



# Accounting for real exchange rate changes in East Asia

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## Abstract

This study measures the proportion of real exchange rate movements that can be accounted for by movements in the relative price of non-traded goods using the framework employed by Engel [1999. Accounting for U.S. real exchange rate changes. *Journal of Political Economy* 107, 507–538]. Among the 21 bilateral Asian-Pacific real exchange rates considered here, that proportion is found to be trivially small for all possible horizons that the data allow – from one month up to 25 years. This pattern appears unaffected by the cross-sectional variation in either income level, or the degree of openness present among these Pacific-Rim economies. The only qualifications occur when considering fixed (or semi-fixed) exchange rate regimes.

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*JEL classification:* F3; F4

*Keywords:* PPP; Traded and non-traded goods; Deviations from the law of one price

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## 1. Introduction

This study provides new evidence on the share of real exchange rate movements that can be accounted for by deviations from purchasing power parity in traded goods. The primary motivation for this exercise is the striking (and influential) evidence presented in Engel (1999). For a sample of high-income countries, he shows that over the past 30 years, movements in relative prices of non-traded goods appear to account for essentially none of the movements in U.S. real

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exchange rates. That is, movements in aggregate real exchange rates overwhelmingly reflect deviations from purchasing power parity (PPP) among traded goods. This finding is important, since many general approaches to modeling the real exchange rate are built on an assumption of PPP in traded goods. Indeed, as emphasized by Obstfeld and Rogoff (2000), a role for relative traded goods prices, in real exchange rate determination is absent in most standard theories. The evidence presented in this study focuses on the experience of six small, open, and generally fast growing Asian-Pacific economies. Given the apparent differences between these economies and those previously studied, an important question is whether Engel's results generalize.

Indeed, there are several a priori reasons why one might question their generality. First, the focus on larger, predominately western G-7 countries misses much of the impressive economic growth that has occurred over the last 25 years. It is possible that wide movements in the relative price of non-traded goods have accompanied these high rates of growth, and that the accompanying sectoral reallocations have influenced the behavior of real exchange rates. Second, the exchange rate regime may itself be important. Recent studies have found significant effects on trade, growth, and economic integration (Rose, 2000; Frankel and Rose, 2002; Parsley and Wei, 2003). Several of the economies included in this study pegged their exchange rates for extended periods (e.g., Hong Kong 1983–present, Thailand 1990–1997), thus precluding nominal exchange rate adjustment. To the extent that the nominal exchange rate regime affects price dynamics, the real exchange rate may also be affected. Third, the Asian-Pacific economies are generally more reliant on external trade than the high-income industrial countries often studied. This openness may also affect real exchange rate dynamics. Finally, there are wide disparities in income levels among the Asian-Pacific economies themselves. Thus, an interesting question is whether the benchmark presented in Engel (1999) is relevant to a set of countries with widely different economic circumstances.

Studies that have focused on the importance of relative non-traded goods prices in real exchange rate determination have had mixed results. Chinn (2000) finds some East Asian real exchange rates (Japan, Korea, the Philippines, and Singapore) do appear cointegrated with relative prices, while others (China, Indonesia, and Thailand) do not. For OECD countries, Canzoneri et al. (1999) find mixed evidence for cointegration between real exchange rates and relative prices. Kakkar and Ogaki (1999) also find mixed results for the U.S., Japan, the U.K., and Canada, and Chinn and Johnston (1999) and Strauss (1999) find somewhat stronger support for this linkage among OECD countries.

This paper 'accounts' for the share of real exchange rate movements attributable to deviations from PPP in traded goods as in Engel (1999). The accounting exercise is based on a characterization of the underlying aggregate price indexes into traded ( $T$ ), and non-traded ( $N$ ) price sub-components. To be specific, express the (log) aggregate price index as a weighted-average of each, i.e.,

$$p = (1 - \alpha)p^T + \alpha p^N, \quad \text{for the domestic country and,}$$

$$p^* = (1 - \beta)p^{T^*} + \beta p^{N^*} \quad \text{for the foreign country.}$$

Then the real exchange rate,  $q = s + p^* - p$ , may be written as the sum of the relative price of traded goods ( $x$ ), and the relative-relative price of non-traded goods ( $y$ ).

$$q = s + p^{T^*} - p^T + \beta(p^{N^*} - p^{T^*}) - \alpha(p^N - p^T) \equiv x + y \quad (1)$$

where  $x = s + p^{T^*} - p^T$ , and  $y = \beta(p^{N^*} - p^{T^*}) - \alpha(p^N - p^T)$ .

This decomposition illustrates how differences across countries in *internal* relative prices impact the real exchange rate even in the absence of nominal exchange rate changes. As

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