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

(Forthcoming in: Open Economies Review, 2019)

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:

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

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

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

► **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		
	KPR		GHH		KPR	GHH	
	γ=1/IES	γ=50	γ=1/IES	γ=50	γ=50	γ=50	Data
	(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)