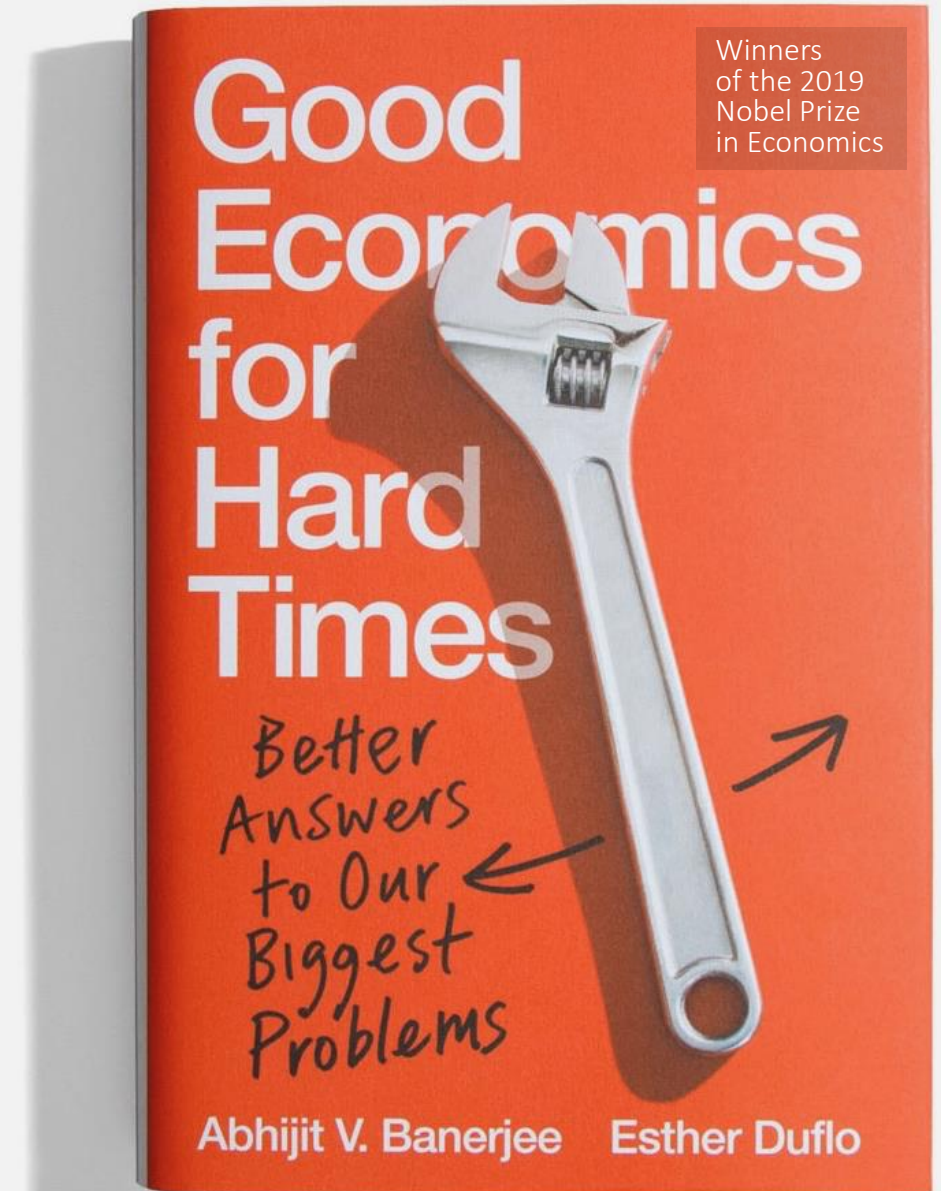


Good Economics For ~~Hard Times~~ ~~Harder Times~~ More Hopeful(?) Times

A course by Abhijit Banerjee
and Esther Duflo



Lectures 9,10, and 11: Growth

The End of Growth?

Welcome!

Conversations about growth dominate our public life

The end of poverty

The technological frontier

Entrepreneurship and
innovation

The rise of China

Climate change

Inequality

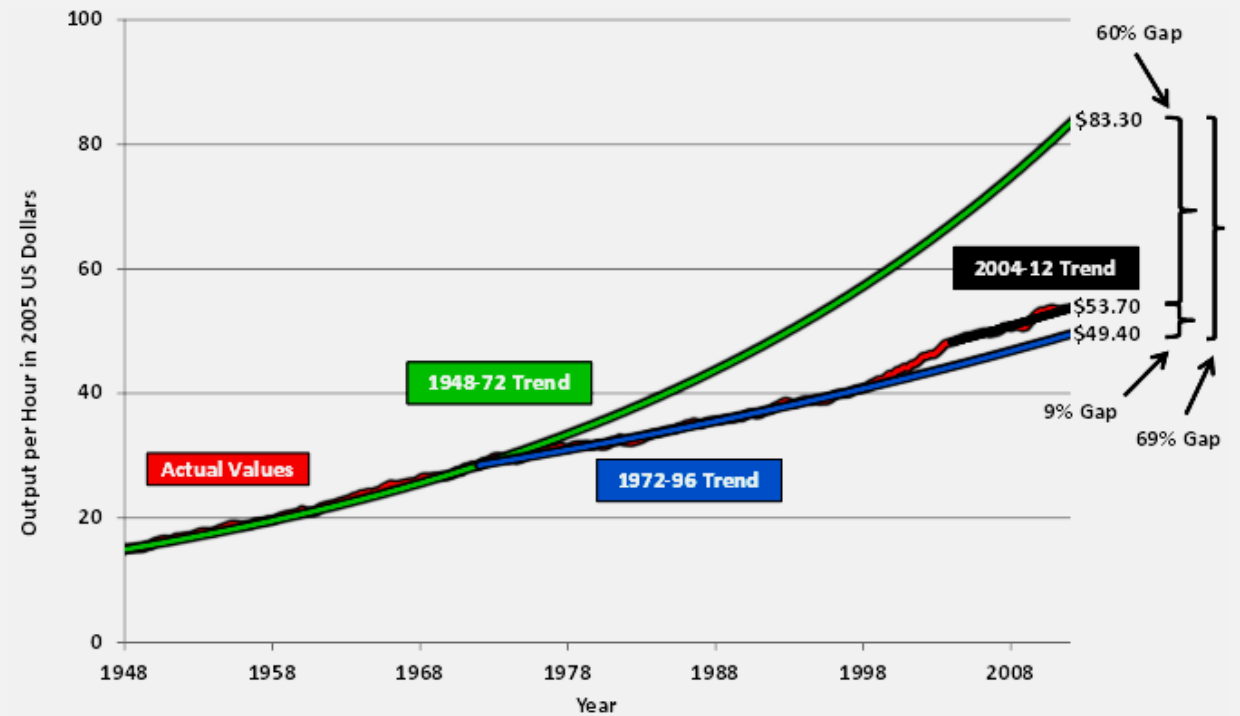
Tax policy

Green growth

Mega-corporations

End of Growth?

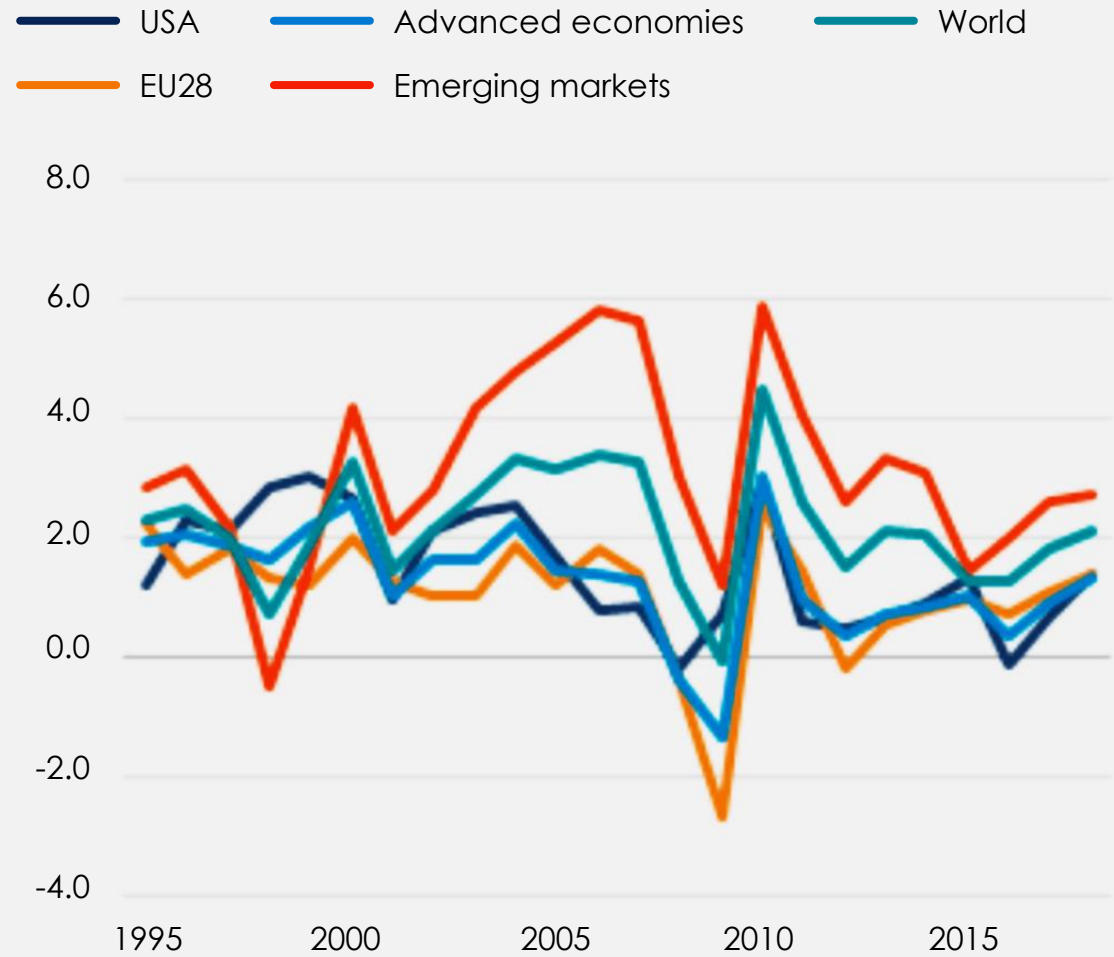
Labor productivity growth in the U.S.



Not just in the US

But not the developing world

Labor productivity growth from 1995 to 2018



Source: Conference Board, 2018

**Are we missing
something: Google,
Facebook, and all that?**

Are we missing something?

- The biggest transformation of the economy in the recent decades has been the rise of online entities that are "free" or charge a few dollars a month: Facebook, Youtube, Twitter, Instragram.
- But perhaps their benefits to consumers are much greater than what they pay.

- And maybe the benefits should be counted in GDP.
- Is GDP underestimated? And GDP growth in recent years?
- Back in 2000, about 80 billion photos were taken each year at a cost of 50 cents a picture in camera & processing fees. This was recorded in GDP.
- Today, 1.6 trillion photos are taken each year, mostly on smartphones, for "free", and excluded from that GDP data.

What is GDP?

The market value of all the final goods and services produced in a specific time period

How does Facebook get treated in GDP?

Is it the same thing as welfare?

- What are examples where they diverge?

Facebook makes money by selling advertising (an input to other firms)

What makes Facebook (and similar firms) special?

They are valued in GDP like any other input producer

Adjusting GDP for online services

- Alcott and Gentzkow (2019) carry out an experiment to understand how much people value Facebook.
- They first asked a sample of Facebook users to name their price for a month deactivation of Facebook
 - They were promised that the authors will pick a price and those who came in below that will have a chance to be paid to deactivate Facebook for a month.
- The chosen price was \$102. 61% came in below that (mean \$180).
- 580 of them, chosen at random, were paid to deactivate.
- After a month, a similar mechanism was used once again to learn how much they would now want for a month of Facebook deactivation.

What did we learn?

- Deactivating Facebook saves an hour a day
 - which can be used to spend time watching TV or with friends/family
- Deactivating Facebook improves subjective well-being
- For the deactivated Facebook use drops by 22% after reactivation
- Nonetheless they still want to be paid to give up Facebook after the first month's experience
 - Though the price is 14% lower than a month ago
- Americans would be willing to pay more than 25 billion dollars per month to hold onto Facebook even after experiencing deactivation

How much should we add to GDP?

- If we add Google, Twitter, Instagram, Youtube, etc.?
 - From Alcott and Gentzkow's estimate, could be as much as \$2T, 10% of GDP
- But how about what they gave up to be on Facebook?
 - How does it compare with the value of hanging out with friends/family, say?
- Two views
 1. Those who were asked to give up Facebook had the choice of hanging out, free.
 - Therefore the price of deactivation *is relative to hanging out*
 2. In a world dominated by social media hanging out is less fun than it used to be and Facebook use is much more of a compulsion (your friends are all there now)
 - We have no idea of how to value what we have lost
- Taking the more optimistic view could add 0.5% to the growth rate since 2000

Solow's Brave Hunch

Why slow-downs may be inevitable



Photo: Nobel Prize Foundation Archive

Robert Solow,
A prophet
of Doom?

1956, amidst the greatest expansion in history he predicts a slowdown

The logic was simple:

- In the short run growth can be very fast, driven by accumulation of capital and human capital.
- Each laborer in the economy works with more and more sophisticated inputs, which raises his productivity.
 - But at a slowing rate
 - Diminishing returns to capital/skills

What Solow's theory implies: in rich countries TFP growth is key

Countries cannot continue to grow fast forever by adding capital or human capital per worker.

- In the long run growth of output per worker is pinned down by the rate of improvements in technology

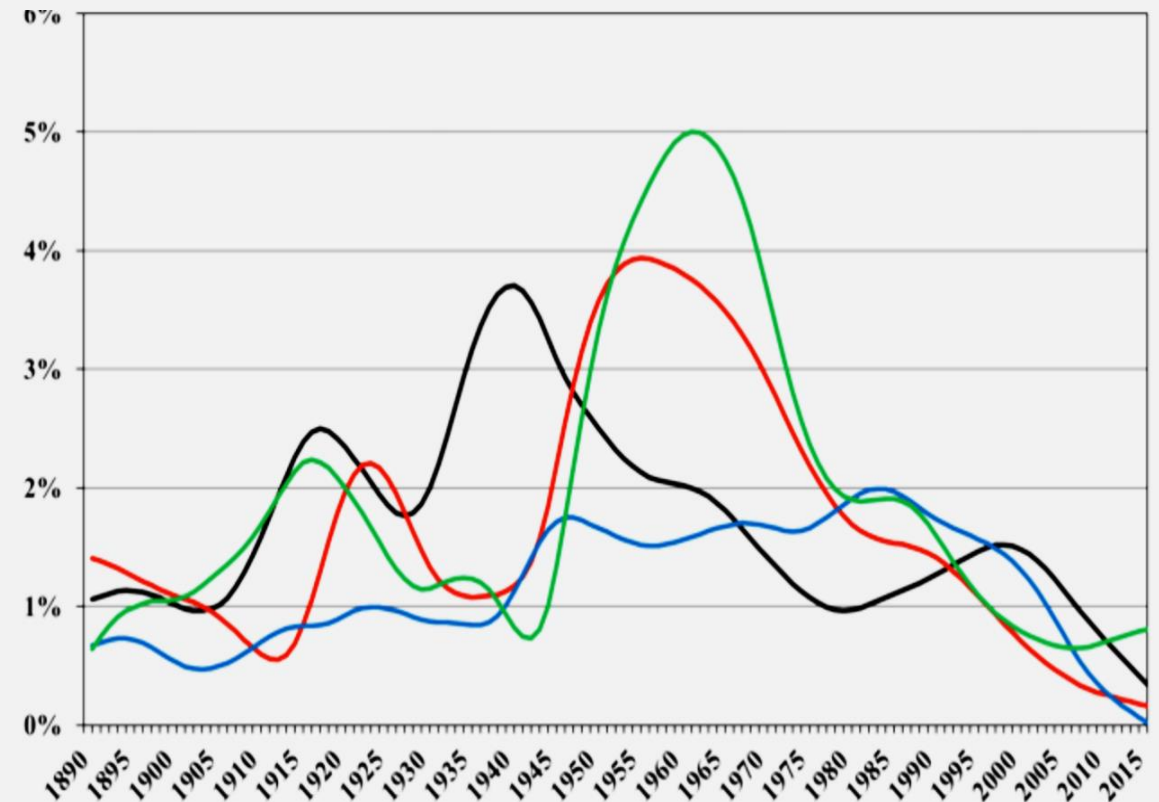
This is usually measured by TFP

- TFP is the part of growth not explained by growth in inputs—labor, capital, human capital

The slowdown in rich countries is driven by a TFP slow-down

Average annual growth rate of TFP (%)

—United States —Euro Area —United Kingdom —Japan



Isn't all the cool stuff coming out of rich countries?

May be, but the uncool stuff can be handy too

- Yesterday's technologies are available for adoption in developing countries
- Often without much patent protection

This may be one reason why TFP growth is so much higher in the Euro Area and Japan right after the war

- Adoption of technologies that were already used elsewhere
- But once that's done, it all depends on the latest innovations.

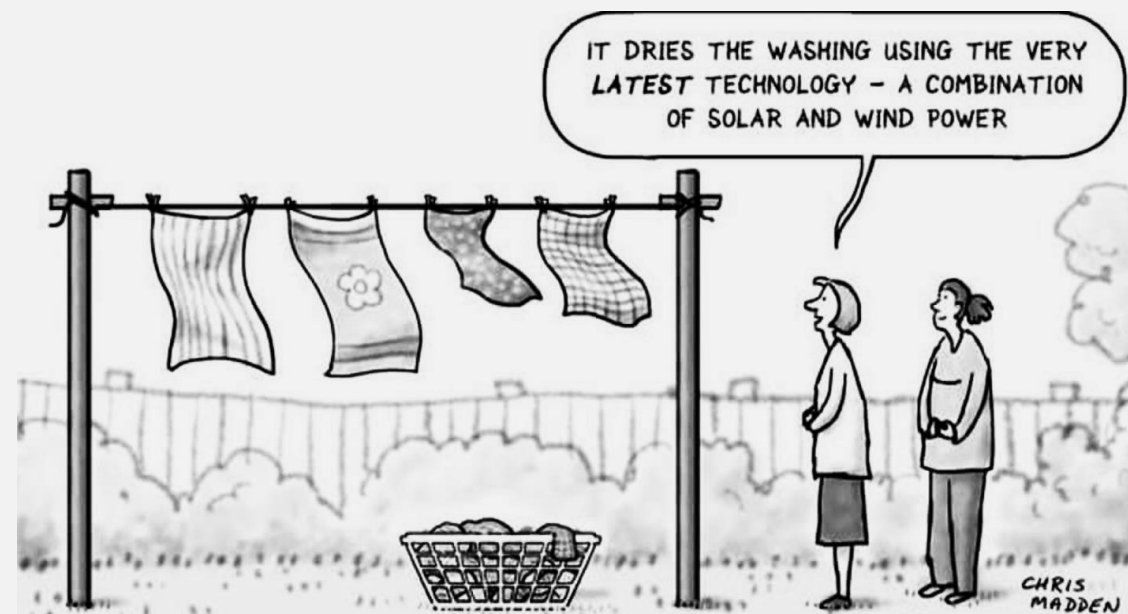


Illustration: Chris Madden

Convergence: An optimistic reading of Solow

Since poorer countries have less capital/human capital per worker, they will benefit more from investment. Also easier to raise TFP

- Predicts catch up with richer countries

A capitalist bed-time story

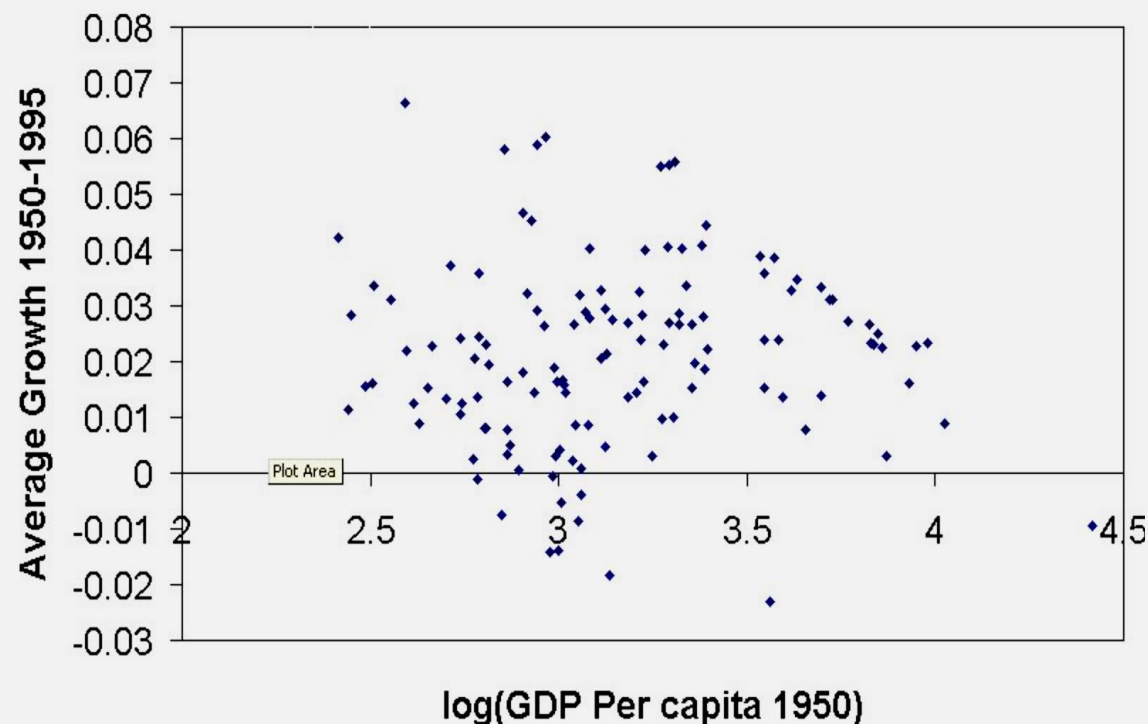
- Alas, doesn't seem to be true

But rich countries do converge...

A possible resolution: convergence only happens if countries have similar rates of investment (Solow)

- Is this the actual resolution? (wait)

No convergence across countries



Growth happens

What determines the rate of TFP growth—the main source of economic growth in the long run?

Solow took the view that TFP growth is largely beyond our control

- That they are driven by the flow of new ideas
- New ideas tend to spread across borders
 - A new great German technology will get licensed and adopted in other rich countries, which have the skills and the capital to use it

Very limited role for policy in influencing TFP growth

Sometimes called an exogenous growth model

**Can we drive
growth?**

Exogenous versus endogenous growth

In Solow's world, growth happens: there is not much to do about it (at least in rich countries).

Many economists felt that this was not the right message

In particular, convergence was not happening. Perhaps this was telling us something about the role of policy.

- Robert Lucas, University of Chicago Professor and Nobel laureate, argued that we must be missing something critical
- His PhD student, Paul Romer decided to investigate how to make growth endogenous (i.e. a result of economic choices and therefore open to influence)
- This was 1986, 30 years after Solow's original paper

The elixir of perpetual growth

At the heart of Solow's story was the idea that machines are not very useful if there are no people to run them

But how about if...The key ingredient is human capital, talented people

Perhaps being around talented people makes everyone else around more productive

- Because it elevates the level of the conversations and the debates
- Everyone benefits from the flow of ideas



Photo: AhBoon.Net | Shutterstock.com

A million Silicon Valleys



Photo: Asif Islam | Shutterstock.com

The idea is that if you keep adding “geniuses” to your firm it is easy to have too many

But if there are more and more firms around you employing a few of these talented misfits

- That is good for all the other firms
- Ideas that are in the air push productivity

These are what economists call “spill-overs”

- No one pays for them

It is these spillovers that make high-tech firms want to be in Silicon Valley (or in Kendall Square next to MIT) even though the rents are exorbitant

And in these mutually reinforcing clusters diminishing returns get defeated

- And countries can keep growing fast

Are spill-overs real?

States in the US clearly believe so

- as the recent competition to attract Amazon's HQ2 suggests

Wisconsin paid 3 billion+ to get a \$10 billion FoxConn plant

But these do not have to be productivity gains

- Firms pay taxes
- Workers can be taken off welfare rolls



Photo: Shutterstock.com

Evidence from Tennessee Valley Authority



Photo: Shutterstock.com

In 1936 TVA was set up to build roads, dams, hydel power etc. using public funds

The literature claims it was a failure

Recent re-evaluation using the fact that there were 6 areas that were initially supposed to get the same kind of project but did not because of political issues

- They argue these are reasonable

Gains in manufacturing continue till 2000

The authors compute that it added \$6.5 billion to the GDP of the region

Evidence from Million Dollar Plants

- Greenstone, Hornbeck and Moretti (Moretti also wrote the TVA paper) use the fact that counties in the US bid for plants
- They compare the winner with first runners up, which they argue were pretty similar
 - For example, BMW went to Greenville/Spartanburg (SC) over Omaha (NE)
- TFP of the plants that were already there was 12% higher 5 years after the million dollar plant was set up. Wages and employment also went up
 - \$430 million per year per county
 - BMW was paid \$115 million
- Not bad on net..

Can these spillovers drive growth?

- Could US accelerate growth by creating new industrial clusters?
- Depends on where the gains are coming from
 - One extreme:
 - The existing workers produced more from the same machines
 - The other extreme:
 - New workers and new machines had to be brought in to increase production
 - This reduced output elsewhere in the US
- The net effect on growth could be small: Moretti thinks it is
- May be very different in developing countries where good urban infrastructure is scarce and firms are forced to be either too dispersed to benefit from spillovers or too small to be efficient.

Charter cities



Photo: Shutterstock.com

Romer thinks that developing countries need better urban infrastructure

At least 130 million people in South Asia live in informal settlements without legal sanction and proper infrastructure

- Commutes are long, pollution unacceptable, health and quality of life low

He set up a non-profit to develop Charter Cities

- New urban clusters with proper regulations enforced by developed country govts.

The (unfortunate) political economy of charter cities

- His first (and only) client was Honduras which planned 20 ZEDE clusters
- It turned out however that the government was not committed to enforce the regulations (including local democracy) that Romer wants
 - Eventually Romer walked out
- It may be difficult to ring-fence charter cities from the political compulsions that create the need for them
- While building better urban infrastructure remains a plausible idea, it is not clear that it can be a source of growth for a country like the US
- And it is difficult (though not impossible) to implement in a country like India where it is probably needed

**Growing TFP:
A different kind
of spill-over**

The economics of innovation

- Firms clearly invest in innovations
- So why should we take TFP growth as exogenous?
- The following (artificial) example helps to clarify the issue
 - Suppose there is one country where all innovations take place
 - After X years, the innovation is available for adoption everywhere
 - It gets licensed to them
 - Or they find a way to get around the patent
 - Or the patent expires
 - Knowledge spills over: as a result all countries will have the same TFP growth rate, though the innovating country will always be ahead

Creative destruction

- In Romer's world firms innovate to produce more productive machines
- Because knowledge spills over, other firms can build on that innovation and come up with their own
- This is why knowledge keeps growing, even though, as any researcher knows, it is always hard to come up with new ideas because most good ideas have already been laid out
- It does not have to be quite so harmonious: firms in the real world are locked in a cut-throat competition to own the latest patent
 - They often try to tweak the previous patent-holder's idea just enough or find some other trick to win the patent race
 - There may be too much innovation (Aghion-Howitt, 1990)

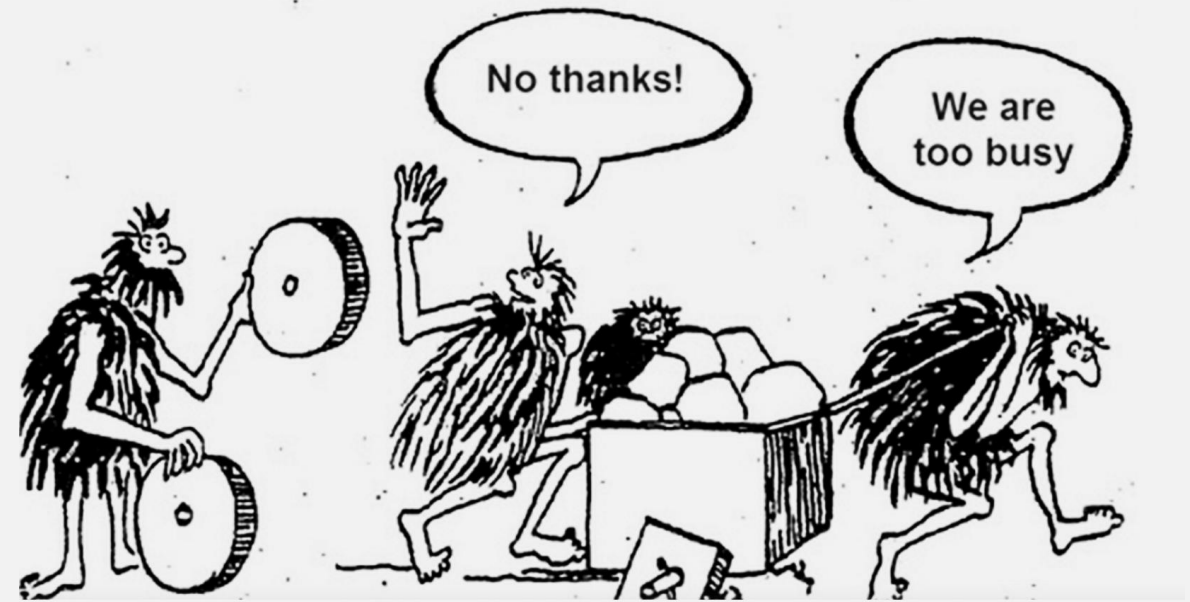
Exogenous vs endogenous growth: Why does it matter?

The innovator as benefactor

In Romer's world innovators
are paid too little

They aren't rewarded for
the fact that every innovator
in the future will stand on
their shoulders

He therefore favors low taxes
on innovators



Taxing the rich

From 1932 until 1980 the rich paid taxes of 70% or more on their marginal earnings in the US

- Over 90% under Eisenhower, a Republican

Reagan cut it to 28% and it has stayed below 40% since

Under both Democrats and Republicans

Similar trends everywhere



Does low taxes on the rich spur growth?

Growth was higher before Reagan than after—but we don't know the counterfactual?

One way to come up with a counterfactual is compare US states

- Because of differences in income distribution some states were much affected by tax cuts for the rich while others benefitted more from tax cuts for the poor
- Using 32 tax cuts since the war, an U of Chicago study finds no impact on growth
- Except when the tax raised incomes of the poor, when growth went up

Do the rich stop trying to make money when they are taxed more?

- No.

Yet

The Trump cuts of corporate taxes, estate taxes and income taxes on the rich were justified by the claim that growth will go up by 0.7% p.a.

Only one of the 50 odd economists on the IGM Booth panel of leading academic economists supported the claim that growth will go up.

On the other hand 42% of ordinary Americans believed that it will boost growth

- Another example how unfounded economic ideas can become common sense

Unsurprisingly given the pro-rich tilt

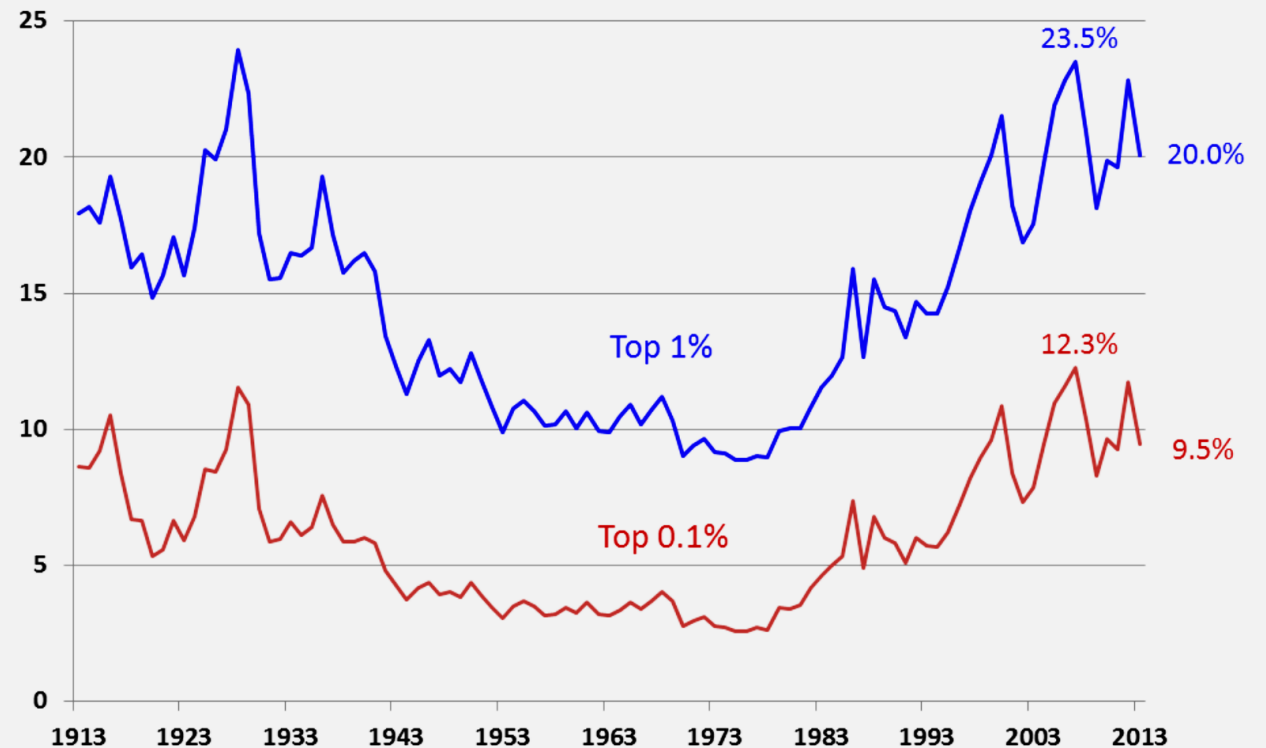
Incomes and wealth are getting more concentrated in the US and UK

- and to a less dramatic extent in the rest of the OECD

This concentration of wealth goes with a concentration of economic power

- In every sector the share of the top 50 corporations is going up
- In retail trade, the share of the top 4 firms has more than doubled

U.S. Income Shares of Top 1% and Top 0.1% of Households – Including Capital Gains (1913-2013)



Could creeping concentration be a part of the reason for the productivity slowdown?

In Aghion-Howitt's vision of competing innovators, what keeps innovation going is the fear that the "other guy will win"

A study compared sectors where a planned merger narrowly failed (say because the judge was unusually strict) with sectors where it went through.

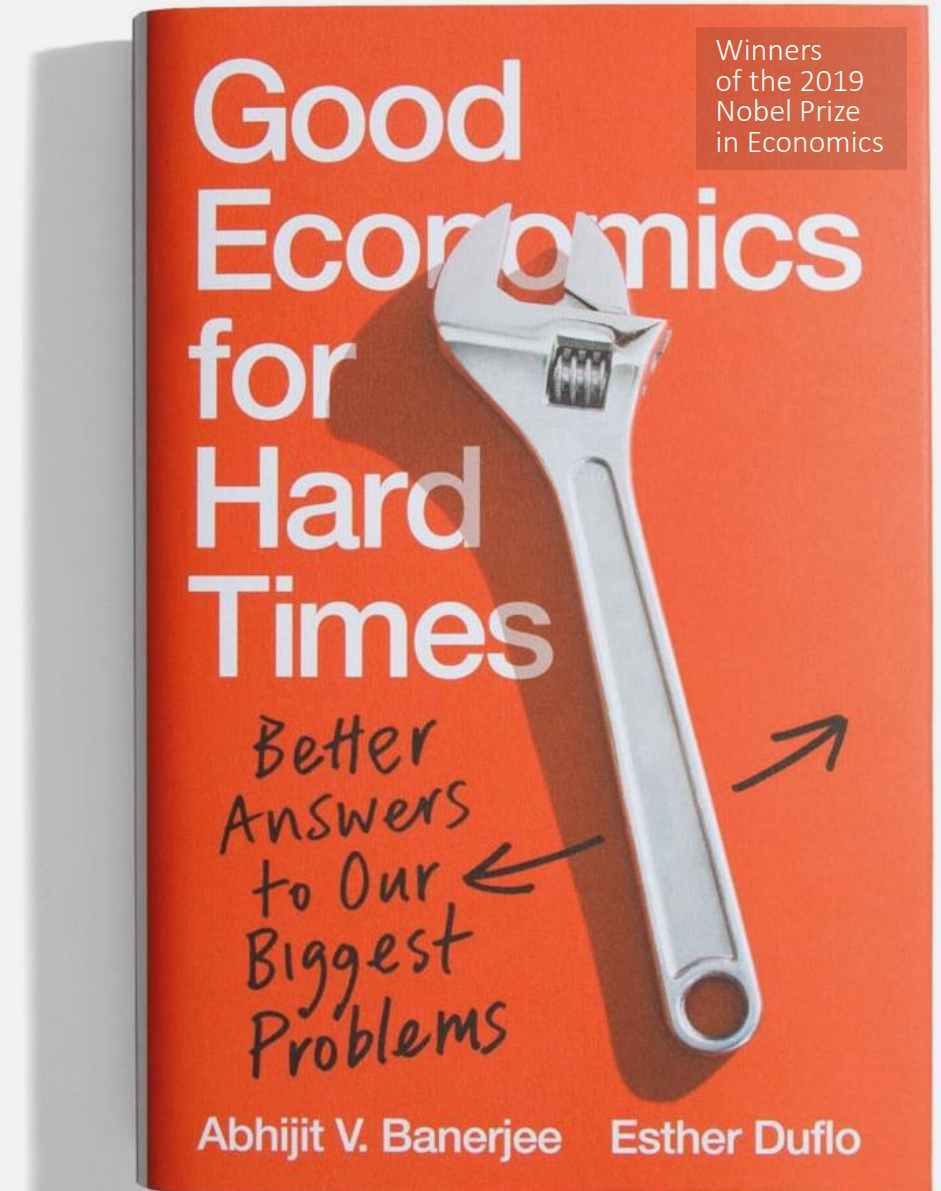
- The former group has more innovation, more investment and more new firms...

This force becomes less potent when the incumbent has much deeper pockets and if needed can buy out the competition or force them to merge (à la Amazon)

An aggressive effort against economic concentration might actually help growth.

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Growth policy for developing world

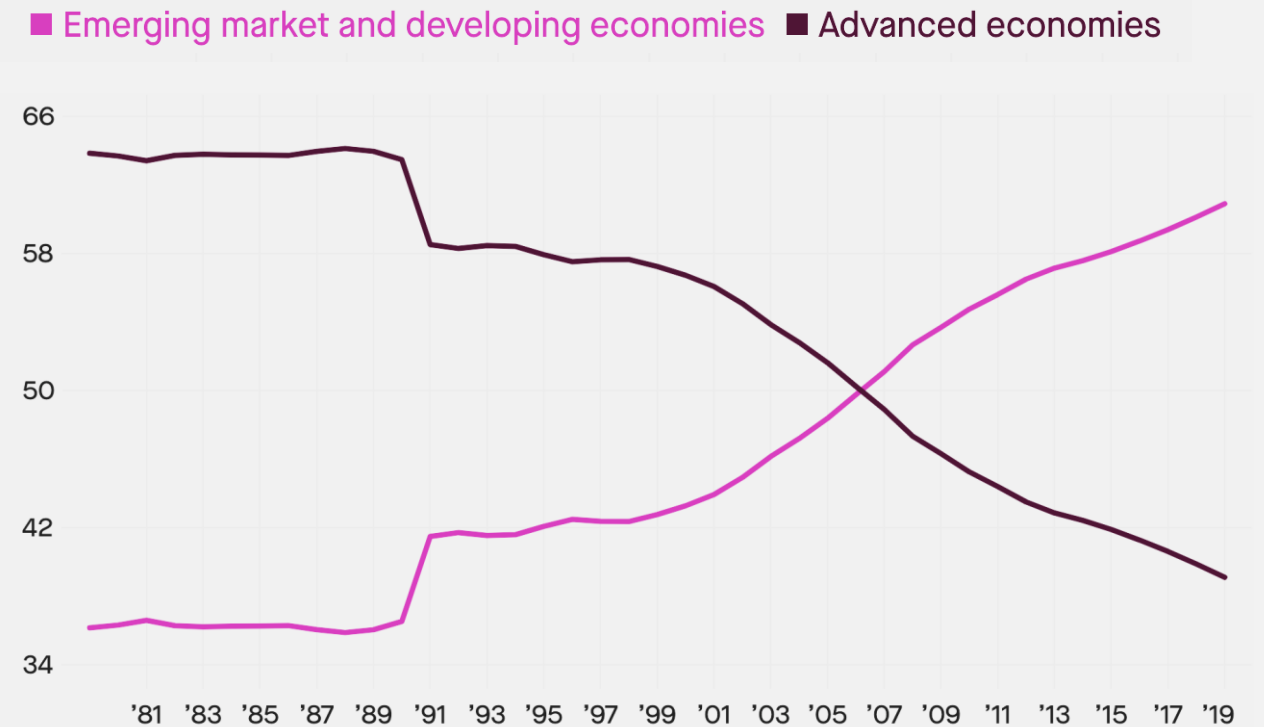
Growth is shifting to the developing world

But the success is heavily concentrated in East, South-east and South Asia

Are there useful policy lessons for the rest of the world?

Or even for countries that are growing fast but could be growing faster

Percent Share of World GDP and PPP



The search for a recipe for growth



Illustration: Dorrance=

Starting around the same time as the attempts to recast Growth Theory (the mid 1980s) there was also growing interest in empirically identifying the recipe for growth

Growth regressions—attempts to estimate the empirical relation between growth, policies and country characteristics—became a “growth industry”.

Hundreds of thousands of papers got written, each with its own distinct message

There were 3 problems with this effort

1. There are too many potential sources of influence and too few countries to test them out.

- Just within education, there are dozens of potentially relevant measures
- Literacy, primary (secondary?) school completion, university degrees, university degrees in the STEM fields, girl's school completion, emphasis on science or languages in secondary schools, PISA scores, and so on

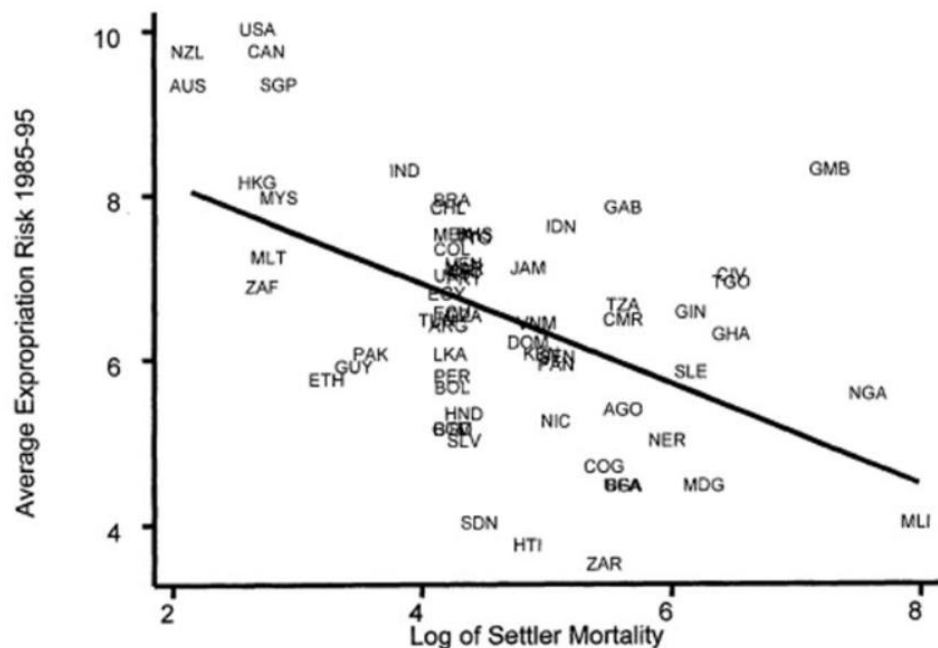
2. Growth rates are very volatile and hard to predict

- Brazil grows fast in 1960s-70s and then stops for twenty years; India grows slowly till 1980s and then accelerates; Bangladesh goes from "basket case" to success story

It is hard to know what is causal

- Is education a cause or a consequence?

Looking for the ultimate sources of growth--AJR



The goal is to identify a “shock” with long-term growth effects

The mortality of original European settlers varied enormously across colonized countries.

Europeans settled where mortality was low

Where it was high they created societies based on exploiting local labor

“Good” institutions where the Europeans settled (USA, Canada, New Zealand..)

“Bad” institutions where they did not, to permit exploitation of labor

These “bad” institutions persisted even after independence—a local exploiting class took them over

Remarkable findings

The long arm of history

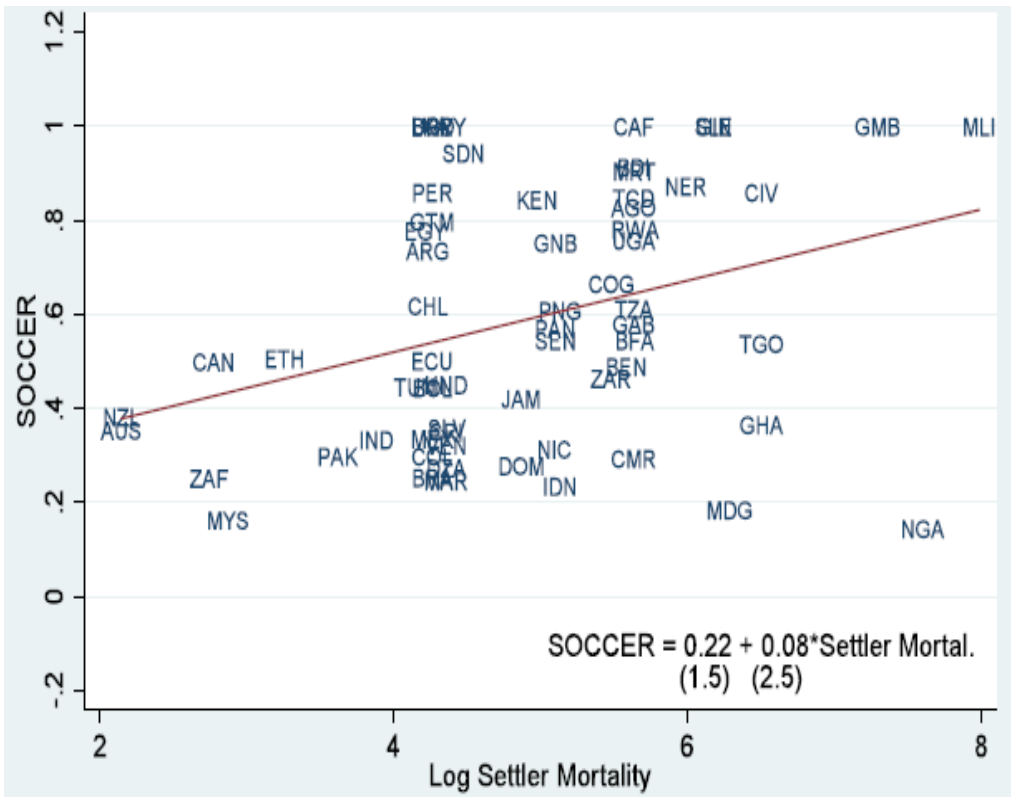
The effects of settler mortality persist till today and have huge effects on GDP per capita

Once you control for settler mortality, most measures that the growth policy literature favors (low inflation, education, investment, low taxes, etc.) do not matter any more



What about growth policy?

Settler mortality also predicts soccer success



T-statistics in brackets. Source: Karayalcin, Ulubasoglu (2010).

- AJR think that the effect is the result of the good non-exploitative institutions where the mortality was low.
 - What else could it be?
- Even if one accepts their diagnosis, questions remain:
 - Are the institutions the same without the many hundred years of history and experience backing them?
 - Is the US constitution the same without the thousands of interpretive judgments?

**So where do
we stand on
growth policy?**

What we have learnt

- Bill Easterly on the Growth Commission report
- “After two years of work by the commission of 21 world leaders and experts, an 11- member working group, 300 academic experts, 12 workshops, 13 consultations, and a budget of \$4m, the experts’ answer to the question of how to attain high growth was roughly: we do not know, but trust experts to figure it out.”

- There seems very little useful as a general recipe for growth that can be justified based on cross-country comparisons
- Apart from avoiding
 - Soviet-Maoist-North Korean style communism
 - And Indian-style central planning
 - And civil wars and environmental disasters

Not very useful for most countries

- Who have already bought into that message
- They want answers to questions like:
 - For example, how closely should Vietnam follow China?
 - Relatedly, is China an instance of not enough reliance on markets or just enough
 - For example, the majority of the Chinese banking sector is in the hands of the state and the share has only grown
 - Would China do even better if there was more reliance on markets or worse?
 - Is some amount of democracy a necessary condition for sustained growth?
 - As AJR would suggest

More generally

Very macro policy conclusions are not necessarily very useful. It is not clear what exactly one does about recommendations like

- Invest in Education'
- Protect property rights
- Healthcare for all

May be it is easier to focus on identifying and solving specific problems

- Better access to electricity
- Teaching at the right level
- The right incentives for bank managers
- Plugging loop-holes in the tax code

Growth theory meets development economics

- In growth theory a country's economy is thought of in terms of total resources (labor, skills, capital) and an aggregate level of productivity
 - The underlying premise is that the available resources are effectively used
 - And that productivity is what is technologically available
- Development economics starts from the possibility of misallocation
 - Resources are not always efficiently used
 - The best available technologies are not always adopted
- In development inspired growth theory, improving the utilization of resources and best technologies can increase TFP and lead to growth
- A further reason to focus on identifying and solving specific problems

3 examples of misallocation

Fishing with cell-phones



Photo: Shutterstock.com

A vivid example of misallocation of fish

In Kerala, India, before cell-phones fishermen would have to guess where to land the fish

They had no way of knowing whether there was demand where they land and how many others had also landed there

Cell-phones led to better coordination and higher productivity/earnings

A factory for junior



Photo: Shutterstock.com

Tirupur is one of the world's centers of knitted garment production

Factories run by entrepreneurs from the local farming community produced only half as much revenue per dollar of investment as factories run by other entrepreneurs

But they held on to the factories so that their children would have a living

Why not sell the factory to a better entrepreneur and invest the cash in the financial markets? Reduces misallocation

Because the financial markets are dysfunctional.

Dreaming in Soweto



Photo: Shutterstock.com

54% of South Africans in the 18-24 range are unemployed

82% report looking for a job for over a year

In part because their expectations are too high

- they expect to be paid 1.7 times more than the market wage for job-seekers with similar skills/experience

It is possible that they actually have very little exposure to the actual labor market

Increasing exposure by providing travel vouchers made their expectations more reasonable

Summing up

The limits of our knowledge

- We know very little about how to make sustained growth happen
- Nor are we particularly good at predicting the future of growth
 - On June 23, 1989, the *Wall Street Journal* marked the publication of its centennial edition by predicting what the global economy would look like 25 years hence. It selected the countries that it thought would be growth leaders and those it saw as future growth laggards.
 - On the former list were Bangladesh, Thailand, and Zimbabwe.
 - On the latter list was China, which, as the newspaper prognosticated, would fail to shake off “the stultifying bureaucracy of hard-line communism”.

Our dangerous obsession with growth

- Yet we continued to be obsessed with the growth league tables
 - In the 1980s, the US was obsessed with Japan and was fighting a covert trade war
 - In 1979 Ezra Vogel published “Japan as Number One”
 - Japan slowed down almost on cue and never caught up with the US
 - The current obsession is China
 - Despite the fact that China is slowing and will slow down further
- The obsession with increasing growth (whether or not we know how to) is costly because it drives (misguided) policies
 - the Reagan-Thatcher tax cuts--did nothing for growth but worsened inequality
 - the Japanese public spending boom, which didn't solve Japan's slowdown but left the government massively indebted

In developing countries as well



Growth numbers dominate political life

- National growth rates are front page news
- Media reports growth rates up to 1/100th of 1 percent despite massive measurement issues

This combined with the faith in the power of low taxes to drive growth

- In the meanwhile inequality is exploding
- The governments are forced to be tight-fisted when it comes to the poor even in the pandemic

What gets squeezed out in the process is what we know how to do best

- Make improvements in people's quality of life
- by building better education, cleaner air, more reliable healthcare, more sustaining infrastructure

Being ready for growth to come when it will and maintaining social peace in the meanwhile