



# Economic Premise

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## Can Real Exchange Rate Undervaluation Boost Exports and Growth in Developing Countries? Yes, But Not for Long

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*A policy of managed real undervaluation may have been an important factor behind the success of East Asia's export-led growth model. But current discussions over the value of China's currency demonstrate the controversy this kind of policy can generate. Although a managed real undervaluation can enhance domestic competitiveness, it is difficult to sustain—both economically and politically—in the post-crisis environment. We show that a real undervaluation works only for low-income countries, and only in the medium term.*

In the wake of the global financial crisis, academics and policy makers are questioning the relative merits of export-led growth strategies. Some have argued that many of the conditions responsible for that model's success are no longer in place. Many developing countries have relied on an undervalued real exchange rate to boost their exports. But global economic prospects are weaker than in the past, and there is greater uncertainty about the advanced economies' capacity to continue absorbing developing countries' exports. Moreover, a strategy of export-led growth paired with managed undervaluation is likely to incur costs if the real exchange rate is kept too low for too long. But how effective has real devaluation been in boosting exports and growth—and is it sustainable?

### The Role of the Real Exchange Rate in Boosting Economic Growth in Developing Countries

In most developing countries, the real exchange rate is managed to various degrees and is largely determined by eco-

nomical policies rather than by market fluctuations. The real exchange rate depends on the balance between savings and investment, and on the balance between expenditures and income. Hence, all policies that produce higher savings relative to investment can lead to real exchange rate depreciation.

Governments have a variety of policy instruments available to achieve a competitive real exchange rate and, potentially, real undervaluation. Examples include a moderate fiscal consolidation in the presence of a low level of private absorption; the introduction of capital controls on capital inflows and the liberalization of capital outflows; targeted interventions on foreign exchange markets; and a nominal depreciation associated with anti-inflationary policies, such as price and wage moderation.

Empirical evidence shows that real exchange rate variations can affect growth outcomes. Faster economic growth is significantly associated with real exchange rate depreciation (Hausmann, Pritchett, and Rodrik [2005], based on an analysis of more than 80 episodes of growth acceleration between 1957 and 1992). Real overvaluation hampers exports

and leads to a fall in economic growth (Easterly 2005; Johnson, Ostry, and Subramanian 2007).

Rodrik (2009) argues that real undervaluation promotes economic growth, increases the profitability of the tradables sector, and leads to an expansion of the share of tradables in domestic value added. He claims that the tradables sector in developing countries can be too small because it suffers more than the nontradables sector from institutional weaknesses and market failures. A real exchange rate undervaluation works as a second-best policy to compensate for the negative effects of these distortions by enhancing the sector's profitability. Higher profitability promotes investment in the tradables sector, which then expands, and promotes economic growth.

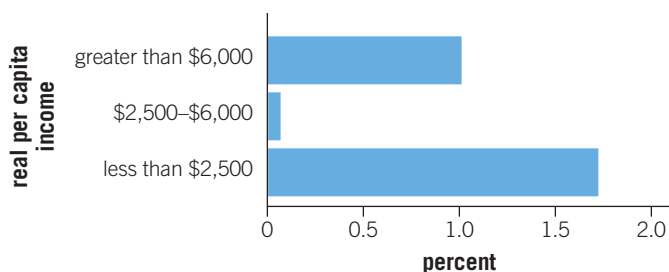
Other researchers showed alternative channels for undervaluation of the real exchange rate to raise growth. Levy-Yeyati and Sturzenegger (2007) claim that an undervalued real exchange rate boosts output and productivity growth not through an expansion of the tradables sector, but through an increase in savings and capital accumulation. Korinek and Servén (2010) show that real exchange rate undervaluation can raise growth through learning-by-doing externalities in the tradables sector—externalities that are suboptimally produced in the absence of policy intervention. They suggest that foreign reserves accumulation lowers the real exchange rate and encourages learning-by-doing externalities of export-led growth without the need for direct subsidies. However, this impact is reduced as more countries embrace such a strategy.

However, a competing strand of the literature claims that large misalignments of the real exchange rate from its equilibrium hamper economic growth. Its proponents define the equilibrium real exchange rate as the rate that guarantees macroeconomic equilibrium in the medium term. They argue that a real overvaluation causes current account deficits and can lead to currency crises, whereas a real undervaluation causes inflation and can lead to an overheating of the economy. They also assert that the real exchange rate should be determined only by market forces and that large misalignments generate distortions, produce wrong signals to economic agents, lead to factor misallocation, and cause instability. Consistent with this literature, Aguirre and Calderón (2005) show that both large real exchange rate overvaluation and large real exchange rate devaluations hamper economic growth. The larger the misalignments, the larger is the decline in growth.

### Evidence of the Positive Impact of Real Exchange Rate Undervaluation on GDP Growth and Export Expansion

We provide further evidence on the links among the real exchange rate, economic growth, and export expansion follow-

**Figure 1. Impact of 50 Percent Real Undervaluation on Growth of Annual Per Capita Income**



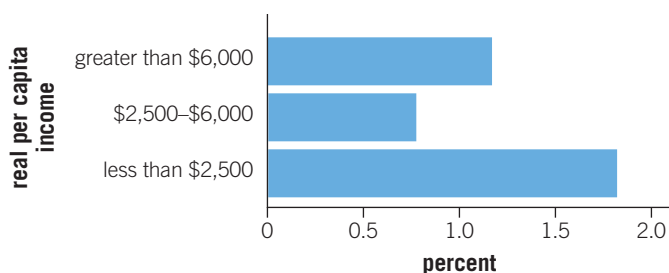
Source: Authors' estimates.

Note: All coefficients are significant at the 1 percent level, but the coefficient for countries with real per capita incomes between \$2,500 and \$6,000 is not significant.

ing Rodrik (2009). Real undervaluation has a positive effect on economic growth and on export expansion, but this effect is significant only for countries with low per capita income. In developing countries with per capita incomes below \$2,500, an increase of 50 percent in real undervaluation is associated with an annual 1.7 percent increase in growth (figure 1) and an annual 1.8 percent increase in exports over GDP (figure 2) in the corresponding five-year period.<sup>1</sup>

In the long run, the effect of a real exchange rate undervaluation on economic growth becomes negative; and on exports, it becomes insignificant. An extended specification of the model (which includes the lagged effect of undervaluation) shows that in developing countries with per capita incomes below \$2,500, real undervaluation has a positive contemporaneous effect on growth but a negative lagged effect. In developing countries with per capita incomes lower than \$6,000 and higher than \$2,500, real undervaluation has an insignificant contemporaneous effect and a negative lagged effect on growth. Real undervaluation has only a positive contemporaneous effect on exports; its lagged effect on exports is insignificant for all income levels.

**Figure 2. Impact of 50 Percent real undervaluation on the Exports-to-GDP Ratio**



Source: Authors' estimates.

Note: All coefficients are significant either at the 1 percent or at the 5 percent level, but the coefficient for countries with real per capita incomes between \$2,500 and \$6,000 is not significant.

## Real Exchange Rate Variability and Economic Growth

Perhaps more important than the level of the real exchange rate is its variability. An unstable real exchange rate causes more volatile relative prices, creates uncertainty, increases risk, and shortens investment horizons. Large real exchange rate misalignments do not provide the right incentives for investment over time, and they negatively affect the quality of investment. Frequent shifting of resources between the tradables and nontradables sectors in response to recurrent changes in relative prices leads to higher adjustment costs. Frequent movements in exchange rate expectations cause interest rate volatility and financial instability.

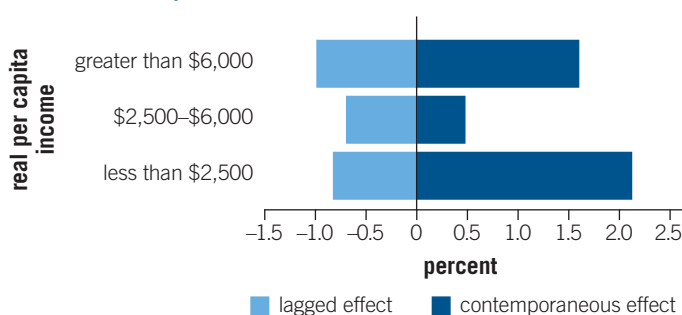
A volatile real exchange rate reduces the profitability of firms and hampers economic growth. But the final effect of real exchange rate volatility on economic performance can also depend on complementary factors, such as political and

macroeconomic stability (Eichengreen 2008). The effect of this variability on economic growth depends crucially on the level of financial sector development. When financial markets are sufficiently developed, agents can use sophisticated financial instruments to hedge against risk (Aghion et al. 2009).

Previous research on the impact of exchange rate volatility on growth has reached contrasting results. Ghosh et al. (1997) find that exchange rate variability does not affect economic growth. Bleaney and Greenaway (2001) find that exchange rate instability negatively affects investment in Sub-Saharan African countries. Bosworth, Collins, and Yuchin (1995) provide evidence that in a large sample of industrial and developing countries, real exchange rate volatility hampers economic growth and reduces productivity growth. Aghion et al. (2009) find a similar result, but they also show that the negative effect of real exchange rate volatility on economic growth shrinks in countries with higher levels of financial development. Servén (2003) shows that real exchange rate volatility negatively affects investment in a large panel of developing countries. This negative impact is significantly larger in countries with highly open economies and less developed financial systems. He also finds evidence of threshold effects, whereby uncertainty only matters when it is relatively high.

The literature concerning the effects of real exchange rate volatility on export expansion in developing countries also has not reached a clear-cut consensus. Arize, Osang, and Slottje (2000) find a significant negative relationship between an increase in exchange rate volatility and exports in developing countries. Chit, Rizov, and Willenbockel (2010) find a similar result for a panel of East Asian countries. Sauer and Bohara (2001) show that volatility has significant negative effects on exports in Latin America and Africa, but not in Asia. They argue that the effect of real exchange rate volatility on exports depends on the type of goods and the countries involved. Some studies also show that exchange rate variability has no significant effect in driving export volumes (Klein 1990; McKenzie 1998).

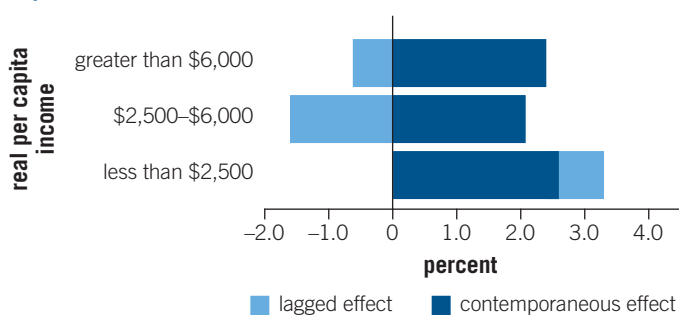
**Figure 3. Impact of 50 Percent Real Undervaluation on Annual Growth of Per Capita Income**



Source: Authors' estimates.

Note: All coefficients are significant at the 1 percent level, except for the contemporaneous coefficient for countries with real per capita GDP between \$2,500 and \$6,000, which is not significant.

**Figure 4. Impact of 50 Percent Real Undervaluation on Annual Exports-to-GDP Ratio**



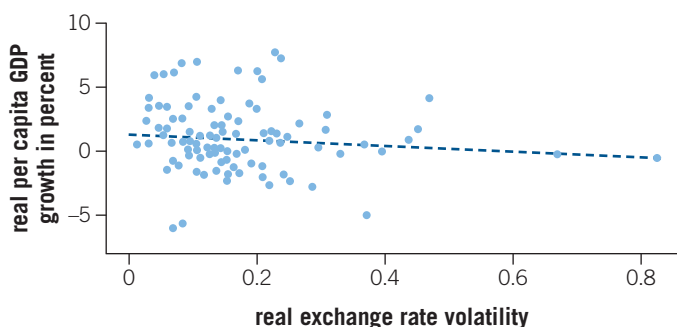
Source: Authors' estimates.

Note: All lagged coefficients are not significant. All contemporaneous coefficients are significant at the 1 percent level, except for the contemporaneous coefficient for countries with real per capita GDP between \$2,500 and \$6,000, which is significant at the 10 percent level.

## Evidence of the Negative Impact of Real Exchange Rate Volatility on GDP Growth and Export Expansion

A stable real exchange rate is a necessary condition for developing countries to achieve sustained economic growth, but only large fluctuations matter for exports. Our evidence confirms the existence of a significant negative relationship between real exchange rate volatility and real per capita GDP growth (figure 5).<sup>2</sup> This relationship does not significantly change when observations with extremely high real exchange rate volatility are dropped. Indeed, it becomes even stronger. Our evidence also confirms the existence of a significant neg-

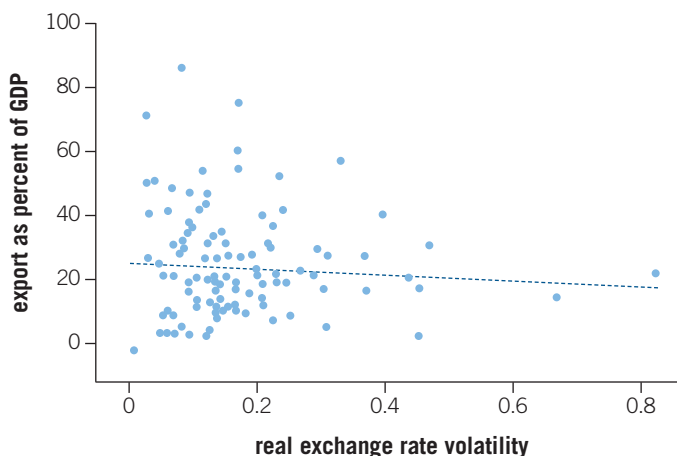
**Figure 5. Impact of Real Exchange Rate Variability on Growth**



Source: Authors' estimates.

Note: The graph presents the cross-country relationship between average real per capita GDP growth and real exchange rate volatility for countries with per capita incomes of less than \$6,000 between 1980 and 2004. Coefficients are significant at the 1 percent level.

**Figure 6. Impact of Real Exchange Rate Variability on Exports**



Source: Authors' estimates.

Note: The graph presents the cross-country relationship between average exports as a percent of GDP and real exchange rate volatility for countries with per capita income less than \$6,000 between 1980 and 2004. Coefficients are significant at the 1 percent level, but not significant if observations with real exchange rate variability above 0.4 percent are dropped.

ative relationship between real exchange rate variability and the exports-to-GDP ratio (figure 6). However, this relationship is no longer significant when observations with extremely high real exchange rate volatility are dropped. Only large real exchange rate variability appears to matter for exports.

### Maintaining an Undervalued Real Exchange Rate over Time Is Not Sustainable

A stable and undervalued real exchange rate can be a key element in promoting economic growth in low-income countries; but maintaining this policy for too long may have significant adverse consequences. First, such a policy may cause an excessive accumulation of low-yielding foreign re-

serves, which is an inefficient outcome. The return produced by foreign reserves is lower than the return produced by the same amount of wealth invested either in infrastructure or in a well-diversified portfolio in international financial markets.

Second, a real undervaluation led by nominal depreciation and not associated with anti-inflationary policies (such as price and wage moderation) can cause high and destabilizing liquidity growth and inflation. It also can lead to financial instability.

Third, an undervalued rate can constrain monetary policy, leaving it no longer free to target domestic objectives. Such constraint may cause an artificial process of overlending and overinvestment, mainly in the presence of an open capital account. The result can be an overheating economy.

Fourth, maintaining an undervalued real exchange rate for a long period of time may reduce the incentives to create a more developed financial sector.

Fifth, an artificial undervaluation is akin to a subsidy for firms that produce tradable goods. The subsidy is paid for by an implicit tax on consumers, who consequently have reduced purchasing power.

Finally, it may be difficult to exit a policy of sustained undervaluation once it becomes necessary to do so. Governments may be pressured by influential lobbies (that is, tradable goods producers) who derive rents from the status quo.

A stable and undervalued real exchange rate is a key step in promoting economic growth, but by no means is it a sufficient condition. The adoption of managed undervaluation as a policy aimed at enhancing sustainable growth should be preceded by an in-depth analysis of its welfare implications. Policy makers must be aware that the costs of such a policy may outweigh the benefits in the medium to long term. To be successful, this policy must be accompanied by other necessary and complementary conditions, such as strong institutions and macroeconomic stability. A country must be prepared to exit before costs begin outweighing benefits—a process that can be done by announcing a clear exit plan when the policy is adopted. To reduce the negative growth effects of possible real overvaluation and of higher real exchange rate volatility, it is best to move away from this policy strategy when the economy is still strong and confidence is high.

### Notes

1. Closely following Rodrik (2009) and using the Penn World Tables 6.3 data (Heston, Summers, and Aten 2009) for the period 1950–2004, we first compute a measure of real undervaluation for a panel of 187 countries and then estimate the effects of real undervaluation on per capita income growth for a panel of developing countries. We define “developing countries” as those countries with GDP per

capita incomes lower than \$6,000. For each time-series, we take a five-year average. This generates a maximum of 11 five-year time periods for each country. The real undervaluation index is a measure of the deviation of the actual real exchange rate from the purchasing power parity real exchange rate, which takes into account the Balassa-Samuelson effect—that is, the fact that the relative price of nontradable goods is higher in countries with higher per capita incomes. The real undervaluation index is computed as the residual of a panel regression of the real exchange rate on real GDP per capita and time-fixed effects. The real exchange rate is defined as the ratio of the nominal exchange rate to the purchasing power parity conversion factor. To capture the effects of real undervaluation on growth, we estimate a panel regression of GDP per capita growth on the real exchange rate undervaluation index, the level of initial income, and time- and country-fixed effects. To capture the effects of real undervaluation on export expansion, we estimate a panel regression of export over GDP on the real exchange rate undervaluation index, the level of real income per capita, and time- and country-fixed effects.

2. This finding is based on estimates of the relationship between real exchange rate volatility—measured as the standard deviation of *RER* (defined as the ratio between the nominal exchange rate and purchasing power parity)—and average real GDP per capita growth in a panel of countries with GDP per capita incomes lower than \$6,000 between 1980 and 2004.

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