Emerging markets and exchange market pressures: Analysis across primary commodity groups

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Abstract

Short-term sensitivity between exchange market pressure and domestic and external factors is a critical component of macroeconomic sustainability in emerging markets that are dependent on primary commodity exports. Across commodity groups and top exporters, volatility transpires via currency pressures, interest rates, and domestic credit cycles, feeding into social costs for structurally weaker economies. In this paper dynamic panel studies are supplemented by a panel vector autoregression model. Results accentuate concerns over economic diversification, speculative capital flows, and the uncertainty of the "new normal". Exchange-rate pegs lead to a drain in international reserves as the terms of trade deteriorate following post-price peaks and foreign exchange constraint worsens.

Introduction

This paper studies the reaction of the **exchange market pressure (EMP)** index—correlating domestic currency depreciation with the changes in international reserves—to a mix of external and domestic factors for **commodity-dependent countries (CDC)** divided by the main export type. Employing dynamic panel study, a **panel vector autoregression (pVAR)** model also helps capture lagged effects.

Two interrelated factors have played a role since the **global financial crisis (GFC)**: 1) a decline in CDCs' revenues from primary commodity exports as prices drop; 2) staggering accumulation of foreign currency–denominated sovereign debt across **emerging markets (EM)** and worsening foreign exchange constraint.

Fluctuations in the main export commodity, and in the benchmark (oil) prices, affect global trade, exporter's foreign revenues, and result in significant exchange market pressures for flexible and soft-peg economies.

Table 1. Select primary commodities exporters in emerging markets, average % share of global exports, 1995-2014

	Country	Share of global exports, %	Post GFC GDP per capita loss	Post GFC IR change	FX Regime
Sugar	Brazil	16.3%	0.15	0.04	Floating
	Thailand	5.5%	(0.04)	0.08	Floating
	India	1.8%	0.43	(0.005)	Floating
	Colombia	1.7%	0.65	0.002	Floating
	Guatemala	1.5%	0.27	0.004	Crawl-like
Ores	Chile	5.5%	0.65	(0.01)	Free floating
	Russia	4.4%	(2.29)	0.01	Floating
	Brazil	3.7%	0.15	0.04	Floating
	South Africa	3.1%	(0.75)	0.03	Floating
	Peru	1.7%	0.46	0.07	Floating
Fuels	Russia	9.7%	(2.29)	0.01	Floating*
	Nigeria	3.1%	(2.14)	(0.10)	Other managed
	Venezuela	3.1%	(1.68)	(0.07)	Conventional peg
	Algeria	2.7%	(0.73)	0.22	Other managed
	Angola	1.5%	(4.37)	0.09	Crawl-like*
Cereal	Argentina	4.6%	0.91	(0.03)	Crawl-like
	Thailand	3.8%	(0.04)	0.08	Floating
	India	2.9%	0.43	(0.005)	Floating
	Russia	1.9%	(2.29)	0.01	Floating
	Ukraine	1.8%	(2.35)	(0.01)	Floating*
Coffee	Brazil	7.3%	0.15	0.04	Floating
	Côte d'Ivoire	5.0%	2.69	0.03	Conventional peg
	Colombia	3.6%	0.65	0.002	Floating
	Ghana	2.8%	2.12	0.02	Floating
	India	2.8%	0.43	(0.005)	Floating

Stylized Facts

Table 1 helps narrow down the sample focus. **Five** points: 1) the sample is constructed around five major primary commodity groups; 2) only the top five CDC exporters per group from emerging markets are included; 3) annual GDP per capita growth rate declined to 2.8% for 2010-14 vs. 3.1% in 2000-14; 4) for the group the FX reserves were up at 21.4% of gross national income (GNI) for 2010-14; 5) diversity in exchange-rate regimes and going off the pegs / managed floats.

Some decline in post-GFC external debt to GDP may be due to nominal growth, while sharp decline in FDI points to ongoing substantial financial capital outflow and loss of foreign exchange, exerting further pressures on currency pegs and financial systems.

Methods and Data

Baseline: $EMP_{it} = \alpha + \beta_i DM_{it} + \theta_{it} EX_{it} + \varepsilon_{it}$ (1) EMP – measure of the volume of intervention necessary to achieve any desired exchange rate target.

EMP defined $EMP_{it} = \frac{e_{it} - e_{it-1}}{e_{it-1}} - \frac{R_{it} - R_{it-1}}{R_{it-1}}$ (2) Extensions (e.g., Aizenman & Hutchison, 2012; Klaassen & Jager, 2011; Tanner, 2002) add interest rate differentials, deflating FX reserves by monetary base, or by the standard deviations.

Domestic factors (DM): monthly domestic industrial index (MPC), domestic lending rate (LR), and the bid-ask spread for the USD expressed in local currency (BIDASK).

EX factors: ten-year US Treasury bond with constant maturity (T10), volatility index (VIX), and individual commodity spot process (OIL, SUGAR, ORES).

Approach: dynamic panel studies focus on the direction of associate changes due to endogenities. Followed up by panel VAR.

Data: monthly from January 2000 to September 2015. Data sources: IMF-IFS, WB GEM, St. Louis FRED, OANDA, UNCTAD.

Table 2. Sugar group EMP.

dep. var = *EMP*	Full sample period (Jan 2000-Sept 2015)				pre-price peak sample (Jan 2000 - Jan 2011)	post-price peak sample (Feb 2011- Sept 2015)
	(1)	(2)	(3)	(4)	(4)	(4)
VIX	0.001*** [0.0002]	0.001*** [0.0002]	0.001*** [0.0002]	0.001*** [0.0002]	0.001*** [0.0002]	0.002*** [0.0004]
dlSUGAR	-0.048*** [0.019]	-0.03* [0.0194]	-0.03* [0.0194]	-0.029* [0.0194]	0.0043 [0.02309]	-0.0883** [0.0346]
dLR	0.006*** [0.002]	0.006*** [0.002]	0.006*** [0.002]	0.006*** [0.002]	0.009*** [0.003]	-0.004* [0.003]
dlOIL		-0.0791*** [0.0179]	-0.08471*** [0.0184]	-0.08462*** [0.0184]	-0.05916** [0.023]	-0.12357*** [0.0271]
dMPC		-0.0017 [0.0175]	-0.002 [0.018]	-0.003 [0.018]	-0.019 [0.022]	0.048** [0.024]
dT10			0.009 [0.007]	0.009* [1.27]	0.005 [0.008]	0.036*** [0.012]
dBIDASK				-0.0003 [0.0005]	-0.0004 [0.001]	-0.001 [0.001]
CONST	-0.0294*** [0.004]	-0.025*** [0.0041]	-0.0255*** [0.0041]	-0.0255*** [0.0041]	-0.0364*** [0.0054]	-0.0272*** [0.0065]
Obs.	940	940	940	940	660	280
Groups	5	5	5	5	5	5
St.Dev of residuals	0.04	0.04	0.04	0.04	0.05	0.03

Table 3. Ores group EMP.

dep. var = *EMP*	Full sample period (Jan 2000-Sept 2015)				pre-price peak sample (Jan 2000 - Jan 2011)	post-price peak sample (Feb 2011- Sept 2015)
	(1)	(2)	(3)	(4)	(4)	(4)
VIX	0.001*** [0.0002]	0.001*** [0.0002]	0.001*** [0.0002]	0.001*** [0.0002]	0.001*** [0.0003]	0.001* [0.0005]
dlORES	-0.2793*** [0.029]	-0.246*** [0.0305]	-0.266*** [0.0307]	-0.269*** [0.0307]	-0.2486*** [0.03662]	-0.22205*** [0.0571]
dLR	0.009*** [0.002]	0.009*** [0.0019]	0.009*** [0.002]	0.009*** [0.002]	0.01*** [0.002]	0.006** [0.003]
dlOIL		-0.0721*** [0.0225]	-0.08448*** [0.0226]	-0.08256*** [0.0226]	-0.02417 [0.0268]	-0.24656*** [0.0397]
dMPC		-0.0484 [0.0438]	-0.042 [0.043]	-0.046 [0.043]	-0.061 [0.053]	0.007 [0.069]
dT10			0.033*** [0.008]	0.033*** [4.02]	0.027*** [0.009]	0.06*** [0.016]
dBIDASK				0.001* [0.0004]	0.001* [0]	0.004 [0.004]
CONST	-0.0239*** [0.0049]	-0.023*** [0.0049]	-0.0252*** [0.0049]	-0.0251*** [0.0049]	-0.0421*** [0.0063]	-0.0112 [0.0087]
Obs.	939	939	939	939	660	279
Groups	5	5	5	5	5	5
St.Dev of residuals	0.05	0.05	0.05	0.05	0.05	0.04

Table 4. Fuels FX Res change.

dep. var = *ΔRESfuels*	Full sample period (Jan 2000-Sept 2015)	pre-price peak sample (Jan 2000 - Jun 2008)	post-price peak sample (Jul 2008- Sept 2015)
	(4)	(4)	(4)
VIX	-0.001*** [0.0004]	-0.002*** [0.0007]	-0.001 [0.0004]
dlOIL	0.045 [0.0376]	0.019 [0.0598]	0.021 [0.046]
dMPC	0.028* [0.015]	0.041** [0.021]	0.003 [0.022]
dBIDASK	0.0004*** [0.0001]	0.00037*** [0.0001]	0.00146 [0.0025]
dLR	-0.0005 [0.001]	0.0001 [0.001]	0.001 [0.002]
dT10	-0.0362** [0.0145]	-0.055*** [0.022]	-0.01 [0.018]
CONST	0.0425***	0.071***	0.0123
Obs.	940	505	435
Groups	5	5	5
St.Dev of residuals	0.09	0.10	0.08

Note: ***, **, * significance at 1, 5, and 10 per cent respectively. Standard errors are in brackets. d in variables names refers to first difference; l are log-transformed variables.

Results and pVAR

Panels w/extensions to (1). Consistency in DM for **Sugar** & **Ores** EMP; lacking in **Fuels** due to FX rate pegs. EX factors built up vs. weak fin. deepening in Sugar vs. Ores. BIDASK may be due to temporary policy in post-GFC. Negative shock to MPC in CDC reverses investor perceptions, leading to FX loss + currency pressures. Commodity exhaustibility plays minimal role but FX Res loss as volatility (VIX) rises and prices drop (Table 4). **pVAR** analysis of EMP and decomposing DM and EX impulses for FXchng and RESchng effects – much diversity due to macro policy.

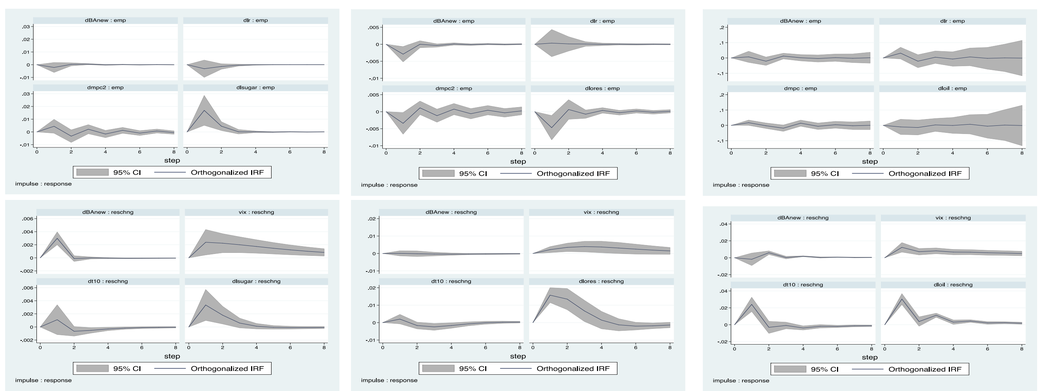

Figure 1. SUGAR DM (top) and EX (Rzvr) panels. **Figure 2.** ORES DM (top) and EX (Rzvr) panels. **Figure 3.** FUELS DM (top) and EX (Rzvr) panels.

Discussion and Conclusions

EMP – association with primary commodity prices for the top exporting nations. Resilience based on FX accumulation and **CB interventions** (Mon Policy gauge). Domestic lending rate reflects the risks of forced depreciation. Strong association with global liquidity access (short-term VIX and long-term T10) vs. FX constraint.

For weak peg FX or float: changes in ToT have implications for debt sustainability. At risk: ability to tap FX markets for public / private borrowers at lower rates.

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References (select)

1. Aizenman, J., & Hutchison, M. M. (2012). Exchange market pressure and absorption by international reserves: Emerging markets and fear of reserve loss during the 2008–2009 crisis. *Journal of International Money and Finance,* 31, 1076–1091.
2. Aizenman, J., Lee, J., & Sushko, V. (2012). From the great moderation to the global crisis: Exchange market pressure in the 2000s. *Open Economies Review,* 23(4), 597-621.
3. Arezki, R., Hadri, K., Loungani, P., & Rao, Y. (2013). Testing the Prebisch-Singer hypothesis since 1650: Evidence from panel techniques that allow for multiple breaks. *IMF Working Paper No. 13/180*
4. Gevorkyan, A.V. and O. Canuto (eds). 2016. *Financial Deepening and Post-Crisis Development in Emerging Markets: Current Perils and Future Dawns.* New York: Palgrave Macmillan
5. Gevorkyan, A. V., & Kvangraven, I. H. (2016). Assessing recent determinants of borrowing costs in sub-Saharan Africa. *Review of Development Economics,* 20(4), 721-738.
6. Khemraj, T., & Pasha, S. (2012). Analysis of an unannounced foreign exchange regime change. *Economic Systems,* 36, 145-157.
7. Love, I., & Zicchino, L. (2006). Financial development and dynamic investment behavior: Evidence from panel VAR. *Quarterly Review of Economics and Finance*, 46, 190-210.
8. Tanner, E. (2002). Exchange market pressure, currency crises, and monetary policy: additional evidence from emerging markets. *IMF Working Paper WP 02/14.*