Trade Invoicing, Bank Funding, and Central Bank Reserve Holdings

Gita Gopinath
Harvard

Jeremy Stein
Harvard

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)
  - Friberg (1998), Engel (2006), Devereux et al. (2004), Bacchetta and van Wincoop (2005), Gopinath et al. (2010), Goldberg and Tille (2013), Perez and Drenik (2017), Doepke and Schneider (2017)
- 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 $\rightarrow$ Dollarized Reserves

Main Idea of Paper 1

High $ invoicing

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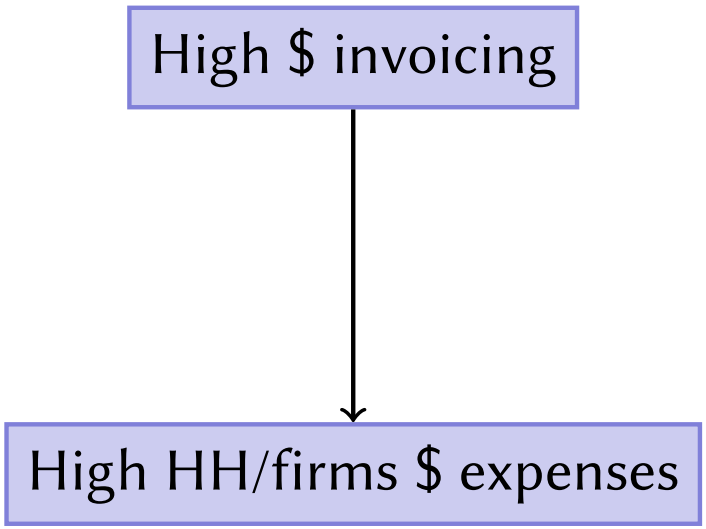

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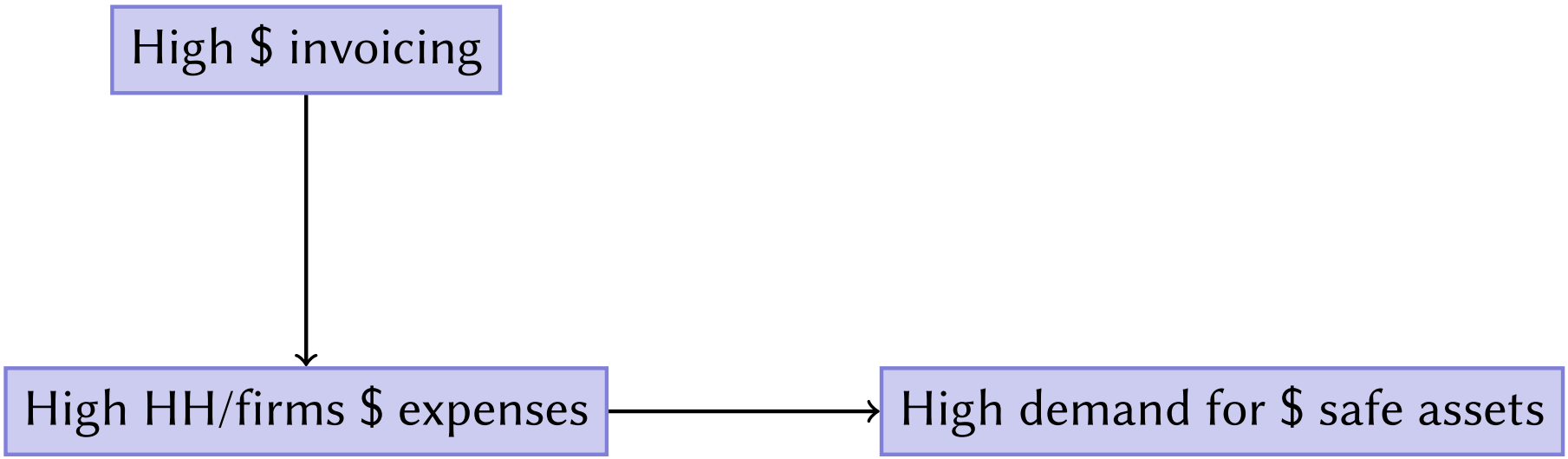

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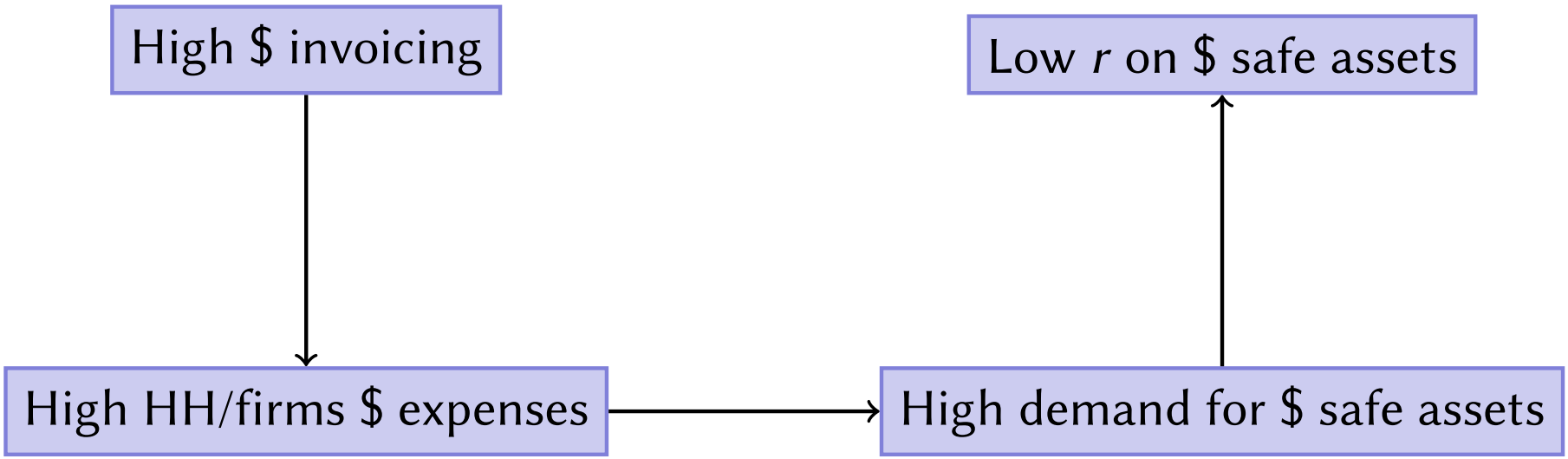

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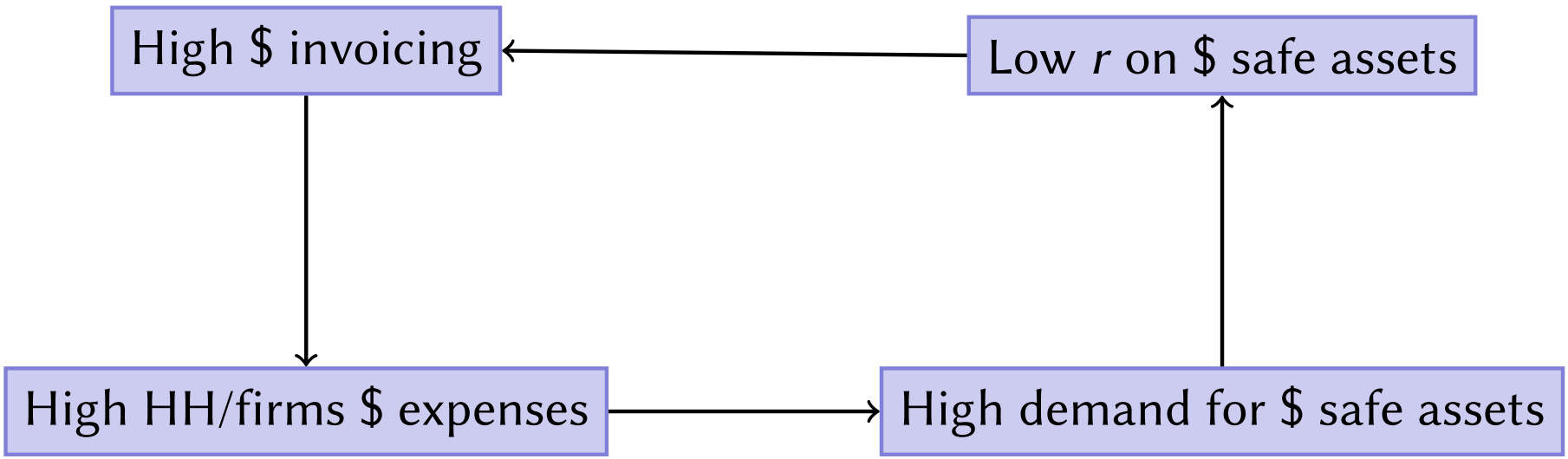

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- Demand for Safe Assets: Preference for 'safety'

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

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

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

$$\frac{Q_\$ - \beta}{Q_h - \beta} = \bar{\mathcal{E}}$$

Main Idea of Paper 1

- Why invoice in dollars? To access cheap dollar financing

$$\eta = \frac{\gamma_L}{\beta\phi}\left(Q_{\$} - Q_h\right)$$

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- Dollar trade invoicing $\rightarrow$ Demand for dollar safe assets

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Strategic complementarities and Multiple Equilibria

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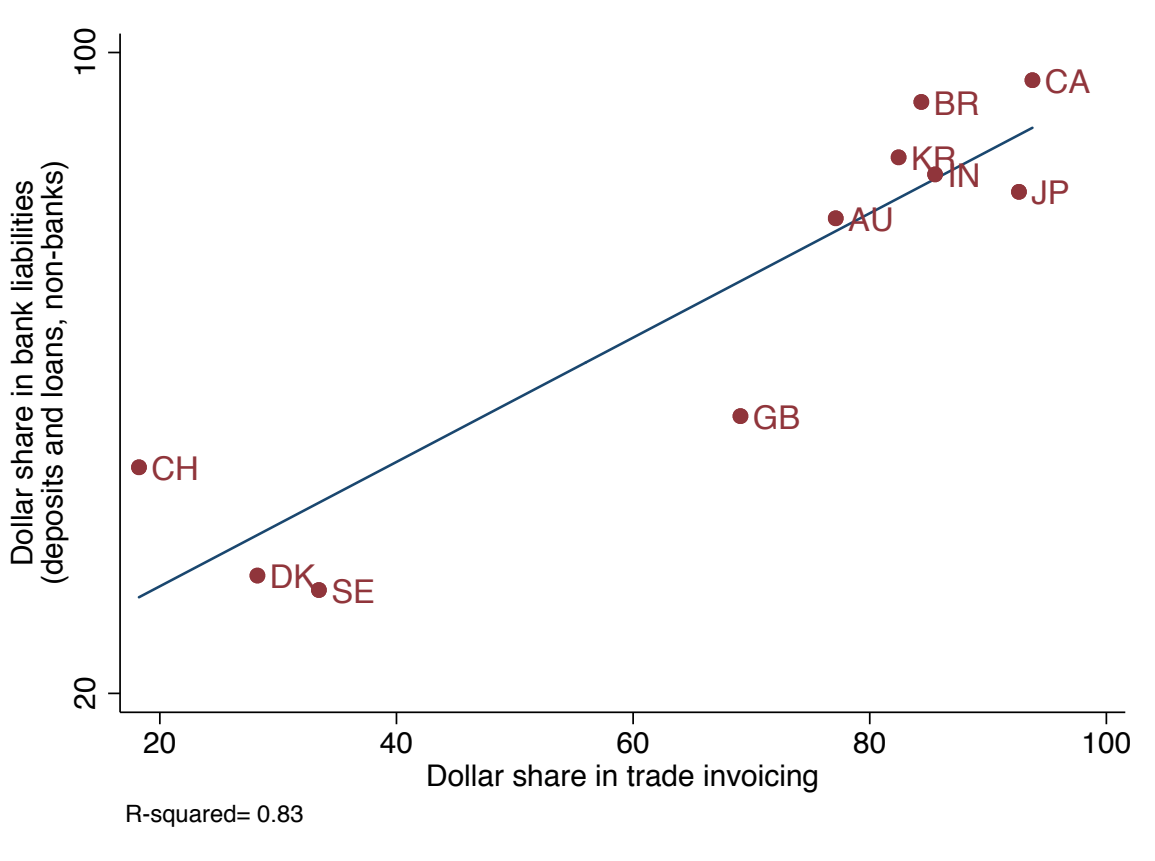
Strategic complementarities and Multiple Equilibria

- 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 $\rightarrow$ 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

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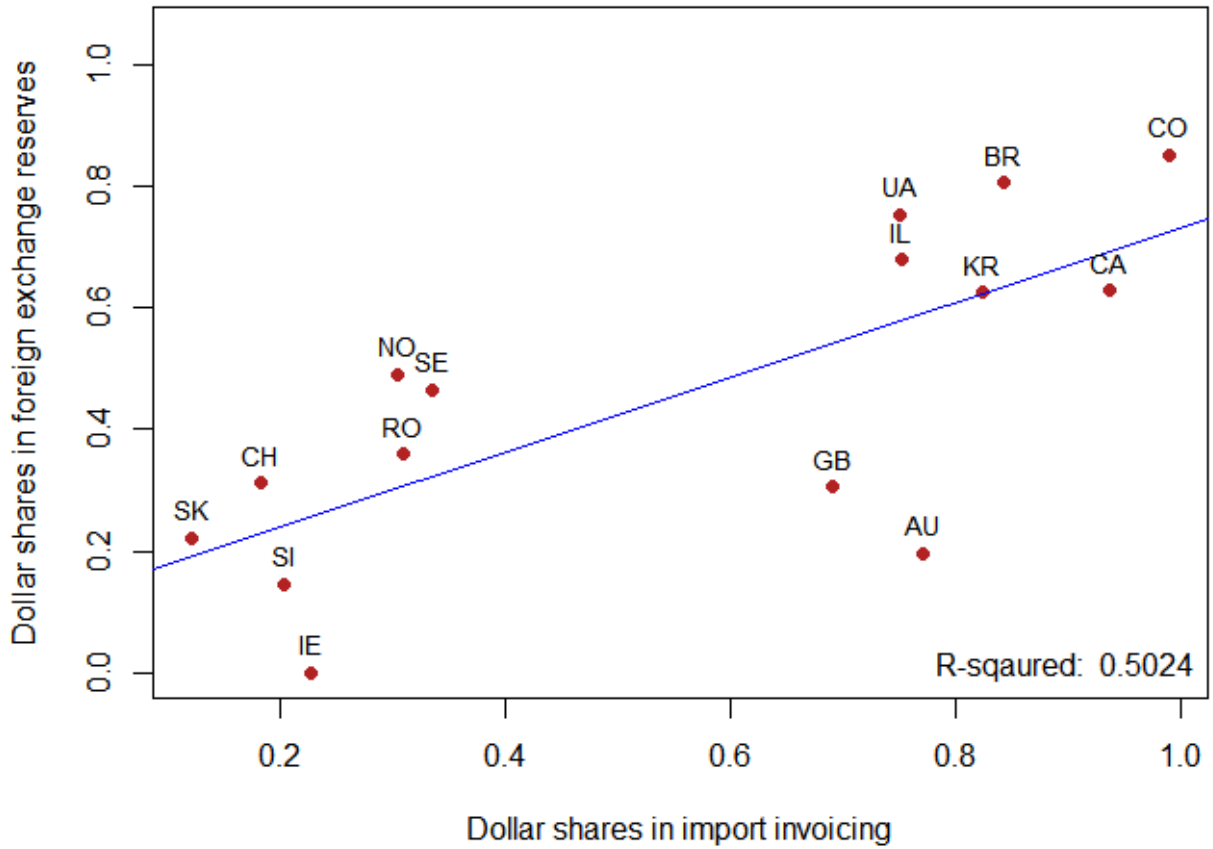

IMF, Wong (2007)