Industrial Structure and Financial Capital Flows

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Introduction

• “Two Engines of Integration:”
  • Commodity Trade
  • Financial capital Flows

• Two types of trade
  • Intratemporal trade
  • Intertemporal trade

• This paper: develops a framework that integrates factor-proportions (intratemporal) trade with financial capital flows (intertemporal trade)

• Investigate how their *interplay* determines:
  – Financial capital flows
  – Sectoral and Aggregate Asset Prices
A Multi-country, Multi-sector Setup

- Two Countries: Home and Foreign
- Two Commodities: Cotton (labor-intensive) and Steel (capital-Intensive)
- Two Factors: Capital (K) and Labor (N)
  - Labor: immobile internationally
  - Capital: mobile internationally
  - Adjustment costs break factor price equalization (FPE)
What changes with multiple sectors?

Consider a permanent labor force increase in Foreign:

- **Two forces** at work in determining capital flows:
  - Standard effect: capital flows to where it is relatively scarce—(Home to Foreign)
  - New: “**composition effect**”—capital flows to the location that specializes more in capital-intensive goods (Foreign to Home)

If composition effect dominates:
  - “Reverse Capital Flows”
  - Investment comovement
  - Asset Price comovement

⇒ With basic ingredients, sharp and surprising results.
In a multi-sector model, 3 cases are encompassed:

- No factor-intensity differences: **standard, neoclassical force**
- Multiple sectors: **neoclassical + composition effect**
- Multiple sectors where most labor-intensive sector uses only labor as an input: **composition effect**
Model Ingredients

- **Two-country OLG model** with capital accumulation (Abel (Econometrica 2003))
- **Free and costless trade** in goods and financial assets
- **Multiple sectors** that differ in factor intensity
- **Adjustment costs** to pin down capital stock and analyze the price of capital
Model

- **Preferences:**
  \[ u(c_t) = \frac{(c_t)^{1-\rho}}{1-\rho} \]

- **Production of Intermediate Goods:**
  \[ Y_{it} = (K_{it})^{\alpha_i} (A_t N_{it})^{1-\alpha_i} \]
  \[ i = 1, 2, \alpha_1 < \alpha_2 \]

- **Capital accumulation equation:**
  \[ K_{i,t+1} = a_{it}^{\phi} K_{it}^{1-\phi} \]

- **Consumption index:**
  \[ C_t = \left[ \sum_{i=1}^{m} \gamma_i^{1/\theta} c_{it}^{\theta - 1/\theta} \right]^{\theta/(\theta - 1)} \]
Consumers

- **Objective:**
  \[
  \max \ u(c_t^y) + \mathbb{E}_t u(c_{t+1}^o)
  \]

- **Constraints:**
  Young:
  \[
  c_t^{y,h} = w_t^h - \sum_{j=h,f}^{2} \sum_{i=1}^{2} q_{it}^j k_{j,t+1}^{h,j} - \sum_s Q(s)b_{t+1}^h(s)
  \]

  Old:
  \[
  c_{t+1}^{o,h} = \sum_{j=h,f}^{2} \sum_{i=1}^{2} R_{j,t+1}^i q_{it}^j k_{j,t+1}^{h,j} + b_{t+1}^h(s)
  \]
Equilibrium

Home’s Investment: $I^h_t \propto \eta_t Y^g_t$

one sector: $\eta_t = \lambda \sum_{k=0}^{\infty} (1 - \lambda)^k \mathbb{E}_t \left[ \frac{Y^h_{t+k+1}}{Y^g_{t+k+1}} \right]$

two sectors: $\eta_t = \left[ \frac{\alpha_1 \gamma}{\alpha_1 \gamma + \alpha_2 (1 - \gamma)} \eta^1_t + \frac{\alpha_2 (1 - \gamma)}{\alpha_1 \gamma + \alpha_2 (1 - \gamma)} \eta^2_t \right]$

weighted-average share of global production

In determining investment, more weight is put on the expected future share of capital-intensive-goods production $\Rightarrow$ Investment depends on the composition of production
The Composition Effect

Special case: $\alpha_1 = 0$

- Commodity trade $\Rightarrow$

\[
\begin{align*}
   w_t &= w_t^* = p_1t \\
   \Rightarrow k_{2t} &= k_{2t}^* \quad \forall t
\end{align*}
\]

► achieved through labor reallocation across sectors
The Composition Effect

Special case: $\alpha_1 = 0$

- Commodity trade $\Rightarrow$

  $$w_t = w_t^* = p_{1t}$$

  $$\Rightarrow k_{2t} = k_{2t}^* \quad \forall t$$

  - achieved through labor reallocation across sectors

- The “neoclassical effect” is effectively shut down
How is a marginal unit of savings allocated?

- Rental $\alpha_2 p_{2t} k_{2t}^{\alpha_2 - 1}$, is equalized across countries.
- Thus, Foreign allocates the marginal unit of savings to both countries, rather than locally, and in such a way that marginal adjustment costs are equalized $\Rightarrow$

$$\eta_t = \frac{I_t}{I^g_t} = \frac{K_{init}}{K^g_{init}}$$

Home’s investment share of world GDP in any period $t$ is determined by its initial capital intensity. If countries were initially symmetric, $\eta_t = 1/2$. 
Results (1)

- **Investment comovement:**
  \[ I_t \propto \eta Y_t \]

- **Current account** \( CA = S - I \downarrow \) at Home

- **Path dependence:** (labor share: \( s_l = 1 - \alpha \gamma \))
  \[
  \tilde{k}_{t+1} = \Theta \eta^{\phi_{s_l}} \left( \frac{\tilde{N}_t^{g}}{\tilde{N}_t} \right)^{\phi_{s_l}} (\tilde{k}_t)^{1-\phi_{s_l}} e^{-\left(\epsilon_{N,t+1} + \epsilon_{A,t+1}\right)}
  \]

Opposite of the one sector results.
Figure: Impact effect of a change in $\frac{k^i}{k^w}$
The General Case

- **Special Case** \( (\alpha_1 = 0) \):
  - FPE occurs after one period (through labor reallocation)
  - Investment and Asset Prices always comove

- **General Case**:
  - \( k_{it} \neq k_{it}^* \)
  - composition effect and “neoclassical” effect are competing
  - Quantitative exercise: composition effect dominates
  - Show conditions under which one dominates the other
When is the Composition Effect Strong Enough?

5 Sectors

Home Investment on Impact

mean = 0.36

From Data
Conclusion

- Potentially important interactions between **intertemporal** and **intratemporal trade**
- Link between global imbalances and specialization patterns
- Lucas puzzle revisited: trade drives capital flows
- Asset pricing implications: developing countries may purchase assets in advanced economies, with portfolios tilted towards capital-intensive assets