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PNG’s resource boom: 2004-2014

Figure: Commodity Prices, 2000-2016

Chart 1. Indices of Primary Commodity Prices
(2005 = 100) 1/

1/ Combines indices of non-fuel primary commodity prices and energy prices.
2/ Deflated by U.S. CPI.
Survey Of Recent Developments:

1. Economic Growth
GROWTH SLOWDOWN

Real GDP Growth Rates (%)
All sectors and non-mining sectors: 1994-2018

Year
-6 -4 -2 0 2 4 6 8 10 12 14

Real GDP Growth Rate_all
Real GDP Growth Rate_non-mining
p: projected

Source: NSO/Treasury/BPNG
Formal sector employment is shrinking
Sharp decline in imports

Source: QEB Statistical Tables, BPNG
Other Indicators

- 25% drop in coastal shipping over last year
- PNG Business Council report drops in sales of 35% in the first six months of 2016

In summary, many key indicators point to an economic recession despite positive change in GDP

In any case, average living standards are falling given high population growth (> 3%)
II. Fiscal Policy
Expenditure greatly exceeds revenue.
Resource taxes have almost disappeared.
Significant decline in discretionary spending

Discretionary spending = total spending minus salaries minus interest minus political commitments minus aid.

Discretionary spending = amount available for core government operations (running hospitals, universities; building major roads)
Papua New Guinea After The Resource Boom
Survey Of Recent Developments

**IMPORTANT GOV’T SERVICES AFFECTED THE MOST**

Source: BPNG and Treasury
Record-high deficits

Deficit/revenue

Debt back at pre-boom level
NEGATIVE PROJECTIONS

Revenue per capita

Kina (2015 prices)

As a result of commodity price shock, revenue is way down.
Spending significantly increased due to commitments made during boom years (e.g. higher salaries and decentralization)
Spending on essential services slashed (similar to Greek experience in terms of %-numbers)
Debt increasing rapidly
III. The Real Exchange Rate
Figure: Real Exchange Rate (RER) and Terms of Trade (TOT), 1999-2015
The Exchange Rate

BACKGROUND

- Theory: Sharp RER appreciation during resource boom and decline of tradable sector ("Dutch Disease").
- After the boom, RER depreciation needed to restore internal and external balance.
- In PNG, RER continued to appreciate even after the boom (See previous Figure)
- FX restrictions since 2014 (US$ 1B excess demand).
- Macroeconomic instabilities via RER induced by volatility in commodity prices one of the causes of the "resource curse" (Frankel, 2010).
- Interference in macroeconomic adjustment process imposes high costs!
- RER overvaluation leads to resource misallocation $\rightarrow$ lower growth.
- Overvalued exchange rates not sustainable in the long run $\rightarrow$ BOP crisis.
Declining FX Reserves

Over-valued exchange rate, foreign exchange rationing

USD billions

Summary of Our Paper

- Issue for policy makers: Equilibrium RER (ERER) is unobserved.
- Previous IMF estimates ambiguous, suggest (implausibly) to real undervaluation.
- Purpose: Inform policy debate on current level of RER misalignment.
- We follow a theory-informed approach by estimating the ERER as a function of macro fundamentals.
- On the basis of our ERER estimate we compute the degree of RER misalignment.

- Main result: RER currently significantly overvalued by around 20%.
The RER is the ratio of the domestic price of nontraded goods relative to the price of traded goods:

\[ RER \equiv \frac{P_N}{E \times P_T} \]

The ERER is that value of the RER that results in the simultaneous attainment of both internal and external equilibriums, given sustainable values of relevant variables achieving this objective (Nurkse, 1945).

- Internal balance: Nontraded goods market clears.
- External balance: CA deficit can be financed through "sustainable" capital inflows.
- Increase in RER denotes real appreciation.
Nurkse (1945) implies that ERER is a function of a set of fundamentals. Theoretical contributions of Edwards (1989), Faruqee (1995), and Montiel (1999) suggest:

\[ ERER = ERER(TOT, \phi, \zeta, G_N, G_T, NFA) \]

where \( TOT \): terms of trade,
\( \phi \): trade policy,
\( \zeta \): productivity differentials (Balassa-Samuelson effect),
\( G_N, G_T \): government consumption on nontradables/tradables, and
\( NFA \): net foreign asset position.
Estimating the ERER

Estimation: Three-step procedure ("Single-equation approach")

- **Step 1** Use empirical equivalent of (1) and estimate:

  \[ \ln RER_t = \beta' F_t + \nu_t. \]

  Estimator: Fully-Modified Ordinary Least Squares (FMOLS)

- **Step 2** Compute ERER using sustainable values of the fundamentals, \( F^S \) (trend-cycle decomposition):

  \[ \ln ERER_t = \beta' F^S_t. \]

- **Step 3** Calculate RER misalignment:

  \[ RERMIS_t = \frac{RER_t - ERER_t}{RER_t}. \]

  RER overvalued when \( RERMIS_t > 0. \)
The Data

- **RER** Multilateral (trade-weighted), CPI-based [Source: IMF]

- **Trade Policy**
  - OPEN: \((M+X)/GDP\)  
    [PWT]

- **Balassa-Samuelson-Proxy**
  - PROD: ratio of GDP per capita to OECD average [WDI]

- **Government Consumption on Tradables and Nontradables**
  - GEXP: Total government consumption (equality restriction on \(G_N\) and \(G_T\))  
    [PWT, BPNG]

- **NFA** Wealth of Nations database [Lane & Milesi-Ferretti, 2007]

- **TOT** [WDI, World Development Reports, and BPNG]
**Figure:** Estimation results. Dependent variable: \( \ln RER \)

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln TOT</td>
<td>0.09 (0.01)**</td>
<td>0.09 (0.01)**</td>
<td>0.15 (0.05)**</td>
<td>0.10 (0.01)**</td>
<td>0.82 (0.11)**</td>
<td></td>
</tr>
<tr>
<td>OPEN</td>
<td>-0.19 (0.06)**</td>
<td>-0.16 (0.04)**</td>
<td>-0.71 (0.09)**</td>
<td>-0.36 (0.09)**</td>
<td>4.82 (0.55)**</td>
<td></td>
</tr>
<tr>
<td>ln PROD</td>
<td>0.30 (0.03)**</td>
<td>0.30 (0.02)**</td>
<td>0.24 (0.04)**</td>
<td>0.36 (0.02)**</td>
<td>1.98 (0.27)**</td>
<td></td>
</tr>
<tr>
<td>GC</td>
<td>0.90 (0.18)**</td>
<td>0.86 (0.17)**</td>
<td>1.75 (0.41)**</td>
<td>0.66 (0.31)**</td>
<td>0.60 (0.21)**</td>
<td></td>
</tr>
<tr>
<td>NFA</td>
<td>0.01 (0.03)</td>
<td>0.17 (0.06)**</td>
<td>0.12 (0.05)**</td>
<td>-0.07 (0.02)**</td>
<td>-2.13 (0.22)**</td>
<td></td>
</tr>
<tr>
<td>TB</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trend</td>
<td></td>
<td></td>
<td></td>
<td>-0.007 (0.004)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.09 (0.10)**</td>
<td>5.08</td>
<td>4.48 (0.23)**</td>
<td>5.68 (0.14)**</td>
<td>5.05 (0.13)**</td>
<td></td>
</tr>
<tr>
<td>$\bar{R}^2$</td>
<td>0.95</td>
<td>0.95</td>
<td>0.86</td>
<td>0.90</td>
<td>0.94</td>
<td></td>
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<tr>
<td>$L_c$</td>
<td>0.57</td>
<td>0.41</td>
<td>0.48</td>
<td>0.27</td>
<td>0.48</td>
<td>13.9***</td>
</tr>
</tbody>
</table>

Note: An increase in RER denotes appreciation. Therefore, RER > ERER indicates RER overvaluation.
**RESULTS**

**Figure:** RER misalignment (%), 1990-2015.

*Note:* Positive values indicate RER overvaluation.
Results

Projections for 2016

- Real overvaluation in 2015=22%.
- In 2016, slow but steady depreciation vis-à-vis US dollar (1% p.m. up until recently).
- However, positive inflation differential between PNG and main trading partners (7% vs. 1.5%).
- Further gov’t budget cuts and worsening in TOT → ERER depreciates.
- Therefore, significant real overvaluation of about 20% ongoing in 2016.
We find that the kina is significantly overvalued.

Policy implication: BPNG should devalue the kina by about 20% in order to restore both internal and external balance.

Benefit: Better allocation of resources $\rightarrow$ higher economic growth.

If not, economic costs are high due to resource misallocation.
Conclusion

In the long run, FX restrictions are extremely unlikely to preserve international reserves and the exchange rate!

Black markets might develop eventually (see Latin America in 1970s/80s, Nigeria, Venezuela, and others.).

Parallel markets are costly: Rent-seeking behavior, lower seigniorage and tariff revenues.

Also, export receipts diverted from official channels → BOP crisis.