Exchange rate misalignments in energy-exporting countries: Do sovereign wealth funds matter?☆

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**Abstract**

In recent years, several energy-exporting economies have established sovereign wealth funds (SWFs), which invest part of their resource rents in foreign assets. This paper investigates whether these SWFs can help to reduce the volatility of real exchange rate (RER) misalignments by dampening the transmission of energy prices. Using a database on 24 oil-producing countries, we rely on recent advances in the panel cointegration literature to determine a measure for RER misalignment. Our results show evidence that establishing a SWF is associated with a reduction in the volatility of RER misalignments, with a more pronounced magnitude when the fixedness of the exchange rate regime increases. This finding is robust to various sensitivity analyses.

1. Introduction

In recent years, several sovereign wealth funds (hereafter SWFs) have been established to deal with the dramatic rise in commodity prices and excessive accumulation of foreign reserves. According to the International Monetary Fund (IMF; 2012), SWFs manage around US$ 3 trillion.1

The SWFs of a given country may have multiple priorities that can change over time (Al-Hassan et al., 2013). According to the Santiago Principles,2 there are five types of SWFs: (1) stabilization funds to insulate the public budget and the economy from commodity price fluctuations (Iran, Russia); (2) savings funds to share wealth across generations by transforming revenue from natural resources into diversified financial assets (Abu Dhabi Investment Authority, Libya, Russia); (3) development funds to sustain priority socio-economic projects (United Arab Emirates, Iran); (4) pension reserve funds to manage the revenues from natural resources and ensure payment of future pensions (Australia, Ireland, New Zealand); and (5) reserve investment corporations to manage foreign exchange reserves, part of which can be invested in less liquid assets (China, South Korea, Singapore). In general, particularly in energy-exporting countries, and regardless of their specific type, SWFs invest in foreign assets (Al-Hassan et al.,...
By investing a part of their natural resource rents abroad, SWFs mitigate the "Dutch disease" effect in the short run. The underlying mechanism of the Dutch disease phenomenon is as follows: a boom in the resource sector leads to a rise in wages in all sectors owing to labor mobility across sectors, and this increases the relative price of the nontraded good. The real exchange rate (RER) then appreciates, resulting in loss of competitiveness of the export sectors (Corden and Neary, 1982). One consequence of the Dutch disease phenomenon is the "resource curse," as postulated by Sachs and Warner, (1995, 2001): a resource boom endangers future growth by weakening the competitiveness of other export sectors. Recently, a wealth of natural resources was shown to have very dissimilar outcomes based on the country's ability to efficiently manage its wealth. Resource-rich countries that succeed in handling the Dutch disease phenomenon (e.g., Norway) perform better in terms of economic development than the ones that do not (e.g., Nigeria).3 Norway's ability to manage natural resources in a better manner seems to be related to its possession of an SWF (Van den Bremer et al., 2013).

In spite of the enthusiasm governments and international organizations have for SWFs and the growing number of case studies on the subject (Fasano-Filho, 2000; Davis et al., 2001; Le Borgne and Medas, 2007; Raymond, 2008, 2010), empirical evidence is still lacking on the effectiveness of SWFs to mitigate the aforementioned macroeconomic problems associated with natural resource wealth (see Brière, 2012).

The present study is an attempt to fill this gap. We analyze the role of SWFs in the short-run RER dynamics generated by energy terms of trade (TOT) shocks. More precisely, we investigate whether establishing SWFs can help reduce the volatility of RER misalignment.4 In fact, as mentioned above, a rise in energy prices results in energy-exporting countries with SWFs experiencing lower RER appreciation (Dutch disease) because their SWFs invest part of their export receipts abroad. Conversely, a decrease in energy prices should diminish the foreign investments of SWFs. Therefore, establishing an SWF leads to reducing the RER misalignment in energy-exporting countries. This must hold for all SWFs (particularly with regard to stabilization of funds, by definition) in energy exporting-countries, because whatever their objectives, SWFs invest a part of their revenue from energy resources abroad.

Thus, we collect an annual database on the key elements of SWFs in 24 oil-producing countries over the period 1980–2010. We rely on the recent advances made in the nonstationary panel literature and use panel cointegration techniques to determine a measure for the real effective exchange rate (REER) misalignment. Following the commodity currency literature initiated by Chen and Rogoff (2003), we consider energy TOT as the sole fundamental for RER in energy-exporting countries. We compute the REER misalignment and investigate whether SWFs can help reduce the absolute REER misalignment by dampening the transmission of energy TOT shocks.

Our results support the intuition that establishing SWFs is associated with a decrease in the volatility of REER misalignment. This holds after controlling for the potential determinants of misalignment and is robust to various sensitivity analyzes. Aghion et al. (2009) posit that RER volatility reduces economic growth, particularly for countries with relatively low levels of financial development (as in developing countries). Therefore, we attempt to highlight the factors that might enhance economic performance through the stabilization of RER.

The remainder of this paper is organized as follows. Section 2 presents the theoretical background for this study through a literature review. The empirical methodology is described in Section 3. Section 4 describes the data used in our empirical estimations. Our empirical results are presented in Section 5. Section 6 concludes the paper, drawing some policy implications.

2. Literature review and theoretical background

2.1. Long-run RER and commodity TOT

To describe the long-run link between RER and commodity prices, we consider the framework used in the commodity currency literature (Chen and Rogoff, 2003; Cashin et al., 2004). This framework is in the spirit of the literature underscoring the importance of TOT in RER dynamics (De Gregorio and Wolf, 1994; Obstfeld and Rogoff, 1996). It is a simplified framework that enables us to focus on the supply effects of commodity TOT, which largely explains the long-run RER.

The domestic (commodity-exporting) economy is a two-sector small open economy consisting of an export sector \(X\) producing a primary commodity \((P)\) and a nontraded sector \((N)\). For firms in both sectors, labor is the only factor of production under a constant returns to scale technology, where labor is supplied inelastically by domestic households. Perfect labor mobility across the two sectors ensures a single wage in the economy. Domestic households consume a nontraded good as well as an imported final tradable good (manufacture) that is not produced domestically.

The foreign economy consists of three sectors: a nontraded sector \((N^*)\), an intermediate sector \((I^*)\), and a tradable sector \((T^*)\). Firms in the nontraded and intermediate sectors have a constant returns to scale technology with labor as the only factor of production. In the foreign economy, labor mobility across sectors ensures a single wage. Firms in the tradable sector produce the final tradable good using two inputs, the imported primary commodity and the locally produced intermediate good. Foreign households consume the final tradable good as well as the locally produced nontraded good.

Let \(E\) denote the nominal exchange rate (an increase indicating appreciation of the domestic currency) and \(Q\) denote the RER as the foreign price of the domestic basket of consumption \((EP)\) relative to the foreign price of the foreign basket of consumption \((P^*)\).
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