper also contributes to a richer understanding of the link between political institutions and policy outcomes (see for example Persson, 2002). In their seminal contribution to the growth and institutions literature, Acemoglu et al. (2001, 2002) have shown that political institutions are

key determinants for long-run economic development. Our present empirical analysis sheds novel insights on a specific, but nevertheless potentially important channel through which political institutions place developing and emerging market economies on different development paths: the accumulation of external debt that is due to plausibly exogenous changes in the international commodity export prices. Indeed, the debt overhang literature has argued for a long time that high external debt levels have adverse effects on real per capita GDP growth (see for example Krugman, 1989; or Sachs, 1990). The main concern is that high external debt levels effectively act as a tax on future investment projects, and thus constrain the financing of these projects in the future. Our empirical results show that democracies use the additional revenues from international commodity price windfalls to reduce their external debt levels, but that autocracies systematically fail to do so. Instead, the later directly spend a large part of their additional revenues on government expenditures. Our empirical results therefore suggest that democracies use windfalls from international commodity price booms more conservatively than autocracies, and thus effectively evade the future tax burden on investment that stems from an accumulation of external debt.

The empirical results in our paper also contribute novel empirical insights on the voracity effect described in the theoretical models of Lane and Tornell (1998) and Tornell and Lane (1999) where revenue windfalls from positive terms-of-trade shocks are predicted to lead to a disproportionate increase in fiscal redistribution in countries with weak legal-political institutions. As stressed by the authors, from a theoretical point of view it is unclear whether a shift from autocracy to democracy ameliorates or exacerbates this voracity effect. What matters for the voracity effect is whether strong democratic institutions successfully constrain powerful groups from extracting transfers from the government budget.

Our empirical results suggest that this is indeed the case: democracies are on average more successful in constraining powerful groups from extracting transfers from the government budget in the wake of windfalls from international commodity price booms than autocracies. In particular,

when we focus specifically on the constraints placed on the political executive by the political institutions in place we find a significant positive effect of international commodity price booms on government expenditures in countries with weak executive constraints, and an insignificant effect of international commodity price booms on government expenditures in countries with strong executive constraints. Moreover, for countries with strong executive constraints positive international commodity price booms had also a significant positive effect on real per capita GDP growth, while in countries with weak executive constraints revenue windfalls from international commodity price booms did not affect GDP per capita growth significantly. Hence, our empirical analysis provides evidence that the voracity effect was well at work in countries with weak political institutions, but that countries with strong political institutions were mostly shielded from it.[2] Finally, and perhaps most interesting for policy makers and private investors we show that while windfalls from international commodity price booms reduced the risk of default on external debt in democracies, this risk significantly increased in autocracies.

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

2. Data

Commodity Revenue Windfalls. We construct a country-specific international commodity export price index that captures revenue windfalls from international commodity prices as:

$$ComPI_{i,t} = \prod_{c \in C} Com\,\mathrm{Pr}ice_{c,t}^{\theta_{i,c}}$$

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. We obtain data on annual international commodity prices for the 1970-2007 period from UNCTAD Commodity Statistics. Our data on the value of commodity exports is from the NBER-United Nations Trade Database.

2 This result is also consistent with the cross-sectional finding by Mehlum et al. (2006) that natural resource dependence is a curse for economic growth in countries with weak political institutions, but that in countries with strong political institutions natural resource dependence is a blessing.

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.

External Debt. Data on the total external debt stock are from the World Bank, Global Development Finance (2009). Total external debt is debt owed to nonresidents repayable in foreign currency, goods, or services.[3] We focus on external debt because data on domestic public debt are not available for many countries, and are moreover difficult to compare across countries as countries with weak administrative capacity often consolidate their accounts at the central government level whereas countries with strong administrative capacity often consolidate their accounts at the general government level.

Democracy. Democracy is measured by the revised combined Polity score (Polity2) of the Polity IV database (Marshall and Jaggers, 2009). The Polity2 score ranges from -10 to +10. Following Persson and Tabellini (2003, 2006) and the Polity IV project, we code countries as democracies (autocracies) if their Polity2 score is strictly positive (negative). To examine also specifically the political competition and executive constraints channel, we use the polity sub-scores on constraints on the chief executive and political competition. According to the Polity IV project, constraints on the executive is a measure of the extent of institutionalized constraints on the decision making powers of chief executives and ranges from 1 to 7, with greater values indicating tighter constraints. Political competition measures the extent to which alternative preferences for policy and leadership can be pursued in the political arena. This indicator ranges from 1 to 10, with greater values denoting more competition. Summary statistics on these variables can be found in Appendix Tables 1 and 2.

3 Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. About two-thirds of total external debt is public and publicly guaranteed debt.

3. Estimation Strategy

To examine the effects that revenue windfalls from international commodity price booms have on external debt and other key variables of interest, we estimate the following econometric model:

$$\Delta \log(ExternalDebt)_{i,t} = \alpha_i + \beta_t + \gamma \Delta \log(ComPI)_{i,t} + u_{i,t}$$

where α_i are country fixed effects that capture time-invariant country-specific unobservables and β_t are year fixed effects that capture common year shocks. $u_{i,t}$ is an error term that is clustered at the country level. As a baseline regression, we estimate the average marginal effect that commodity export price fluctuations have on external debt in a world sample. We then split the sample into autocracies and democracies and estimate separately for these two groups the effects that export price fluctuations have on external debt (and other key variables of interest). To formally test whether the estimated coefficient on the international commodity export price index in the autocracy sample is significantly different from the estimated coefficient in the democracy sample we apply a generalized form of the Chow test that allows for arbitrary within-country serial correlation of the error term.

4. Main Results

Table 1 presents our estimates of the average marginal effect that revenue windfalls from international commodity price fluctuations have on external debt in a world sample. The main finding from the distributed lag estimates is that positive *t*-1 change in the international commodity export price index leads to a significant reduction in external debt. Column (1) presents the pooled panel estimates that do not control for country or year fixed effects and this yields a significant negative *t*-1 effect of international commodity export price index on external debt that is significant at the 1% level. In column (2) the country fixed effects are included in the regression which does not change the point estimates substantially. When controlling in addition to the country fixed effects for also the year fixed effects that capture global business cycle effects the effect of *t*-1 commodity revenue windfalls on external debt becomes smaller in absolute size but remains

negative and statistically significant at the 5% level (column (3)). Quantitatively, the year and country fixed effects estimates imply that a positive commodity price windfall of size 1 standard deviation significantly decreased on average external debt by over 0.03 standard deviations.[4]

In column (4) we present panel fixed effects estimates that include on the right-hand side of the estimating equation the commodity price index in period t+1. The motivation for including the period t+1 commodity price index is to check whether external debt reacts to future, potentially anticipated changes in international commodity prices. We find that the point estimate on the period t+1 commodity price index is not statistically significant. Quantitatively, the point estimate is also quite small. Hence, we do not find evidence of significant anticipatory effects.[5] Moreover, the effect of period t-1 commodity price shocks on external debt remains negative and statistically significant at the 5% level.

To take into account dynamics in the evolution of external debt, we show in columns (5) and (6) dynamic panel estimates that include on the right-hand side of the estimating equation the lagged level of external debt. Both the least squares and system-GMM estimates show that there is quite a bit of persistence in the dynamics of the external debt stock. The estimated convergence coefficient is around -0.12 to -0.16 and implies a half-life in shocks to the level of external debt of around 4 years. Most importantly, the dynamic panel data estimates confirm that there is a significant negative t-1 effect of international commodity price booms on external debt.[6]

In Table 2 we examine how democratic institutions affect the relationship between international commodity price booms and debt accumulation by separating countries into democracies and autocracies (based on the Polity IV data). Our main finding is that the significant

4 We have checked whether there is an asymmetry between positive and negative changes in the international commodity export price index by including in the regression an interaction dummy that captures differences in the marginal effect between negative and positive changes. We found that this interaction variable on differences in the marginal effect between negative and positive changes in the international commodity price index is statistically insignificant. We also checked for further non-linearities by including a quadratic term of international commodity price index, which also turned out to be insignificant.

5 We have also checked for the statistical significance of further leads in commodity price shocks and found that they were insignificant.

6 We have also checked whether price shocks of different commodities (i.e. minerals vs. agricultural commodities) have different effects on external debt. We did not find a significantly different impact of these two categories (results not shown).

negative effect of international commodity price booms on external debt is particularly large and statistically significant for democracies. For autocracies we find that the estimated relationship is statistically insignificant and quantitatively the point estimates are very small. The point estimate in column (1) implies that for countries with democratic institutions a positive international commodity price shock of size 1 standard deviation leads to a significant reduction in external debt by over 0.05 standard deviations. The Chow test rejects the hypothesis that the structural coefficient in the autocracy sample is the same as the structural coefficient in the democracy sample. Hence, the Chow test confirms that also in the statistical sense the effect of international commodity booms on external debt in democracies is significantly different from the effect in autocracies.

Columns (3)-(6) of Table 2 show that we obtain similar results when running separate regressions for countries with strong executive constraints and strong political competition on the one hand, and countries with weak executive constraints and weak political competition on the other hand. In particular, in countries with strong executive constraints and a high degree of political competition we find that windfalls from international commodity price booms lead to a statistically significant and a quantitatively large reduction in external debt (see columns (3) and (5)). In countries with weak executive constraints and weak political competition windfalls from international commodity price booms do not lead on average to a significant reduction in external debt (see columns (2) and (4)). Moreover, Table 3 shows that importantly these results continue to hold when controlling for the lagged level of external debt and Appendix Table 1 shows that results are also robust to running an interaction model that allows for possible heterogeneity in the structural relationship due to cross-country differences in (average) GDP per capita.

A possible explanation for why windfalls from international commodity price booms lead to a significant reduction in external debt in countries with strong democratic institutions, but not in countries with weak democratic institutions is that strong democratic institutions effectively constrain political leaders in spending additional revenues on wasteful activities. In Table 4, we

provide supportive empirical evidence for this explanation by documenting that in autocracies and countries that have weak executive constraints and slack political competition, revenue windfalls from international commodity price booms lead to a highly significant and quantitatively large increase in total government expenditures.[7] On the other hand, in democracies and countries with strong executive constraints and strong political competition commodity price booms did not lead to a significant increase in total government expenditures. Table 4 therefore shows that while in autocracies commodity windfalls were used to increase government spending, this did not happen systematically so in democracies.

In Table 5 we explore a further channel through which dichotomy in the response of external debt to international commodity price booms may arise: the rule of law, which is a safeguard against arbitrary governance and abuse by those who are in power. Interestingly, we find that in democracies the rule of law significantly increased in the presence of windfalls from international commodity price booms. On the other hand, in autocracies the rule of law deteriorated, or at best did not change significantly. Note that in autocracies the relationship is quite imprecisely estimated so that we cannot reject that the effect is significantly different from zero. Nevertheless, we can reject that the structural relationship between windfalls from international commodity price booms and the rule of law in democracies is the same as in democracies.

Table 6 documents that revenue windfalls from international commodity price booms were associated with higher real per capita GDP growth in democracies and countries with strong executive constraints and high levels of political competition. In autocracies and countries with weak executive constraints and low levels of political competition -- where a large part of the commodity price windfalls were directly spent by the government (see Table 4) -- there was no significant effect on real per capita GDP growth however. This suggests that while commodity price windfalls were conservatively administered in democracies, in autocracies the high government spending did not lead to a significant increase in output. All in all, our results therefore point to

7 Data on total government expenditures are from Heston et al. (2009).

revenue windfalls from international commodity price booms leading to a significant reduction in external debt in democracies because the democratic institutions placed sufficient constraints on politicians, prohibiting them from spending the windfalls on socially sub-optimal activities.[8] Importantly, Table 7 shows that there is a significant positive response in the terms of trade for both democracies and autocracies, with the (elasticity) effect being actually larger for autocracies than for democracies. Hence, it is not the case that international commodity export price changes had smaller effects on the terms of trade in autocracies than in democracies.

In Table 8 we report the effect that international commodity price booms have on the risk of the country defaulting on its external debt.[9] We use the conditional logit fixed effects estimator to take into account the nonlinear structure of our dependent variable and that standard nonlinear probability models (such as the logit or probit model) produce biased estimates of the slope coefficients when country fixed effects are used.[10] Consistent with our previous findings, the nonlinear probability estimates show that the structural relationship between international commodity price booms and the risk of default in democracies is significantly different from the structural relationship in autocracies. Moreover, in autocracies we find that the risk of default significantly increases following revenue windfalls from international commodity price increases.[11] This finding matches indeed well with the recent concern of a possible default of Dubai on its external debt. For the democracy sample, we also find that the estimated effect that international commodity price booms have on the risk of debt default is negative. Statistically, we are unable to reject that in the democracy sample the effect of revenue windfalls from commodity price booms is different from zero. However, this is due to a much larger standard error on the point estimates in

8 Obviously, we recognize that government expenditures could have potentially high social returns in autocracies. However, they may be rendered inefficient because of the lack of transparency and corruption that is associated with government spending in many autocratic regimes.

9 The data on external debt default are from Beers and Chambers (2003).

10 This is due to the incidental parameter problem (see for example Wooldridge, 2002). The conditional logit fixed effects model does not suffer from this bias because slope estimates are computed from using maximum likelihood estimation of the density function that is conditional on the country fixed effects. Note that the point estimates reported in Table 8 do not represent marginal effects because this would require knowledge of the distribution of the country fixed effects.

11 This finding matches with the graphical and mostly informal evidence presented in Manzano and Rigobon (2001) that rising commodity prices in the 70s triggered a debt overhang in many resource rich countries.

the democracy sample, which follows from the democracy sample being quite a bit smaller than the autocracy sample. Moreover, quantitatively the size of the point estimates is actually larger (in absolute terms) in the democracy sample than in the autocracy sample.

5. Conclusion

We have examined in this paper the relationship between revenue windfalls from international commodity price booms and external debt using rigorous panel data techniques that allow to identify the effects that international commodity price booms have on external debt exclusively from the within-country variation of the data. Our main finding is that external debt moves countercyclically with commodity revenue windfalls, but that this relationship is not unconditional on the political institutions that are in place in the debtor country. In particular, we find that while external debt moved highly countercyclically in democracies it moved acyclically in autocracies. We made an attempt to explain this finding by documenting that autocracies mostly spent the additional revenues accruing from international commodity price booms by increasing government expenditures, while democracies kept a large part of the windfalls to reduce their external debt. Our empirical results therefore highlight the role of political institutions in shaping external debt policy.

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Table 1. Commodity Windfalls and External Debt

	Δ External Debt					
	(1)	(2)	(3)	(4)	(5)	(6)
	LS	LS	LS	LS	LS	SYS-GMM
ΔComPI, t	-0.52 (-1.03)	-0.50 (-0.94)	-0.18 (-0.38)	-0.16 (-0.34)	-0.11 (-0.21)	-0.14 (-0.25)
ΔComPI, t-1	-1.39*** (-3.69)	-1.38*** (-3.62)	-0.84** (-1.97)	-0.91** (-2.06)	-0.98** (-2.48)	-0.88** (-2.15)
ΔComPI, t-2	0.02 (0.07)	0.07 (0.24)	-0.29 (-0.89)	-0.31 (-0.90)	-0.17 (-0.40)	-0.48 (-1.13)
ΔComPI, t+1				-0.17 (-0.37)		
Debt, t-1					-0.16*** (-5.97)	-0.12*** (-3.54)
Country Fe	No	Yes	Yes	Yes	Yes	Yes
Year Fe	No	No	Yes	Yes	Yes	Yes
Observations	2676	2676	2676	2583	2676	2676

Note: The dependent variable is the log-change of external debt. The method of estimation in columns (1)-(5) is least squares; column (6) system-GMM (Blundell and Bond, 1998). The t-values shown in parentheses below the point estimates are based on Huber robust standard errors that are clustered at the country level. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 2. Commodity Windfalls, Democracy, and External Debt

	Δ External Debt					
	Democracy	Autocracy	Strong Executive Constraints	Weak Executive Constraints	Strong Political Competition	Weak Political Competition
	(1)	(2)	(3)	(4)	(5)	(6)
ΔComPI, t-1	-1.67** (-2.16)	-0.09 (-0.18)	-1.78** (-2.24)	0.15 (0.28)	-1.79** (-2.04)	-0.08 (-0.16)
Chow Test: Coefficient is same as in Col. (1); resp. Col. (3); resp. Col. (5)		[0.08]	.	[0.04]	.	[0.08]
Country Fe	Yes	Yes	Yes	Yes	Yes	Yes
Year Fe	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1221	1445	1283	1383	1162	1504

Note: The dependent variable is the log-change of external debt. The method of estimation is least squares. P-values are reported [in square brackets] on the null hypothesis of the Chow test that the point estimate in column (1) (respectively, columns (3) and (5)) on *ΔComPI* is the same as in column (2) (respectively, columns (4) and (6)). Democracy (Autocracy) refers to countries that according to the Polity IV database have a strictly positive (negative) Polity2 score. Strong (weak) executive constraints refers to countries that have according to the Polity IV database an above (below) median sample score of executive constraints; strong (weak) political competition refers to countries that have according to the Polity IV database an above (below) median sample score of political competition. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 3. Commodity Windfalls, Democracy, and External Debt

	Δ External Debt					
	Democracy	Autocracy	Strong Executive Constraints	Weak Executive Constraints	Strong Political Competition	Weak Political Competition
	(1)	(2)	(3)	(4)	(5)	(6)
ΔComPI, t-1	-1.88*** (-3.40)	-0.30 (-0.51)	-1.95*** (-3.36)	-0.33 (-0.57)	-2.07*** (-3.29)	-0.19 (-0.34)
Debt, t-1	-0.07*** (-6.57)	-0.15*** (11.90)	-0.06*** (-5.54)	-0.17*** (-13.69)	-0.11*** (-9.64)	-0.12*** (-9.48)
Chow Test: Coefficient is same as in Col. (1); resp. Col. (3); resp. Col. (5)	.	[0.06]	.	[0.05]	.	[0.02]
Country Fe	Yes	Yes	Yes	Yes	Yes	Yes
Year Fe	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1221	1445	1283	1383	1162	1504

Note: The dependent variable is the log-change of external debt. The method of estimation is system-GMM. P-values are reported [in square brackets] on the null hypothesis of the Chow test that the point estimate in column (1) (respectively, columns (3) and (5)) on *ΔComPI* is the same as in column (2) (respectively, columns (4) and (6)). Democracy (Autocracy) refers to countries that according to the Polity IV database have a strictly positive (negative) Polity2 score. Strong (weak) executive constraints refers to countries that have according to the Polity IV database an above (below) median sample score of executive constraints; strong (weak) political competition refers to countries that have according to the Polity IV database an above (below) median sample score of political competition. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 4. Commodity Windfalls, Political Institutions, and Government Expenditures

	Δ Government Expenditures					
	Democracy	Autocracy	Strong Executive Constraints	Weak Executive Constraints	Strong Political Competition	Weak Political Competition
	(1)	(2)	(3)	(4)	(5)	(6)
ΔComPI, t-1	-0.02 (-0.09)	0.92*** (3.89)	0.04 (0.24)	0.85*** (3.66)	0.08 (0.55)	0.77*** (2.86)
Chow Test: Coefficient is same as in Col. (1); resp. Col. (3); resp. Col. (5)	.	[0.004]	.	[0.008]	.	[0.004]
Country Fe	Yes	Yes	Yes	Yes	Yes	Yes
Year Fe	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2314	2269	2459	2124	2415	2168

Note: The dependent variable is the log-change of total government expenditures. The method of estimation is least squares; t-values (shown in parentheses) below the point estimates are based on Huber robust standard errors that are clustered at the country level. P-values are reported [in square brackets] on the null hypothesis of the Chow test that the point estimate in column (1) (respectively column (3) and (5)), on ΔComPI is the same as in column (2) (respectively, column (4) and (6)). Democracy (Autocracy) refers to countries that according to the Polity IV database have a strictly positive (negative) Polity2 score. Strong (weak) executive constraints refers to countries that have according to the Polity IV database an above (below) median sample score of executive constraints; strong (weak) political competition refers to countries that have according to the Polity IV database an above (below) median sample score of political competition. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 5. Commodity Windfalls, Political Institutions, and the Rule of Law

	Δ Rule of Law					
	Democracy	Autocracy	Strong Executive Constraints	Weak Executive Constraints	Strong Political Competition	Weak Political Competition
	(1)	(2)	(3)	(4)	(5)	(6)
ΔComPI, t-1	3.73** (2.38)	-0.40 (-0.46)	3.83** (2.43)	-0.57 (-0.67)	4.32** (2.44)	-0.49 (-0.65)
Chow Test: Coefficient is same as in Col. (1); resp. Col. (3); resp. Col. (5)		[0.02]		[0.01]		[0.01]
Country Fe	Yes	Yes	Yes	Yes	Yes	Yes
Year Fe	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1256	1214	1334	1136	1214	1256

Note: The dependent variable is the change in the ICRG rule of law variable. The method of estimation is least squares; t-values (shown in parentheses) below the point estimates are based on Huber robust standard errors that are clustered at the country level. P-values are reported [in square brackets] on the null hypothesis of the Chow test that the point estimate in column (1) (respectively, column (3)) and (5)), on ΔComPI is the same as in column (2) (respectively, column (4) and (6)). Democracy (Autocracy) refers to countries that according to the Polity IV database have a strictly positive (negative) Polity2 score. Strong (weak) executive constraints refers to countries that have according to the Polity IV database an above (below) median sample score of executive constraints; strong (weak) political competition refers to countries that have according to the Polity IV database an above (below) median sample score of political competition. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 6. Commodity Windfalls, Political Institutions, and Economic Growth

	Δ GDP					
	Democracy	Autocracy	Strong Executive Constraints	Weak Executive Constraints	Strong Political Competition	Weak Political Competition
	(1)	(2)	(3)	(4)	(5)	(6)
ΔComPI, t-1	0.27* (1.83)	-0.31 (-1.23)	0.27* (1.84)	-0.33 (-1.28)	0.30** (2.19)	-0.34 (-1.32)
Chow Test: Coefficient is same as in Col. (1); resp. Col. (3); resp. Col. (5)	.	[0.05]	.	[0.04]	.	[0.03]
Country Fe	Yes	Yes	Yes	Yes	Yes	Yes
Year Fe	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2314	2269	2459	2124	2267	2316

Note: The dependent variable is the log-change of real per capita GDP. The method of estimation is least squares; t-values (shown in parentheses) below the point estimates are based on Huber robust standard errors that are clustered at the country level. P-values are reported [in square brackets] on the null hypothesis of the Chow test that the point estimate in column (1) (respectively, column (3) and (5)), on ΔComPI is the same as in column (2) (respectively, column (4) and (6)). Democracy (Autocracy) refers to countries that according to the Polity IV database have a strictly positive (negative) Polity2 score. Strong (weak) executive constraints refers to countries that have according to the Polity IV database an above (below) median sample score of executive constraints; strong (weak) political competition refers to countries that have according to the Polity IV database an above (below) median sample score of political competition. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 7. Commodity Windfalls, Political Institutions, and the Terms of Trade

	ΔTOT					
	Democracy	Autocracy	Strong Executive Constraints	Weak Executive Constraints	Strong Political Competition	Weak Political Competition
	(1)	(2)	(3)	(4)	(5)	(6)
ΔComPI	0.56*** (4.83)	1.51*** (8.64)	0.55*** (4.72)	1.52*** (8.75)	0.53*** (4.68)	1.57*** (9.03)
Chow Test: Coefficient is same as in Col. (1); resp. Col. (3); resp. Col. (5)	.	[0.00]	.	[0.00]	.	[0.00]
Country Fe	Yes	Yes	Yes	Yes	Yes	Yes
Year Fe	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2314	2269	2459	2124	2267	2316

Note: The dependent variable is the log-change of the terms of trade. The method of estimation is least squares; t-values (shown in parentheses) below the point estimates are based on Huber robust standard errors that are clustered at the country level. P-values are reported [in square brackets] on the null hypothesis of the Chow test that the point estimate in column (1) (respectively, column (3) and (5)), on ΔComPI is the same as in column (2) (respectively, column (4) and (6)). Democracy (Autocracy) refers to countries that according to the Polity IV database have a strictly positive (negative) Polity2 score. Strong (weak) executive constraints refers to countries that have according to the Polity IV database an above (below) median sample score of executive constraints; strong (weak) political competition refers to countries that have according to the Polity IV database an above (below) median sample score of political competition. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Table 8. Commodity Windfalls, Political Institutions, and the Risk of Default on External Debt

	Default on External Debt					
	Democracy	Autocracy	Strong Executive Constraints	Weak Executive Constraints	Strong Political Competition	Weak Political Competition
	(1)	(2)	(3)	(4)	(5)	(6)
ΔComPI, t-1	-12.92 (-1.00)	9.75* (1.81)	-15.98 (-1.36)	16.01*** (2.69)	-14.27 (-1.17)	10.52** (1.97)
Chow Test: Coefficient is same as in Col. (1); resp. Col. (3); resp. Col. (5)	.	[0.06]	.	[0.01]	.	[0.02]
Country Fe	Yes	Yes	Yes	Yes	Yes	Yes
Year Fe	Yes	Yes	Yes	Yes	Yes	Yes
Observations	640	1174	708	1106	638	1176

Note: The dependent variable is an indicator variable that is 1 if the country defaulted on external debt. The method of estimation for the conditional logit fixed effects model is maximum likelihood. P-values are reported [in square brackets] on the null hypothesis of the Chow test that the point estimate in column (1) (respectively, column (3) and (5)) on ΔComPI is the same as in column (2) (respectively, column (4) and (6)). Democracy (Autocracy) refers to countries that according to the Polity IV database have a strictly positive (negative) Polity2 score. Strong (weak) executive constraints refers to countries that have according to the Polity IV database an above (below) median sample score of executive constraints; strong (weak) political competition refers to countries that have according to the Polity IV database an above (below) median sample score of political competition. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Appendix Table 1. Commodity Windfalls, Democracy, and External Debt
(Controlling for Heterogeneity Due to Cross-Country Differences in GDP Per Capita)

	Δ External Debt		
	(1)	(2)	(3)
ΔComPI, t-1	-2.26** (-3.19)	-2.318*** (-3.27)	-2.08*** (-2.90)
ΔComPI, t-1* Autocracy	1.94** (2.34)		
ΔComPI, t-1* Weak Executive Constraints		2.03** (2.45)	
ΔComPI, t-1* Weak Political Competition			1.64** (1.98)
ΔComPI* GDP Per Capita	-0.65 (-1.17)	-0.66 (-1.19)	-0.53 (-0.97)
Debt, t-1	-0.12*** (-14.76)	-0.12*** (-14.76)	-0.12*** (-14.76)
Country Fe	Yes	Yes	Yes
Year Fe	Yes	Yes	Yes
Observations	2548	2548	2548

Note: The dependent variable is the log-change of external debt. The method of estimation is system-GMM; t-values (shown in parentheses) below the point estimates are based on Huber robust standard errors that are clustered at the country level. *Significantly different from zero at 90 percent confidence, ** 95 percent confidence, *** 99 percent confidence.

Data Appendix Table 1. Summary Statistics

	Mean	Std. Dev.	Min	Max	Obs.
ΔExternal Debt	0.095	0.253	-1.427	3.900	2676
ΔComPI	0.001	0.008	-0.059	0.152	2676
ΔGovernment Expenditures	0.012	0.152	-2.135	1.719	2670
ΔGDP	0.032	0.078	-1.107	0.718	2670
ΔRule of Law	0.026	0.473	-2.5	3	1468
ΔTerms of Trade	0.000	0.046	-0.519	0.573	2670
Polity2 Score	-0.546	4.740	-10	10	2676
Executive Constraints Score	3.647	1.525	1	7	2676
Political Competition Score	4.687	2.173	1	10	2676

Data Appendix Table 2. List of Countries

Country	ExtDebt/GDP	ComExp/GDP	Country	ExtDebt/GDP	ComExp/GDP
Albania	95	0.4	Madagascar	214	1.3
Algeria	144	5.2	Malawi	149	2.8
Angola	347	9.5	Malaysia	115	5.5
Argentina	167	0.7	Mali	216	1.1
Armenia	69	0.1	Mauritania	365	5.9
Bangladesh	50	0	Mauritius	78	2.9
Belarus	22	0.2	Mexico	123	0.9
Belize	159	4.2	Mongolia	151	1.6
Benin	145	1.2	Morocco	133	0.1
Bolivia	178	0.6	Mozambique	258	0.8
Brazil	96	0.7	Nepal	39	0
Bulgaria	189	0.7	Nicaragua	583	2.7
Burkina Faso	77	0.5	Niger	141	0.4
Burundi	140	1.5	Nigeria	137	7.5
Cambodia	88	0.3	Pakistan	67	0.3
Cameroon	154	4	Panama	319	1.1
Chad	54	0.8	Papua New Guinea	224	10.8
Chile	150	2.6	Paraguay	82	1.3
Colombia	83	1.5	Peru	159	1.2
Costa Rica	137	1.6	Philippines	125	0.6
Cote d`Ivoire	296	5.9	Poland	174	0.3
Croatia	341	1.2	Romania	66	0.6
Djibouti	98	0.6	Russia	123	2.4
Dominican Republic	85	1.6	Rwanda	84	0.9
Ecuador	172	2.6	Samoa	182	0.7
El Salvador	99	1.9	Senegal	163	0.3
Ethiopia	111	0.6	Seychelles	244	2.7
Fiji	66	4.3	Sierra Leone	97	0.6
Gabon	274	14.9	Somalia	437	0.3
Gambia, The	207	0.6	South Africa	69	0.7
Georgia	75	0.5	Sri Lanka	80	1.3
Ghana	158	4.5	Sudan	314	1.1
Guatemala	50	1.5	Tajikistan	80	2
Guinea	104	1.6	Tanzania	331	1.7
Guinea-Bissau	764	3.1	Thailand	100	1.1
Guyana	756	13.4	Togo	265	2
Haiti	62	0.6	Tunisia	141	1.1
Honduras	178	1.9	Turkey	165	0.4
India	33	0.2	Turkmenistan	39	0.8
Indonesia	100	2.1	Uganda	112	2.4
Jamaica	207	2.7	Ukraine	61	0.5
Jordan	265	0	Uruguay	154	1.3
Kazakhstan	127	3.1	Uzbekistan	85	3.1
Kenya	99	1.4	Vietnam	96	0.7
Latvia	323	7.2	Zambia	421	7.8
Lebanon	181	0.2	Zimbabwe	98	1.2
Liberia	1605	18.6	Average	187	2.3

Note: The Table lists the external debt to GDP ratio and the commodity export to GDP ratio. Both ratios are multiplied by 100.