Developing Countries
Chapter 22
1. Growth

2. Borrowing and Debt

3. Money-financed deficits and crises

4. Other crises

5. Currency board

6. International financial architecture for the future
1 Growth

1.1 Developing Countries

- Output depends on factors of production and technology

\[ Y = AK^\alpha L^{1-\alpha} \]

- Per worker output depends on technology and per worker capital

\[ \frac{Y}{L} = \frac{AK^\alpha L^{1-\alpha}}{L} = \frac{AK^\alpha L^{1-\alpha}}{L^\alpha L^{1-\alpha}} = A \left( \frac{K}{L} \right)^\alpha \]
• Marginal product of capital

\[
\frac{\partial Y}{\partial K} = AK^{\alpha-1}L^{1-\alpha} = A \left( \frac{K}{L} \right)^{\alpha-1}
\]
• Developing countries have low \( \frac{K}{L} \) and therefore high marginal productivity of capital
  
  – Investment in developing countries should be high
  
  – If saving not high enough to finance it, borrow from rest of world
  
  – High MPK means country will be able to repay

• Since countries with low \( \frac{K}{L} \) have low \( \frac{Y}{L} \), poor countries should be investing more than wealthy countries

• Therefore poor countries should grow faster than wealthy ones, implying convergence of per worker output levels
1.2 Convergence

- Do poor countries grow faster than wealthy ones?

- Among rich countries – relatively poorer countries do grow faster

- For entire world – no such relationship
  - East Asian countries have grown faster
  - Latin American countries have had mixed experience
  - African countries have grown more slowly
1.3 Structural Characteristics – lower value for A

- Direct government control
  - government ownership of business
  - government allocation of loans
  - keeps market from allocating resources efficiently
• High and volatile inflation
  – makes planning more difficult and risky
  – increases nominal and real interest rates

• Inefficient and weak financial markets
  – poor supervision of banks
  – stock markets poorly developed due to lack of transparency about behavior of management
  – legal framework to resolve bankruptcy weak
• Capital controls (changing)
  – prevent capital from leaving – will not enter
  – interest rate ceilings leave interest rates too low to attract capital

• Lack of diversification in output
  – large portion of exports are agricultural or single commodity
  – volatile terms of trade

• Corruption and rent-seeking
2 Borrowing and Debt

2.1 Facilitates intertemporal trade

- Investment can occur where MPK is highest
- Consumption smoothing
2.2 Assets Used to Finance Intertemporal Trade

- Equity
  - allows financing with foreign creditor sharing risk of project
    * if the project does well dividends are high
    * if the project does poorly, there are no dividends
  - requires credible financial disclosure and absence of corruption
Domestic-currency debt

- allows financing with promise to repay a fixed amount of interest and principle
- if the project does poorly, borrower defaults
- unless the borrower is the government
  * government can print money to repay
  * generates inflation reducing the real value of the repayments
  * lenders know this and might refuse to lend in domestic currency
  * refusal to lend due to "original sin"
• Foreign-currency debt
  – promise to repay fixed amount
  – if cannot repay, agent defaults
  – government cannot print money to pay foreign-currency debt
2.3 Why Does Default Occur?

- Projects are less profitable than expected and do not generate enough revenue to allow repayment in full
  - negative domestic shock
  - negative world shock (interest rates, oil prices)
• Moral hazard – projects which are expected to fail are undertaken

  – bank accepts deposit of $100

  – invests in a project, which, if successful, will return $200 and nothing if unsuccessful

  – probability of success is 40%, so expected profit is $200 \times .4 - 100 = -20$

  – now assume that in the event of failure, the government will return the original $100 deposit

    * expected profit $= -20 + 100 \times .6 = 40$

    * implies projects which are expected to fail will be undertaken
• Sudden stop

  – creditors believe that debtors cannot repay so lending ends
  – forces end to current account deficit
  – default reduces debt and restores solvency
2.4 Crisis triplets

- Default crisis – firms fail to repay bank loans in foreign currency

- Bank crisis – creditors, fearing bank failure, withdraw deposits in foreign currency

- Currency crisis – central banks, as lender of last resort, lend foreign exchange reserves to banks
Money-financed government deficits and crises
Latin countries – early 1980’s

3.1 Capital inflows financed

- Foreign creditors were lending enough to finance a current account deficit plus reserve accumulation
- Current account deficit
  - Due to excess of private investment over saving
  - And government budget deficit

\[ Y = C + I + G + CA \]

\[ (Y - T - C) - I + (T - G) = CA \]

\[ S^p - I + (T - G) = CA \]

- Increasing official reserves
3.2 Exchange rates were crawling pegs

- pre-announced schedule of depreciation with respect to the dollar

- allowed countries more inflation than that of dollar

\[
\frac{\Delta P}{P} = \frac{\Delta E}{E} + \frac{\Delta P_\$}{P_\$}
\]

- allowed higher seigniorage revenues
3.3 US contractionary monetary policy increased world interest rates

- from perspective of Latin countries $R^*$ increases

- extended model – DD shifts left and AA accompanies

- world-wide recession since this occurred in many countries

- project profitable with low interest rates were no longer profitable with high interest rates (over investment?)

- capital inflows stopped, leaving reserves to finance deficits
• speculative attacks on reserves and currency crises

• banking crises as deposits were withdrawn (moral hazard?)

• default as government and firms unable to repay

• not resolved until 1989 when US convinced US banks to forgive some debt
4 Latin Countries in 1990’s

4.1 Argentina – policy to end hyperinflation

- Currency board 1991 – held $1 in reserves for every peso in circulation
  - could not run out of reserves until base money exhausted
  - gave up monetary policy
  - gave up lender of last resort
• Promised to reduce government deficits, but after first few years, they rose again

  – DD right due to G up and AA accompanies

  – Current account deficit and falling foreign exchange reserves

  – relative price of domestic goods rising over time, worsening CA deficit

  – 1/1999 Brazil devalued, further increasing CA deficit

  – CA deficit was being financed with reserves which were falling
• Sudden stop of capital flows

  – Creditors believed the country could not pay its debts

  – Sudden stop did not exhaust reserves

  – defaulted on debt 12/2001

  – abandoned currency board on 1/2002 and currency depreciated
● Banking crises

- banks were forced to hold government debt which was rapidly growing
- with default, bank assets reduced
- to prevent bank runs, government prohibited people from withdrawing money from banks
- huge loss of confidence in banking system
4.2 Chile

- crawling peg allowed larger seigniorage than US

- reduced fiscal deficits to eliminate growing government debt

- maintained fiscal reform so government debt did not grow

- central bank was made independent of fiscal authority with goal of reducing fiscal reliance on seigniorage
  - seigniorage was restricted to that allowed by the crawling peg
• capital controls designed to limit short-term capital inflows
  
  – worried about ability to roll over short-term capital

  – capital inflows of debt accompanied by a 1-year non-interest-bearing deposit equal to 30% of transaction

  – most costly for short-term assets

• banking reform to reduce possibility of bank insolvency and liquidation of insolvent banks

• improved bankruptcy laws

• reduction in corruption
• no crises
4.3 Mexico

- exchange rate system
  - 1987 fixed peso to US dollar
  - 1989 crawling peg
  - 1991 crawling band
  - increasing flexibility over time

- reduced fiscal deficits and maintained fiscal reform
• weak banks
  – interest rate ceilings
  – credit rationing to customers preferred by government (corruption)
  – little supervision leading to risky loans due to moral hazard

• political uncertainty in 1994, including assassination
  – perhaps $E^e$ increased

• NAEFTA increased expectations of future output
  – DD shifts right increasing CA deficit and increasing price
• new government devalued in December 1994
  
  – sudden stop of capital flows (expected future devaluations? defaults?)
  
  – increase in interest rates (due to $E^e$ up)
  
  – abandoned fixed exchange rate in 1995
  
  – loans by US and IMF
4.4 Southeast Asia

4.4.1 Asian Growth Miracle

- macroeconomic stability with low inflation

- no large fiscal deficits

- high savings rates used to finance investment in physical and human capital

- large human capital and low physical capital led to high marginal product of capital – attracted savings from ROW
high rate of accumulation of factors of production led to high growth rates

\[
\frac{Y}{N} = A \left( \frac{K}{N} \right)^\alpha \left( \frac{L}{N} \right)^{1-\alpha}
\]

- high rate of capital accumulation – \( \frac{K}{N} \) increasing
- growing labor-force participation – \( \frac{L}{N} \) increasing
- not a particularly high rate of growth for \( A \)
4.4.2 Asian Crises 1997

- Exchange rates were pegged to US dollar

- Weak banks and other financial intermediaries due to absence of monitoring and incentives for moral hazard

- Weak bankruptcy laws
• Bank failures

  – moral hazard

  – negative shocks and risky loans to firms (recession in close trading partner, Japan)

  – foreign-currency reserves used in lender of last resort role to support banks
• Sudden stop of capital flows
  – exogenous sun-spot equilibrium – if everyone else stops lending, optimal for me to stop lending too
  – increase in expected future government spending to recapitalize the banking system
  – with increase, government could have trouble paying debt

• Large exchange rate depreciation
  – reserves reached lower bound – very little post-crisis inflation
  – depreciation restores fiscal solvency
• Contagion - first depreciation was in Thailand – spread to Malaysia, Indonesia, and South Korea

• Large build-up in reserves after the crisis to enable countries to withstand a future sudden stop in capital flows without a crisis
5 Currency Boards

- hold foreign exchange reserves for every unit of domestic currency – can’t run out of reserves

- credibility higher because cannot be forced to devalue

- lose lender of last resort ability
6 International Financial Architecture for the Future

6.1 Reduce the probability of bank crises

- well-regulated banks with increased capital requirements

- transparency – accounting rules so lenders know the position of those to whom they lend

- credit lines for countries with liquidity (not solvency) problems
6.2 Reduce the probability of debt crises

- increase equity finance

- increase direct foreign investment
6.3 Role of the IMF

- Moral hazard – IMF loans are expected to shield creditors from loss encouraging risky behavior

- Lender of last resort – provide liquidity so countries and their firms do not have to liquidate long-term projects at short notice to pay creditors

- International bankruptcy laws for insolvent countries
  - administered by IMF?
  - allow countries to reenter capital markets sooner

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