Trade Invoicing, Bank Funding, and Central Bank Reserve Holdings

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Dominant Currency?

1. **Trade invoicing**
   - \[
   \frac{\text{Dollar Invoicing in World Imports}}{\text{U.S. Imports}} = 4.7
   \]
   - \[
   \frac{\text{Euro Invoicing in World Imports}}{\text{Euro Area Imports}} = 1.2
   \]
   - Prices rigid in currency of invoicing

2. **International bank funding and corporate borrowing**
   - Dollar liabilities of non-U.S. banks comparable to U.S. banks
   - 60% (62%) of foreign currency local liabilities (assets) of banks denominated in dollars
   - Currency mismatch

3. **Central bank reserves**
   - Dollar: 64%; Euro: 20%; Yen: 4%

4. **‘Exorbitant Privilege’**
   - Violation of UIP: Dollar risk-free assets pay lower expected returns (in a common currency)
Literature

- **Trade invoicing (unit of account)**

- **Safe assets and exorbitant privilege (store of value)**
  - Hassan (2013), Gourinchas and Rey (2010); Maggiori (2017); He, Krishnamurthy, Milibradt (2016), Farhi and Maggiori (2016)

- **Central Bank Reserves**
  - Obstfeld, Shambaugh, Taylor (2010); Bianchi, Hatchondo, Martinez (2017); Bocola, and Lorenzoni (2017)
What we do

Paper 1: Banking, Trade and the Making of a Dominant Currency
- Unified theory for dominance in trade invoicing and finance
- Strategic complementarity of unit of account and store of value
- Dominant currency, despite multiple candidates
- ‘Currency mismatch’ and ‘exorbitant privilege’

Paper 2 (AEA P&P): Trade Invoicing, Bank Funding, and Central Bank Reserve Holdings
- ‘Lender of last resort’ role of central banks
- Dollarized Bank Liabilities → Dollarized Reserves
Main Idea of Paper 1

High $ invoicing
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High $ invoicing

High HH/firms $ expenses
Main Idea of Paper 1

- High $ invoicing
- High HH/firms $ expenses
- High demand for $ safe assets
Main Idea of Paper 1

High $ invoicing

High HH/firms $ expenses

Low $ on safe assets

Low $ on safe assets

High demand for $ safe assets

High HH/firms $ expenses
Main Idea of Paper 1

- High $ invoicing
- Low $ safe assets
- High HH/firms $ expenses
- High demand for $ safe assets
Main Idea of Paper 1

- Demand for Safe Assets: Preference for ‘safety’

\[ Q_h = \beta + \theta \frac{\alpha_h}{(\alpha_h + \alpha_P)} D_h \]

\[ Q_P = \beta + \theta \frac{\alpha_P}{(\alpha_h + \alpha_P)} D_P \]
Main Idea of Paper 1

- **Demand for Safe Assets: Preference for ‘safety’**

\[ Q_h = \beta + \theta \frac{\alpha_h}{(\alpha_h + \alpha_\$)D_h} \quad Q_\$ = \beta + \theta \frac{\alpha_\$}{(\alpha_h + \alpha_\$)D_\$} \]

- **Supply of Safe Assets: U.S. supply + EM banks**

\[ \bar{E} B_\$ + B_h \leq \gamma_L N \]
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- Supply of Safe Assets: U.S. supply + EM banks

\[ \bar{E}B_\$ + B_h \leq \gamma_L N \]

UIP Violation & Exorbitant Privilege: \( Q_\$ > Q_h \)

\[ \frac{Q_\$ - \beta}{Q_h - \beta} = \bar{E} \]
Main Idea of Paper 1

- Why invoice in dollars? To access cheap dollar financing

\[ \eta = \frac{\gamma L}{\beta \phi} (Q_\$ - Q_h) \]

\[ \bar{E} B_\$ + B_h \leq \gamma L N_0 + (1 - \eta) \gamma L N + \bar{E} \eta \gamma L N \]
Main Idea of Paper 1

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• Dollar trade invoicing → Demand for dollar safe assets

\[ \alpha_{\$i} \equiv a + b \int_{j \neq i} \eta_j dj \]

Strategic complementarities and Multiple Equilibria
Main Idea of Paper 1

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• Dollar trade invoicing \( \rightarrow \) Demand for dollar safe assets

\[ \alpha_{\$i} \equiv a + b \int_{j \neq i} \eta_j dj \]

Strategic complementarities and Multiple Equilibria

• Despite the dollar and euro being identical ex ante can have an equilibrium with only one dominant currency
Data: Relation between trade invoicing and bank liabilities

BIS Locational Banking Statistics, Local liabilities
Main Idea of Paper 2
Dollarization of central bank reserve holdings

- **Lender of last resort** role of central banks
  - Banking crisis and fraction of banks fail

- **Banks tempted to hold more dollars deposits**
  - Higher dollar invoicing → cheaper cost of dollar financing
  - Moral Hazard from bailouts: Greater the ER volatility

- **Dollar Reserves:**
  - **Plus:** Provide a hedge against dollar appreciations. Lower taxes ex-post.
  - **Minus:** Dollar reserves costly because earn a negative carry.
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Dollar reserves increase with dollar invoicing when greater ER volatility and/or higher cost of taxation
Data: Relation between trade invoicing and central bank reserves

IMF, Wong (2007)