

ECON 672: Economics of Development

Week 2: The state of development

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What Our Metrics Tell Us

We have previously identified ways to quantify and measure development, but what do these metrics tell us?

We also acknowledged that national output, GNI and GDP, are not complete measures of wellbeing and growth in a country. However, it is primarily these measures (GDPpc) we will first use to discuss the state of development.

However, we should be careful to distinguish income *growth* from income *level*; fast growth does not necessarily mean levels of income are equal between two places.

Two Groups and the Distribution of World Income

Two main groups:

- ▶ “**Convergence** club” of East Asia, the Pacific, and South Asia, especially China and India, catching up to HICs
- ▶ Other LMICs, sub-Saharan Africa, Middle East, North Africa, and Latin America, failing to catch up

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How is income distributed?

- ▶ HICs with 17% of population but 65% of world income
- ▶ LMICs with 83% of the population but 35% of world income
- ▶ 1-5-1 billion populations in LICs, MICs, and HICs (Collier, 2007) with 1-34-65 income split

The Population Tax on Growth

How does population growth affect economic growth?

Remember that $GDP_{pc} = GDP/N$, such that a faster population growth rate slows down growth in GDPpc holding GDP constant:

$$\ln\left(\frac{GDP}{N}\right) = \ln(GDP) - \ln(N)$$

Faster population growth in Africa and slower population growth in Europe and Central Asia means GDPpc is growing similarly (~2%) even if GDP overall is growing much faster in the former region.

We call this the **population tax** on growth.

GDP Growth and the Population Tax by Region

Region	GDP	Pop.	GDPpc	Pop. tax
South Asia	6.6	1.5	5.0	23.0
Sub-Saharan Africa	4.8	2.7	2.0	56.8
East Asia and the Pacific	4.5	0.7	3.7	16.4
Middle East and North Africa	3.9	2.0	1.9	51.2
World	2.9	1.2	1.7	42.4
Latin America and the Caribbean	2.7	1.2	1.4	45.9
Europe and Central Asia	1.9	0.3	1.6	17.6

Table 1: Average annual growth rates (%), 2000-2017. Population tax is population growth as a % of GDP growth. de Janvry & Sadoulet, Table 2.3

Growth Volatility and Initial Income

Income growth volatility appears correlated with initial GDPpc:

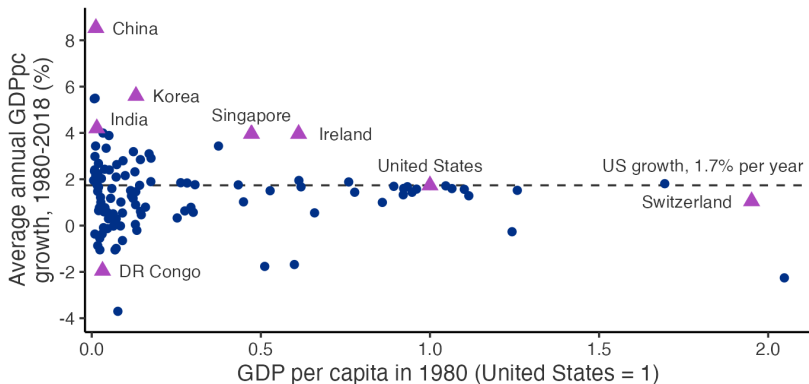


Figure 1: After de Janvry & Sadoulet, Figure 2.2

Metrics We Consider for Development

What metrics do we consider for development?

- ▶ GDP and GDPpc level and growth
- ▶ Population growth and fertility
- ▶ Volatility of growth and income
- ▶ Poverty (lines), nutrition, hunger, food prices
- ▶ *Geography* of growth, poverty, and hunger

Rural Poverty and the Agricultural Sector

...any attempt at reducing world poverty must first and foremost focus on the rural sector, one reason why the performance of agriculture is so important for poverty reduction in the developing world...rural populations must be prepared to migrate successfully out of poverty instead of transposing poverty from the rural to the urban population. This requires investing in their human capital, while rural education has typically lagged far behind urban achievements. The rapid rise of urban slums testifies to this lack of preparedness of rural people when they reach urban labor markets.

— de Janvry & Sadoulet, p. 62

Measuring Inequality

Average income levels hide inequality! How do we measure this?

- ▶ **Gini coefficient:** 0-100 for perfect income or wealth equality to perfect inequality
- ▶ **Kuznets inverted-U curve:** a negative parabolic relationship we observe between income per capita and income inequality
- ▶ Growth rates of the Gini coefficient: capture how inequality is changing over time along with income growth

How World Inequality Has Changed

How has *world* inequality changed over time?

1. Growth produces inequality (e.g. China, Vietnam) but social programs can redistribute growth and reduce inequality (e.g. Brazil). Both markets and governments have roles to play.
2. Incomes grew and inequality fell in all regions between 2000 and 2008, showing temporary convergence is possible.
3. Income growth was generally concentrated in populous countries (e.g. China, India), leading to a fall in population-weighted inequality. This growth lifted huge numbers out of poverty, leading to the rise of a new global middle class.

The World Distribution of Income

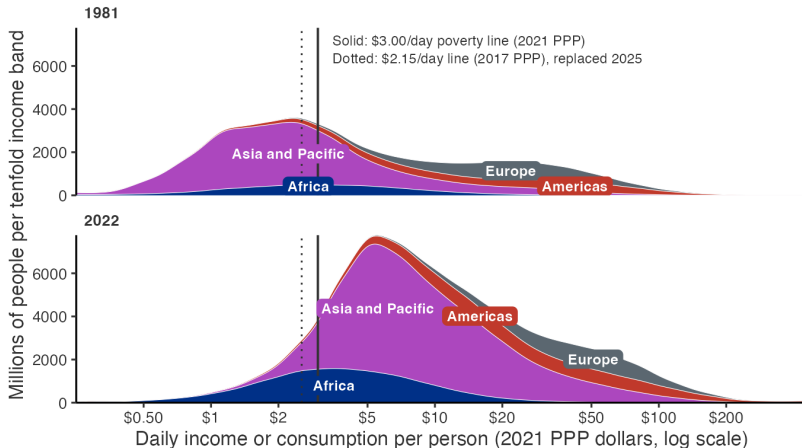


Figure 2: World Bank PIP, 2021 PPP. After de Janvry & Sadoulet, Figure 2.11

Basic Needs: Health and Education

We also consider *basic needs*, health and education. Here we observe more progress than with GDPpc but still not perfect convergence.

- ▶ Bounded vs. unbounded outcomes may drive some differences
- ▶ Life expectancy and education catching up, infant mortality less so
- ▶ Policy priorities in funding public services matter in addition to income growth

Sustainability and the Emissions Tradeoff

Is growth sustainable?

- ▶ Food, funding, climate vulnerabilities
- ▶ Rising energy and water usage (from AI)
- ▶ Resource scarcity, deforestation, and environmental damage
- ▶ Negative externalities from growth

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Emissions-growth tradeoff:

- ▶ If growth requires large emissions, should developing countries be allowed to pollute in order to catch up?
- ▶ Who bears responsibility for cutting their emissions most quickly or sharply?

Multidimensional Quality of Life

Multidimensional measures for *quality of life*:

- ▶ Happiness generally correlates with income, *World Happiness Report* and *World Values Survey*, but at higher levels of income other factors matter
- ▶ Institutional and government quality determines corruption levels, public service provision, property protections, and more factors critical for growth
- ▶ Democratic freedoms expanded and armed conflict and violence declined after the Cold War, all positive for growth, though both trends have reversed since the mid-2010s

Explaining Uneven Convergence

How can we explain this uneven economic convergence we observe?

We will briefly¹ consider several models of growth at the **macro** level, across entire economies.

Generally these models include:

- ▶ **factors of production:** land, labor, capital inputs
- ▶ a **production function:** turns inputs into output
- ▶ **factor productivity:** scaling how technology, institutions, and factor quality in production change over time

¹We will not cover the structural form or solution to these models here. However, I recommend trying to solve these models yourself, starting on p. 220.

Models: Criteria and Components

What makes a good economic model?

- ▶ Simplification of messy reality but still useful
- ▶ Unnecessary complexity is eliminated in favor of tractability
- ▶ Assumptions (sometimes strong) are made and reassessed
- ▶ Positive and normative analysis can be conducted

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Components of a model:

- ▶ **Exogenous** variables, policy instruments and environment
- ▶ **Endogenous** variables, outcomes of interest
- ▶ **Functional forms** for behavior, technology, or institutions

Harrod-Domar and Solow

General models of growth:

- ▶ Harrod-Domar: post-Great Depression; saving, foreign aid, and constant marginal product of capital drives growth
- ▶ Solow: post-HD; decreasing marginal product of capital leads to a **steady state** conditional convergence; [total] factor productivity (TFP) drives growth

These models consider:

- ▶ Capital and labor used in the production process
- ▶ Investment equal to savings, determined by a savings *rate*
- ▶ Constant capital depreciation and population growth

Limits of These Growth Models

Limits of these models:

- ▶ Endless borrowing to fund endless capital lead to debt crises
- ▶ Where does TFP growth come from? Backwardness advantage?
- ▶ Universal convergence does not hold in the data; conditional convergence appears to
- ▶ Other factors besides population growth, saving, depreciation, and TFP likely affect growth
- ▶ We do not see labor and financial capital chasing faster growth and higher returns in LDCs (Lucas paradox)

5-minute Break

Acemoglu, Johnson, & Robinson (2001)

Randomly selected presenter: **Steph**

1. What is the research question?
2. How do the authors answer it?
3. What do they find?
4. Are you convinced by the design and results?
5. How does the paper connect to our other readings?

Instrumental Variables (IV) Approach

This paper (and most other papers) wants to estimate the *causal* impact of some X on some Y , but faces the problem that variation in X is not *exogenous* or (as-good-as) randomly determined.

One method to address this is to find some variable Z that is correlated with X and affects Y *only through* X . If we first regress X on Z and then use the predicted values of X to estimate the effect on Y , we can isolate the causal effect of X on Y . This approach is called **instrumental variables** (IV) estimation² and Z is called an **instrument**.

This approach relies on two key assumptions:

1. **Relevance:** Z is correlated with X (we can test this)
2. **Exclusion restriction:** Y is not affected by Z except through X (we cannot exhaustively test this)

²We implement this two-stage process using Ordinary Least Squares (OLS), and thus call this type of IV estimation **two-stage least squares** or 2SLS.

Instrumental Variables in AJR (2001)

The authors ask how much a country's institutions shape its income today, across a sample of 64 former colonies. Regressing income on institutions directly will not answer this, since richer countries may also be able to afford better institutions.

- ▶ Y : log GDP per capita in 1995, PPP basis
- ▶ X : protection against expropriation risk
- ▶ Z : log mortality rates faced by Europeans in the colonies

Relevance: where disease killed European settlers, colonizers extracted resources rather than settling, and those early institutions persist into the present.

Exclusion restriction: the diseases that killed Europeans, mainly malaria and yellow fever, were far less deadly to local populations who had acquired immunity, so settler mortality is unlikely to be correlated with the health burden a country carries today.

Group Discussion

Bringing together our lecture material and academic article, I have prepared the following suggested discussion questions:

1. What factors shape development? How might policy be designed to improve growth? Where might it fail?
2. What measures are used to discuss “development”? Are these measures comprehensive given what we discussed last week? What are their limitations?
3. We often talk about “good institutions” as a vital ingredient of development; how might we define such “good institutions” and why might these matter so much for development?

Roadmap

Looking Ahead to Week 3

What do we have on the horizon before next Tuesday?

- ▶ Our **Initial Topic Proposals** assignment will be due on Friday at 6pm to identify prospective topics for the final project
- ▶ My office hours for ECON 672 will be held Tuesday before class, 12:15-2:15pm in MCL 108 or virtually by appointment
- ▶ Our third topic will be *Structural transformation and inequality*. Our textbook reading will be Chapter 8, pp. 230-244 and Chapter 6. Our required journal article will be Gollin, Lagakos, & Waugh (2014), "The Agricultural Productivity Gap," QJE.
- ▶ Our **Weekly Reading Response** assignment for this paper will be due Tuesday at 2:40pm before class. One student will be randomly selected to **present their response** to the class in 5-8 minutes.