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Commodity prices and growth: An empirical investigation ☆

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ABSTRACT

Whereas empirical evidence on the effect of higher commodity prices on the long-run growth of commodity exporters is ambiguous, time series analyses using vector autoregressive (VAR) models have found that commodity booms raise income in the short run. In this paper we adopt panel error correction methodology to analyze global data for 1963 to 2008 to disentangle the short and long run effects of international commodity prices on output per capita. Our results show that commodity booms have unconditional positive short-term effects on output, but non-agricultural booms in countries with poor governance have adverse long-term effects which dominate the short-run gains. Our findings have important implications for non-agricultural commodity exporters with poor governance, especially in light of the recent wave of resource discoveries in low-income countries.

1. Introduction

Empirical evidence on the long-run effect of natural resources on economic growth is ambiguous. Some studies find that resources are a "blessing" (Alexeev and Conrad, 2009; Brunnschweiler and Bulte, 2008; Lederman and Maloney, 2007; Sala-i-Martin et al., 2004), while others find that they are a "curse" (Sachs and Warner, 1999, 2001; Gylfason et al., 1999; Sala-i-Martin and Subramanian, 2003). The theoretical literature offers several explanations for this mixed evidence. First, it may be due to adverse effects of natural resources that occur in some countries but not in others. Mehlum et al. (2006), for example, argue that resource rents invite non-productive lobbying and rent seeking in countries with weak "grabber-friendly" institutions but not in countries with strong "producer-friendly" institutions. An alternative explanation is put forward by Robinson et al. (2006), who argue that commodity booms lead to inefficient redistribution by governments in return for political support but that this occurs only in countries where government accountability is lacking. In addition to these political economy channels, other adverse effects of natural resources may also occur in some countries but not in

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others. Examples include Dutch disease (Corden and Neary, 1982; Torvik, 2001), a deterioration in governance (Baland and Francois, 2000; Tornell and Lane, 1999; Torvik, 2002), conflict (Collier and Hoeffler, 2004), excessive borrowing (Mansoorian, 1991; Manzano and Rigobon, 2007), volatility (Sala-i-Martin and Subramanian, 2003), and lower levels of education (Gylfason, 2001).

But the mixed evidence on the long-run effect of resources on growth could also be due to methodological problems that apply to much of the resource literature. Manzano and Rigobon (2007), for example, show that the resource curse effect identified in the cross-sectional growth regressions of Sachs and Warner (1999) disappears when using a panel and employing a fixed effects estimator to control for unobserved country characteristics.[1] But even when using fixed effects, many of the proxies used for natural resource dependence or abundance are likely to suffer from endogeneity, which makes it difficult to interpret the estimated effects as causal. Brunnschweiler and Bulte (2008), for example, point out that the Sachs and Warner proxy for resource dependence (the share of resources in GNP) is endogenous. They show that, when instrumenting for resource dependence, its negative effect on growth disappears whereas subsoil resource wealth (abundance) positively affects growth.

Whereas the resource literature predicts an ambiguous effect of commodity booms on long-run growth, empirical studies by Deaton and Miller (1995) for Africa and Raddatz (2007) for low-income countries use vector autoregressive (VAR) models and find that higher commodity prices significantly raise income in the short run. Since the purpose of these studies is not to estimate long-run effects of commodity booms, an unexplored possibility is that these positive short-run effects are followed by others, beyond the horizon of the VAR models, whose sign is conditional upon country characteristics and which potentially more than offset initial benefits.

In this paper we adopt panel error correction methodology to analyze global data for 1963 to 2008 to disentangle the short and long run effects of international commodity prices on output per capita. This approach has several advantages compared to earlier studies. First, unlike many of the resource proxies used in previous literature, international commodity prices are typically unaffected by the behaviour of individual countries and so can be viewed as a relatively exogenous source of variation in a country's resource revenues (Deaton and Miller, 1995).[2] Second, the error correction model allows us to jointly estimate short-run growth effects of booms and long-run level effects within one regression framework, which to our knowledge has not previously been done. It avoids that the long-run estimates are contaminated by short-run effects, a problem that is typically ignored in the resource literature. Third, the size of our panel dataset represents a substantial increase in the number of observations used in estimation when compared to the cross-sectional datasets that are used in much of the resource literature, but also when compared to earlier studies that employ panel data, such as Lederman and Maloney (2007) and Manzano and Rigobon (2007). Also, the length of the panel (46 years) is long compared to earlier panel data studies, which is helpful when estimating long-run relationships as a large time span of the data gives more observations on long-run fluctuations (Hakkio and Rush, 1991). Our estimations include fixed effects and regional time dummies to control for unobserved country characteristics and common regional shocks and we allow the effects of commodity prices to vary across different types of commodities. We also address potential sources of endogeneity that have sometimes been neglected in previous literature.

Our results show that commodity booms have positive short-term effects on output, but conditional adverse long-term effects. The adverse long-term effects are confined to "high-rent", non-agricultural commodities. Within this group, we find that the adverse long-term effects are avoided by countries with sufficiently good governance.

The conditional adverse long-term effects we identify in our estimations are consistent with the above mentioned theories of Mehlum et al. (2006) and Robinson et al. (2006). They also, we believe, lend more credibility to cross-section results in three previous studies that suffer from the same methodological problems as much of the resource literature (e.g., the use of endogenous resource proxies, the failure to control for unobserved country characteristics and the relatively short length of the sample period). The first of these three studies, by Boschini et al. (2007), shows that in countries where resources are highly appropriable, as determined by both the type of resources and institutional quality, resources lower growth, while in countries with less appropriable resources, they promote growth. The other two studies, by Mehlum et al. (2006) and Iimi (2007), show that natural resources raise growth in countries with good institutions but lower growth in countries with bad institutions.[3]

Our finding that positive short-term effects of booms on output co-exist with conditional adverse long-term effects has important implications for non-agricultural commodity exporters with weak institutions, many of which are located in Sub-Saharan Africa. Global commodity prices remain markedly higher than those before the post-2000 boom and are, if past behaviour is repeated, likely to have strongly adverse long term effects, so that the recent acceleration in growth rates of Africa's commodity exporting economies is particularly misleading. However, if our tentative diagnosis of the root cause of the adverse effects as being due to errors in governance is correct, then this prognosis could be avoided by improvements in the quality of governance.

[1] Lederman and Maloney (2007) find that the Sachs and Warner results also disappear when using the unmanipulated data in cross section, or when employing a system GMM estimator.

[2] We relax this assumption of exogeneity when we address concerns over endogeneity in Section 5.

[3] Collier and Hoeffler (2009) show that the effect of natural resources on growth depends on different features of democracy. Whereas electoral competitition worsens the effect, checks and balances improve it. Others have argued that the effect of natural resources depends on inequality (Dunning, 2008) or human capital (Bravo-Ortega and de Gregorio, 2007).