

Explaining International Business Synchronization: Recursive Preferences and the Terms of Trade Channel

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Robert Kollmann, Université Libre de Bruxelles & CEPR

Contact: robert_kollmann@yahoo.com, www.robertkollmann.com

Abstract

- Business cycles of advanced economies are synchronized. Standard models cannot explain this.
- This paper: simple two-country model with high endogenous business cycle correlation
- Key ingredients: recursive intertemporal preferences (Epstein-Zin-Weil) and muted wealth effect on labor supply (GHH preferences and demand-determined employment under rigid wages)
- Key mechanism: recursive preferences magnify terms-of-trade response to country-specific shocks
- ⇒ A productivity increase in a given country triggers a strong improvement on foreign terms of trade
- ⇒ Increase in foreign labor demand
- ⇒ With muted labor wealth effect, foreign hours & GDP ↑
- ⇒ domestic and foreign GDP are synchronized in model!

Endogenous international shock transmission

Not plausible that world business cycle is solely driven by common (world-wide) shocks: demand & supply shocks are LESS correlated across countries than GDP. E.g., GDP is more correlated internationally than GDP!

Corr. across US & aggreg. of 13 other OECD countries: TFP: 0.13. GDP: 0.45 (quarterly growth rates)

⇒ INTERNAT. BIZ CYCLE SYNCHRONIZATION MUST PARTLY BE ENDOGENOUS: SYNCHRONIZED DOMESTIC & FOREIGN RESPONSES TO COUNTRY-SPECIFIC SHOCKS

- Problem: existing models do NOT generate strong endogenous international shock transmission.
- MODEL HERE GENERATES STRONG INTERNATIONAL TRANSMISSION OF TFP SHOCKS, DUE TO STRONG TERMS-OF-TRADE CHANNEL

The model

Simple two-country (Home, Foreign) structure:

- 2 traded goods, local spending bias
- Each country produces 1 traded good (from K & L)
- Complete financial markets
- Exogenous persistent TFP shocks

• Period utility

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

- Recursive EZW intertemporal preferences:

$$U_{i,t} = \left\{ (1-\beta) [\psi_{i,t}(C_{i,t}, L_{i,t})]^{1-\sigma} + \beta [E_t U_{i,t+1}]^{1-\sigma} \right\}^{1/(1-\sigma)}$$

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

γ : coefficient of risk aversion (CRA)

NB When $\gamma = \sigma$: time-separable utility

Intertemporal marginal rate of substitution (IMRS) depends on future life-time utility

$$\rho_{i,t+1} \equiv \beta \frac{\partial u_{i,t+1} / \partial C_{i,t+1}}{\partial u_{i,t} / \partial C_{i,t}} \left(\frac{U_{i,t+1}}{(E_t U_{i,t+1})^{1-\gamma}} \right)^{\sigma-\gamma}$$

► Efficient risk sharing

$$\rho_{H,t+1} / \rho_{F,t+1} = RER_{t+1} / RER_t$$

Standard assumption: $\gamma > \sigma \equiv 1/IES$ (preference for early resolution of uncertainty)

• Unexpected **RISE** in future life-time utility **LOWERS** IMRS: **Consumption & life-time utility are 'substitutes'**

► Positive TFP shock in country H:

- Relative consumption of country H ↑
- Relative life-time utility of country H ↑
- RER of country H depreciates strongly

⇒ Relative price of good H ↓

Terms of trade of country H worsen,
Terms of trade of country F improve

Foreign terms of trade improvement RAISES foreign marginal product of capital & labor, in final good units

⇒ Foreign Investment and labor demand ↑

Quantitative results

Predicted moments: Flexible wage vs. Rigid wage

Role of: KPR/GHH utility; risk aversion (γ)

	Flexible wage				Predeterm. wage		Data
	KPR		GHH		KPR	GHH	
	$\gamma=1/IES$	$\gamma=50$	$\gamma=1/IES$	$\gamma=50$	$\gamma=50$	$\gamma=50$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Standard deviations (%)							
GDP	0.82	0.85	0.90	0.84	1.36	1.36	0.81
Standard deviations relative to GDP							
C	0.22	0.25	0.48	0.39	0.48	0.72	0.66
Labor	0.61	0.63	0.67	0.61	1.07	1.03	0.89
RER	0.37	1.51	0.16	1.53	0.95	0.95	3.03
Cross-country correlations							
GDP	0.23	0.14	0.14	0.35	0.52	0.47	0.45
C	0.13	-0.02	-0.30	0.65	0.69	0.69	0.35
I	0.19	0.34	0.21	0.64	0.70	0.54	0.34
Labor	0.38	0.15	0.15	0.62	0.73	0.61	0.43
Hansen-Jagannathan bound	0.002	0.257	0.002	0.225	0.257	0.225	

HJ bound=std(IMRS)/E(IMRS); Sharpe ratio=E(Rx)/std(Rx); SR≤HJ. Rx: excess return; historical SR equity: 0.22

Conclusion

• Paper has developed simple DSGE model that solves the 'international correlation puzzle':

► Country-specific productivity shocks generate sizable cross-country correlations of GDP, investment, Labor.

► Real exchange rate is volatile

• Key ingredients (BOTH are needed!)

► recursive intertemporal preferences (⇒ volatile RER)

► weak wealth effect on labor supply (⇒ positive international shock transmission, via t.o.t. channel)