Wealth Accounting
Macroeconomic Indicators

Main implications on the macro and fiscal fronts, and policy applications

Keith Jefferis & Gianluca Mele
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Why Wealth Accounting?

- Focus on Sustainable Growth
  - Is sustainability important?
  - If yes, do conventional measures such as the SNA measure sustainable growth?
  - If no, what adjustments can we make?
- Policy implications
  - How should renewable and non-renewable natural resources be managed for sustainability?
Do we have a measure of sustainability?
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<tbody>
<tr>
<td>GDP at constant prices</td>
<td>6.0</td>
<td>5.7</td>
<td>6.4</td>
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<td>7.4</td>
<td>8.4</td>
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<tr>
<td>GDP excluding extractive industries at constant prices</td>
<td>7.3</td>
<td>6.4</td>
<td>7.1</td>
<td>6.6</td>
<td>6.2</td>
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<td>Iron ore production (tons)</td>
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<td>13.5</td>
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<td>GDP deflator</td>
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<td>2.8</td>
<td>2.2</td>
<td>4.4</td>
<td>4.3</td>
<td>4.6</td>
<td>4.9</td>
<td>4.7</td>
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<td>Consumer price index (period average)</td>
<td>4.9</td>
<td>4.1</td>
<td>3.5</td>
<td>4.6</td>
<td>4.6</td>
<td>4.9</td>
<td>5.1</td>
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<tr>
<td>Consumer price index (end of period)</td>
<td>3.4</td>
<td>4.5</td>
<td>4.7</td>
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<td>5.0</td>
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<td>Value growth of exports of goods, f.o.b.</td>
<td>-4.9</td>
<td>0.4</td>
<td>-8.3</td>
<td>-6.1</td>
<td>14.0</td>
<td>20.4</td>
<td>0.8</td>
<td>20.9</td>
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<td>Value growth of imports of goods, f.o.b.</td>
<td>28.5</td>
<td>-4.0</td>
<td>-15.5</td>
<td>15.8</td>
<td>23.4</td>
<td>25.9</td>
<td>-14.8</td>
<td>-0.3</td>
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<td>Terms of trade</td>
<td>-14.6</td>
<td>34.2</td>
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<td>0.5</td>
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<td>Current account balance (in percent of GDP)</td>
<td>-26.1</td>
<td>-24.8</td>
<td>-18.5</td>
<td>-25.8</td>
<td>-35.4</td>
<td>-40.2</td>
<td>-26.3</td>
<td>-15.4</td>
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<td>Gross official reserves 1/</td>
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<tr>
<td>In millions of U.S. dollars, end of period</td>
<td>961.9</td>
<td>996.4</td>
<td>963.1</td>
<td>1005.3</td>
<td>1061.4</td>
<td>1107.3</td>
<td>1173.9</td>
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<td>In months of following year’s imports excluding extractive industries</td>
<td>6.8</td>
<td>6.9</td>
<td>6.6</td>
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<td>6.4</td>
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<td>PPG external debt (percent of GDP) 2/</td>
<td>73.5</td>
<td>69.2</td>
<td>73.1</td>
<td>61.7</td>
<td>62.4</td>
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<th>Investment and savings</th>
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<td>Gross investment (percentage of GDP)</td>
<td>37.3</td>
<td>37.4</td>
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<td>44.4</td>
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<td>Gross savings (percentage of GDP)</td>
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<td>6.7</td>
<td>10.2</td>
<td>4.3</td>
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<td>-3.5</td>
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<th>Central government operations</th>
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<td>Nonextractive revenue and grants</td>
<td>29.2</td>
<td>25.4</td>
<td>23.7</td>
<td>23.8</td>
<td>23.7</td>
<td>22.6</td>
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<tr>
<td>Nonextractive revenue</td>
<td>22.8</td>
<td>24.4</td>
<td>22.8</td>
<td>23.0</td>
<td>23.0</td>
<td>22.0</td>
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<td>Expenditure and net lending</td>
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<td>32.7</td>
<td>30.6</td>
<td>29.3</td>
<td>30.6</td>
<td>29.3</td>
<td>28.4</td>
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<tr>
<td>Basic non-oil balance; previous program definition (percent of non-oil GDP) 3/</td>
<td>0.5</td>
<td>1.0</td>
<td>1.0</td>
<td>0.8</td>
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<td>2.9</td>
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<tr>
<td>Overall balance excluding grants</td>
<td>-3.0</td>
<td>-2.2</td>
<td>-2.1</td>
<td>-2.6</td>
<td>-1.7</td>
<td>-0.1</td>
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<tr>
<td>Overall balance excluding grants (in percent of GDP)</td>
<td>-2.2</td>
<td>-1.7</td>
<td>-1.7</td>
<td>-2.2</td>
<td>-1.4</td>
<td>-0.1</td>
<td>0.6</td>
<td>1.6</td>
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<tr>
<td>Public sector debt (percent of GDP) 2/</td>
<td>79.4</td>
<td>73.7</td>
<td>76.5</td>
<td>69.5</td>
<td>66.2</td>
<td>64.7</td>
<td>65.0</td>
<td>61.7</td>
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Let’s look at our conventional measures

- **GROSS domestic product (GDP)**
  - Measures the output (value added) of an economy
  - Doesn’t reflect consumption of assets
- **NET domestic product (NDP)**
  - Adjustment of GDP to reflection consumption of produced capital
  - But not widely used, and often not available
  - Doesn’t reflect all consumption of assets, or other “damage”, e.g. environmental damage
- **SUSTAINABILITY** needs a broader measurement concept
A quick reflection:

GDP tells you nothing about sustainability. [...] No one would look just at a firm's revenues to assess how well it was doing. Far more relevant is the balance sheet, which shows assets and liability. That is also true for a country.

(Joseph Stiglitz, « Good Numbers Gone Bad », October 2006)
Main research questions:

1) What is the estimate existing stock of capital in the country, including produced, intangible, and both renewable and nonrenewable natural capital?

2) What is the current rate of adjusted net national savings in our country, and what are its implications for the sustainability of the country’s stock of wealth?

3) What would sustainable growth require in terms of the management of both renewable and nonrenewable resources?
GDP growth is not necessarily correlated to wealth creation

i. Wealth is a stock, while GDP is a flow concept

ii. There are several cases of high GDP growth and limited (or even negative) wealth creation

iii. Change in GDP tells us if growth is occurring, changes in wealth tell us if growth is sustainable in the long-term

iv. Small number of countries compile wealth accounts. Even fewer include natural capital
Measuring Sustainability

- An ADJUSTED measure of macroeconomic output, taking into account depletion of physical, environmental and natural capital
- A measure of ASSETS or WEALTH, tracked over time
  - Is the wealth trend positive or negative?
  - What is happening in real terms, as a percentage of GDP, and per capita?
What is wealth?

Many definitions, from the most simple to the most complex, but intuitively clear:

"anything of value"

The annual production of the land and labor of the society”. (Adam Smith, The wealth of Nations)

The accumulation of all assets owned, net of all liabilities owed, at a point in time.
The concept of wealth has at least two basic features:

1- Wealth is a stock

2- Wealth is composite – has many components
**What is wealth?**

Comprehensive (or Inclusive) Wealth

- Net Foreign Assets
- Intangible Capital
- Produced Capital
- Natural Capital

Calculated as the residual of total wealth after subtracting produced and natural capital. It represents, inter alia, investment in human capital.

1 “Where is the Wealth of Nations” (2006), World Bank, pag 6
Comprehensive Wealth

Physical Capital

Natural Capital

Intangible Capital

Ecosystems

Pasture Land

Crop land

Timber and non-timber forest resources

Fisheries

Mining and energy
Anticipating some results: composition of total wealth, a global perspective

- Natural capital is most important in low income countries—more than twice as large as produced capital.

- In middle income countries, natural capital and produced capital are roughly equal.

- Intangible wealth dominates in all countries, especially in high income countries.
All countries rely on System of National Accounts (GDP) for economic planning and assessment of performance, but some information is missing or invisible:

- Depletion of natural capital – minerals, forests
- Use of materials and energy not fully represented
- Environmental degradation – air & water pollution, loss of soil productivity
- Ecosystem services – carbon storage, flood mitigation

**Natural Capital Accounting**

- Provides crucial information to manage natural resources
- Builds this information as satellite accounts to the System of National Accounts to fill the information gap

\[
\text{ANS} = \text{NNS} + \text{Education Expenditure} - \text{Energy Depletion} - \text{Mineral Depletion} - \text{Forest Depletion} - \text{CO}_2 \text{ Damages} - \text{Particulate Matter Damages}
\]
One of the goals of our analysis graphically:

Only if ANS > 0 we have actual wealth creation. Recent discussion at the Bank looks more and more also at ANS/population > 0
The System of National Accounts was embraced in 1950s because of the confluence of three elements:
- A sound theory: Keynesian macroeconomics
- A clear methodology: the System of National Accounts (SNA) framework
- Willingness by policy-makers to pursue a policy goal: economic growth and full employment

In order to successfully develop an Environmental Accounting practice we will need the same:
- A sound theory: Capital approach to sustainable development
- A clear methodology: SEEA (System of Integrated Environmental and Economic Accounting)
- Willingness by policy-makers to pursue a policy goal: sustainable development
Growth in adjusted Net National Income (aNNI), which deducts pollution damage and resource depletion from NNI. Annual growth rates 2000-2008 for China: NNI = 10.3%, aNNI = 9.2%
China’s goal is to reduce its environmental externalities from 9% of GDP to 3% or less by 2030.

Environmental and Natural Resource Degradation and Depletion as % of Gross National Income (World Bank, 2010)
The “one million dollar question”: Why should we care about resource depletion and – more in general – greening growth, if this imposes higher costs?
It does not.

Here is how and why..
A “greener” growth has a number of macroeconomic advantages:

- It reduces environmental COSTS
- It strengthen macroeconomic STABILITY over time
- It induces INNOVATION
- It actually aims at INCREASING the stock of total WEALTH
- It is directly linked to fiscal sustainability
- It directly affects social sustainability issues

IN A NUTSHEL:
Green growth is an investment. Like any investment, in imposes costs but can generate high returns. Some returns are immediate (e.g., higher income due to efficiency gains) while others are in the medium and longer term (e.g., improved human capital through improved health).
Different regions show different trends on these issues

Countries can convert of one form of capital to another through investment, although there are limits to sustainable losses of natural capital.
Where macroeconomics, environmental valuation, and ethics meet

How to preserve total wealth and equal standards of living for future generations: the standard Hartwick rule

Resource Abundance and Capital Accumulation (Standard Hartwick Rule)

Source: World Bank 2006
Macroeconomic implications: Public Policies

- Extraction efficiency
- Resource Rents Maximization
- Adequate Fiscal Policy
- Land Tenure
- Trade Facilitation
- Clear Investment Policies

How much to invest in the economy and where?
Looking at the macroeconomic framework, the key question is whether the balance between consumption Vs investment Vs saving is optimal and what could be done to improve it.
Volatility Vs Stability:

- Dutch disease – Resource Curse (explain!)
- What are the effects on RER?
- What is the level of inflation? Are there inflationary pressures?

Aside these issues, resource rents require strong macromonitoring, to manage the volatility of flows. This is more and more a current issue. As a matter a fact, prices have dramatically fluctuated in recent years.
Increasing investment in infrastructure is expected to produce important and several spillover effects on the overall economy. However, it is important to consider also the absorption capacity. One possibility: Sovereign Wealth Funds, or Generation Funds?
Macroeconomic implications: Securitization options and debt sustainability

Complex implications on debt and innovative ways to fund development

Debt/bonds/securities? Natural resources wealth?
Governments, the World Bank, and other development agencies are increasingly using natural capital valuation and accounting in four ways:

- Macroeconomic policy analysis and loans (development policy loans, or DPLs)
- Sectoral policy analysis and investments (water, land, forestry, energy...)
- Regional development projects (cross-sectoral analysis and projects, such as those with land-use tradeoffs)
- Links to climate change (analysis of emissions reduction options, adaptation actions, financing)
GERMANY: Environmental accounts play a major role in informing the German National Sustainable Development Strategy (out of 21 indicators, 5 based or derived from the German environmental accounts)

NORWAY: Norway intentionally sets aside large parts of the rent from the exploitation of its oil reserves. Thus, it has created the largest sovereign wealth fund in the world – worth $950 billion! This fund is used by Norway to invest in financial and produced assets around the world.

SWEDEN: The Swedish Ministry of Finance prepares medium-term economic forecasts based on a general equilibrium model developed at the Swedish National Economic Research Institute that includes some environmental dimensions.

MAURITANIA: A Natural Capital Valuation Study conducted by the World Bank Group in 2013-14 supported the negotiation of a Fishery bilateral agreement with the European Union, which was characterized by strong resistances on both sides, resulting in a fairer agreement for both.
Data is getting better and better... !

But.. Continue developing better statistical capacity is essential to strengthen the intrinsic value of this analysis (SEEA)
Also, these issues are **public** issues

- Collect and disseminate information on natural wealth
- Involve all stakeholders in the debate (civil society)
We must make sure that we replace this.... with this.....
Thank you for your attention

For more information:
www.wavespartnership.org
www.worldbank.org/africa

IBRD The International Bank for Reconstruction and Development

IDA The International Development Association

keith@econsult.co.bw
gmele@worldbank.org