Equilibrium Real Exchange Rates, Misalignment, and Competitiveness in the Southern Cone

Peter J. Montiel
Williams College

I. Motivation

- New emphasis on the real exchange rate as an important instrument of development policy.

- Reason: View that growth of economywide TFP may depend on the share of output devoted to strategic activities in the traded goods sector (Rodrik 2006).

- A relatively depreciated real exchange rate, by enhancing the competitiveness of such activities, may thus encourage the growth of TFP.
In particular, the export of manufactures has been described as such a strategic activity.

The claim is that it generates positive production externalities of various types, including labor training, technology transfer, backward and forward linkages, “self-discovery.”

This is not entirely new, of course. A depreciated real exchange rate has been a key component of the development strategies of a number of successful economies in East and Southeast Asia (see World Bank 1993 on the HPAEs), including most recently China.

Has also been important in Latin America (Chile, Costa Rica, Dominican Republic).
But because the allocation of resources such as physical capital generally involves incurring irreversible costs, we would expect the allocation of investment – and thus changes in the size of the traded goods sector – to depend on the perceived *sustainable* value of the equilibrium real exchange rate (SERER), not necessarily the level that prevails at the time that the investment decision is made.

This does not mean that the actual RER does not matter, because repeated and severe episodes of misalignment would tend to complicate the signal-extraction problem faced by investors.

In short, we would expect competitiveness to be enhanced by a relatively depreciated SERER that is tracked fairly closely by the actual RER.
Unfortunately, this is not enough to tell us what we’d like to know about the likely competitiveness of strategic activities.

It also matters why the SERER takes on the values that it does.

Reason: poor productivity performance in the tradable sector will itself depreciate the SERER while simultaneously undermining its competitiveness (Balassa-Samuelson effect).

Consequently, to assess the effects of RER movements on the competitiveness of strategic industries, we need to identify the contributions of the non-productivity fundamentals to the evolution of the SERER.

Objective of the paper is to conduct an illustrative exercise of this type for six Southern Cone countries (Argentina, Bolivia, Brazil, Chile, Paraguay, Uruguay).
Procedure

- Estimate SERER.
- To identify likely effects on competitiveness:
  - a. Calculate frequency and severity of misalignment.
  - b. Decompose SERER into the contributions of productivity effects and other fundamentals.

II. Methodology

- Many alternative methodologies to estimate the SERER (PPP, FEER, BEER, etc.).
- Will adopt a single-equation reduced-form approach.
Pitfalls

a. Defining sustainability (time frame).
b. Multiplicity of fundamentals suggested by theory.
c. Imperfect proxies.
d. Short spans of data.
e. Low power of statistical tests.
f. Imperfect methods for estimating the sustainable values of the fundamentals.

Time Frame

- Time frame matters because the economy’s state variables adjust at different rates (e.g., nominal wage, IIP, capital stock).

- Choice of time frame determines the variables on which the SERER is conditioned – i.e., the identity of the fundamentals.
Time Frame

- Relevant horizon should depend on the issue that motivates concern with the SERER.

- In present application, should depend on the horizon that governs investment decisions in the traded goods sector.

- Choose to condition on IIP and capital stock, not on the nominal wage, thus taking a relatively short-run perspective.

Fundamentals

- Productivity relative to trading partners (increase → appreciation)

- International investment position (increase → appreciation)

- Terms of trade (improvement → appreciation)
Fundamentals

- Government consumption
  (increase in government consumption $\rightarrow$ appreciation)
- Commercial policy
  (more openness $\rightarrow$ depreciation)
- Receipt of external transfers
  (increase $\rightarrow$ appreciation)

Empirical Strategy

- Test RER, fundamentals for stationarity.
- Identify a cointegrating relationship between the RER and the nonstationary fundamentals.
- To do so, adopt a “general to specific” approach – i.e., begin with the full set of fundamentals, eliminate variables that are incorrectly signed or statistically insignificant, retaining the cointegrating vector with the largest number of correctly-signed and statistically significant fundamentals.
- Estimate the SERER as the fitted values of the resulting cointegrating vector using HP-filtered values of the included fundamentals.

- Misalignment = RER – SERER.

- Decompose SERER into the contributions of productivity and other fundamentals.

### Results: Cointegrating Vectors

<table>
<thead>
<tr>
<th></th>
<th>Argentina</th>
<th>Bolivia</th>
<th>Brazil</th>
<th>Chile</th>
<th>Paraguay</th>
<th>Uruguay</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROD</td>
<td></td>
<td>-16.93</td>
<td>-3.193</td>
<td>-2.903</td>
<td>-1.804</td>
<td>-0.908</td>
</tr>
<tr>
<td></td>
<td>(3.61)</td>
<td>(1.252)</td>
<td>(0.332)</td>
<td>(0.396)</td>
<td>(0.462)</td>
<td></td>
</tr>
<tr>
<td>HFP</td>
<td>-0.010</td>
<td>-0.014</td>
<td>-0.018</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.003)</td>
<td>(0.003)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LTOT</td>
<td>-1.689</td>
<td>-0.582</td>
<td></td>
<td>-0.588</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.204)</td>
<td>(0.253)</td>
<td></td>
<td>(0.294)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GOVCON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPEN</td>
<td>0.010</td>
<td></td>
<td></td>
<td></td>
<td>0.019</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td></td>
<td></td>
<td></td>
<td>(0.001)</td>
<td></td>
</tr>
<tr>
<td>TREND</td>
<td>-0.028</td>
<td>0.002</td>
<td>0.048</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Observations

- Proved possible to find cointegrating equations for the real exchange rate for all six countries in which the fundamentals possessed the theoretically-predicted signs.

- PROD plays an important role in five of the six countries considered. But set of fundamentals includes more than the productivity effect in every case except that of Chile, suggesting that the competitiveness of the traded goods sector in each of these economies has indeed been affected by a variety of other factors.

Observations

- Government consumption variable does not enter any of the estimated cointegrating equations.

- Despite these common features, the factors driving the SERER tend to be country-specific.
Results: Error-Correction Regressions

Table 2. Properties of Error-Correction Regressions for MERCOSUR Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Coefficient of the error-correction term</th>
<th>Adjusted $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>-0.796 (0.374)</td>
<td>0.151</td>
</tr>
<tr>
<td>Bolivia</td>
<td>-0.232 (0.083)</td>
<td>0.154</td>
</tr>
<tr>
<td>Brazil</td>
<td>-0.632 (0.142)</td>
<td>0.404</td>
</tr>
<tr>
<td>Chile</td>
<td>-0.873 (0.184)</td>
<td>0.405</td>
</tr>
<tr>
<td>Paraguay</td>
<td>-0.623 (0.134)</td>
<td>0.481</td>
</tr>
<tr>
<td>Uruguay</td>
<td>-0.318 (0.130)</td>
<td>0.362</td>
</tr>
</tbody>
</table>

Observations

- Meaningful empirical estimates of misalignment can be generated with a relatively small set of fundamentals.

- In all six of these countries real exchange rate movements during the sample period have not been driven primarily by the fundamentals.
Observations: Argentina

- Argentine peso was consistently overvalued during the entire Convertibility Plan episode.

- By the time of the end-2001 crisis, it was overvalued by approximately 22 percent.

- Crisis resulted in significant and persistent overshooting. Gap of 78 percent between the actual and equilibrium rates in 2005.
Figure 2 Argentina: Decomposition of SERER

- Terms of trade have largest impact on the SERER.

- Appreciation from improvement in TOT during 1985-2005 was mitigated by increased openness and deterioration in the country’s international investment position.

- Since the mid-1990s these factors have effectively canceled each other out, suggesting little change in competitiveness of nontraditional activities.
Observations: Bolivia

- Three episodes: substantial undervaluation during the decade of the 1970s, a sustained overvaluation from 1981 to 2000, and renewed undervaluation since then.

- Most of the variation in SERER attributed to changes in relative productivity.

- Since appreciation over past decade due to improvement in productivity performance, suggests improved competitiveness over that time.

Figure 5 Brazil: Actual and Equilibrium Real Exchange Rates
Observations: Brazil

- SERER on a strongly depreciating trend over the past 15 years.


- Mild overshooting after crisis, rapidly reversed, with estimated overvaluation of 24 percent in 2005.

![Figure 6. Brazil: Decomposition of SERER](image)
Observations: Brazil

- Trend deterioration in relative productivity performance since 1980 contributed to a strong depreciating trend.

- Partly offset by depreciation in SERER induced by deterioration in IIP since 1993.

- Net effect on competitiveness unclear.

Figure 7 Chile: Actual and Equilibrium Real Exchange Rates
Observations: Chile

- No episodes of serious overvaluation over past two decades.
- Extended period of mild undervaluation from 1985 to 1995.
- Overvaluation of a little under 5 percent in 2005.
- Rapid rise in relative productivity tempered effects of (unexplained) trend depreciation in SERER.
Figure 9. Paraguay: Actual and Equilibrium Real Exchange Rates

Figure 10. Paraguay: Decomposition of SERER
Observations: Paraguay

- As in Chile, RER has tracked the SERER fairly closely over the past two decades.

- Combination of the depreciating effects of deteriorating IIP and increased commercial openness with a neutral role for productivity developments in recent years indicates improved competitiveness in the traded goods sector over that time.

Figure 10. Uruguay: Actual and Equilibrium Real Exchange Rates
Observations: Uruguay

- Stable SERER. Severe overvaluation in 1980-82 and 2000-01.

- RER behaves like Argentina, but SERER does not. Crisis of 2000-01 did not result in overshooting in Uruguay.

- SERER driven by relative productivity and TOT. Recent depreciation in RER driven by TOT deterioration, suggesting improved competitiveness for nontraditional activities.
Conclusions

- Can produce estimates of the SERER for all of these countries that are consistent with standard theory, but “fundamentals” driving the SERER turn out to be quite different among the countries in the group.

- Estimates of misalignment have sensible properties: help to systematically predict future real exchange rate movements, and are consistent with the macroeconomic history of these countries during the period covered.

For these countries and over this sample period, most real exchange rate movements have been driven by non-fundamental factors. Suggests that actual real exchange rates have been noisy indicators of sustainable equilibrium rates.

As of 2005, estimates suggest significant undervaluation in Argentina and Bolivia, large overvaluation in Brazil, little discernible difference between the REER and the SERER in Chile, Paraguay, and Uruguay.
Suggestion that since the mid-1990s, competitiveness of nontraditional traded goods sector has stabilized in Argentina while improving in Bolivia, Chile, Paraguay, and Uruguay. Results for Brazil are ambiguous.

Implications for MERCOSUR

Trade relations among countries in the region have been complicated by sharp fluctuations in bilateral real exchange rates.

Good news: Large share of such fluctuations due to non-fundamental factors, so more stable macro environment should sharply reduce bilateral real exchange rate swings.
Bad news: such swings cannot be eliminated entirely. Fundamentals driving the SERERs tend to be country-specific, so SERERs will tend to move independently.

Upshot: asymmetric shocks are likely to remain important. Future forms of macroeconomic cooperation within MERCOSUR must take into account mechanisms for allowing smooth adjustment of the SERER in each country to such shocks.