



# Terms of trade shocks and private savings in the developing countries



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## ABSTRACT

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Economic agents in the developing countries are subject to tight credit constraints, which are more pronounced during bad state of nature. Thus, adverse shocks to commodity prices in the world market can force them to reduce savings by a larger amount than they would otherwise have. Empirical analysis using a dynamic GMM model and data from 45 developing countries confirm that most of the determinants of savings identified in the literature also apply to the developing countries. The transitory component in the terms of trade have a larger positive impact than the permanent component. This reflects the lack of access to foreign borrowing. Although the impact of terms of trade shocks is found to be asymmetric, the magnitude of the impact appears to be relatively small. Results show some differences in the response of savings in the three regions considered here. The results are, however, robust for alternative estimators and determinants. *Journal of Comparative Economics* 43 (4) (2015) 1122–1134. Marquette University, Milwaukee, WI 53021, United States.

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## 1. Introduction

There has been a voluminous literature on the potential importance of terms of trade shocks in explaining macroeconomic performance.<sup>1</sup> A question regularly raised in these studies is: how should economic agents respond to greater fluctuations in tradable commodity prices, and the resulting volatility in current account balances and real income? This question is particularly relevant as commodity exporting countries across the world have benefitted largely from the commodity price boom of the last decade. One answer, provided by the theory of precautionary savings, suggests that in response to an increase in the volatility of income arising, say, out of an increase in the probability of being unemployed, economic agents would increase savings in order to hedge against the greater problem of a large negative income shock in the future. The international economics literature beginning with studies by [Obstfeld \(1982\)](#), [Sachs \(1981\)](#) and [Svensson and Razin \(1983\)](#) have devoted particular attention to the response of private savings to terms of trade shocks in the context of macroeconomic models where spending decisions are based on intertemporal optimization by forward-looking agents. An important result emerging from this

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<sup>1</sup> For an early work in this area, see [Bevan et al. \(1993\)](#). [Attanasio and Weber \(2010\)](#) provides a detail review of the theoretical and empirical literature on this issue. [Adler and Magud \(2013\)](#) studies the relationship over the last four decades.

work is that the nature of the impact of these shocks on private savings depend on whether the shocks are permanent or transitory, and expected or unexpected.

However, most of the empirical studies in this area have concentrated on the developed economies. Very few studies have considered the developing economies. This paper attempts to fill this gap in the literature. Why is this an important issue for the developing economies? Terms of trade disturbances have been an important source of macroeconomic uncertainty in a number of these countries (Adler and Magud, 2013; Osterholm and Zettelmeyer, 2008).<sup>2</sup> Many of them remain heavily dependent on primary commodities increasing their vulnerability to external shocks, and complicating macroeconomic management, particularly on the fiscal side (Adler and Magud, 2013; Cespedes and Velasco, 2011; United Nations, 2002, pp. 139–46). Recent events associated with, on the one hand, the sharp decline in commodity prices, and, on the other, the continuous increase in the volatility of commodity prices have exacerbated the pressure on the current account of these countries.

For example, since 2008, the rebound in world oil price has helped to boost the OPEC and other oil producing economies, while many of the non-oil producing countries have faced substantial terms of trade losses as export prices of non-fuel commodities and other primary products remain generally depressed, particularly in real terms, while energy import prices have risen.<sup>3</sup> Moreover, commodity price changes have also been asymmetric often with long troughs and sharp peaks, making it difficult to insulate the domestic economy from such shocks (Cashin et al., 2002; Spatafora and Warner, 1999).<sup>4</sup>

Given the absence of efficient domestic credit and capital markets and limited access to international financial markets, economic agents in the developing economies are subject to tight credit constraints which are more pronounced during bad state of nature. Consequently, adverse shocks to commodity prices in the world market can force them to reduce savings by a larger amount than they would otherwise have. Empirical studies on the impact of terms of trade shocks on private savings have excluded the developing economies on the ground that their performance is less amenable to explanation using standard economic variables (Agenor and Aizenman (2004) on Sub-Saharan Africa and Aquino and Espino (2013) on Peru are exceptions). This is one of the first studies that we are aware of that tackles this issue for the developing countries with the realistic expectation of obtaining results comparable in quality and reliability to those available in the literature.

This paper studies the impact of terms of trade shocks on private savings in 45 developing countries over the 1990–2008 sample period. The paper uses the Generalized Method of Moments (GMM) dynamic panel regression framework that controls for bias arising out of the presence of simultaneity, use of lagged dependent variable and omission of country-specific effects (Edison et al., 2002). This, however, gives rise to a number of potential problems as discussed in the literature (see Campos and Kinoshita, 2002). We try to address these concerns by using several different estimators. First, we conduct estimations including country and time fixed effects to account for unobserved country characteristics and for common shocks and trends across countries. Our preferred choice of estimator to deal with the likely (weak) endogeneity in the relationship is the System GMM dynamic panel data estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998).

We compute robust two-step standard errors by following the methodology proposed by Windmeijer (2004). This approach addresses the issues of joint endogeneity of all explanatory variables in a dynamic formulation and of potential biases induced by country-specific effects (Dabla-Norris and Srivisal, 2013). Moreover, in order to address biases due to reverse causality, we run regressions lagging all regressors one period and we conduct dynamic system Generalized Method of Moments (GMM) estimations à la Arellano and Bover (1995), using lagged regressors as instruments. We also perform a battery of sensitivity tests to check the robustness *vis-à-vis* alternative estimators, determinants and country groupings, and we verify that our findings are indeed relatively robust.

The paper is organized as follows. Section 2 reviews the literature, while the methodology is discussed in the subsequent section. Empirical results and sensitivity test analyses are presented and discussed in Section 4. The paper ends with concluding remarks in the final section.

## 2. Literature review

What is the impact of movements in the external terms of trade on private savings? This question has been a source of a major debate in international economics for the last few decades.<sup>5</sup> The traditional explanation, known as the Harberger–Laursen–Metzler (HLM) effect (Harberger, 1950; Laursen and Metzler, 1950), states that an improvement in the terms of trade increases a country's real income level (that is, raises the purchasing power of its exports in the world market) consequently increasing savings. A deterioration in the terms of trade can be shown to lower private savings. Obstfeld (1982)

<sup>2</sup> Several studies have also emphasized the importance of trade dynamics in the process of transition (see Chowdhury (2004), and Campos and Coricelli (2002) and the references therein).

<sup>3</sup> Reinhart and Wickham (1994) show that commodity prices have experienced a mostly secular decline accompanied by an increase in volatility. The standard deviation for terms of trade growth has ranged from an average of 9 percent per year for developed countries to about 19 percent per year for developing countries (Baxter and Kouparitsas, 2000). The World Bank's index of non-oil real commodity prices has also shown a trend decline of about 1.5 percent per annum since the late 1940s. The Bank predicts this trend to continue over the next decade.

<sup>4</sup> Cashin et al. (2002) found commodity price cycles to be asymmetric – price slumps last longer than price booms. Averaging across 36 real commodity price series, they estimated the typical length of price slumps (39 months) to be about 10 months longer than the typical length of price booms, giving an average cycle of about 68 months. Using a stock-holding model with intertemporal arbitrage, Deaton and Laroque (1992) identified the asymmetry involved in storage activity – stocks cannot be negative and a stock-out will lead to sharp price fluctuations – as the reason for this pattern of commodity price movements.

<sup>5</sup> For a survey of early works in this area, see Ostry and Reinhart (1992).

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