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EXCHANGE RATE DYNAMICS AND INTERNATIONAL BUSINESS CYCLES WITH TRADE SHOCKS

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Abstract

►Real Exchange Rates (RER) are volatile & weakly correlated with GDP (at business cycle frequencies)

► RER volatility & 'disconnect' are key puzzles for standard macro models

►This paper: simple two-country model with supply (TFP) shocks & TRADE shocks: exogenous shifts in local spending bias (proxy for time-varying trade costs, protectionism or changes in markups charged by exporters)

► A positive home bias (trade) shock appreciates a country's RER and raises its GDP; foreign GDP falls

► A positive TFP shock depreciates the RER & raises GDP

► Model with *simultaneous* supply & trade shocks can generate volatile RER and realistic small (unconditional) RER-GDP corr.

The model

Simple **two-country model:**

- 2 traded intermediate goods
- Each country produces 1 traded good (from K & L)
- Complete financial markets
- Country *i* final good $Z_{i,t}$ produced from domestic $(y^i_{i,t})$ & imported $(y^j_{i,t})$ tradables:

$$Z_{i,t}\equiv(y^i_{i,t}/(1-\alpha_{i,t}))^{1-\alpha_{i,t}}\,(y^j_{i,t}/\alpha_{i,t})^{\alpha_{i,t}}$$

$1-\alpha_{i,t}$: local spending bias

$\alpha_{i,t}$: import share

- Trade shock can directly be estimated from imports/absorption data

$\alpha_{i,t}=p_{j,t}y^j_{i,t}/(P_{i,t}Z_{i,t})$= imports/absorption

$$\ln\alpha_{i,t}=(1-r^\alpha)\ln(\alpha)+r^\alpha\ln\alpha_{i,t-1}+\varepsilon^\alpha_{i,t}$$

Empirically (US): $r^\alpha=0.98$ and $\sigma^\alpha=3.58\%$

- Also assume persistent TFP shocks (θ)
- **Period utility**

$$u_{i,t}(C_{i,t},L_{i,t})=\tfrac{1}{1-\sigma}[\psi_{i,t}(C_{i,t},L_{i,t})]^{1-\sigma}\quad \sigma>0,\ \sigma\neq0$$

- Recursive EZW intertemporal preferences:

$$U_{i,t}=\{(1-\beta)\cdot[\psi_{i,t}(C_{i,t},L_{i,t})]^{1-\sigma}+\beta[E_tU^{1-\gamma}_{i,t+1}]^{(1-\sigma)/(1-\gamma)}\}^{1/(1-\sigma)}$$

σ: 1/IES intertemporal elasticity of substitution (IES)

γ: coefficient of risk aversion (CRA)

Recursive utility magnifies RER response to persistent shocks (Kollmann (2017))

Quantitative results

PREDICTED MOMENTS (growth rates) with TFP Shocks and Trade Shocks (α)

	Shocks to: TFP & Trade	TFP	Trade	Data
	(1)	(2)	(3)	(4)
Standard deviations (in %)				
Y	1.48	1.36	0.37	0.80
Standard deviations relative to GDP				
C	0.80	0.72	0.77	0.66
L	1.11	1.04	1.55	0.89
RER	1.43	0.75	**3.32**	3.05
Correlations with domestic GDP				
RER	**-0.17**	**-0.48**	**0.76**	-0.06
Cross-country correlations				
Y	**0.35**	**0.40**	**-0.84**	0.45
C	**0.37**	**0.55**	**-0.78**	0.35
I	**0.36**	**0.44**	**-0.79**	0.34
L	**0.37**	**0.52**	**-0.84**	0.43

Model calibration: high risk aversion (γ=50; σ=.66)

- **Trade shocks have much smaller effect on GDP (Y) than TFP shocks, but trade shocks matter for RER**
- **Trade shocks induce negative cross-country correlations of GDP, consumption (C), investment (I) and labor hours (L)**
- **Allowing for simultaneous TFP & trade shocks brings volatility of RER, correlation between RER & GDP , and cross-country correlations of C,I,L closer to the data (compared to model with just TFP shocks)**