ECONOMICS OF LESS DEVELOPED COUNTRIES

EC3040b
Spring 2017

Lecture 1

Michael King
Course Details

1. Contact Details:
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   Office Hours: Wednesday 14.30 – 16.30, Room 3002.

2. Marks for the course will be allocated as follows:
   – 10% for academic referee report due in Week 4
   – 10% for group presentation due in Week 6
   – 20% for essay due in Week 11
   – 60% for relevant section in summer examination.
Tutorials Schedule

- **Week 3** – Review of the Growth Models
- **Week 5** – Institutions
- **Week 9** – Trade
- **Week 11** – Pre Exam Revision and Q&A

... where Week 7 is reading week

**Time and Room**
- Friday 10.00 in Room 3071
- Friday 12.00 in Room 2039
Understanding the Journey
Course Outline

1. Contemporary Theories of Economic Development
2. Policymaking: What Role for the State in development?
3. The Role of Institutions in Development
4. Aid: Does it work?
5. Trade: Engine of growth or obstacle to development?
6. Domestic and International Finance: Opportunities and instability
7. Economic Growth and Environmental Sustainability
Part 1: Contemporary Theories of Economic Development

1. Historical Trends in Economic Growth
2. Review of the Classic Theories of Economic Growth
3. Coordination Failures
4. The Big Push
5. Kremer’s O Ring Theory
6. Economic Development as Self Discovery
7. Growth Diagnostics
8. Summary
Readings

Required

Supplementary
4. C.I. Jones An Introduction to Economic Growth (1998) (Chapters 1, 2, 3)
1. Historical Trends in Economic Growth

- Small differences in growth rates over long periods of time can make huge differences in final outcomes.
- US per-capita GDP grew by a factor 10 from 1870 to 2000. Average growth rate was 1.75%.
  - If US had grown with .75% (like Pakistan or the Philippines), its GDP would be only $8,700 in 1990 (i.e., 1/4 of the actual).
- At a growth rate of 1%, our children will have $\approx 1.4$ our income. At a growth rate of 3%, our children will have $\approx 2.5$ our income.
- Some East Asian countries grew by 6% over 1960-1990; this is a factor of $\approx 6$ within just one generation.
Long-run Log Income per Person

Short-run Log Income per Person

Figure 1.8 in Acemoglu, K. Daron. *Introduction to Modern Economic Growth*. Princeton, NJ: Princeton University Press, 2009
Developments since 1801: Interactive

1. Check out [www.gapminder.org](http://www.gapminder.org)
2. Income per person (GDP per capita, inflation adjusted $) vs Life Expectancy
2. Classic Theories of Economic Growth: Review

• Characteristics of ‘Miracle’ economies
  – Macroeconomic and political stability
  – Investment in health and education
  – Effective governance and institutions
  – Favourable environment for private enterprise
  – Favourable geography
Harrod-Domar
(Rostow - Stages of Economic Growth)

Building Blocks
• $S = sY$
1. $I = \Delta K$
2. As capital-output ratio is simply $k = K / Y$, therefore $k = \Delta K / \Delta Y$, thus $k(\Delta Y) = \Delta K$
3. As $I = S$ (closed economy)

Algebra
✓ By definition $I = \Delta K = k(\Delta Y)$
✓ By assumption $S = sY = I = \Delta K = k(\Delta Y)$
✓ $sY = k(\Delta Y)$
✓ so $\Delta Y/Y = s/k$ - simplified version of famous H-D equation.

Conclusion
• Growth jointly determined by $s$ and $k$
• Mobilisation of domestic and foreign savings for pre-growth investment (increased taxes, foreign aid, consumption deferral and in an open economy - aid and FDI)
• Tech progress as a decrease in $k$
• Neglects quality of investment, institutions, but is simple and can be accurate in the short term
Rostow's Model - the Stages of Economic Development

In 1960, the American Economic Historian, WW Rostow suggested that countries passed through five stages of economic development.

Stage 1 Traditional Society
subsistence, barter, agriculture

Stage 2 Transitional Stage
specialization, surpluses, infrastructure

Stage 3 Take Off
Industrialisation, growing investment, regional growth, political change

Stage 4 Drive to Maturity
diversification, innovation, less reliance on imports, investment

Stage 5 High Mass Consumption
consumer oriented, durable goods flourish, service sector becomes dominant

According to Rostow development requires substantial investment in capital. For the economies of LDCs to grow the right conditions for such investment would have to be created. If aid is given or foreign direct investment occurs at stage 3 the economy needs to have reached stage 2. If the stage 2 has been reached then injections of investment may lead to rapid growth.
Solow Model

• Extension of H-D model – allows for substitution between L and K
• CRTS for K and L combined, DRTS in K
• \( Y = K^\alpha (AL)^{1-\alpha} \), where A is the productivity of labour
• \( y = Ak^\alpha \) (per worker), note that k is K/L
• \( \Delta K = sY - dK \)
• \( \Delta k = sy - (n+d)k \) (capital accumulation equation in per worker terms)
• Output growth = short run \( f(\downarrow \text{labour quantity}, \uparrow \text{in capital (savings and investment)}, \uparrow \text{in the long run} \) \( f(\uparrow \text{technology}) \).
The Solow Diagram and Steady State \((k_0)\)

\[
y = Ak^{\alpha}
\]

\[
\Delta k = sy - (n+d)k
\]

See pages 24, 25 & 26 in Jones
Changes in Savings and Population Growth Rates
Growth and Savings may be Related: But we cannot assign causality

Saving and Growth, Latin America and E. Asia
Percent of GDP, 1984-1993
Solow Conclusions

• Differences in income levels due to:
  – More investment
  – Lower population growth rates

• Differences in sustained growth rates
  – Technological progress (known as Total Factor Productivity)

• Policy Conclusions:
  – Open to foreign investment and mobilise local savings
  – Technology transfer
Solow Growth Model Convergence

• When economies have the same levels of technology, investment and population growth, those countries that have lower income levels have higher rates of growth compared to higher income level countries.

• Countries starting further below the steady state (poorer countries) should grow faster than countries closer to balanced growth path.

• World capital markets should speed this process. Capital should flow from rich (high \( K, \text{ low } MPK \)) to poor countries (low \( K, \text{ high } MPK \)).
  
  \( MPK = \text{marginal product of capital} \)
Evidence on Convergence

- 1870-1990 there was a pattern of convergence among the per capita income growth rates developed “advanced capitalist” countries.

- The poorest six countries in 1870 that are presently high income countries (Sweden, Canada, Italy, Norway, Finland and Japan) display the fastest national growth rates in the period between 1870-1960.

- In the same time period the richest five countries have the slowest growth rates.
Pritchett (1997) Includes Estimates for Developing Countries

• Discussion of convergence biased by the availability of historical economic data for set of advanced capitalist countries.
  – Developing countries have been on average growing slower providing evidence for actual divergence in per capita income.
  – Between 1870 and 1990, the ratio of richest to poorest countries' income increased from roughly 9 to 1 to 45 to 1.
Divergence since 1850

Simulation of Divergence of Per Capita GDP, 1870–1985
(showing only selected countries)

<table>
<thead>
<tr>
<th></th>
<th>1870</th>
<th>1960</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richest / poorest std. dev.</td>
<td>8.7</td>
<td>38.5</td>
<td>45.2</td>
</tr>
<tr>
<td></td>
<td>0.64</td>
<td>0.88</td>
<td>1.06</td>
</tr>
</tbody>
</table>

- USA
- Ethiopia
- Chad
- Minimum

Conclusions from Pritchett (1997)

• The growth rates of advanced developed countries indicate a certain convergence in income levels which gives credit to idea of “advantage to backwardness”.

• With the larger sample of countries that include lesser developed economies, clear empirical evidence of divergence.

• Acknowledges instances of rapid growth and regional convergence (primarily in East Asia).
Introducing Human Capital

- Klenow and Rodriguez-Clare (1997) find half or more of differences in GDP per capita is due to differences in productivity
- \( y = f(k,h,1) = f(k,h) = Ak^\alpha h^\beta \)
Endogenous Growth Theory

- Relaxes the assumption of CRTS in all outputs
- No diminishing returns to capital opens the possibility that $\Delta K$ can generate external economies and productivity improvements beyond the private return
- Ideas are nonrivalrous
3. Underdevelopment as a Coordination failure

- Coordination failures occur when agents’ inability to coordinate their actions leads to an outcome that makes all agents worse off.
- Several things must work well at the same time to get sustainable development underway (self-reinforcing cycles).
- Examples
  - Decision to up skill and firms decision to locate.
  - Use of new technology.
- Reasons
  - Low expectations
  - Everyone is better off waiting for someone else to make the 1st move.
Policy and Coordination Failures

• Significant role for government in the coordination of deep interventions.
• One time interventions can be very successful (moving to a higher stable equilibrium) but bad policy can mire economy in bad equilibrium for years.
• Multiple equilibria
Coordination Failures
Game Theory in a Developing World Context

<table>
<thead>
<tr>
<th></th>
<th>Businessman 2 Invests</th>
<th>Businessman 2 Extorts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Businessman 1 Invests</td>
<td>6,6</td>
<td>1,7</td>
</tr>
<tr>
<td>Businessman 2 Extorts</td>
<td>7,1</td>
<td>2,2</td>
</tr>
</tbody>
</table>
4. Starting Economic Development: The Big Push

- Pioneered by Paul Rosenstein-Rodan, popularised by Paul Krugman in 1995.

- Circular Causality Example: Who will be the first firm to sell in a closed economy? What advantage does the first entrepreneur have in investing heavily in skills development?
  - Profitability of the first firm depends on how many other factories open. Who will buy the goods produced by the first firm to industrialise?
  - Momentum seems to be important.

- Perceived value in explaining the East Asian miracle economies.

- Strong rationale for public policy intervention.
The Big Push: Eight Assumptions

1. One factor of production (fixed labour supply)
2. Two sectors (traditional (earn 1) and modern (earn w)), where w>1
3. Each sector has a number of markets with own good (N)
4. Each good receives a constant equal share of consumption out of national income
5. Same production function for each sector with a fixed cost (F) in the modern sector
6. Modern workers are more productive after the fixed cost is paid (IRTS)
7. Closed economy (results hold if there is a sizable domestic market)
8. Perfect competition with traditional firms, modern firm is a monopolist in own market but can not change price from 1 as in competition with traditional firms
   • Can not assume perfect competition in the modern sector because of increasing returns to scale (natural monopoly)
Big Push Model

• A potential producer with modern technology is considering investing and this depends on
  – how much more efficient the modern sector is and
  – how much higher the wages (costs) are in the modern sector.
• Traditional firm uses linear technology (with slope 1), with each worker producing one unit. The wage bill and production function are coincident.
• Modern firm incurs cost $F$ and then produces with a linear technology with slope $1/c > 1$
• Price is 1, so revenues $[PQ]$ can be read off the Q axis.
• Wage bill line $W_1$ passing below point A. Low modern wage, revenue exceeds costs and modern firms will pay fixed costs and enter the market.
• With wage bill line $W_2$, passing between points A and B, the modern firm would not enter if it were the only firm because it would incur losses.
Big Push Diagram

All modern firms enter (demand expands)
Big Push: Conditions for Multiple Equilibria

• But if modern firms enter in each of the markets then wages are increased to the modern wage in all markets, income expands. Firms in each sector can sell all of their output at point B.
• Point B is profitable after industrialisation because it lies above the $W_2$ line.
• With $W_2$ as the prevailing wage rate, there are two equilibria, one in which producers with modern technologies enter in all markets and profits, wages and output are higher than before and one in which no modern producer enters and wages and output remain lower.
• If the wage line passes between A and B it makes sense to industrialise but the market will not achieve it.
Big Push Summary

- Each firm's failure to take into consideration the impact of its investments on demand for other firms' goods represents a very small distortion by itself.
- But when added up across all sectors, the resulting distortion—failure to industrialise—is very large indeed.
Big Push: Other Cases

• Technological externalities
  – Learn by watching others firms’ production techniques

• Intertemporal effects
  – Firm 1’s profits do not capture the external contribution to overall demand in period 2.

• Infrastructure effects
  – When one sector industrialises, it increases the demand for the use of infrastructure services.

• Training effects
  – Underinvestment in training because not enough demand for specialised skills and firms don’t want to lose staff.
Further Problems of Multiple Equilibria

- Inefficient advantages of incumbency
  - May slow the adoption of new technologies (or firms)

- Behavior and norms
  - Rent seeking or corruption v’s honest and reputation building
  - To trust or not to trust

- Poverty traps and access to credit
5. Kremer’s O-Ring Theory of Economic Development

- The O-Ring Model (based on the Challenger disaster)
  - Production is modeled with strong complementarities among inputs
  - Positive assortative matching in production
- Explains the existence of poverty traps and the wide gap in incomes between countries
- Assumptions
  - Workers must be sufficiently imperfect substitutes
  - Must have sufficient complementarities in tasks
- Implications of strong complementarities for economic development and the distribution of income across countries
O-Ring Theory

• Production is broken down into n tasks
• q is the level of skill, 0<q<1.
  – .95 chance of task completed successfully
• Production function: \( BF(q_i q_j) \) (2 people/tasks)
• B is characteristics of firm
• Assortative matching because (4 person economy)
  \[ q_H^2 + q_L^2 > 2q_H q_L \]
• Higher pay in the more productive firms
Implications of the O-Ring Theory

1. Firms tend to employ workers with similar level of skills
2. Workers performing the same task earn higher wages in a high skill firm
   – More than proportionally higher than a measure of skill level would predict
3. Higher incentive to invest in education when those around you are higher skilled
4. Can get caught in low-production-quality traps
   • O-Ring effects across firms as well as within firms
5. Local production bottlenecks have a multiplicative effect
6. Self-discovery: Critique of other models

• Remarkably simple view of growth fundamentals
  – foreign technology
  – good institutions.

• Failure to grow can be attributed
  – Closed-economy: governments retard technological progress by reducing access to foreign trade and investment and imported capital equipment and intermediate goods.
  – Corruption: leaders fail to respect property rights and fall traps in which sound money and fiscal policies perish
Self-discovery: Critique of Policy Performance

• Quality of policymaking in Latin America has been unmistakably and significantly better in the 1990s than it was two or three decades before.
  – But per capita income declined in these countries from an average of 22.9 percent of the US level in 1985 to 17.7 in 1999.

• Asian Growth (South Korea and Taiwan in 1960s, China since late 1970s, and India since the early 1980s)
  – South Korea and Taiwan retained high levels of protection for a long time and made active use of industrial policies.
  – China’s lack of respect for property rights
Economic Development as Self-discovery

• In simple models with perfect information, assumed that firms and countries know their comparative advantage
  – But underlying costs of production differ from country to country
• Thus nations must learn what activities are most advantageous to specialise in
• If a firm invests heavily and learns that textile production works in Bangladesh, there will be imitators (i.e. an information externality)
• But the initial entrepreneur who makes the “discovery” can capture only a small part of the social value that this knowledge generates
  – Identical to the problem faced by innovators in the advanced industrial

_policy: Encourage broad investment in the discovery phase, rationalise production afterwards (impose discipline)
Economic Development as Self-discovery

• Building blocks of the theory
  – Uncertainty about what products a country can produce efficiently
  – Local adaptation of technology is necessary
  – Imitation is often rapid, reducing profitability for pioneers

• Support investment in the discovery phase, rationalise production afterwards so that only the most productivities industries remain
Self-discovery: Evidence

- East Asian governments provided their firms during the 1960s and 1970s with both promotion (the carrot) and discipline (the stick).
- Under import substitution, Latin America was marked by plenty of promotion, but too little discipline.
- In the 1990s, Latin America has considerable discipline (provided through competitive markets and open trade), but too little promotion.
## Self-discovery: Policy Options

<table>
<thead>
<tr>
<th></th>
<th>Trade protection</th>
<th>Export subsidies</th>
<th>Government loans and guarantees</th>
</tr>
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<tbody>
<tr>
<td>Increases pay-off to innovation by...</td>
<td>...increasing the returns to success and lowering $\tilde{\theta}$</td>
<td>...increasing the returns to success and lowering $\tilde{\theta}$</td>
<td>...lowering the losses in case of failure and lowering $\tilde{\theta}$</td>
</tr>
<tr>
<td>Can discriminate between innovators and copycats</td>
<td>No</td>
<td>No, but better at rewarding high productivity activities</td>
<td>Yes</td>
</tr>
<tr>
<td>Other distortions to innovation</td>
<td>Biased against export activities</td>
<td></td>
<td>Distorts risk assessments (moral hazard)</td>
</tr>
<tr>
<td>Action required to impose discipline</td>
<td>Lowering tariffs</td>
<td>Lowering subsidies</td>
<td>Cut funding</td>
</tr>
</tbody>
</table>

$\tilde{\theta}$ is the uncovered limit productivity that means that an entrepreneur will choose to remain in the modern sector (i.e. long run revenues cover variable costs)
7. The Hausmann-Rodrik-Velasco Growth Diagnostics Framework

• Focus on a country’s most binding constraints on economic growth
• No “one size fits all” in development policy
• Not simple to find the binding constraint. Uncertainty leads to probabilistic assessments
Hausmann-Rodrik-Velasco Growth Diagnostics Decision Tree

Hausmann-Rodrik-Velasco: Guidelines

1. Moving downwards in the decision tree, rather than upwards or sideways

2. Working off at least an implicit model of what drives (or will drive) growth in the economy

3. Looking for the tell-tale symptoms that a given constraint binds (if the constraint is human capital, the skill premium must be rising while returns to complementary factors remain depressed)

4. Looking for clues that the hypothesized constraints are consistent with recent growth experience (i.e., did growth boosts occur when those constraints were relaxed?)
Hausmann-Rodrik-Velasco (HRV): Guidelines

5. Using firm-level surveys critically, cognisant that complaints do not always accurately identify binding constraints
   • Businesses may complain about access to finance when the real trouble is that they cannot document profitable projects; or respondents may be the established firms that do not represent the most dynamic part of the economy

6. Locating successful firms or sectors and tracing their success

7. Combining cross-national benchmarking, firm-level surveys, and aggregate macroeconomic data
Growth Diagnostics Framework: Dominican Republic

- HRV argue that economy is constrained by a lack of productive ideas
- BC: Lack of innovation and demand for investment to replace traditional industries
- Policy: Encourage entrepreneurship and business opportunities
Growth Diagnostics Framework: Brazil

- BC: Lack of sufficient funds to invest despite the abundance of productive ideas. Private returns are high so education, infrastructure, weak business environment are not constraints.
- Policy: Increase savings domestically and improve access to foreign capital
8. Concluding Comments

• Important to draw elements from the different models in framing the challenge of economic growth

• Delicate balance between ‘context matters most’ and ‘laws of economics are universal’