Discussion of Gabaix and Maggiori’s "International Liquidity and Exchange Rate Dynamics"

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Question

How does the limit to arbitrage of international financiers affect the exchange rate dynamics?

Limit to arbitrage tightens

→ exchange rate of debtor country depreciates. In the extreme, financial autarky

Limit to arbitrage loosens

→ exchange rate of debtor country appreciates. In the extreme, uncovered interest rate parity
Basic two-period framework

US representative household

\[ U = C^N_0 + \nu_0 \ln C^F_0 + E(C^N_1 + \nu_1 \ln C^F_1) \]

Japanese representative household

\[ U^* = C^{N*}_0 + \xi_0 \ln C^{F*}_0 + E(C^{N*}_1 + \xi_1 \ln C^{F*}_1) \]

The taste of future consumption is stochastic. Output is exogenous endowment

Between periods, US household holds only US bond which pays \( R \) units of US nontradable per unit

Japanese household holds only Japanese bond which pays \( R^* \) units of Japanese nontradable per unit
International financier with exchange rate \( ¥1 = \$e_t \)

<table>
<thead>
<tr>
<th>B/S at date 0</th>
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<tbody>
<tr>
<td>credit to US h.</td>
<td>debt to Japanese h.</td>
</tr>
<tr>
<td>( $(\nu_0 - e_0 \xi_0) )</td>
<td>( ¥ \left( \frac{\nu_0}{e_0} - \xi_0 \right) )</td>
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<td>credit to US h.</td>
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<tr>
<td>( $R(\nu_0 - e_0 \xi_0) )</td>
<td>( ¥R^* \left( \frac{\nu_0}{e_0} - \xi_0 \right) )</td>
</tr>
<tr>
<td>profit: ( $ \left( R - R^* \frac{e_1}{e_0} \right) (\nu_0 - e_0 \xi_0) )</td>
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Limit to arbitrage

\[
V_t = E \left( 1 - \frac{R^* e_1}{R e_0} \right) (\nu_0 - e_0 \xi_0)
\]

\[
\geq \Gamma \frac{1}{e_0} (\nu_0 - e_0 \xi_0)^2
\]
Solving the financier’s problem, we get

\[ \nu_0 - e_0\xi_0 = \frac{1}{\Gamma} E \left( e_0 - e_1 \frac{R^*}{R} \right) \]  

(1)

Budget constraint of US household

\[ \nu_1 - e_1\xi_1 = -R(\nu_0 - e_0\xi_0) \]

FOC \rightarrow R = R^* = 1 \rightarrow

\[ e_1\xi_1 = \nu_1 + \nu_0 - e_0\xi_0 \]  

(2)

In a special case \( \xi_0 = \xi_1 = \xi \), constant

\[ e_0 = \frac{1(1 + \Gamma \xi)\nu_0 + E(\nu_1)}{\xi(2 + \Gamma \xi)} \]  

(3)

\[ \nu_0 - e_0\xi_0 = \frac{\nu_0 - E(\nu_1)}{2 + \Gamma \xi} = \frac{1}{\Gamma}[e_0 - E(e_1)] \]  

(4)
Expectation of future exchange rate:

Financier's choice:
\[ \xi_0 - e_0 \xi = \frac{1}{\Gamma} [e_0 - E(e_1)] \]

US household's choice:
\[ [e_0 + E(e_1)] \xi = \xi_0 + E(\xi_1) \]

\( E(e_1) \): expectation of future exchange rate

45° line

US household's choice

Financier's choice

UIP

0

\( e_0 \): present exchange rate

\( \xi \)
Critical Comments

A nice application of the limit to arbitrage to foreign exchange market

Many assumptions and free parameters → difficult to refute the theory

For developed countries, gross positions of different currencies are much larger than the net position

For an emerging economy, how different from the reduced form of transaction service model?

\[
\ln (NFA_t + CL_t) \simeq \zeta_t \ln (NFA_t + CL)
\]

\[
e_t - \frac{R^*}{R} E_t (e_{t+1}) = \frac{\zeta_t}{NFA_t + CL}
\]