

Economic Development 570B

Lecture 1

September 2, 2003

I. Course Information

Office hours: 4:00-5:00 Tuesday, 4:00-5:00 Wednesday, and by appt.
grading – 30% Midterm, 30% Final, 20% reviews, 10% attend., partic., homeworks
readings – some books drawn on a number of times. Many journal articles can be downloaded. Others, . . .

II. Preliminary Overview of the Developing World

A. Most People Live in Poor Countries (handout)

- 1) Countries with per capita incomes below \$785 US account for 35% of world's pop.

Most of these countries are in S. Asia, E. Asia, and Sub-Saharan Africa.

If we add in "lower middle income" (between \$785 and \$3,125), we have 74% of the world's pop.

Only 16 percent of the world's population lives in "high income" countries; essentially the OECD countries.

- 2) We call the non-wealthy countries, "3rd world", "less developed," or "developing". Low incomes there

- translate into poor health
 - poor sanitation, limited access to potable water
 - very low per capita expenditure on health (col. 7)
 - low caloric intake (col. 5)
 - hence rel. low life expectancies (col. 4)
- also mean rel. low "quality of life"
 - squalid living conditions
 - low education levels
 - adverse working conditions
 - vulnerability to earnings shocks

B. Of course, aggregates mask diversity (table 2.1, WDR 1990)

- define "poor" < \$370 per annum (dollar a day); "extremely poor" < \$275

By this draconian yardstick 1/5 of world is poor, about 12% extremely poor.

- But the link between low average income and high poverty rates is surprisingly weak:
 - In sub-Saharan Africa, 30 percent of pop. was below extreme poverty line in 1985.
 - In China, only 8 percent.
 - In Latin America (much wealthier on average), 12 percent.

Put differently, income distribution matters a lot.

C. The problem is not going away

- Excluding China and India, pop. growth has been fastest among the poorest countries (look at Africa, E. Asia and Pacific)
- No evidence of (unconditional) convergence in per capita incomes

II. What has caused this state of Affairs?

A. Production Problems?

Low output per capita might be due to insufficient factor stocks, low quality factor stocks, or poorly utilized factor stocks

- 1) Labor force problems
 - excessive pop. growth?
 - low skill levels?
 - insufficient effort?
- 2) Inadequate capital accumulation
 - low savings rates?
- 3) Low productivity and productivity growth
 - waste in production?
 - poor allocation of capital or labor across sectors or projects?
 - markets don't clear?
 - little innovation or diffusion?

B. Underlying Causes?

may be something to each of these explanations, but they are only proximate causes.
What causes them to occur in some countries but not others?

- 1) -externalities and market failures?
 - . tragedy of the commons
 - . poorly functioning credit markets
 - . sub-optimal provision of public goods
 - . human capital spillovers
 - . information asymmetries (e.g., sharecropping)
 - . or, coordination problem (if you invest its profitable for me to; otherwise not)

- 2) -historical accident?
 - . who got there first? (learning by doing and agglomeration economies)
 - . changing medical science
 - . initial resource endowment (see Guns, Germs and Steel)

- 3) -problems interacting with the rest of the world?
 - . not reaping benefits of free trade (comp. adv., import discipline, tech. transfer)
 - . not reaping benefits of foreign capital inflows
 - . adverse external shocks
 - . unable to absorb foreign technologies

- 4) -exploitation by the first world and its legacy?
 - . prevented emergence of entrepreneurial class
 - . extraction of wealth (essentially in primary products)
 - . collusion of external powers with established internal power brokers to prevent emergence of industry

(We'll explore each of these except the last one.)

III. The Structure of the Course (syllabus)

A. What we'll Cover

Section I: Historical background on the regions of the world, and on the field of development economics. Also, narratives on conditions in the developing countries.

Section II: We'll document the patterns of development the world has witnessed; the "stylized facts" regarding structural transformation, growth and income distribution.

Also, we'll do so basic growth accounting to determine how much growth is coming from factor accumulation versus improvements in factor productivity.

To the extent that factor accumulation matters, it is important to discuss the forces that govern accumulation. Thus section II includes a discussion of the empirical evidence on the role of physical and human capital accumulation.

It will turn out that factor accumulation is far from the complete story. That is, countries do not automatically develop by simply increasing their savings rates. The rest of the course is about what else might be going on.

Section III: A large class of models demonstrates that it's possible to have "good" and "bad" equilibria. The latter "trap" economies in poverty, but in principle are escapable *without* factor accumulation if the government is able to orchestrate a "big push". Section III is devoted to this literature.

Sections IV-VI: Human capital may play a subtle role in development it not only affects the marginal product of labor in goods and services (section IV), but (1) education decisions interact with fertility decisions: parents make both at once and the next generation deals with the consequences (section V), and (2) human capital affects an economy's ability to innovate (section VI).

Sections VII-IX: The rest of the course deals with interactions between developing countries and the rest of the world. First we'll consider general equilibrium growth models of trade and growth, along with some evidence on the relevance of these models. This will flag some issues and give us a broad organizing framework to refer back to (Section VII). Then we'll focus in on trade and industrial sector performance (Section VIII). We'll treat the specific effects of openness on market power, scale economy exploitation, efficiency, and productivity growth. These topics will be treated in relative detail because they are my current research interest. Finally, we will consider the issue of endogenous long run capital flows—how they are determined and whether they help to spur development. FDI is now viewed as a key ingredient of successful development; we'll consider the merits of this view.

B. What's Missing

The course focuses on medium and long-term forces in the development process. To get very far with this, I need to neglect a number of sub-fields studied by development economists:

- Basic growth theory (treated in 503 and 522B),
- Political economy of reform (treated in 507A)
- The role of institutions (treated in 507A)
- Transition Economics (treated in 507A)
- Rural markets; agency problems (Priyanka's domain)
- Macro stabilization, Debt
- Environmental issues
- Project evaluation

Also, given their increasing irrelevance (and the fact that I never learned much about them), we will not treat

- Planning models, and
- Marxist/Dependency theory

IV. Ruminating about development (section I on syllabus)

Some brief comments on the optional readings

Development is a strange field—not really a unified body of thought; rather a shifting discipline with only its focus on poor countries as a common thread. Krugman (1992) provides some background—I won't devote lecture time to it, however.

Development is also a topic that can be approached from a variety of perspectives. Ours will be strictly neoclassical economics, but historians, political scientists and others have lots to say. Diamond's book is one of my favorite big think pieces. You're not required to read it but I urge you too anyway. Whenever we talk about models where initial conditions lock a country into a particular fate (i.e., "history matters"), think back to Diamond: geography and climate are the ultimate exogenous variables.

If you have not traveled much in the developing world, you may not have a good feel for the conditions we are trying to understand in this course. Kaplan's book provides an imperfect substitute for first-hand experience.

V. Stylized facts of underdevelopment (Section II on syllabus)

A. Overview

Countries can exist for centuries in a kind of "low level equilibrium" Most production is household, though significant fraction (40-50%) of activity is non-agric. Most (80-90%) of population is rural. Population grows, but output merely keeps pace, either through technical improvement (e.g., new crops, double-cropping, increase in inputs like fertilizers), or through use of new land. Reynolds calls this stage "extensive growth" and argues that most all countries have passed through it at one time.

When output growth significantly outpaces population growth for an extended period, we say "intensive growth" has begun. Typically, there is a phase of growth acceleration, and then a settling down into lower, sustained intensive growth.

Reynolds argues this stage of development occurred for most countries either during (1) industrial revolution (1850-1913) or (2) post WWII boom (1945-1973). The latter are, roughly speaking, what we think of as "developing countries."

Syrquin (1986) notes that "In every decade since 1950, middle income countries have grown faster than groups with lower or higher incomes." Today I want to characterize this accelerated growth period, and in doing so, contrast features of "developed" countries with those of "underdeveloped" countries.

Unlike Reynolds, who takes a very broad view, will limit ourselves to countries considered to be "developing" during the post-WWII period.

B. Methodology

We'll characterize the transformation in terms of:

- processes of physical and human capital accumulation
- patterns of resource allocation, including international trade and net capital flows
- demographic transitions
- Poverty and income distribution

What is the "typical path" of these variables over time?

How much variation is there around this path, and is it systematic?

Over what range of income do most of the change occurs

We'll forget about structural modeling for now, and simply study reduced-form patterns of correlation. Basically, we're interested in functions like:

$$X = f(\ln Y, \ln Y^2, \ln N, \ln N^2, D_1, D_2, \dots)$$

$$X = \beta_0 + \beta_1 \ln(Y/N) + \beta_2 [\ln(Y/N)^2] + \beta_3 \ln(N) + \beta_4 [\ln(N)^2] + \dots$$

where X is the country characteristic of interest

Y is GDP

N is population

D_j are dummies occasionally used to control for things (e.g., socialism)

C. Findings for "typical" case

1. Accumulation Variables

- a) **Capital accumulation: As per capita income (in 1980 dollars) increases 400 to 5,000 (i.e., as log(GDP per capita) increases from 6 to 8.5), the typical I/GDP ratio increases from .17 to about .24.** Savings rates behave similarly.

The relationship isn't that strong—note the $R^2 = .11$

Do cross-country patterns reflect temporal patterns within countries? Crudely speaking, this one does. In time series regressions with 106 separate countries, negative slopes in only 20 cases; 56 cases had positive slopes greater than .10. Also find slope declines with per capita income, suggesting a leveling off of I and S rates.

rising I/Y and S/Y suggests:

- rising income allows everyone to save more (APS shifts)
- changing demographics
- changing returns to savings
- note causality can go investment to income, too

- b) **As GDP per capita increases 400 to 5,000, (G, T) goes from .10 to .21.** This is a tighter relationship than the one with savings, but still substantial heterogeneity across countries. ($R^2 = .395$)

suggests:

- increasing ability to pay
- redistribution among taxable groups; perhaps toward the corporate sector
- active gov't might "cause" development advances with provision of infrastructure, for example.

- c) **As income increases 400 to 5,000, public spending on education as a ratio to GDP go from (3% to 4%).** Can think of this as another dimension of investment.(Note that the

fraction of the population that is school age actually falls as GDP per capita rises.) Also, enrollment rates go from 60% to 90% and illiteracy rates drop from 80% to 10%.

suggests:

- Education is a luxury good.
- As GDP rises, the return to education increases, either because of more government subsidies (as government sector expands), or because of changes in the endowment of other factors such as fixed capital, or changes in the mix of demand for goods (especially services) and size of govt. This greater return causes an increased demand for schooling.
- Increasing school enrollments may *cause* development. People with more education are more productive.

2. Resource Allocation

- a) As income goes from 300 to 4,000, **nonfood consumption** goes from 60% to 80% (Engel's law)
- b) Since trade not strongly offsetting to domestic consumption changes, **domestic production** likewise increasingly non-food (i.e., services and industrial). Agriculture drops from 60-70% of GDP to about 10% of GDP over the income range \$400 to \$5000.

Similar patterns occur within manufacturing. Food tobacco and beverages go from 70-80% of production to 20-30% over the same income range.

Suggests:

- Demand-side Engel effects.
- As capabilities improve (human capital accumulation), move toward more sophisticated manufactured products.
- Once a minimum scale of operations is reached, it may be possible to initiate modern factory production of relatively sophisticated products and/or products that require upstream suppliers

Similar patterns are discerned from time series, within-country regressions. Here we can confirm that the transformation levels off in the higher income ranges (Syrquin, HDE1, fig. 7.2). De-industrialization eventually occurs.

- c) Within manufacturing, another clear trend is toward more intensive **use of intermediate inputs**. Overall, from 33% up to 45% of output is intermediate input use as income goes

\$575 to \$7,600. Reflects partly shift toward manufacturing out of primary; also, however, changing I-O relationships within sectors. Latter estimated to account for well over 1/2 of total increase. Within-sector effects concentrated in agriculture, although light industry gives way to heavy industry too.

(Remember this intensification of intermediate goods use for growth models, and for models with agglomeration economies.)

- d) **Labor** follows production shifts, and dramatic urbanization occurs. These responses are not only large, they are relatively predictable (refer to R^2 's). Migration to cities has outpaced demand for labor in urban areas, but I have no explicit figures on this

Suggests:

- Pull to the city reflects job shift.
- Other agglomeration economies (infrastructure, commerce)

- e) both **exports and imports** rise with development (over the 400 to 5000 income range). (From about 20% to about 25% of GDP)

suggests

- Globalization induces development (embodied technology transfers, diversified input menus, heightened incentives to innovate, learning by exporting)?
- Induced need for capital imports?
- Diversifying tastes toward foreign goods?

Aside: trade flows are strongly negatively correlated with N, population size. (why?)

Typical pattern is an increase in **primary exports** associated with early stages of intensive growth.

As development progresses, primary products fall in importance, tend to be replaced by **simple manufactured** goods. All the while, total exports are growing as a proportion of GDP

Imports are at first primarily **consumer goods**, then as domestic industry emerges with import substitutes of light manufactures, get more emphasis on **capital goods** and **intermediates** goods to service these industries. (About 40% of capital formation is machinery and equipment; most of this --e.g., 90% -- is imported.)

3) **Demographic transition and income distribution**

- a) income-related fall in **birth rate** exceeded by fall in **death rate** until reach \$600;

then switches. (45/1000, 18/1000) to (25/1000, 10/1000). (**refer to xerox of WDR 1985 graphs**)

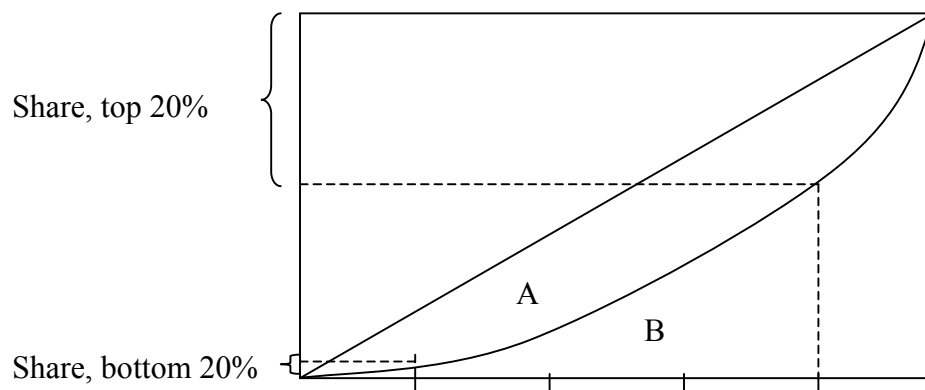
Noteworthy that population growth rates are much higher for LDCs than industrialized world experience when it began intensive growth. Reason: advances in medical science have dramatically reduced death rates -- first in 1920s, and again after 1945. Contributed to surplus labor problem. Note also that demographics vary a lot across countries at given per capita income levels.

When birth rates and death rates are high, the population is skewed toward the young; development shift the distribution toward older people. One issue is the dependency ratio.

b) Income distribution can be measured two basic ways: functional distribution (how much does each productive factor earn?) and size distribution (how unevenly is income distributed across individuals, households, or other classes of people.) For welfare purposes we are more interested in the latter.

Measures of size distribution:

- Quintiles or similar measures
- Lorenz curves and Gini coefficients



Studying percentiles, many studies using data from the 60s and 70s found that income distribution gets less equal as income rises from very low levels to moderate levels. For example, Ahluwalia (1976) reports:

<u>income shares of</u>	<u>const.</u>	<u>ln(Y)</u>	<u>ln(Y)²</u>	<u>share ag.</u>	<u>socialist</u>
top 20%	-8.71 (.26)	49.62 (2.24)	-7.97 (2.10)	-.258 (2.15)	-9.44 (3.27)
middle 40%	34.27 (1.57)	-5.81 (.40)	.977 (.39)	.226 (2.86)	.751 (.40)
lowest 40%	74.5 (4.01)	-43.8 (3.54)	7.00 (3.30)	.032 (.48)	8.70 (5.40)

Graphs confirm this pattern.

But

Different measures of inequality have been used in different countries. In particular, Latin American studies have tended to be income-based, while others have been consumption based. Income measures show more variation because of consumption smoothing. Hence LA, when it falls in the middle income bracket creates the illusion of an inverted U. (Bruno et al):

Interestingly, in the 1960s, the countries at the low-income, low-inequality end of the curve were largely E. Asian. Since that time these super success countries have increased their per-capita income dramatically, while not changing much in terms of inequality. This has weakened the cross-sectional inverted-U picture. (see scatterplot).

A basic problem with these studies is that they presume all countries are at different points on the same path. But conditions (and prospects) for a country with \$200 in 1900 aren't the same as today, because rest of world changes, as do internal circumstances.

-exp DC were once at the LDC income levels, but as they developed pop. growth slowed much more rapidly than it has for LDCs.

Countries differ in terms of initial wealth distributions, land tenure polices, etc. in ways that persist through time. Bruno et al find that 92 percent of the total variation in a panel of 45 countries is due to persistent country effects, while only 7 percent is due to temporal variation. (Error component specification: $G_{it} = \mu_i + \varepsilon_{it}$.)

Fields and Jakubson (1992) recently re-visited the issue of temporal patterns with a better data base and got very different results:

$$G_{it} = \beta_1 + \beta_2(Y/P)_{it} + \beta_3(Y/P)_{it}^2 + \alpha_i + \varepsilon_{it}$$

Using a fixed effect estimator, they find that inequality falls in the early stages of development, then may or may not get better, depending upon whether logs are taken. For the above specification, they estimate (std. errors in parentheses):

$$\beta_2 = .030 (.013); \quad \beta_3 = -.011 (.005) \text{ without country fixed effects}$$

$$\beta_2 = -.050 (.015); \quad \beta_3 = -.010 (.004) \text{ with country fixed effects}$$

What do you think? (business cycle effects; inequality really measured?)

Bruno et al trace individual countries through time and find no systematic tendency for income inequality to decline or improve (Table 1 and figure 1).

Finally, Deininger and Squire use panel data to estimate a similar model:

$$G_{it} = \beta_0 + \beta_1 D_i + \beta_2 (Y/P)_{it} + \beta_3 (Y/P)_{it}^{-1} + \alpha_i + \varepsilon_{it}$$

where D is a dummy for socialist countries

note: $\beta_2 > 0, \beta_3 > 0$ implies falling then rising inequality
 $\beta_2 < 0, \beta_3 < 0$ implies rising then falling inequality

	Cross-Country	Within Estimation
β_0	48.6066 (30.66)	--
β_1	-15.47 (8.22)	--
β_2	-0.001078 (6.75)	.00006168 (0.90)
β_3	-4112.00 (2.53)	863.00 (0.80)
R^2	.323	.929
No. observations	223	511

Again, most of the variation is cross-country, time invariant, and there is no evidence that countries typically experience worsening, then improving Gini coefficients.

In light of all this recent evidence, most people don't believe in the Kuznets inverted U.

Nonetheless, our understanding of dispersion in material well-being remains limited (Berry, 1985):

- often based on hhds; difficult to get back to per capita measures (joint consumption; large families have lower income per capita, this not picked up. Moreover, demographics change through time.)
- not obvious how to treat public goods
- Satisfaction of basic needs hard to measure; not closely related to income (e.g., Sen, 1984)
- lifetime income most relevant; by looking at cross section get spurious inequality due to age dispersion. Again this demographic effect can be expected to change with development
- The data used are of varying quality, and not strictly comparable across countries (e.g., sometimes looking at inequality across hhds., sometimes across employees, etc.) The most recent studies (Bruno et al, Deininger and Squire) are probably the best in this respect.

5. What about poverty *levels*?

- a) The incidence of poverty clearly falls with growth in per capita income. For example, defining the extreme poverty cut-off as \$1 per day, one can count the number of extreme poor in a country. The elasticity of growth in this number with respect to growth in per capita income is about -2 and highly significant (Bruno et al, 1996). (Not limited to transition.)

So although growth isn't everything (policies directed at education, land reform, social safety nets certainly matter) it is definitely a big factor in lifting the extreme poor.

(Soon, when we consider the correlates of growth, we'll ask whether initial income or wealth distributions might influence subsequent growth.

III. NOT ALL COUNTRIES FOLLOW THE ARCHETYPE:

Sometimes it is useful to form subgroups by endowment

Large

-primary based vs. manufacturing

Small

-primary based vs. manufacturing

Large countries typically industrialize earlier than smaller countries. They are also more diversified, and less reliant on trade.

One can also form subgroups by policy:

- Socialist countries tend(ed) to have better income distributions, but suffer relatively severe problems of coordination.
- Inward oriented countries (which are concentrated among the large country group) have not done as well as outward-oriented countries in terms of growth, controlling for endowments (Syrquin, HDE1).
- It is important to bear in mind, however, that tremendous cross-country variation in performance remains within the subgroups distinguished by trade or by resource endowment.