1: Important measures of development

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1. Introduction

How do we know if a country is "developing"? This seemingly simple question has sparked decades of debate among economists, policymakers, and development practitioners. The answer you get depends entirely on how you measure development – and as you'll discover in this guide, there are many ways to do so.

Just as a simple example, consider these three scenarios:

- **Country A** has doubled its GDP per capita over the past decade, but income inequality has also increased dramatically
- **Country B** has modest economic growth but has achieved universal primary education and dramatically reduced infant mortality
- **Country C** exports sophisticated technology products but relies heavily on imported food and has frequent power outages

Which country is developing most successfully? The answer depends on what you think development means and how you choose to measure it. Development indicators can be both exciting and frustrating. On the one hand, they force people to be explicit about what they mean by "development." On the other hand, however, in practice, people who use development indicators often don't think about the big ideas and normative commitments behind these numbers. After reading this short introduction to the most common development indicators, you should be ready to do better.

Why Measurement Matters

Development measurement isn't just an academic exercise. The indicators discussed below shape how real-world decisions are being made:

- **International aid** allocation often depends on GDP per capita and poverty headcount ratios
- **Investment flows** are influenced by economic complexity and governance indicators

- **Policy priorities** shift based on whether countries focus on economic growth, human development, or inequality reduction
- **Academic research** and policy recommendations depend heavily on how we define and measure development success

What You'll Learn

This guide introduces you to the most important quantitative measures used in development economics today. Rather than advocating for any single approach, we'll explore multiple perspectives – from traditional economic indicators to alternative measures that challenge conventional thinking.

Throughout this guide, we maintain a pluralist perspective that recognizes legitimate disagreement about how to measure development. Whether you're drawn to neoclassical growth theory, capabilities approaches, or structuralist critiques, you'll need to understand how different schools of thought measure progress toward their vision of development.

As you'll see, there is no "perfect" development indicator. Each measure captures something important while missing something else. The goal isn't to find the one true measure, but to build your analytical toolkit so you can choose the right tools for your research questions – and understand the implications of those choices.

2. Basic economic indicators

2.1 Gross Domestic Product (GDP)

GDP is probably not only the most widely used measure for development, but also the one that received the most critiques. The main reason is that while GDP was developed as a measure for the total income in an economy, it is often used - implicitly or explicitly - as a measure for *wellbeing*. Something it has not been designed for in the first place. But we come back to this debate later on, here is is mainly about what GDP is in the first place. If you are looking for a slightly more complete, but still very accessible introduction, read chapter 24 of Mankiw (2024).

Definition & Calculation:

A common **definition** of GDP is "the market value of all final goods and services produced within a country in a given period" (Mankiw 2024: 24).[1] GDP aggregates many different goods and services by using their market value as a common unit - for example, it adds together cars, haircuts, and smartphones by using their prices.

While this allows straightforward aggregation, it comes with drawbacks: GDP excludes most goods for which no market value is available (or uses only approximate estimations of their hypothetical market value), such as goods produced for subsistence or household consumption.

Also note that GDP focuses on **final demand**, so it does not include intermediate goods (like steel sold to car manufacturers). It also focuses on produced goods, so sales of new cars are included while sales of used cars are not.

An important distinction in practice is that of **Real vs. Nominal GDP:** Nominal GDP measures output at current market prices, while real GDP adjusts for inflation by using constant prices from a base year. For instance, if we look at the GDP for the years 2010, 2011 and 2012, nominal GDP would be calculated using the respective prices of each year. For the real GDP we need to set a

[1] Sometimes you hear GDI (Gross Domestic Income), which measures the same economic activity from the income side and should theoretically be equivalent to GDP.

base year. Assume we set 2010 as this base year. Then we compute the GDP for 2011 and 2012 using the prices from 2010 for all three years. Real GDP enables meaningful comparisons over time by removing the effect of price changes. For example, if nominal GDP doubles but all prices also double, real GDP remains unchanged - the economy has not actually grown, but only prices have.

Another important correction in the context of development is that of **Purchasing Power Parity (PPP) adjustment:** PPP corrects for price level differences between countries, enabling better comparisons across nations. This is important because the same basket of goods might cost very different amounts of money in different countries: 1,000 USD, for instance, buys more goods in India than in Norway, simply because the price level in India is much lower than in Norway. PPP adjustments convert all countries' GDP to a common currency (usually so called international dollars) based on what the money can actually buy domestically, rather than using market exchange rates.

Common Data Sources:

- World Bank World Development Indicators (WDI):
  - `NY.GDP.PCAP.CD` (current US$)
  - `NY.GDP.PCAP.KD` (constant 2015 US$)
  - `NY.GDP.PCAP.PP.CD` (PPP current international $)
- IMF World Economic Outlook Database: GDP per capita, current prices & PPP
- Penn World Table 10.01: `rgdpe` (expenditure-side real GDP), `rgdpo` (output-side real GDP), `rgdpna` (national accounts).
  - The expenditure-side measures GDP from spending (consumption + investment + government + net exports), while output-side measures from production value-added.

What it captures and other advantages:

- Market value of final goods and services, i.e. overall productive strength
- It correlates with many more fundamental welfare measures
- Standardized methodology across countries through the UN System of National Accounts
- Long time series available (back to 1960s for most countries)
- High frequency updates (annual, some quarterly)

What it omits and other disadvantages:

- It has not been designed as a measure for well-being
- Correlation with fundamental welfare measures does not imply causality
- Does not consider the informal economy, unpaid work, subsistence production and non-market activities (significant in developing countries)
- Ignores aspects, such as income distribution, or environmental costs and resource depletion
- Market prices may not reflect social value

2.2 Gross National Income (GNI) per capita

Definition & Calculation:

GNI equals GDP plus net income from abroad (labor and capital income earned by residents in other countries minus income earned by non-residents domestically). This captures income earned by residents regardless of where production occurs. The World Bank uses the Atlas method (3-year average exchange rates) to smooth currency fluctuations. GNI is also available in PPP terms using the same adjustment as GDP.

Data Sources:

- World Bank WDI: `NY.GNP.PCAP.CD` (Atlas method), `NY.GNP.PCAP.PP.CD` (PPP current international $)
- World Bank country classifications based on GNI per capita Atlas method

What it captures and other advantages:

- Widely available and standardized definition
- Captures income flows to residents regardless of location
- Used for World Bank income classifications (low, lower-middle, upper-middle, high income)
- Other advantages similar to GDP

What it omits and other disadvantages:

- Data availability sometimes limited for net income flows
- Less frequently used than GDP in policy discussions
- Other disadvantages similar to GDP

2.3 Application: Comparing GDP and GNI

There is the very useful package `WDI`, which allows you to download many development indicators from the World Bank database directly.

Using this data we can look at the relationship between GDP and GNI for some selected countries. See Figure 1 and Table 1. As you can see the two are usually very similar. The larger differences for some countries point to some important structural features:

- For the Philippines, GNI is much higher than GDP. This is because of the large diaspora experienced by the country, with many residences working abroad and sending remittances to their families. The resulting net primary income from abroad increases GNI above GDP.
- For Qatar, the fact that GDP is larger than GNI points to relatively large net outflows of income to foreign residents and companies. This is due to the large share of foreign workers and foreign-owned companies in the country, resulting in substantial outflows of income as remittances and profit repatriation. As a result, net primary income from abroad is negative, making GNI lower than GDP.

Figure 1: GNI and GDP for some selected countries. The dashed line shows where the two measures are equal.

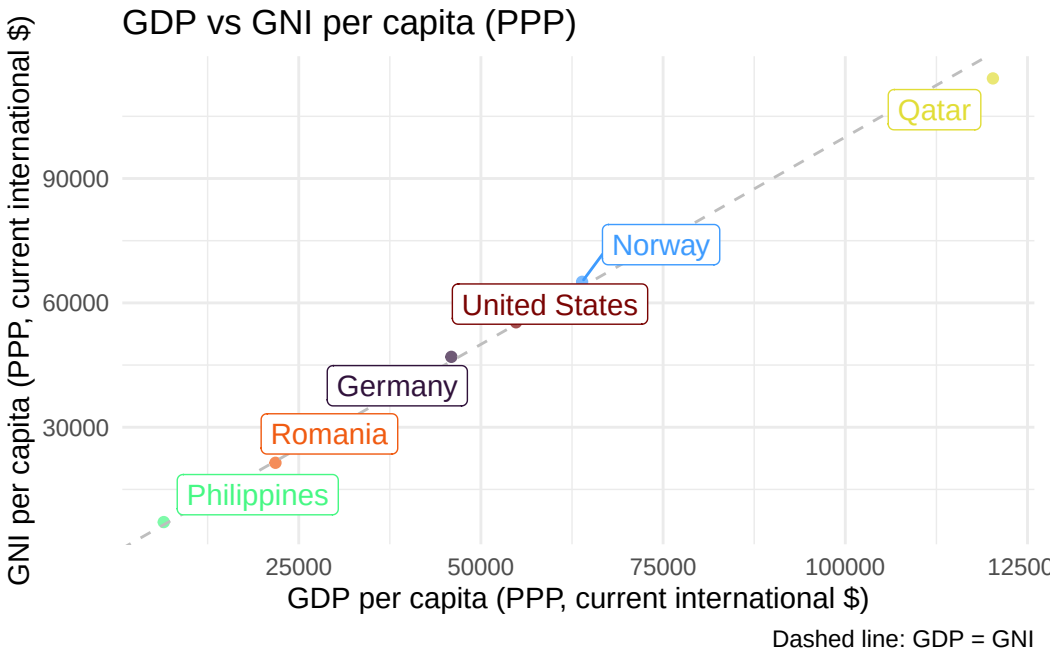


Table 1: Percental differences between GDP and GNI.

Country	Difference (%)
Philippines	9.8973412
Qatar	-5.0794819
Germany	2.2651947
Norway	1.8765902
Romania	-1.7633074
United States	0.8986123

3. Human Development Indicators

The Human Development Index (HDI) was created in 1990 as a response to the limitations of GDP as a development or welfare measure. While GDP captures economic output, it tells us little about whether this translates into better lives for people. The HDI was inspired by Amartya Sen's capabilities approach (Sen 2000) and was designed to shift focus from economic growth to human-centered development. While it was meant to provide a more comprehensive view on development, another goal was to keep the indicator simple and transparent, to ensure international comparability and computability.

3.1 Human Development Index (HDI)

Definition & Calculation:

The HDI is a composite measure that combines three dimensions of human development:

1. **A long and healthy life**: measured by life expectancy at birth
2. **Knowledge**: measured by mean years of schooling (for adults 25+) and expected years of schooling (for children)
3. **A decent standard of living**: measured by GNI per capita (PPP)

Each dimension is normalized to a scale of 0 to 1, then the HDI is calculated as the geometric mean of the three dimension indices. Countries are classified into four categories: Very High (0.800+), High (0.700-0.799), Medium (0.550-0.699), and Low (below 0.550) human development.

Data Sources:

- UNDP Human Development Reports: complete HDI data and methodology
- Individual components available from: WHO (life expectancy), UNESCO (education), World Bank (GNI)

What it captures and other advantages:

- Multidimensional measure beyond income
- Simple, intuitive methodology
- Widely recognized and comparable across countries
- Relatively long time series (1990 onwards)

What it omits and other disadvantages:

- Equal weighting of dimensions is arbitrary
- Still misses important dimensions (inequality, environment, political freedom,…)
- Aggregation masks trade-offs between dimensions
- Relies on national averages, hiding within-country disparities
- Choice of indicators and thresholds debatable
- More complex than GDP, not not as widely available

3.2 Gender Development Index (GDI) & Gender Inequality Index (GII)

Definition & Calculation:

Inequality across gender has received more and more attention in development economics. One straightforward mearues for differences between living conditions across gender is the **GDI**. It measures gender gaps in human development by calculating separate HDI values for women and men, then taking their ratio. A GDI value of 1 indicates perfect equality.

The **GII** takes a slightly different approach and considers different dimensions than the classical HDI, all more focused on measuring the living conditions of females. It takes into account three dimensions:

- reproductive health (maternal mortality, adolescent birth rates)

- empowerment (parliamentary representation, secondary education)
- economic status (labor force participation).

Higher values of the GII indicate greater inequality.

Data Sources:

- UNDP Human Development Reports
- UN Women, WHO, ILO for component indicators

What they capture and other advantages:

- Highlight gender disparities often hidden in more traditional aggregate measures
- Cover multiple dimensions of gender inequality
- Enable tracking progress on gender equality

What they omit and other disadvantages:

- Limited by data availability, especially for developing countries
- Some indicators may not capture full extent of gender inequality
- Cultural and contextual factors make it difficult to standardize across countries

3.3 Application: The HDI and its components

The HDI data can be obtained from the official homepage.[2]

Figure 2 shows the countries with the highest and lowest HDI values. The relationships between the different components are visualized in Figure 3. Correlations can be seen in Table 2.

Table 2: Pairwise correlations between HDI components.

var1	var2	correlation
Expected years of schooling	Mean years of schooling	0.7718560
Expected years of schooling	Life expectancy at birth	0.7567681
Gross national income (GNI) per capita	Life expectancy at birth	0.7426323
Life expectancy at birth	Mean years of schooling	0.7398667
Gross national income (GNI) per capita	Mean years of schooling	0.6499526
Expected years of schooling	Gross national income (GNI) per capita	0.6380733

[2]Note that you need to remove the sub-heading rows such as 'Very high human development' from the Excel file, replace the variable descriptions in line 6 with the variable names from line 5, and remove row 7 with the years to read it into R without problems.

Figure 2: The five countries with the highest and lowest HDI in 2023.

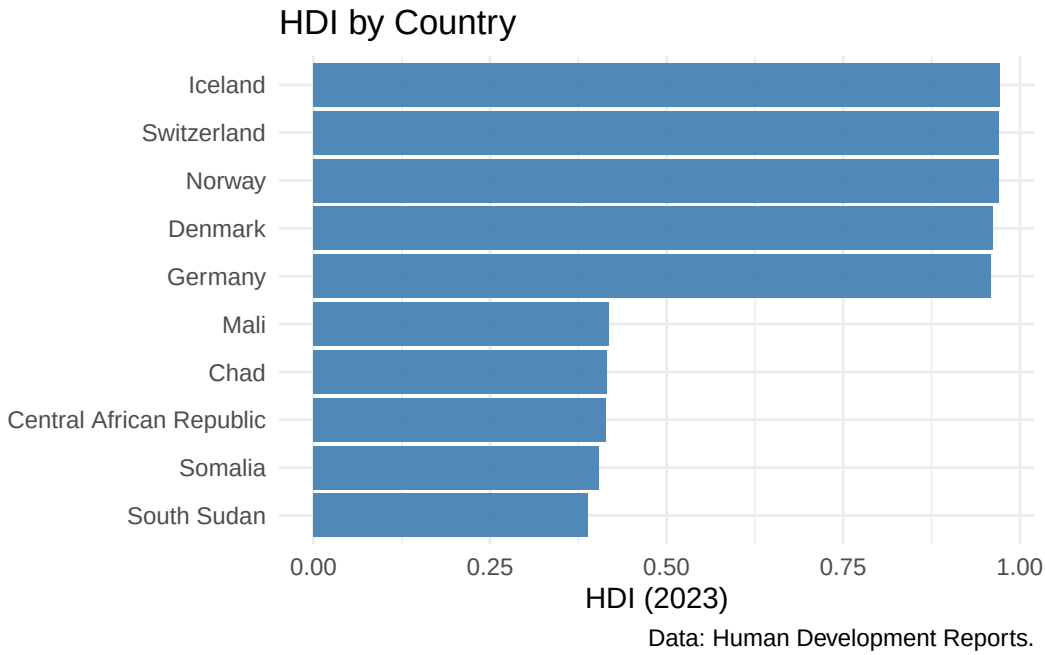
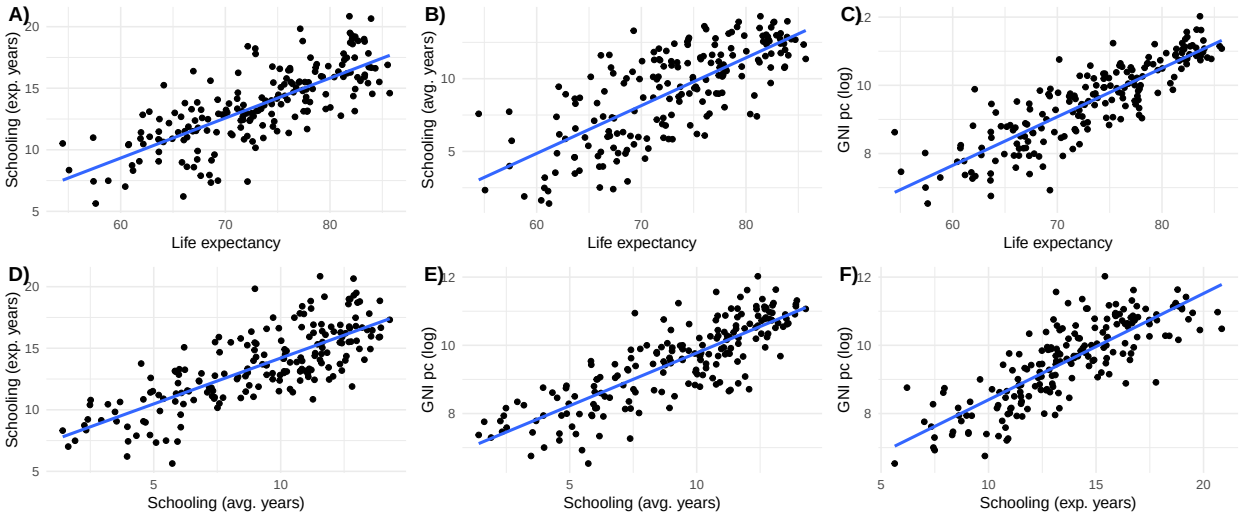


Figure 3: Relationships between the HDI components.



4. Inequality Measures

While GDP and HDI provide average measures of economic output and human development, they tell us nothing about how these outcomes are distributed within countries. Two countries with identical GDP per capita or HDI scores can have vastly different levels of inequality.

> Consider two hypothetical economies with 10 inhabitants each. In the first, each inhabitant has a total income of 100 EUR. Assuming this is the only source of income, the GDP of this economy would be 1,000 EUR. In the other economy, one inhabitant has an income of 991 EUR, while every other inhabitant has an income of 1 EUR. While the reality of this economy is very different, it has the same GDP as the first one: 1,000 EUR. To distinguish cases like this, we need to take into account inequality.

Understanding the distribution of wealth and income is crucial for studying development because high inequality can undermine social cohesion, political stability, and even future economic growth and development.

> **Wealth vs. income inequality:** It is very important to distinguish inequality in terms of income and in terms of wealth. While income inequality is much easier to measure, wealth inequality is often even more pronounced and practically relevant. Very wealthy individuals, for instance, often get much of their income from profits, dividends and interest rather than wages. So while their reported taxable income might be relatively low, their wealth can be very high. In Germany, for example, estimations suggest that wealth inequality is much higher and more pronounced than income inequality, but there are no official comprehensive data about wealth distribution in the first place.

4.1 Gini Coefficient

Definition & Calculation:

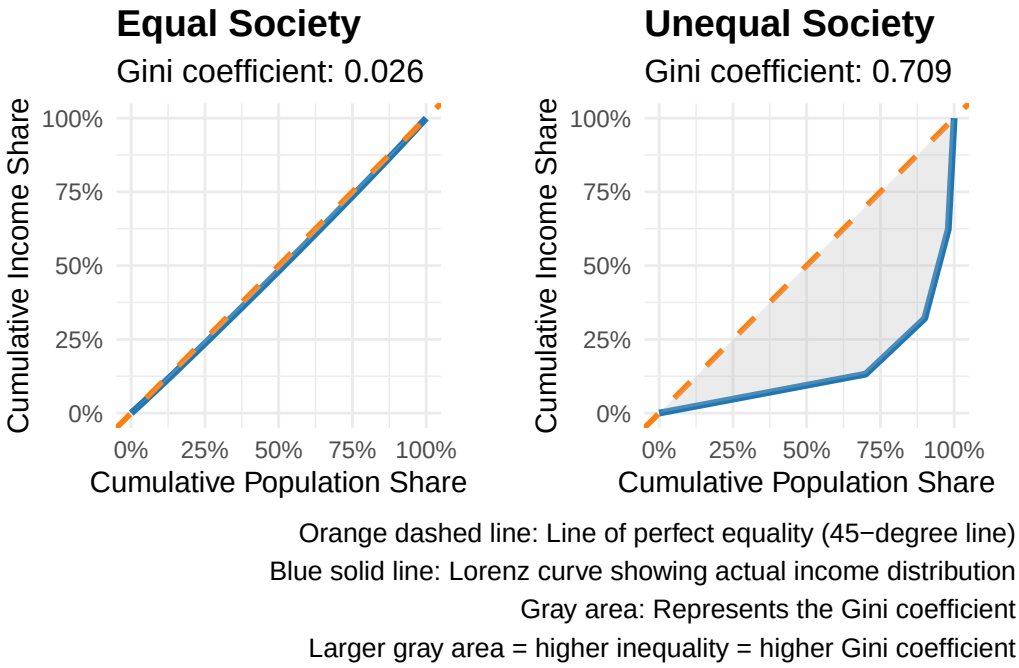
The Gini coefficient is the most widely used measure of income (or wealth) inequality. It ranges from 0 (perfect equality, where everyone has the same income) to 1 (perfect inequality, where one person has all the income). It is often expressed as a percentage (0-100%).

The Gini coefficient is derived from the *Lorenz curve*. You get the Lorenz curve if you plot the cumulative percentage of total income received on the y axis, and the cumulative percentage of the population (ranked from poorest to richest) on the x axis. In a perfectly equal society, where each person has exactly the same income, the two percentages are always equal and the Lorenz *curve* is actually a straight 45 degree line. If there is at least a little inequality, the curve emerging from connecting the actual observations diverges from the straight line. This is visualized for two examples in Figure 4. The Gini coefficient is then defined as the area between the Lorenz curve and the line of perfect equality, divided by the total area under the line of perfect equality. While this sounds complex, Figure 4 shows its actually pretty straightforward.

Data Sources:

- World Bank PovcalNet: `SI.POV.GINI` (Gini index)
- World Inequality Database (WID.world): comprehensive inequality data
- Luxembourg Income Study (LIS): harmonized microdata

Figure 4: The relationship between the Lorenz curve and the Gini coefficient for two hypothetical cases.



- World Income Inequality Database (WIID)

What it captures and other advantages:

- Single number summary of entire income distribution
- Widely used and internationally comparable
- Relatively intuitive interpretation
- Available for many countries over long time periods

What it omits and other disadvantages:

- Same Gini value can represent very different distributions
- Sensitive to data quality and survey methodology
- May not capture informal economy or non-monetary income
- Can be influenced by outliers at top or bottom of distribution

4.2 Income/Wealth Share Ratios

Definition & Calculation:

Income share ratios compare the income (or wealth) held by different parts of the population. Common measures include:

- **Top 10% income (or wealth) share**: percentage of total income (wealth) held by richest 10%

- **Bottom 40% income (wealth) share**: percentage of total income (wealth) held by poorest 40%
- **Top 1% wealth share**: percentage of total wealth held by richest 1%

These measures complement the Gini coefficient by focusing on specific parts of the distribution. Especially for wealth shares, there is a lot of discussion about the adequate estimation methodology, as wealth is, unfortunately, often not officially recorded and often remains hidden.[3]

Data Sources:

- World Inequality Database (WID.world): top income and wealth shares
- Credit Suisse Global Wealth Reports: wealth inequality data
- World Bank: shared prosperity indicators (bottom 40% income growth)
- Oxfam reports: wealth concentration statistics

What they capture and other advantages:

- Focus on specific parts of distribution (especially extremes) gives information hidden by aggregate measures such as the Gini
- Can reveal changes in top-end inequality not captured by Gini
- Makes it easier to compute measures for wealth inequality
- More intuitive than Gini for understanding concentration

What they omit and other disadvantages:

- Only capture part of the distribution
- Wealth data often less reliable
- Different methodologies across countries and sources
- May not account for differences in household size or composition

4.3 Palma Ratio

Definition & Calculation:

The Palma ratio divides the income share of the top 10% by the income share of the bottom 40%. It is based on the empirical observation that the middle class (50th-90th percentiles) tends to receive about half of total income across countries. It is, therefore, an insightful complement to the other inequality measures. But because of its simplicity and straightforward interpretation, some see it also as superior compared to the Gini and other wealth share indicators (Cobham and Sumner 2014).

Data Sources:

- UNDP Human Development Reports
- Academic studies and policy reports
- Calculated from household survey data

What it captures and other advantages:

[3] If you are interested in this topic, you might want to check out books like Zucman and Piketty (2016) or Saez and Zucman (2019).

- Focuses on the parts of distribution that vary most across countries
- Less sensitive to measurement errors in the middle of distribution
- Simpler to compute and to interpret than Gini coefficient
- Policy-relevant for targeting interventions

What it omits and other disadvantages:

- Ignores inequality within the top 10% and bottom 40%
- Assumes stability of middle class share (may not hold universally)
- Relatively new measure, not as accessible as Gini

Application: Comparing income and wealth inequality

You can get a lot of key inequality indicators from the WID.world database. For this example I the post tax data directly from their webpage and compare the 10% shares for income and wealth.

Figure 5: The relationship between income and wealth inequality, measured by the top 10% shares as an average between 2010 and 2023. The orange dashed line shows perfect equality between income and wealth concentration. Source: WID.

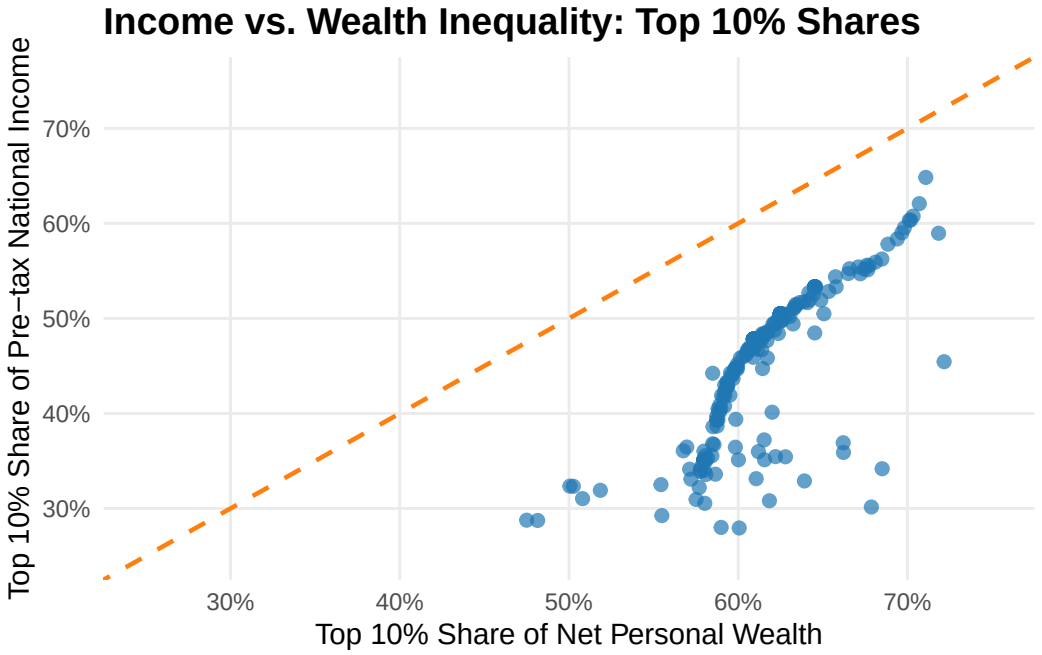


Figure 5 reveals a number of interesting patterns:

- **Strong positive correlation:** Countries with higher income inequality tend to have higher wealth inequality
- **Wealth inequality exceeds income inequality:** All points lie below the orange diagonal line, showing wealth is more concentrated than income in all countries

From a policy viewpoint this means that focusing only on income inequality underestimates true economic inequality considerably - wealth concentration provides a more complete picture. From

a methodological perspective this demonstrates why using multiple inequality measures (income vs. wealth shares) reveals different aspects of economic inequality that single measures miss.

5. Poverty Measures

While inequality measures show how resources are distributed across the entire population, poverty measures focus specifically on those at the bottom of the distribution. Poverty measurement is crucial for development policy because it identifies who needs help most urgently and tracks progress in improving living conditions for the worst-off. However, defining and measuring poverty involves fundamental choices about what constitutes a minimally acceptable standard of living, which is why poverty measures are among the most normative and most debated indicators, not only in the context of development economics, but social sciences as a whole.

5.1 Absolute Poverty Lines

Definition & Calculation:

Absolute poverty lines define poverty as living below a fixed threshold, typically expressed as daily income or consumption. The World Bank currently uses three international poverty lines:

- $3.00 per day (2021 PPP): Extreme poverty line
- $4.20 per day (2021 PPP): Lower-middle-income poverty line
- $8.30 per day (2021 PPP): Upper-middle-income poverty line

These lines are updated periodically to reflect new PPP data and changing economic conditions. Poverty headcount ratios show the percentage of population living below each threshold. These measures are critisized for various reasons, such as the PPP conversion not reflecting the living realities of the poor, World Bank statistics being very different to national estimates, or national povery lines failing to reflect the actual costs of living (e.g., Reddy and Pogge 2010).

Data Sources:

- World Bank PovcalNet/Poverty and Inequality Platform:
  - `SI.POV.DDAY` ($2.15)
  - `SI.POV.LMIC` ($3.65)
  - `SI.POV.UMIC` ($6.85)
- World Bank World Development Indicators: poverty headcount ratios
- Country-specific household surveys (LSMS, DHS, etc.)

What it captures and other advantages:

- Clear, intuitive threshold for basic needs
- Enables international comparisons using PPP adjustments (but see also below)
- Long time series available for tracking progress
- Directly policy-relevant for targeting interventions

What it omits and other disadvantages:

- Arbitrary choice of poverty line levels
- Ignores relative poverty and social exclusion
- PPP adjustments may not reflect actual purchasing power of the poor
- Binary classification ignores depth of poverty
- May not capture non-monetary dimensions of deprivation

5.2 Multidimensional Poverty Index (MPI)

Definition & Calculation:

The MPI recognizes that poverty extends beyond low income to include deprivations in health, education, and living standards. It uses 10 indicators across three dimensions:

- **Health**: nutrition (BMI/stunting), child mortality
- **Education**: years of schooling, school attendance
- **Living standards**: cooking fuel, sanitation, drinking water, electricity, housing, assets

A person is considered multidimensionally poor if deprived in at least one-third of weighted indicators. The MPI combines the incidence of poverty (percentage of poor) with the intensity (average deprivation among the poor).

Data Sources:

- UNDP Human Development Reports: global MPI data
- Oxford Poverty & Human Development Initiative (OPHI): detailed MPI methodology and data
- Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS)

What it captures and other advantages:

- Captures multiple dimensions of deprivation beyond income
- Identifies which specific deprivations affect the poor
- Can guide targeted policy interventions
- Less sensitive to measurement errors in any single indicator
- Reflects lived experience of poverty more comprehensively

What it omits and other disadvantages:

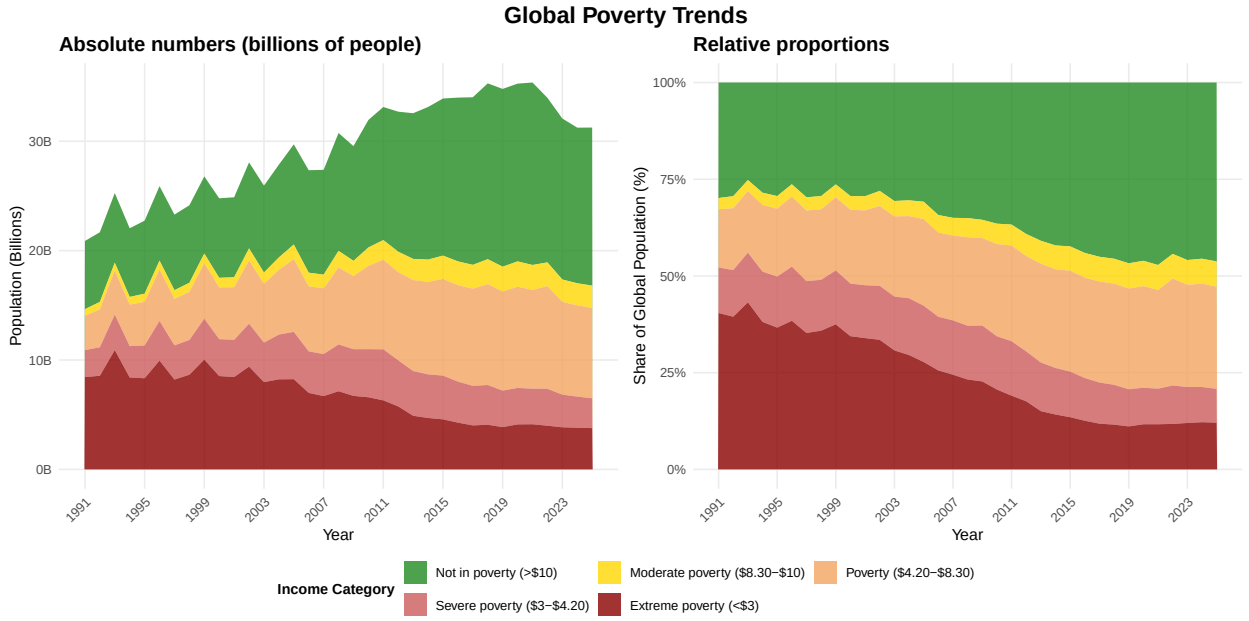
- Weighting of different dimensions and indicators is somewhat arbitrary
- Requires extensive household survey data (limited availability)
- More complex to calculate and interpret than income poverty
- Cut-off thresholds for each indicator involve value judgments
- May not capture local cultural definitions of basic needs
- Less comparable across very different contexts than income measures

5.3 Application: National Poverty Lines

Here we use data from World Bank Poverty and Inequality Platform (2025) that has been processed by the development blog and data center Our World in Data. For a subset of the world population, this visualizes the amount and share of people living in different kinds of poverty, following the official World Bank definition.

Please note that the measure used has been subject to critique, and the overall story, according to which the number of people not living in poverty has been increasing, has been called into question. The debate about the dynamics of poverty is certainly among the most important ones in development economics, also because it brings us to very fundamtental questions about capitalism and alternative economics systems. For populat contributions to this debate see, e.g., (Hickel 2019) or (Smith 2021), and for more academic examples (Sullivan and Hickel 2023) and the response in (Rutar 2024).

Figure 6: The dynamics of absolute numbers and shares of people living in poverty, as defined by different poverty thresholds. Note that all these thresholds are subject to considerable debate.



6. Economic Complexity

Economic complexity measures go beyond traditional economic indicators to assess the sophistication and diversification of a country's productive capabilities. These measures are based on the idea that economic development involves accumulating productive knowledge and capabilities that enable countries to produce increasingly complex goods and services.

6.1 Economic Complexity Index (ECI)

Definition & Calculation:

The Economic Complexity Index measures the technological complexity of an economy. By this one refers to the *technological capabilities* accumulated by the economic actors in this economy. The underlying idea is that these capabilities are an important driver, not only for growth, but for development more generally.[4]

A related concept is that of the *product space*. This is a network of products, where links between products represent the similarity in capabilities required for their production. The network shows that certain products require only a few capabilities - the products located in the periphery of the space - and other require a lot of capabilities - the products in the core. The latter are those that can only be produced by countries that have a very complex economy. This way it is a strong argument for the relevance of technological capabilities for economic development.[5]

Data Sources:

- Atlas of Economic Complexity (Harvard Growth Lab)
- Observatory of Economic Complexity (OEC)

What it captures and other advantages:

- Captures productive capabilities not measured by GDP or other traditional indicators
- Strong predictor of future economic growth and development
- Identifies opportunities for economic diversification
- Available for most countries over long time series

What it omits and other disadvantages:

- Focuses on exported goods
- May not capture all forms of economic sophistication (especially in service economies)
- Requires detailed, high-quality trade data (may exclude informal trade)
- Complex methodology can be difficult to interpret for policy purposes
- Potential bias toward manufacturing over other forms of economic activity ("there are other ways to develop")

6.2 Application in R: Economic Complexity and Development

- Strong correlation with GDP per capita, helpful in predicting future growth
- But there are other ways to get rich, e.g. by exporting particularly valuable resources such as oil
- Therefore, controlling for resources significantly improves the explanatory power of economic complexity

[4] More information about capabilities and their accumulation can be found in Aistleitner et al. (2021). An overview over the measure of economic complexit is given on the Atlas website or, on a more academic level, in Hidalgo (2021).

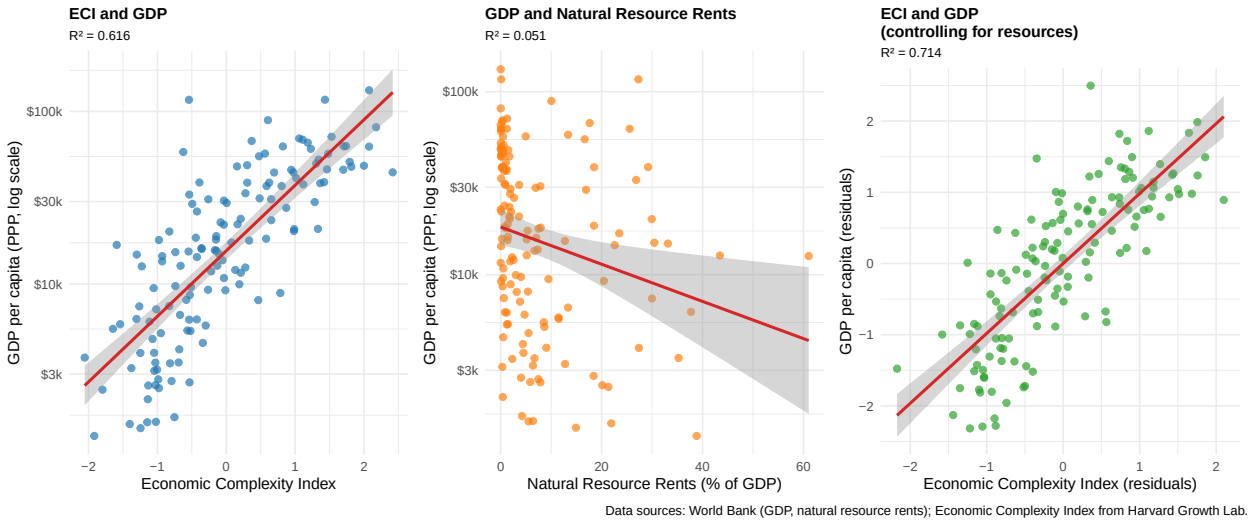
[5] More information about the product space can be found in the original article, which is still worth reading (Hidalgo *et al.* 2007).

- At the same time, resources alone are usually not considered an important driver of economic development (there is even something called the 'resource curse'.)
- In this example, we look at the correlation between complexity and income, and see how controlling for ressource endowment affects this correlation

The left panel in Figure 7 shows the correlation between ECI and income per capita. In the center we see, as an altenrative, the correlation between ressource endowments and income per capita. Then on the right panel we see the complexity-income after controlling for resources.

The data used in this example was downloaded directly from the Atlas of Economic Complexity ("Complexity Rankings & Growth Projections") and we focus on the year 2023 as this is the latest year for which the ressource data from the World Bank is available.

Figure 7: Left: Complexity-income relationship | Center: How natural resources affect income | Right: Complexity-income after controlling for resources. Resource wealth can boost income without increasing productive complexity (resource curse effect). Countries above trend lines have higher complexity/income than their resource endowments predict.



7. Social Development Indicators

While there are many more or less sophisticated development indicators out there, it is often more revealing to measure directly what you are interested in. An while the precise definition of 'development' remains contested, most agree that improvements in health, education, and basic living conditions are something positive and something associated with development. Thus, it is often most insightful to study these issues directly. Here is a short exposition of some of the most widely used fundamental welfare indicators - if you explore, for instance, the World Bank Data Section, you will surely find more!

7.1 Education Indicators

Key education indicators:

- **Literacy rate**: Percentage of population aged 15+ who can read and write
- **Mean years of schooling**: Average years of formal education received by adults 25+
- **Expected years of schooling**: Total years a child entering school can expect to receive
- **Net enrollment ratios**: Percentage of official school-age children enrolled in primary/secondary education
- **Completion rates**: Percentage of children who complete each education level

Data Sources:

- UNESCO Institute for Statistics: comprehensive education data
- World Bank WDI: `SE.ADT.LITR.ZS` (literacy rate), `BAR.SCHL.15UP` (mean years schooling)
- Demographic and Health Surveys (DHS): detailed education statistics

What it captures and other advantages:

- Direct measure of human capital accumulation
- Strong predictor of future economic development
- Gender disaggregated data available for most indicators
- Relatively standardized measurement across countries
- Long time series for tracking dynamics

What it omits and other disadvantages:

- Quality of education not captured by quantity measures
- Different education systems make international comparisons difficult
- Rural/urban and socioeconomic disparities often hidden in national averages
- Adult literacy may not reflect current education system performance
- Skills and learning outcomes not measured by enrollment/completion alone

7.2 Health Indicators

Key health indicators:

- **Life expectancy at birth**: Expected number of years a newborn will live under current mortality conditions
- **Infant mortality rate**: Deaths of children under 1 year per 1,000 live births
- **Under-5 mortality rate**: Deaths of children under 5 years per 1,000 live births
- **Maternal mortality ratio**: Maternal deaths per 100,000 live births
- **Immunization rates**: Percentage of children receiving key vaccinations

Data Sources:

- WHO Global Health Observatory: comprehensive health statistics
- World Bank WDI: `SP.DYN.LE00.IN` (life expectancy), `SP.DYN.IMRT.IN` (infant mortality)
- UN Population Division: demographic and health data
- Country health surveys and vital registration systems

What it captures and other advantages:

- Direct measure of population health and healthcare system effectiveness

- Sensitive to both income levels and healthcare quality
- Strong correlation with overall development levels
- Relatively objective and comparable across countries
- Available with gender and sometimes regional breakdowns

What it omits and other disadvantages:

- National averages hide significant within-country health disparities
- Data quality varies significantly across countries
- Some health outcomes influenced by factors beyond healthcare (culture, environment)
- Mental health and non-communicable diseases often not well captured
- Healthcare access and quality not directly measured by outcome indicators

7.3 Access to Basic Services

Key indicators for basic services:

- **Access to clean water**: Percentage of population with access to improved drinking water sources
- **Sanitation access**: Percentage with access to improved sanitation facilities
- **Electricity access**: Percentage of population with access to electricity
- **Internet penetration**: Percentage of population using the internet
- **Mobile phone subscriptions**: Per 100 inhabitants

Data Sources:

- WHO/UNICEF Joint Monitoring Programme (JMP): water and sanitation data
- World Bank WDI: `EG.ELC.ACCS.ZS` (electricity access), `IT.NET.USER.ZS` (internet users)
- International Telecommunication Union (ITU): ICT statistics

What it captures and other advantages:

- Measures basic infrastructure essential for human development
- Directly policy-relevant for government planning
- Clear benchmarks for development progress
- Often available with urban/rural breakdowns
- Strong correlation with poverty reduction

What it omits and other disadvantages:

- Access doesn't measure quality or reliability of services
- Different standards of "improved" access across contexts
- Urban bias in data collection and definitions
- Cost and affordability of services not captured
- Environmental sustainability of service provision not considered

7.4 Application: Gender literacy gap and income growth

In the following example we compute the *gender literacy gap*, i.e. the difference between the literacy rales for males and females for adults older than 15 years. It is an indication for differences in capabilities for men and women.[6]

Figure 8: The relationship between the gender literacy gap and GDP. The relationship is non-linear. The estimated curve is the result of a quadratic regression model.

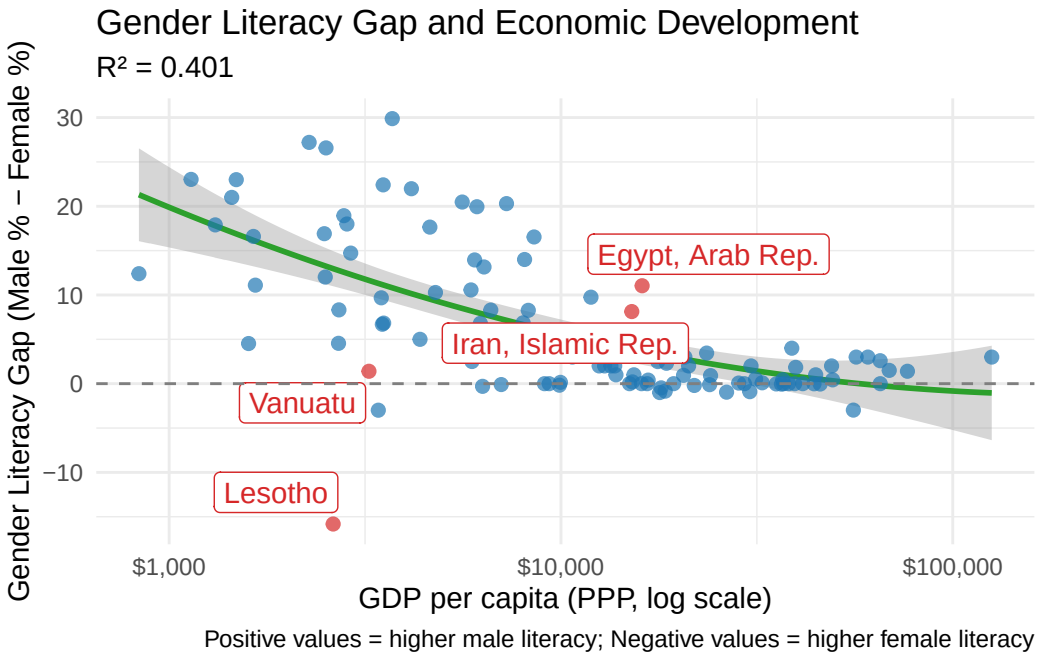


Figure 8 shows that there is a negative, non-linear relationship between total income, as measured by GDP per capita, and the literacy gap. Richer countries tend to have a smaller literature gap, but the data does not tell us whether (a) countries are rich because of smaller gender inequality, or (b) gender inequality is easier to reduce in wealthy countries. The simple regression might also suffer from important variables being omitted. So you would need more sophisticated analysis tools to answer this important question about causality. Still, the observation as such is already interesting.

Interesting is, however, not only the relationship, but also the outlier countries, that do not align well with the predicted relationship. For instance, there are some countries with very high literacy gaps despite being rather rich: Egypt and Iran are such examples. One explanation could be that both countries have acquired their wealth because of the export of particular resources, which do not require a very educated population. But again, further investigation would be necessary to reveal the true reasons.

Similarly, there are some countries with very low literacy gaps, despite being rather poor. The most notable example is Vanuatu, an island nation in the South Pacific made up of over 80 volcanic islands. The country has one of the region's lowest gender literacy gaps because policies and community efforts have helped ensure that both boys and girls have nearly equal access to primary schooling,

[6] As in many cases, data is available for women and men only; data about other gender is usually hard to obtain.

resulting in similar literacy rates for men and women despite a very traditional culture and strong gender inequalities in other areas of life.

Finally, Lesotho is an interesting case as it has a highly negative literacy gap with women being far more literate than men. Lesotho's negative gender literacy gap results mainly from male labor migration reducing boys' school attendance, higher dropout rates among boys due to cultural and economic factors, as well as strong policy emphasis on female education, which has led to very high female literacy rates.

8. Summary

This guide provided a practical introduction to the most important quantitative measures used in development economics. Here we focused on economic and social indicators, but note that often environmental measures are also very important for understanding sustainable development. So you might want to complement these measures with environmental indicators, which we'll cover later.

Key Takeaways for Your Studies

There is no "perfect" development indicator. Each measure we've explored - from GDP to HDI to inequality indices - was designed for specific purposes and captures different aspects of development. This isn't a weakness; it just means that you need different tools analytical toolkit and you need to learn how to use them together.

Think like a researcher: Before diving into data, always ask yourself: *What exactly am I trying to understand?* Are you interested in economic output (use GDP), human capabilities (try HDI), distribution (look at Gini or Palma ratios), or productive sophistication (consider Economic Complexity)? Your research question should guide your choice of indicators, never the other way around!

Combine indicators for richer insights. The most interesting analyses come from using multiple measures together. As you've seen in the applications, comparing GDP with inequality measures, or economic complexity with resource endowments, reveals patterns that no single indicator could show.

Question the data: Every indicator has limitations - missing informal economies, hiding regional disparities, or reflecting methodological choices. Good development economists are always curious about what the numbers *don't* tell us.

Moving Forward

As you continue studying development, you'll encounter these measures repeatedly in academic papers, policy reports, and international comparisons. Now you know not just what they measure, but how to access the data yourself and - most importantly - how to think critically about what they reveal and what they miss.

The goal isn't to memorize definitions, but to become comfortable navigating the landscape of development measurement and making informed choices about which tools best serve your analytical purposes.

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