

# Development Economics

What is economic development?

Minimum requirement for a « developed » country: that the physical quality of life be high, and be so uniformly, not just for a privileged minority.

But we also value political rights, intellectual and cultural development, low crime rates, etc.

Level and growth of per capita GDP is important, but should not serve as the unique basis to define economic development

Development is also better health and education, higher life expectancy, etc.

Correlation between GDP and other desired features is not automatic.

Two good books about development issues by two development economists with very (VERY!) different points of view:

The End of Poverty, by Jeffrey Sachs

The Elusive Quest for Growth, by William Easterly

The ladder of economic development (See Sachs)

The poorest of the poor: about 1 billion people, 1/6 of humanity

too ill, hungry or destitute even to get a foot on the first rung of the development ladder

fight for survival everyday

Sachs describes a small village in Malawi:  
devastated by AIDS: just a few men between 20 and 40 years old left in the  
village. There remain mostly old women and kids  
people live in mud huts  
drought, withering crops, insufficient crop yields for proper nutrition  
lack access to malaria prevention and treatment

A few rungs up the ladder: the poor: 1.5 billion

Live above mere subsistence, but struggle to make ends meet

Even if death is not at their door, their daily life still lacks basic amenities (safe drinking water, functioning latrines...)

Note that « the poor » + « the poorest of the poor » = 40 percent of humanity

## Basic macroeconomics concepts

2 kinds of goods:

consumption goods (to satisfy human wants and preferences)

Capital goods (used to produce other goods: machines, etc.)

Income generated from producing all goods ( $Y$ ) is spent on both kinds of goods.

Households consume (C) and save (S) (some borrow too, but overall, national S is generally  $>0$ )

(all these variables are aggregates over the population)

S: households abstain from current consumption, thereby making available

(through banks, governments, stock markets, etc.) a pool of funds that firms can use to buy capital goods: investment (I)

Simple starting point of theory of growth: Firm's investment (new business, expand...) create a demand for capital goods. They add to the stock of capital in the economy which, in the future, endows it with a large production capacity: the economy grows.

But if no S, no funds available for I and so no growth...

Macroeconomic balance (in a closed economy):

Households consume and save:

$$(1) Y(t) = C(t) + S(t)$$

must be true (an accounting identity) at all dates  $t$ .

firms produce goods worth  $Y$ , and goods are of two types (consumption and capital goods) so that

$$(2) Y(t) = C(t) + I(t)$$

Combining (1) and (2) gives the macroeconomic balance equation

$$(3) S(t) = I(t)$$

Now, what about the capital stock (K):

New investment augments K and replaces the part that depreciates. Suppose that at each period, a fraction  $d$  of K depreciates. Then:

$$(4) \quad K(t+1) = (1-d)K(t) + I(t)$$

this is how the capital stock changes over time.

Two important concepts:

Savings rate:  $s=S(t)/Y(t)$

Capital-Output ratio:  $\theta=K(t)/Y(t)$

Then, combining (3) and (4), you get the **Harrod-Domar equation** (economists from 30's and 40's):

$$(5) \quad s/\theta=g+d$$

where  $g$  is the rate of growth of  $Y$ ,  $g=[Y(t+1)-Y(t)] / Y(t)$

This looks like a recipe (cook with ingredients  $s$  and  $\theta$  to achieve target  $g$ ), and for this reason, it was very influential.

A small variant allows us to see the effect of population growth:

Let  $P(t)$  be the population at  $t$  and  $n$  its growth rate, so that  $P(t+1)=(1+n)P(t)$

Then, if you convert all equations into per capita magnitudes, you get

$$(5) \quad s/\theta=(1+g^*)(1+n)-(1-d)$$

where  $g^*$  is the rate of *per capita* growth

And an approximation (since  $g$  and  $n$  are small numbers) gives the more handy version:

$$(6) \quad s/\theta=g^*+n+d$$

## **Variations of the model**

### Endogenous savings

s is the most important parameter in Harrod-Domar model. Can it really be treated like a parameter that the government can manipulate easily?

It's likely to depend on the level of per capita income.

Indeed, think first about poor countries: with the majority of people close to subsistence levels of consumption, they likely to have a low savings rate.

In middle income countries, the savings rate may be high because people aspire to become richer.

In richer countries, the fact that people are ahead of so many individuals makes it less necessary to accumulate more wealth, thereby making current consumption relatively attractive.

Under these assumptions, since  $g^* = s/\theta - n - d$ , growth is higher in middle income countries (because  $s$  is).

## Endogeneity of population growth $n$

fundamental reason why  $n$  varies with level of development: demographic transition.

What we denote by  $n$  is the net population growth rate, i.e the difference btw birth and death rate.

In poor countries, death rates are high, especially among children. Combination of high birth rate and high death rate keeps  $n$  low.

As income rises, death rates fall, but birth rate (which comes from households' decisions, so culture, norms, needs, etc.) adjust relatively slowly. At this stage,  $n$  is high.

In the long run, with further development, birth rates fall as well and  $n$  falls to a low level again.

Draw graph 3.2 here.

There is a *poverty trap*: if a country starts close to it, it ends up there.

In the absence of a policy that pushes the economy beyond the threshold, it remains stuck in the poverty trap. Policy implication: a temporary boost can have long term effects; temporarily encouraging savings, foreign aid, etc. might push a poor country out of the trap forever...

Fun point made by William Easterly: even Domar has disavowed his theory (published in 1946) in 1957!!!

But anyway, it has remained influential. Why is it so appealing? Because in this framework, we can explain underdevelopment by the existence of a « financing gap »

Then, all we have to do is identify how much it is, and donors can fill the gap with foreign aid...

But what if capital investment was in fact NOT the key to growth?

Here comes Solow...

## The Solow Model

a variation of H-D with endogenous capital-output ratio  $\theta$

We keep  $s$  constant, and as before, macroeconomic balance requires  $S=I$ .

Equation of capital accumulation:

$$K(t+1)=(1-d)K(t) + sY(t)$$

Dividing both sides by population  $P(t)$ , and recalling that  $P(t+1)=(1+n)P(t)$ , you get things with per capita variables ( lower case letters):

$$k(t+1)=(1-d)k(t) + sy(t)$$

Moreover, production function:  $y(t)=f(k(t))$ , with positive but diminishing returns to per capita capital, that is:  $f'>0$  and  $f''<0$

(figure 3.3 page 65)

so that  $(1+n)k(t+1)=(1-d)k(t) + sf(k(t))$

What does it mean? On RHS, depreciated capital + savings (per capita), which should add up to  $k(t+1)$ , but population growth which exerts a downward drag on  $k$ , hence the LHS.

(steady state diagram here)

There is a steady state (i.e, per capita variables are constant)

$$(1+n)k = (1-d)k + sf(k)$$

$$\text{or: } sf(k) = (n+d)k$$

So in the long run,  $k$  settles to some steady state level  $k^*$ , but then, so does  $y$ !

In his version of Solow, there is no growth of output per capita in the long run

(and  $Y$  just grows at rate  $n$ ) (and so no growth of per capita consumption either:

$$(1-s)f(k^*))$$

In particular, no effect of savings on long run growth...

Why? Diminishing returns to capital!

Note, however, that savings do have an impact on the level of  $k^*$ .

In the short run, increases in  $s$  push the economy to a higher trajectory, but long run growth is unaffected: the effect is eventually killed off by diminishing returns.

(However, as Basu points out: the short run can last a long time...

but Easterly would reply: what has the long run been doing all this time

easy to introduce technological progress in Solow model

Then,  $k$  (and  $y$ , and  $c$ ) grow at the rate of technological progress. In this version, we understand that technological progress is the key to long run growth. This was Solow's original point to explain growth in the US.

But what does all this say about poor countries?

Solow never mentioned poor countries in his papers on growth.