Abstract  This paper studies the impact that oil prices have had on the floating exchange rate (ER) of the Dominican peso during the 1990–2008 period. The existing empirical literature has documented a link between these two variables for large developed economies and oil-producing countries, always including the 1970s oil crises in their sample periods. Few authors analyze the case of small open economies dependent on oil imports. Since the acceleration of economic growth in the Dominican Republic during the last decade has greatly increased its degree of external energy dependence, this country’s experience presents an ideal case study. We estimate the influence that changes in international gasoline prices have on the real exchange rate between the Dominican peso and the United States dollar. The cointegrated nature of the gasoline price and ER time series are tested and a vector error correction model is developed. Our results indicate that a 10% rise in the price of gas coincides with a 1.2% depreciation of the peso in the long run and that the causality runs from gas prices to the peso.

Keywords  Real exchange rates · Oil prices · Cointegration · Dominican Republic

JEL Classification  F31 · F41 · C22

1 Introduction

Oil imports represent a significant fraction of the trade balance for energy-dependant economies. In the case of small open economies with floating exchange rates (ER),
the variability in oil prices is expected to have a large impact on the relative value of the currency. Since oil contracts are denominated in US dollars, changes in the price of oil have significant implications for the demand and supply of foreign exchange. This relationship between the price of oil and the ER was brought to fore by the oil crises of the 1970s and has been established in the literature for both oil-exporting countries and large oil-importing countries. This paper uses the case of the Dominican Republic, an energy dependant small open economy with a floating ER, to illustrate the persistence of this connection beyond the 1970s.

The literature on the empirical relationship between the international price of oil and the ER of oil-producing countries is extensive yet surprisingly recent. 1 The seminal work belongs to Amano and van Norden (1998a,b) who find a stable link between oil price shocks and the U.S. effective real exchange rate (RER) during the 1972–1993 time period. Chaudhuri and Daniel (1998) build on that finding to show that the non-stationarity of U.S. dollar RERs is due to the non-stationary behavior of real oil prices. 2 They study 16 OECD countries between 1973 and 1996. Other authors have explored the same connection for oil-exporting countries. Akram (2004) and Rautava (2004) have analyzed the cases of Norway (between 1986 and 1998) and Russia (between 1995 and 2002), respectively. In both instances, they corroborate the aforementioned structural relationship without including the 1970s oil crises in their sample periods, although in both case studies oil revenues are important sources of foreign exchange inflows. A similar array of cointegration analysis techniques are employed by Wang and Dunne (2003); Joyce and Kamas (2003); Bergvall (2004), and Chen and Chen (2007) to assess the determinants of RER fluctuations for a series of countries in East Asia, Latin America, Northern Europe, and the G-7, respectively. In all cases they find fluctuations in the price of oil contributing to changes in the RER.

All along, the literature is scarce on the topic of how oil-dependent small open economies with flexible ERs are impacted by fluctuations in energy prices. This specific macroeconomic question has gained relevance in recent years. Since 1999, and due to a combination of global supply and demand factors, the yearly average price of oil has been increasing at an accelerating pace. For example, Mexican Mayan crude oil trading at $23 per barrel in May 2003 was quoted in May 2008 at $103 per barrel, a 348 percent increase. Such a price escalation is particularly significant for the Dominican Republic. As the country continued its process of economic development, demand for energy grew as well. Between 1995 and 2003 the Dominican Republic increased its GDP at an average of 6.4% per year, while its energy demand increased an average of 8.9% per year. More than half of the energy needs are supplied by fossil fuels while the country lacks any kind of oil deposits. Such energy dependence on imported fossil fuels exerts large pressures on the current account and by extension on the relative value of the Dominican peso. As the volume of imported fossil fuels increases, or

1 Amano and van Norden (1998a) argue that most empirical efforts have been directed, with little success, to the modeling of monetary determinants of ERs (p. 300). For an extensive literature review of the theoretical treatment of the relationship between oil prices and ERs see Golub (1983).

2 Brown and Phillips (1986) and Cooper (1996) provide examples of empirical studies performed before new techniques for the study of non-stationary time series were available. Although both document a link between oil prices and the foreign value of the dollar during 1973–1984 and 1972–1992 (respectively) their chain of causation is the inverse of that determined by Chaudhuri and Daniel (1998).