Comments to:

Precaution Versus Mercantilism: Reserve Accumulation, Capital Controls, and the Real Exchange Rate

Woo Jin Choi and Alan M. Taylor

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Harvard Business School and NBER
What Does the Paper Do?

- Re-evaluates the relationship between External Assets and RER
- New Focus: reserves (external assets held by the public sector)
  - Important component of EM external balance sheet 00’s.
- RER
  - Different Public/Private Assets
  - Different financially closed/open economies
- Very Complete: Theory + Data
  - 75 countries over 1975–2007.3 + GFC, developed/emerging.
  - Several Robustness / cuts of the data / etc.
Recent Trends  
Reserve Accumulation

- The rise in international reserves has spurred renewed interest in policy and academic circles about the optimal level of foreign reserves sovereign countries should hold.  
  - Widespread phenomenon among many emerging markets, including countries that hold a large amount of external debt.  
    * reserves 20% of GDP in low- and middle-income countries; 5% in high-income countries (2005).

- The cost of holding reserves has been estimated at close to 1% of GDP (Rodrik, 2006)
  - What are the benefits?
  - Insurance against the risk of external crisis can’t account observed cost/reserve levels (Alfaro and Kanczuk, 2009, 2015; Bianchi et al., 2012; Durdu, Mendoza, and Terrones, 2008; and Jeanne and Ranciere, 2009).
# Trends: Foreign Reserves to Total External Debt

## Selected Countries

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<td>Argentina</td>
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<td>48.0%</td>
<td>44.3%</td>
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<td>23.8%</td>
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<td>India</td>
<td>24.0%</td>
<td>40.6%</td>
<td>113.7%</td>
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<td>113.3%</td>
<td>103.0%</td>
<td>79.2%</td>
<td>94.9%</td>
<td>38.6%</td>
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<td>93.4%</td>
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<td>Peru</td>
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<td>57.1%</td>
<td>64.4%</td>
<td>102.6%</td>
<td>136.5%</td>
<td>31.3%</td>
<td>110.7%</td>
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<td>South Africa</td>
<td>17.6%</td>
<td>30.6%</td>
<td>42.9%</td>
<td>47.5%</td>
<td>50.1%</td>
<td>42.8%</td>
<td>36.9%</td>
<td>16.8%</td>
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<tr>
<td>Thailand</td>
<td>36.9%</td>
<td>40.9%</td>
<td>88.9%</td>
<td>139.4%</td>
<td>166.7%</td>
<td>167.7%</td>
<td>135.2%</td>
<td>98.5%</td>
<td>94.3%</td>
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<td>Turkey</td>
<td>18.8%</td>
<td>20.1%</td>
<td>30.5%</td>
<td>29.6%</td>
<td>25.5%</td>
<td>28.7%</td>
<td>35.3%</td>
<td>9.5%</td>
<td>15.2%</td>
</tr>
<tr>
<td>Venezuela</td>
<td>30.0%</td>
<td>37.2%</td>
<td>65.7%</td>
<td>69.3%</td>
<td>79.9%</td>
<td>45.5%</td>
<td>40.9%</td>
<td>32.1%</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

Source: WB, WDI.
Related Trends:
Exchange Rate Management

- Managing exchange rates.
- Calvo and Reinhart (2002) coined the term “fear of floating”: the reluctance of the authorities to allow free fluctuations in the nominal (or real) exchange rate.
  - Number of countries actively managing the exchange rate has increased (even “inflation targeters”), IMF (2012), Reinhart (2013).
Choi and Taylor (2017)
General Reactions

- Extremely ambitious paper in a good way!
  - Theory and Data
    - Longer term patterns; across different type of countries and regimes.
    - **General Framework:** precaution + mercantilism
- Key differentiation: “sovereign” versus private type of flows
  - Right direction!
  - (Self serving)

Conclusions: Final Thoughts

• Results have normative implications: they suggest that a positive model, that aims to reproduce the stylized facts, would need to focus on alternative motivations for reserve accumulation.

• Perhaps the recent reserve holdings observed in emerging markets can be better explained by political economy motivations associated with exchange rate management policies.

• Yet, another issue worth considering is the interaction between the government’s and the private sector’s holdings of debt and reserves.
Sovereigns, Upstream Capital Flows and Global Imbalances, Alfaro et al. (2012)

• Importance distinguishing private from “sovereign-sovereign flows”
  – “Our findings show that overemphasizing private saving and failing to consider public saving, official flows, and governments’ current account targeting as the main drivers of uphill flows and global imbalances are serious shortcomings of the recent theoretical literature.”
Outline Comments

• Suggestion Model / Framework
  – Alternative Policies: Complements-Substitutes
    • Vulnerabilities (Precaution)
    • Mechanisms Externalities (Mercantilism)
      – Trade-offs (quantitative - qualitative)

• Suggestions Empirics
  – Few (authors perform many robustness) / relate to framework
  – Balance Sample
    • AKV (2009): type of countries/data available early on to achieve balance sample
      – Eastern Europe (footnote) / small countries-islands
Theoretical Framework

• Small open economy model, tradable and nontradable goods.
  − Positive external wealth shock: RER appreciation (standard + prediction).

• Capital account policies—reserve accumulation and capital control—shape the current account balance/trade balance.
  − Reserve accumulation—affects consumption tradables: RER depreciation as public sector increases its external savings (opposite standard prediction)
  • Public savings are offset by private capital flows
  • K controls: change marginal effect of reserve accumulation on RER

• Precautionary/insurance motive: reserves can be used “sudden stop”/crises.
• Mercantilist motive: exports a positive spillover/externality on growth.
Theoretical Framework (cont.)

- Objective: Smooth Consumption intertemporal and intratemporal

- Manage RER \( \rho_t = [\theta^N c_t^T / \theta^T c_2^N]^{1/\sigma} \)
  
  \[
  c_1^T + \rho_1 c_1^N + a + \tau(d^*, \kappa) \leq (1+\omega)y^T + \rho_1 y^N + d^* + T_1
  \]
  
  \[
  c_2^T + \rho_2 c_2^N + (1+r^*) d^* \leq y_2^T + \rho_2 y^N + (1+r)a + T_2
  \]

- Foreign debt is private (\( d^* \) in tradables), subject to a capital control;

- Government issues “assets-reserves, rsrv”; domestic government bond a (?)
  
  \[
  rsrv + T_1 \leq a + \tau(d^*, \kappa); \quad T_2 + (1+r)a \leq a + (1+r^*) rsrv
  \]
  
  \[
  c_1^T = (1+\omega)y^T - rsrv + d^*; \quad c_2^T = (1+g)y^T(1+r^*) rsrv - (1+r^*) d^*
  \]

- Optimal policy reserves and K controls: degree of learning-by-doing externality and the degree of crisis loss
Suggestions Framework

- Generalize model (more periods / other policies / gov.)
  - Output shocks may be different from wealth shocks
    - Valuation effects
  - Trade-offs government accumulation debt / reserves
    - Alternative policies to reduce vulnerabilities (precaution / insurance)
  - Trade-offs Capital Controls
    - Alternative effect controls (mercantilism)
    - “Effective international rate”
  - Short-term versus long-term
    - Timing of Policies / Effects
Alternative Policies: Precaution

• Manage RER: Fiscal Policy ($g_N$)

• Reduce Risk: Sovereign countries have an alternative way of reducing the probability and negative effects of external crisis: reduce the level of sovereign debt.
  – Even when reserve accumulation has positive liquidity benefits in terms of reducing the probability of suffering financial crises and the output costs associated with it,
    • A similar net asset position can be obtained by reducing instead the level of foreign debt

• Empirics: Differentiate private/public liabilities;
  – RER: $g_N$
Joint Decisions: Reserves versus Debt
A Digression

• In Eaton and Gersovitz (1981): demand for international loans derives from a desire to smooth consumption.
  – Alternative policy to reduce vulnerability: even when reserves have positive liquidity benefits, reducing foreign debt achieves a similar net asset position.
    • + Reserves reduce sustainable debt levels (sovereign’s willingness-to-pay incentive problems).

• In more recent models, the sovereign does not use debt primarily as a way to smooth consumption (a departure from the “pure” Eaton and Gersovitz, 1981).
  – Consumption smoothing is mostly achieved through default (contingent debt service, Grossman and Van Huyck, 1988).
  – Debt is predominantly used to front-load consumption, (Aguiar and Gopinath, 2005; Alfaro and Kanzuk, 2005; Arellano, 2008).
Debt and Reserves

• In contingent debt service models, reserves and debt (regardless of maturity) are not perfect substitutes
  – Debt and reserves are alternative ways of achieving consumption smoothing, (Alfaro and Kanczuk, 2009).

• A sovereign’s choice to default: instantaneous reduction in the costs of rolling debt.
  – Benefit: Higher consumption (particularly when the debt service is large).
  – Cost: lower output + reduction in the possibilities to smooth consumption in future periods (temporary loss access to credit markets).

• Reserves
  – Benefits: Allow to reduce consumption volatility even when excluded from international markets (default or sudden stop) and cannot issue debt.
  – Cost: Sovereign impatience > reserves remuneration (to build reserve stock, an economy has to consume less).
    • Reserve endogenously affect the willingness to default, reducing the amount of “sustainable” debt.
Reserve and Debt: Quantitative Puzzle, not Qualitative

- Even in a model of borrowing, there is a role for reserves: defaultable debt is not contingent enough.
  - Smoothing consumption through increasing debt is less effective than smoothing consumption through defaulting (Grossman and Han, 1999).
  - Since reserves are useful even after defaulting, they can be even more so when the sovereign opts to pay service contingently: “Defaultable” debt and reserves (a risk free bond) complete the market.

- Comparative statics:
  - Higher discount factor $\beta$: the costs of consuming latter are smaller, and since reserves are a means to postpone consumption, its equilibrium amount increases; while debt decreases.
  - Reserves increase with volatility (standard deviation of the endowment process) because they interact with debt to complete the markets (insurance motive becomes more important when endowment volatility is higher).

- Full fledge model effects depend on calibrated parameters (AK, 2009).
Implications

• The implication of our paper is that there is indeed a role for reserves in the model (Alfaro and Kanczuk, 2009).
  – (i) extremely volatile endowment process (more than observed in data)
  – (ii) high impatience parameter conflicting with the consumption front-loading in data.

• The puzzle is a calibrated (quantitative one) not qualitative.
  – Realistic parameters can’t justify observed reserve levels (contagion, sudden stops, contingent reserves, reduction of output costs..).

• Need other motivations…
Alternative Policy (cont.): Local Currency Debt

Related Trends: Foreign Participation

• Foreign participation in local currency bond markets in emerging economies:
  – Quantitatively relevant only in the present millennium. (Burger, Warnock and Warnock, 2010; BIS, 2012)
  • Borrowing resources in low interest rate currencies and investing in high interest rate currencies without hedging for exchange rate risk (carry trade activities).

• Local-currency bonds/issuance of debt not indexed or linked to exchange rate independently of the legal framework adopted for its issuance (different definitions: Reinhart and Rogoff, 2011)
Selected Asian Countries: Foreign Holdings in Local Currency Government Bonds

Source: Asian bondOnline.
Brazil-Total Federal Domestic Debt and Non-Resident Participation
Alternative Policies (cont.): Valuation Effects
Domestic Debt + Reserves

- Debt denomination: useful means of smoothing consumption
  - Asset positions in domestic currency: good hedge to international shocks, Cole and Obstfeld (1991), and Heathcote and Perri (2013).

- Negative international shock: debt services become lower and consumption increases; whole invariant distribution of shocks: more stable consumption level and higher welfare

- To achieve consumption smoothing, the sovereign would have to increase debt.
  - Strategy is limited by a sustainability ceiling (default).
  - Reserves allow to improve net asset position

- Implications: Reserves remains high during bad times (Alfaro and Kanczuk, 2015).
  - Contrary to the usual argument, reserves would not be an insurance to be “used” in bad times (not to buy consumption goods that deplete the stock of reserves);
  - Aizenman and Hutchison (2010) “fear of reserve loss”: EM reluctance to deplete reserves GFC
Mercantilism

• Export externalities: learning by doing

• Rodrik (2008): RER depreciation promotes economic growth, through its positive impact on the share of tradables relative to the nontradables

• Woodford (2008), Henry (2008):
  – No consensus on the channels: larger aggregate savings, externalities from specialization in tradables,...; other effects.
  – Empirical issues: omitted variables, reverse causality, etc.

• Mostly country, industry analysis
  – Few firm level data results (availability)
RER, Productivity, Innovation
Alfaro, Cuñat, Fadinger, Liu (2017)

• Evaluate manufacturing firms' responses to changes in the real exchange rate (RER) using detailed firm-level data for a large set of countries for the period 2001-2010.
  – Emerging Asia: real depreciations are associated with faster growth of firm-level TFP, sales and cash-flow, higher probabilities to engage in R&D and export.
  – No significant effects for firms from industrialized economies.
  – Negative effects for firms in other emerging economies (less export-intensive and more import-intensive).
    • Consistent with paper (but not exporting per se).

• Estimate + quantitatively evaluate the different mechanisms by providing counterfactual simulations of different RER movements.
  – Dynamic model: real depreciations raise the cost of importing intermediates, increase demand and the profitability to engage R&D, relax borrowing constraints and enable firms to overcome the fixed-cost hurdle for financing R&D and trade.
    • Effects on physical TFP growth, different across regions, non-linear and asymmetric.
Capital Controls – Data Intensive Margin

- Capital control index: Agree with concerns, but 1-0 may be “harsh” (e.g. Chile/Mexico).

- New Data Base Intensive-Extensive margins (Alfaro, Du, Fernandez, Schreger)
  - PRELIMINARY
  - 21 E.M., quarterly 1995-2015 (daily also partially available)
  - IMF AREAR, local sources, other papers, etc.
  - Focus NOT on “authorizations”
    - Quantitative-intensive (URR, Taxes, etc.);
    - Correlate to indexes of “effectiveness”.
    - Complement with macro prudential measures (Vegh and Vulletin, etc.).

- Controls: not widespread/ (few changes/remain in place for long time).
  - More frequently use / more intensive (Brazil-outlier)
  - Reserve requirements have been used much more.
## Capital Controls: Brazil
*Alfaro, Chari, and Kanczuk (2017)*

<table>
<thead>
<tr>
<th>Date</th>
<th>Change in Bovespa (%) 2 days after</th>
<th>Debt Event</th>
<th>Equity Event</th>
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<td>3/12/08</td>
<td>-0.30%</td>
<td>1</td>
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<td>IOF tax=1.5% on fixed income investments made by non-residents</td>
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<td>10/22/08</td>
<td>-10.23%</td>
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<td>10/23/2008</td>
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<td>10/19/09</td>
<td>-2.61%</td>
<td>1</td>
<td>1</td>
<td>IOF tax=2% introduced on equities and fixed income securities</td>
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<td>11/18/09</td>
<td>0.44%</td>
<td>0</td>
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<td>Tax=1.5% on American Depositary Receipts (ADRs) converted into local stocks</td>
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<td>10/4/10</td>
<td>0.22%</td>
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<td>IOF tax=4% on fixed income bonds and derivatives; 2% for equities</td>
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<td>10/18/10</td>
<td>-1.86%</td>
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<td>IOF tax=6% on fixed income bonds and derivatives; 2% for equities</td>
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<td>3/28/11</td>
<td>1.20%</td>
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<td>IOF tax=6% on overseas loans and bonds with maturities up to 1 year</td>
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<td>4/6/11</td>
<td>-0.46%</td>
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<td>IOF tax to overseas bonds and bonds with maturities up to 2 years</td>
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<tr>
<td>7/26/11</td>
<td>-1.06%</td>
<td>0</td>
<td>1</td>
<td>Tax of 1% on foreign exchange derivatives; legislation allow tax to be increased up to 25%</td>
<td>7/27/11</td>
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<td>12/1/11</td>
<td>1.32%</td>
<td>0</td>
<td>1</td>
<td>IOF tax=0% on variable income instruments traded on the exchange and certain debentures</td>
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<td>2/29/12</td>
<td>2.99%</td>
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<td>IOF tax to cover overseas loans and bonds with maturities up to 3 years</td>
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<td>3/9/12</td>
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<td>5/21/12</td>
<td>-3.48%</td>
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<td>IOF tax=1.5% for individual borrowers (from 2.5%)</td>
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<td>6/13/12</td>
<td>0.82%</td>
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<td>0</td>
<td>IOF tax to overseas loans and bonds with maturities up to 2 years</td>
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<td>12/4/12</td>
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<td>0</td>
<td>IOF tax to overseas loans and bonds with maturities up to 1 year</td>
<td>12/5/12</td>
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</table>
Effects Capital Controls: Brazil

- Alfaro, Chari and Kanczuk (2017) evaluate the effects of capital controls on firm-level stock returns and real investment using data from Brazil.
  - Event-study methodology around the dates when the various capital control measures were announced using stock prices and firm level data.
- Significant decline in cumulative abnormal returns following changes in capital controls: consistent with increase in the cost of capital.
- Controls on equity perceived worse than controls on debt flows
  - Markets view equity and debt flows as different.
- Firm characteristics:
  - The largest exporting firms (> $100 million) less affected by controls.
  - Dependent on external finance.
- Increase volatility, uncertainty; (fall in real investment)
Effects of Capital Controls

- Renewed interest: focus on aggregate variables (to examine the optimality of macro-prudential regulation), abstract from firm-level heterogeneity.
  - Capital controls have differential effects across different type of firms.
  - Important to consider firm heterogeneity, and controls effects on investment and innovation (for which capital market access crucial), Varela (2016), Forbes (2007), Alfaro, Chari and Kanczuk (2017)

- Unclear K controls: prudential efforts to reduce the volatility of foreign capital
    - Not countercyclical / optimal? Are they increasing resilience?
    - Is it optimal mercantilism or political economy?

- More empirical research before selling them as the “yellow cream”.
Framework Precaution and Mercantilism: Policy Options Complements or Substitutes?

- Tighten fiscal policy
  - Procyclical policies in poor countries (Kaminsky, Reinhart and Vegh, 2005; Vegh and Vuletin, 2012); Cyclicality of borrowing costs faced in international financial markets

- Reduce Debt/ Currency Denomination


- Macro prudential (Mendoza: papers limit debt not impose K controls).

- Reserves

- Capital controls

- Monetary Policy

  ➢ How do they interact?
Final Thoughts

• Paper has a great research agenda
  – Unified Framework to think about policy options
  – Unified empirics to think about effects
• Analysis very complete/well done
• Enjoyed reading the paper!