

# Discussion of "Worker's Remittances and the Equilibrium RER: Theory and Evidence" by Barajas, Chami, Hakura and Montiel

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# Key Question (1/2)

- **What is the effect of a permanent increase in worker remittances on the equilibrium real exchange rate (RER) in recipient economies?**
- Model
  - Use a small open economy model with remittances (Montiel, 1999);
  - Show that a permanent increase in remittances causes the equilibrium RER to appreciate (the “benchmark” case);
  - But several modifications to model assumptions dampen the RER appreciation; in one particular case, the effect is reversed.
- Very interesting and rich model; clearly explained (equations, graphs, intuition).

## Key Question (2/2)

- **What is the effect of a permanent increase in worker remittances on the equilibrium real exchange rate (RER) in recipient economies?**
- Empirically
  - Use panel cointegration techniques (dynamic OLS) to estimate the effects of permanent changes in remittances on the equilibrium RER;
  - The empirical evidence shows that remittance inflows are indeed associated with RER appreciation, but the effect is quantitatively small;
- The empirical exercise is carefully executed; large data set; interesting results.

# Three comments

- 1 Model - special cases
- 2 Motivation for empirical methodology
- 3 Connection between model and empirics

# Motivation

- The Remittance/GDP ratio (explanatory variable in this paper) in developing economies has risen in the past few decades:

	1970 - 2007	1998 - 2007	2007
Mean workers' remittances-to-GDP ratio across countries and time	3.7	4.2	5.1

- Remittances are sizeable relative to non-FDI inflows:

	Ratio of Workers' Remittances to			
	Official Transfers	Official Capital Flows	Private Capital Flows	Exports
Recent period, 1998-2007				
Mean across countries and time	14.8	18.3	2.4	0.3

- They also represent more than 1/2 of FDI inflows:
  - In 2008, remittances to developing countries: US\$ 336 bn;
  - Net capital flows: US\$ 707 bn (of which FDI: USD\$ 583 bn);
  - See Ratha, Mohapatra and Silwal (World Bank, 2010); World Bank (2009, *Global Development Finance*).

# Comment 1 - Model

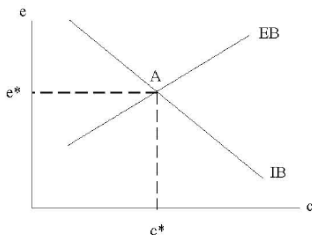
- SOE, traded and non-traded goods, traded good as numeraire;
- $e = p_T/p_N$  ( $\downarrow$  is appreciation);
- Steady-state  $e^*$  and  $c^*$  depend on internal & external bal. condit.:
  - IB: market clearing for non-traded goods:

$$y_N(e) = (1 - \theta)ec, \quad \Rightarrow \quad \partial e / \partial c < 0.$$

- EB: balanced current account in zero-growth, SS equilibrium:

$$y_T(e) - (\tau^* + \theta)c + \text{Rem} + r^*a = 0, \quad \Rightarrow \quad \partial e / \partial c > 0.$$

- Therefore,  $\partial e^* / \partial \text{Rem} < 0$ .



# Comment 1 - Model

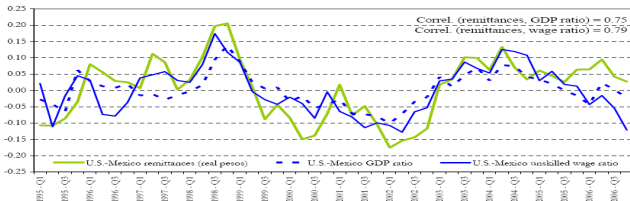
- The "benchmark" result is more than just a "special" case, since remittances lead to RER appreciation in most cases, although certain assumptions indeed reduce the quantitative effect:
  - larger share of traded goods in consumption (EB shifts by less);
  - less concave PPF (IB and EB flatter);
  - remittances inversely related to domestic income (EB flatter);
- The effect disappears in one special case (i.e. when the risk premium depends on the "remittance-inclusive" net worth);
- The RER appreciation is reversed under very particular assumptions (1-3 below must hold simultaneously):
  - (1) remittances are devoted entirely to the purchase of traded goods;
  - (2) utility is derived from  $(c_T - \text{Rem})$ ;
  - (3) transaction costs are born in the form of traded goods.  
(IB and EB shift right, the latter by less).

# Comment 1 - Model: induced remittances

- In this paper, there is an interaction between the *steady-state* levels of remittances, the RER and domestic income;

$$\text{Rem} = \text{Rem}^a + \text{Rem} \left( \frac{\text{Dom. real income}}{e} \right)$$

- The "counter-cyclicality" of remittances is a *business cycle* story, I wouldn't use the term in relation with steady-state equilibria.



- The permanent component of the increase in remittances is smaller, as the increase in income reduces the inflow of remittances in the long run. (As countries get richer, they receive less remittances);
- It's not that a given increase in permanent remittances has a smaller effect on the RER; instead, remittances increase by less.



# Comment 1 - Model: rem. in the risk premium

- The model generates interesting transition dynamics; highlight them, not only the long-run equilibria:
  - A permanent rise in remittances initially increases the net worth and lowers the risk premium;
  - Consumption rises for a while, causing the international investment position to worsen;
  - The permanent increase in remittances is offset by reduced steady-state interest income;
- In steady state, the "remittance-inclusive" net worth must remain unchanged, since the risk premium  $\rho$  is exogenous:

$$\rho \left( a + \frac{\text{Rem}}{r^*} \right) = \rho - r^W;$$

- The equilibrium  $e^*$  and  $c^*$  remain unchanged.

## Comment 2 - Empirical methodology

- Explain the assumptions behind Dynamic OLS (DOLS).
  - Hamilton (1994): if  $y_t \equiv (y_{1,t}, \mathbf{y}_{2,t})$  is cointegrated:

$$y_{1,t} = \alpha + \gamma' \mathbf{y}_{2,t} + z_t^* \quad (1)$$

$$\mathbf{y}_{2,t} = \mathbf{y}_{2,t-1} + \mathbf{u}_{2,t} \quad (2)$$

- .. the OLS estimation of (1) generates consistent point estimates of  $\gamma$  under the assumption that  $\text{corr}(z_t^*, \mathbf{u}_{2,t}) = 0$ , i.e. weak exogeneity.
- However, if  $\text{corr}(z_t^*, \mathbf{u}_{2,t-1}) \neq 0$  (i.e. past remittances affect today's RER) or  $\text{corr}(z_t^*, \mathbf{u}_{2,t+1}) \neq 0$  (i.e. today's RER affects tomorrow's remittances), the point estimates would have non-standard distributions, and the OLS t-statistics would be irrelevant.
- DOLS avoids this problem by including  $\Delta \mathbf{y}_{2,t+1}$  and  $\Delta \mathbf{y}_{2,t-1}$  in (1):
$$y_{1,t} = \alpha + \gamma' \mathbf{y}_{2,t} + \beta' \Delta \mathbf{y}_{2,t+1} + \delta' \Delta \mathbf{y}_{2,t-1} + \tilde{z}_t \quad (3)$$
- Are one lead and one lag of  $\Delta \mathbf{y}_{2,t}$  enough to solve the problem?
- Still unclear how DOLS helps identify the effect of remittances on the *equilibrium* RER (rather than just the actual RER).

## Comment 2 - Empirical methodology

- Reverse causation: does the RER affect remittances?
  - RER appreciation may discourage remittances.
- Besides the WR/GDP ratio, there are 11 other explanatory variables in baseline results;
  - Explain the theoretical rationale for including them;
  - Explain the intuition for their sign;
- Trade-off between number of explanatory variables vs. sample size;
  - Specifications with fewer explanatory variables seem to allow for larger sample size, more countries, stronger results.
  - The sample size is particularly important for low and lower-middle income countries.

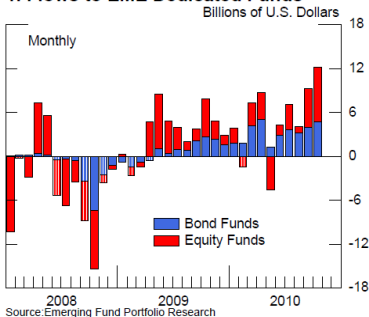
## Comment 3 - Connect model with empirics

- **(1) Do remittances affect the RER less in countries with greater shares of traded goods in consumption?**
  - Remittances have a stronger, more robust effect on RER in countries with low trade & capital account openness (Table 7, panels 7-10);
- **(2) Are remittances inversely related to domestic income in equilibrium?**
  - Use remittances as the dependent variable;
  - As countries get richer, do they receive less remittances?
- **(3) Do remittances worsen the recipients' trade balance and international investment position?**
  - In these cases, do remittances affect the RER by less?
  - Does a permanent increase in remittances affect risk ratings in the short vs. long run?

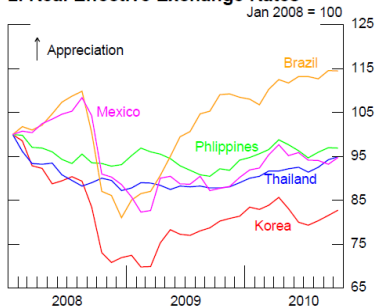
# Remittances vs. capital inflows

- Resemblance between portfolio inflows and remittances in their effect on the REER:

## 1. Flows to EME Dedicated Funds



## 2. Real Effective Exchange Rates



- If the loss of export competitiveness is a concern,
- ... some of the policy responses may apply to both type of inflows:
  - E.g. cut government spending (usually focused on non-traded goods) to dampen REER appreciation.

# Conclusion

- A very interesting paper!
- Rich model, with a variety of channels through which remittances may affect the RER;
- In addition to the long-run equilibrium, the model generates interesting transition dynamics;
- The model implications are testable empirically;
- Highlight the link between model implications and empirics.