Issues in International Finance

Benefits of international capital markets II

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Roadmap

▶ Where we have been

  1. Measuring external transactions and wealth

  2. Unbalanced trade means borrowing or lending with ROW

  3. The long run budget constraint

▶ Today

  1. The gains from international borrowing and lending

  2. Consumption smoothing, efficient investment, risk diversification

Gains from intertemporal trade

▶ Gains from intertemporal trade

  1. Consumption smoothing ✓

  2. Efficient investment

  3. Risk diversification

Efficient investment

► We have seen how world capital markets allow for smoothing the costs of investment: very similar to the consumption smoothing benefit we studied earlier.

► Now we consider a second aspect of investment: moving capital across countries to equalize returns

► This is a long run idea. Remember: with flexible prices and open capital markets, we have real interest rate parity. Let's see what this implies.

Optimal capital investment

▶ Production function (A=productivity, K=capital, L=labor)

$$Q = AL^{1-\theta}K^{\theta}$$

▶ In per worker terms (k=capital per worker)

$$q = Ak^{\theta}$$

▶ To maximize output, how much capital do we choose?

$$\max_{k} q = Ak^{\theta} - rk$$

▶ The first order condition is

$$\theta Ak^{\theta-1} = r$$

The marginal product of capital

▶ The first order condition says that $MPK = r$

$$\theta A k^{\theta-1} = r$$

▶ r is the marginal cost of capital: if not investing in capital, could be lending to someone

▶ MPK is falling as k grows

    ▶ This is the diminishing returns to capital

    ▶ When k is small, MPK is high

    ▶ When k is large, MPK is low

▶ $A = 1$ and $\theta = 1/3$ Let's take a look...

MPK in rich and poor countries

- ▶ Two countries: US and Mexico
- ▶ Assumption: A and θ are the same in both countries
- ▶ $k^{us} = 1$, $k^{mx} = 0.08$
- ▶ $q^{us} = 1$, $q^{mx} = 0.43$
- ▶ Mexico is poor relative to the US because it doesn't have enough factories, trucks, machines...
- ▶ ...but Mexico should be a great investment opportunity!
- ▶ $MPK^{us} = 0.333$, $MPK^{mx} = 1.79 \rightarrow MPK^{mx}/MPK^{us} = 5.4$
- ▶ Capital should flow to Mexico

MPK in rich and poor countries

► Capital should flow out of rich countries and into poor countries (capital flows to places with highest returns)

► Eventually all countries **converge** to the same level of k and then r will be same across countries (we have already seen this result)

► This is a very powerful (and optimistic) implication of economic theory: poor countries will become rich countries!

► We can speed up this transition by subsidizing loans to poor countries or giving 'gifts'

The Lucas Paradox

▶ Problem: we do not observe capital flowing out of rich countries and into poor countries (we even see the opposite)

▶ What model assumption should we get rid of? Identical A.

▶ Suppose $A^{mx} = 0.63$ and $A^{us} = 1$

▶ Need $k^{mx} = 0.33$ to have the same output as before

Technology in rich and poor countries

- $k^{us} = 1$, $k^{mx} = 0.33$

- $q^{us} = 1$, $q^{mx} = 0.43$

- Mexico is poor relative to the US because it doesn't have enough factories, trucks, machines... and because it cannot produce as much output per unit of capital

- The *MPK* difference falls dramatically

- $MPK^{us} = 0.333$, $MPK^{mx} = 0.44 \rightarrow MPK^{mx}/MPK^{us} = 1.33$

- The returns are not so different anymore...

What is A?

- ▶ Total factor productivity (TFP)

- ▶ Most of the differences in q across countries come from A

- ▶ It is an unobserved 'residual'
    - ▶ If you know K, L, and Q you can compute A

- ▶ It is technological efficiency
    - ▶ Do poor countries use worse technology? To some extent, but not thought to be the big difference across countries.

- ▶ It reflects the ability to implement technologies
    - ▶ Institutional quality: How good is the government? How much red tape? Bribes? Infrastructure?
    - ▶ The World Bank doing business is inspired by this idea
      http://www.doingbusiness.org/

The Lucas Paradox

- ► Why doesn't capital flow to poor countries?

- ► The rate of return is much lower than simply theory predicts

    - ► TFP differences across countries

    - ► Risk premiums (poor countries default more)

- ► Downer: Giving subsidized loans (or aid) not likely to help much

Gains from intertemporal trade

- ► Gains from intertemporal trade
    1. Consumption smoothing ✓
    2. Efficient investment ✓
    3. Risk diversification

Risk diversification

► Business cycles are shocks to income; households would like smooth consumption

► We studied one way to smooth consumption: debt

► Another way to smooth consumption is to smooth income: hold equity in other countries

► Since business cycles are not perfectly synchronized across countries, this allow for diversification of risk

► The more out-of-sync are business cycles, the more room there is for risk sharing

Diversification

▶ Assumption: Labor and capital used to produce output

▶ Assumption: No borrowing or lending (not important)

▶ Assumption: No investment, no government (not important)

▶ Assumption: Two countries suffer equal and opposite shocks to income (important)

  ▶ In state 1: $Q^A = 90$, $Q^B = 110$

  ▶ In state 2: $Q^A = 110$, $Q^B = 90$

  ▶ States alternate through time: 1,2,1,2,1,2...

▶ Split between labor and capital is 60–40 (important)

Closed economy

▶ No cross border borrowing/lending or equity

▶ Each country owns all of its capital stock

	Country A			Country B			World
	rK	wL	GNI	rK	wL	GNI	GNI
State 1	36	54	90	44	66	110	200
State 2	44	66	110	36	54	90	200

▶ In each country, consumption alternates between 90 and 110. Not very smooth.

▶ World output (income) is constant

Open economy

- ► Allow countries to own some of the other country's capital stock

- ► Receive income payments from your capital in the other country

- ► Suppose each country buys 50% of the other country's capital

	Country A					Country B			World
	rK	wL	GNI	TB	NFIA	rK	wL	GNI	GNI
State 1	40	54	94	–4	+4	40	66	106	200
State 2	40	66	106	+4	–4	40	54	94	200

- ► Capital income has zero volatility

- ► Income (and consumption) volatility has fallen

Limits to risk sharing

▶ The extent of risk sharing depends on two factors

1. The correlation of country income

  ▶ Income shocks that are negatively correlated can be diversified

  ▶ Income shocks that are positively correlated cannot

2. How much income can be traded

  ▶ How easy is it to own capital in a foreign country?

  ▶ Not generally easy to own someone else's labor income

Gains from intertemporal trade

- Gains from intertemporal trade
    1. Consumption smoothing ✓
    2. Efficient investment ✓
    3. Risk diversification ✓

- Q: How much of the gains do we see?

- A: Not as much as theory predicts.

    - Consumption is not very smooth

    - Cross border investment is low

    - Portfolios are biased toward domestic assets

- Tends to be worse in poorer countries

Limits to international financial markets

- ▶ Why do we not see more international finance?

    - ▶ Regulation (limits to foreign investment)

    - ▶ Capital controls

    - ▶ Transactions costs

    - ▶ Institutional risk (expropriation, default)

    - ▶ Undiversifiable risk (global shocks, labor income shocks)

- ▶ Many of these are institutional factors