



‘Yes you can’

How to change **GDP**

Ehsan Masood

Editor, **researchprofessional.com**
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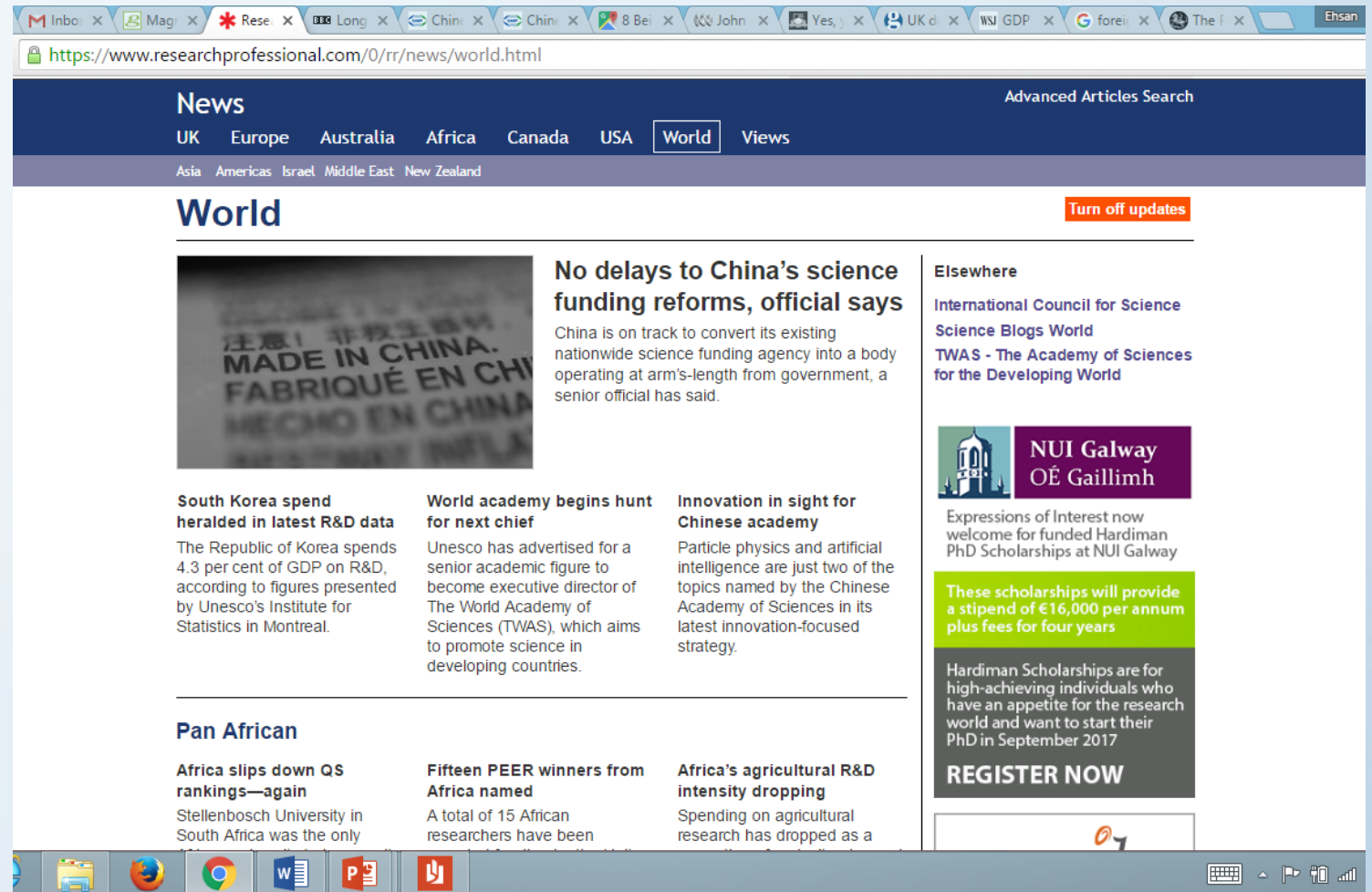
Today's presentation is in 3 parts

- **Part One:** About *GDP* and its problems
 - **Part Two:** Why reform efforts have failed
 - **Part Three:** How GDP can change
-
- **Please do ask questions.** During the presentation. At the end. Any time later.

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The screenshot shows a web browser window with multiple tabs open. The active tab is 'Research Professional' with the URL 'https://www.researchprofessional.com/0/rr/news/world.html'. The website has a dark blue header with 'News' and 'Advanced Articles Search'. Below the header is a navigation bar with links for 'UK', 'Europe', 'Australia', 'Africa', 'Canada', 'USA', 'World', and 'Views'. The 'World' link is highlighted. Below the navigation bar is a sub-navigation bar with links for 'Asia', 'Americas', 'Israel', 'Middle East', and 'New Zealand'. The main content area is titled 'World' and features a large article titled 'No delays to China's science funding reforms, official says'. The article text states: 'China is on track to convert its existing nationwide science funding agency into a body operating at arm's-length from government, a senior official has said.' To the right of the main article is a sidebar titled 'Elsewhere' with links to 'International Council for Science', 'Science Blogs World', and 'TWAS - The Academy of Sciences for the Developing World'. Below the sidebar is a purple box for 'NUI Galway O'É Gaillimh' with the text 'Expressions of Interest now welcome for funded Hardiman PhD Scholarships at NUI Galway'. Below this is a green box stating 'These scholarships will provide a stipend of €16,000 per annum plus fees for four years'. Below the green box is a dark grey box with the text 'Hardiman Scholarships are for high-achieving individuals who have an appetite for the research world and want to start their PhD in September 2017' and a 'REGISTER NOW' button. The bottom of the page shows a Windows taskbar with icons for various applications.

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World

No delays to China's science funding reforms, official says

China is on track to convert its existing nationwide science funding agency into a body operating at arm's-length from government, a senior official has said.

Elsewhere

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Expressions of Interest now welcome for funded Hardiman PhD Scholarships at NUI Galway

These scholarships will provide a stipend of €16,000 per annum plus fees for four years

Hardiman Scholarships are for high-achieving individuals who have an appetite for the research world and want to start their PhD in September 2017

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South Korea spend heralded in latest R&D data

The Republic of Korea spends 4.3 per cent of GDP on R&D, according to figures presented by Unesco's Institute for Statistics in Montreal.

World academy begins hunt for next chief

Unesco has advertised for a senior academic figure to become executive director of The World Academy of Sciences (TWAS), which aims to promote science in developing countries.

Innovation in sight for Chinese academy

Particle physics and artificial intelligence are just two of the topics named by the Chinese Academy of Sciences in its latest innovation-focused strategy.

Pan African

Africa slips down QS rankings—again

Stellenbosch University in South Africa was the only

Fifteen PEER winners from Africa named

A total of 15 African researchers have been

Africa's agricultural R&D intensity dropping

Spending on agricultural research has dropped as a

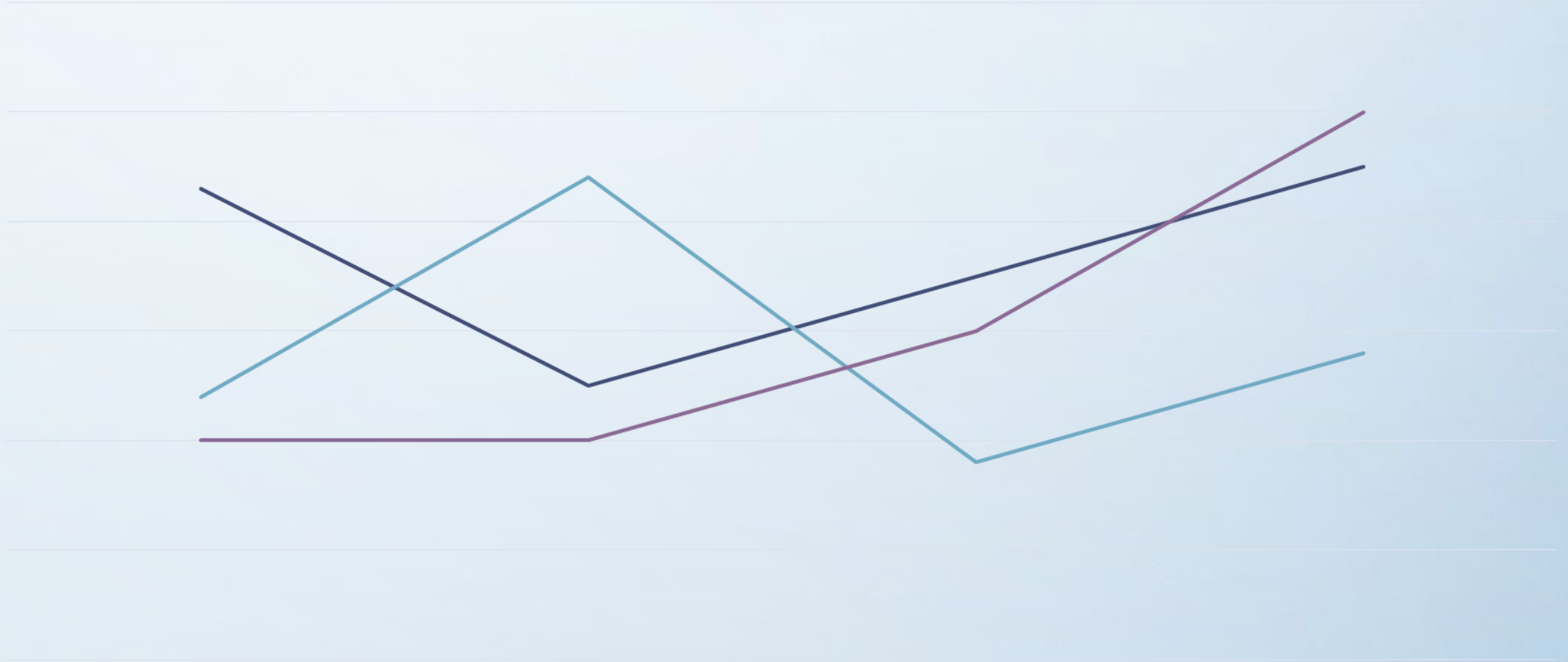
Part one
About **GDP**



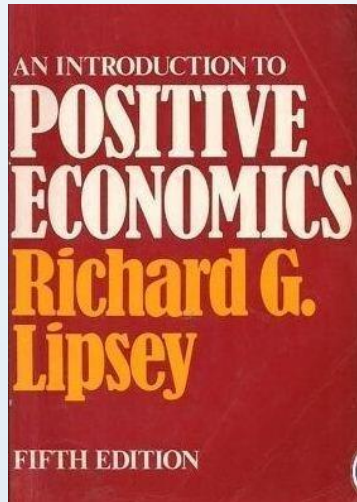
What do we know about GDP

- Measure of spending as a proxy for growth or productivity
- Dictates how every government must run an economy.
- Designed in the UK/US in the years preceding WII when governments knew little about the state of their finances.
- 'The appliance of science'.
- Rapidly globalised through the UN and OECD.
- Rules set largely by developed countries. Can be gamed.
- No space to measure environment, quality of life, or wellbeing.
- Incentivises bad behaviour.

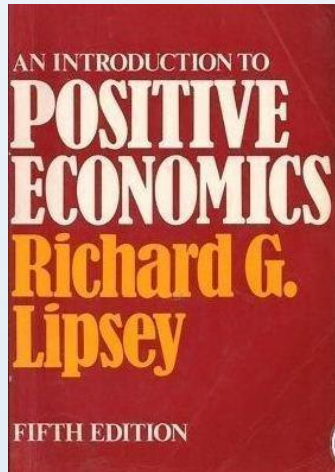
Why is a science-policy journalist writing about GDP?



2 years of economics in Karachi

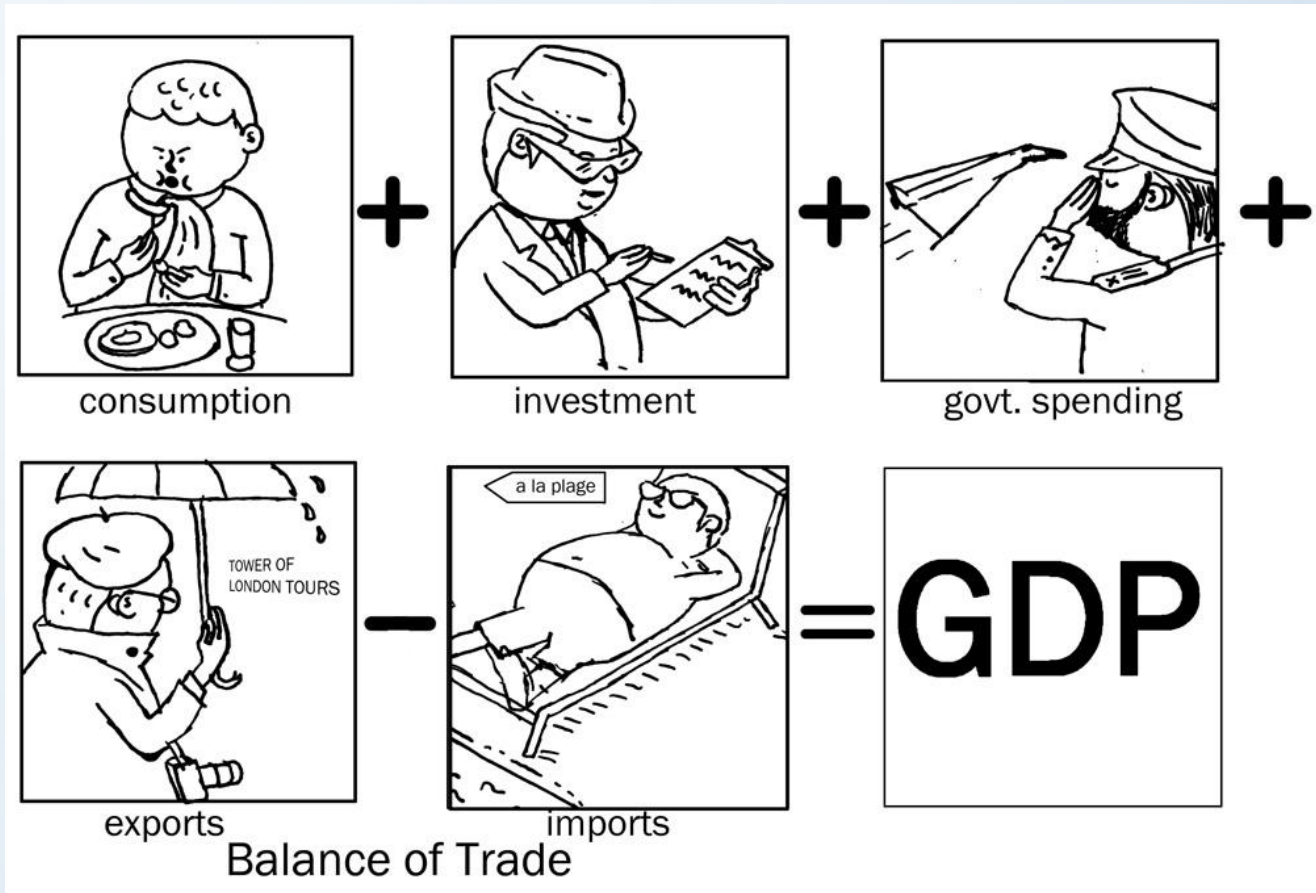


2 (more) years in London



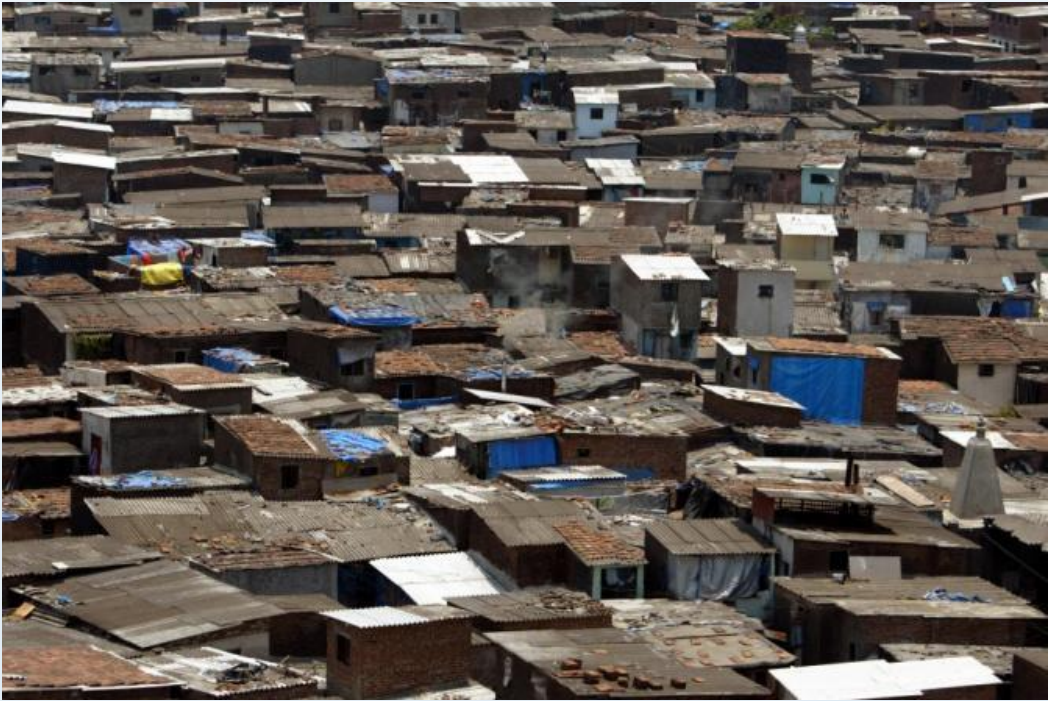
Re-Introduced to the GDP formula

$C+I+G+(X-M)$



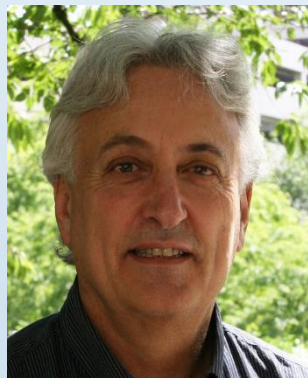
Why are we using the same measure to value world prosperity..

What does this society..



.. have in common with this?





Nature 387, 15 May 1997.
Cover line: "Pricing the Planet".

The value of the world's ecosystem services and natural capital

Robert Costanza^{1,2}, Keith D'Arge³, Rudolf de Groot⁴, Stephen Farber⁵, Monica Grossi⁶, Bruce Hanson⁷, Kari Loomis⁸, Daniel Naeem⁹, Robert E. O'Neill¹⁰, Jose Parakkal¹¹, Robert C. Paikow¹², Paul Raitner¹³, A. Marjan van den Bergh¹⁴

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⁷ Department of Economics, Middlebury, New York, USA

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¹¹ US Forest Service, Forest Sciences, California 95631, USA

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¹³ Ecological Economics Research and Application Inc., White Plains, New York 10622, USA

The services of ecological systems and the natural capital stocks that produce them are critical to the functioning of the Earth's life-support system. They contribute to human welfare, both directly and indirectly, and therefore represent part of the total economic value of the planet. We have estimated the current economic value of 17 ecosystem services for 18 biomes, based on published studies and a few original calculations. For the entire biosphere, the value (most of which is outside the market) is estimated to be in the range of \$28.64–\$54.12 billion (1992) per year, with an average of US\$33.7 billion per year. Because of the nature of the uncertainties, this must be considered a minimum estimate. Global gross national product total is around \$24.64 billion per year.

Because ecosystem services are not fully 'captured' in commercial markets or adequately quantified in terms comparable with economic services and manufactured capital, they are often given less than their weight in policy decisions. This neglect may ultimately compromise the sustainability of humans in the biosphere. The economists of the world would prefer a tool without the services of ecological life-support systems, so it is not clear that total value to the economy is infinite. However, it can be instructive to estimate the 'functional' or 'biological' value of ecosystem services (the estimated rate of change of value compared with changes in ecosystem services from their current levels). There have been many studies in the past few decades aimed at estimating the value of a wide variety of ecosystem services. We have gathered together the large (but scattered) amount of information and present it here in a form useful for ecologists, economists, policy makers and the general public. From the synthesis, we have estimated values for ecosystem services put into use by humans, and then multiplied by the total area of each biome and summed over all services and biomes.

Although we acknowledge that there are many conceptual and statistical problems inherent in producing such an estimate, we think this exercise is essential in order to: (1) make the range of potential values of the services of ecosystems more apparent; (2) establish at least a first approximation of the relative magnitudes of global ecosystem services; (3) set up a framework for their further analysis; (4) point out those areas that in need of additional research; and (5) stimulate additional research and debate about the problems and opportunities associated with the value of the services of ecosystems and the natural capital stocks that are

essential to humans. A minimum value, which would probably increase: (1) with additional effort in studying and valuing a broader range of ecosystem services; (2) with the incorporation of more realistic representations of ecosystem dynamics and interdependence; and (3) as ecosystem services become more valued and 'accounted' in the future.

Ecosystem functions and ecosystem services

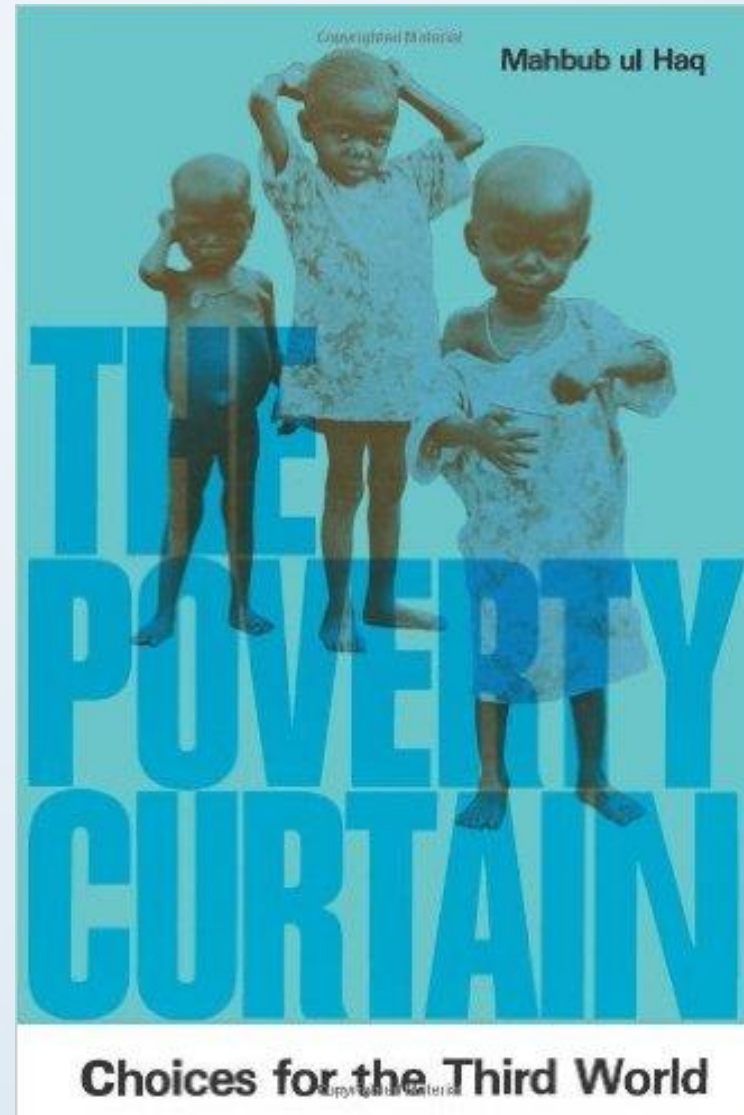
Ecosystem functions refer externally to the habitat, biological or abiotic properties or processes of ecosystems. Ecosystem goods such as food and services such as waste assimilation represent the benefits human populations derive, directly or indirectly, from ecosystem functions. For simplicity, we will refer to ecosystem goods and services together as ecosystem services. A large number of functions and services can be identified¹. Here, we provide a loose, ordered compilation of descriptions, measuring and valuing ecosystem services. For the purposes of this analysis we grouped ecosystem services into 17 major categories. These groups are listed in Table 1. We included only renewable ecosystem services, excluding non-renewable fuels and minerals and the atmosphere. Even the ecosystem services and functions do not necessarily show a one-to-one correspondence. In some cases a single ecosystem service is the product of two or more ecosystem functions whereas in other cases a single ecosystem function contributes to two or more ecosystem services. It is also important to emphasize the interdependence of many ecosystem functions. For example, some of the net primary production in an ecosystem ends up as food, the consumption of which generates respiratory greenhouse gases for primary production. Even though these functions and services are interdependent, in many cases they can be added because they represent 'joint products' of the ecosystem, which support human

¹ Terms defining functions of ecosystem ecology, economy or medicine, and in qualitative terms.

“One practical use of the estimates we have developed is to help modify systems of national accounting to better reflect the value of ecosystems services and natural capital.”



Mahbub ul Haq, co-creator in 1990 (with Amartya Sen) of the Human Development Index



“Any measure that values a gun several hundred times more than a bottle of milk is bound to raise serious questions about its relevance to human progress.”



Why efforts to reform GDP are failing

Part two

So we know it's harmful, why can't we do something about it?

Unity among economists and policymakers

- The alternatives are methodologically questionable
- Status quo is 'the best of the worst'.
- This consensus is defended by relatively influential people.



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GDP and Its Enemies

Gross domestic product was constructed to count things, not services. But would what a better measure be?

nature

ECONOMICS

GDP in the dock

Diane Coyle savours a history of the long-standing economic measure and possible alternatives.



ECONOMICS

The GDP and its discontents

Can a single number ever really capture all of what matters about a society?

MEASURE THE SCALE FIRST

A new book, *The Great Invention* by Ehsan Masood, unveils the genesis of the Gross Domestic Product (GDP) and how it shaped the modern economic paradigm. It comes at a time when a growing number of people are questioning this flawed metric. Is GDP a true and accurate measurement of growth? Exclusive excerpts from the book, followed by a cross-section of views on the efficacy of GDP

Forbes

Is GDP Outmoded? Maybe, Maybe Not

And a **divided** opposition

- Human Development Index was a missed opportunity for reform
- Opposition fragmented and failing to engage with GDP politics
- Lots of support for the 'dashboard' approach

“Development means enlarging the choices, not of trees, but of people.”

Mahbub ul Haq in *Reflections on Human Development*

Part Three

How to change **GDP**



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Defence plans national broker for research grants

Australia's federal and state governments are to set up a national "one stop shop" to match university researchers with Defence science and technology projects.

UQ to cut administration jobs in 2017

The University of Queensland has announced plans to reduce administrative jobs, including research support and management, by 25 per cent as part of a major restructure in 2017.

C SIRO report targets climate research staff 'subculture'

Australia's top science agency needs to confront pockets of "staff activism" that threaten to undermine management decisions, a report has claimed.

Finkel says universities must tackle PhD 'glut'

Australia's chief scientist, Alan Finkel, has warned that universities must do more to address the "false expectations" that PhD graduates will find jobs that are linked to their specialist research skills.

Canberra Playbook

Crime research merger creates 'super agency'

One of Australia's leading criminology research centres will become part of a new national criminal intelligence and law enforcement agency.

Voice tech deal links Macquarie with US firm

Macquarie University in Sydney has signed a deal with US company VoiceBox Technologies to set up a national research centre for speech recognition and voice navigation technologies.

Southern Cross helping Gold Coast surf startups

Wave pools, kite surfing and new technologies for surfboard design were among startup opportunities discussed at a one-day surfing research and business forum at Southern Cross University in Lismore.

Government Agencies

Policy advisor urges shakeup of education

C SIRO to hold 'TED style' ocean research forum

Rural agency reviews climate research funding

A chance discovery in *The Financial Times*

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April 21, 2013 6:29 pm

Data shift to lift US economy 3%

By Robin Harding in Washington

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The US economy will officially become 3 per cent bigger in July as part of a shake-up that will see government statistics take into account ...

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21:12 16/04/2016

What the *FT* story showed

- R&D spending is to be transferred to the *investment* column of the national accounts
- The economies of OECD states will become larger as a result
- **It showed there is a policy process in which the components of the GDP index are decided.**

How did this change to GDP happen?

- The change is the result of a decades-long effort.
- In effect a campaign, led by richer countries, but largely hidden from the public—until now.
- Policymakers in London and Washington argue that the prime function of R&D is to make money.
- Academic weight for this view comes from science and innovation policy practitioners.
- The academic leadership knows it to be debatable, but is complicit because they know budgets are protected when the axe-wielders come.
- **“What is measured matters”.**

But... Change happened in spite of
methodological problems

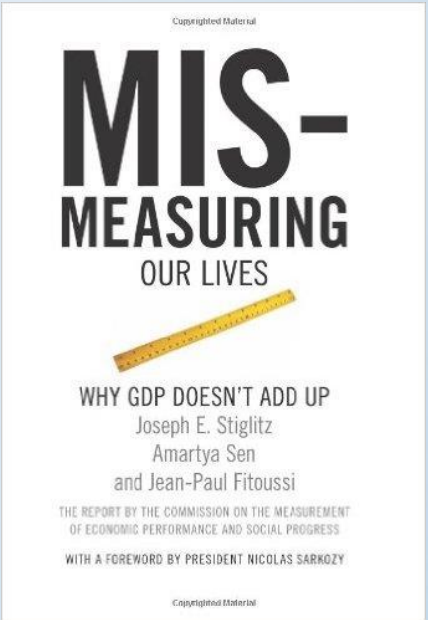
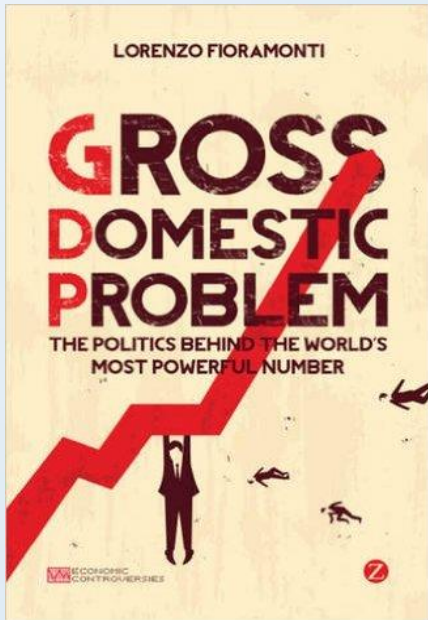
What are these problems?

- $\text{R\&D spend} = \text{public} + \text{commercial} + \text{philanthropic}$
- Most non-OECD countries (and some in the OECD) do not measure R&D with anything like the granularity of the US/UK.
- In some countries, *all* R&D spending is lumped together with universities/higher education.
- OECD countries with significant private R&D spending will see GDP gain.
- Countries with little private R&D spending will see little/no gain.
- The change benefits wealthier nations.

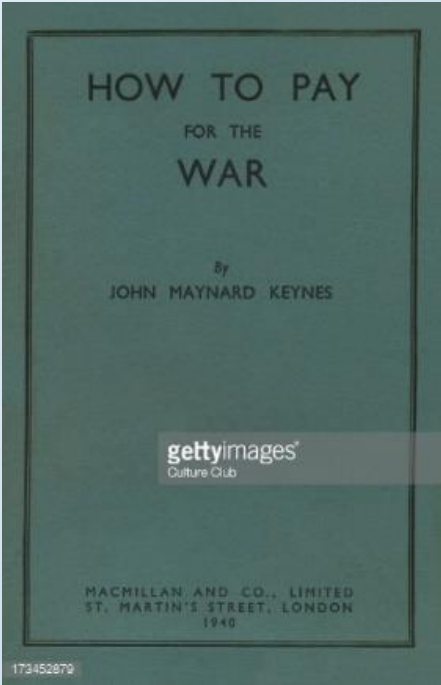
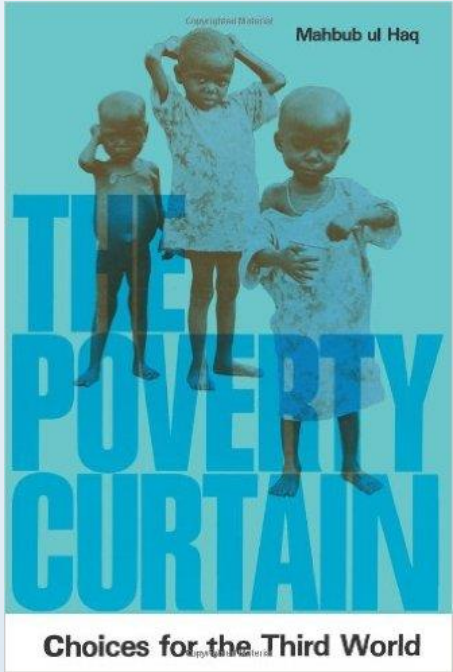
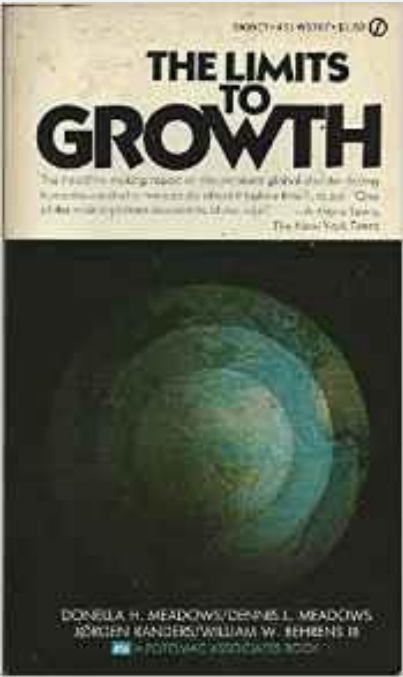
What lessons for GDP reform

- The R&D example shows that data accuracy is of secondary concern in GDP reform.
- Interests of rich countries need to be protected.
- Economic and Environmental communities will need to find common cause.
- The politics of the UN body that guards GDP must be mastered.
- If we start now, change will happen after 20 years.

Further reading



Further reading



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