First Beyond GDP Sprint Meeting of the United Nations Network of Economic Statisticians

10 March 2022
Welcome

Stefan Schweinfest
Director of United Nations Statistics Division

Richard Heys
Deputy Chief Economist
Office For National Statistics

Office for National Statistics
Agenda – shown in UK time

12:00 – 12:15  Welcome and introduction – Stefan Schweinfest, Director of United Nations Statistics Division and Richard Heys, Deputy Chief Economist, Office for National Statistics


12:45 – 13:20  Data as an asset – John Mitchel, (OECD)
  Country Presentation by Sean Crick, Australian Bureau of Statistics

13:20 – 13:30  Break

13:30 – 14:00  Natural Capital – Bram Edens, UN, Carl Obst, ME and Mark de Haan, IMF

14:00 – 14:30  Human Capital – Gueorguie Vassilev, Office for National Statistics

14:30 – 14:45  Consolidating discussion, Richard Heys, Deputy Chief Economist, Office for National Statistics

14:45 – 15:00  Next steps and closing remarks – Erich Strassner, Associate Director for National Economic Accounts, US Bureau of Economic Analysis on Distributional Sprint
Beyond GDP Sprint
Session One: Measuring Modern Capital

Richard Heys (ONS)

March 2022
High level Sprint objectives

“What we measure affects what we do. If we have the wrong metrics, we will strive for the wrong things.”

(Stiglitz, Fitoussi & Sen 2010)

While the Stiglitz Report set the dimensions of the global debate around ‘Beyond GDP’, it was not prescriptive of specific approaches or measurement. Since then, many approaches, frameworks, and specific measures have been put forward.

The sprint’s objective is to review the potential to agree an extended framework for measuring all aspects of economic activity, in a way which is compatible with GDP / national accounts, but captures key elements excluded from that measure.
Sprint Design

Session One: Modern Capital

Sessions Two & Three: Distributional Accounts
  • SNA update issues, environment, wellbeing (Fitoussi, Stiglitz and Durand report)

Session Four: Population and wellbeing
  • Socio-demographic disaggregation of national accounts, vulnerability, HDI index

Session Five: Synthesis and Next Steps
Sprint One: Modern Capitals

‘What does capital look like in the modern economy, and how should we measure modern capital and its flows of benefits?’

Scope:
• What is modern capital and where do we classify it?
• How does our current measurement techniques impact on our understanding of modern capital?
• How do we think about ownership v use?
• How do we think about capital assets which are not exclusive or rivalrous?
• Does the produced / non-produced boundary help or hinder efforts to understand modern capital?
• How do we tackle capital which isn’t defined by national borders?
Defining Capital

We need to agree which types of capital we consider to be in scope:

SNA 2008 Para 10.8 *An asset is a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the entity over a period of time. It is a means of carrying forward value from one accounting period to another.*

But not just economic statistics contain capital assets – many statistical domains cover assets beyond the traditional economic asset boundary.
Classification of Statistical Activities Mapped to Measuring Capital

**Domain 1: Demographic & Social Statistics**
- 1.5 Income & Consumption
  - Household Satellite Account
  - Cultural Capital
  - Financial and Non-Financial Capital
  - Human Capital
  - Natural Capital
  - ‘Uncapitalised’ Intangible Capital

**Domain 2: Economic Statistics**
- 1.9 Culture
  - Theatres, Cinemas
  - Museums & Libraries
  - Books
  - Integrated Economic Accounts
  - Acquisition & Disposal of Capital
  - Flow of Funds & Capital Services

**Domain 3: Environment & Multi-Domain Statistics**
- 2.2 Economic Accounts
  - Human Capital
  - Environment
  - Information Society
  - Entrepreneurship

- 2.3 Business Statistics
- 2.9 Science, technology & innovation
- 3.1 Environment
- 3.3 Multi-Domain Statistics
Measuring the value of modern capital

Sum of Costs of Production = Expected Sum of Discounted flow of benefits

+ Margin

• Under assumption of perfect competition, institutions will invest up to the point equal to the discounted sum of future benefits.

• However, numerous reasons why this may not be the case in market economy, even harder to assume perfect competition outside of the market:
  • Human Capital – credit market constraints
  • Risk aversity – without perfect foresight, investors may exhibit caution
  • Future benefits may be dependent on other investments / decisions – particularly natural capital may see cliff-edges in returns
  • Fast-moving innovation (e.g. technology) makes it increasingly hard to form expectations of future returns
  • Sufficiently long-lived assets can find new purposes and renewed benefit streams

• Is it valid to assume the different methods are consistent?
Ownership & Use

- Many assets are owned by someone other than the user.
  - The current treatment of capitals within the accounts mean some payments to access assets are treated as rentals, some as rents, and particularly for infrastructure held by the public sector either not at all or indirectly through taxes.
  - Practical problems at identifying ownership, particularly in the context of globalisation.
  - Human capital lies outside the core national accounts framework, for technical reasons but even if it did not, who owns human capital and who utilises it? How could its rewards be treated – as compensation or a rent?
  - Atmosphere and natural capital raise similar questions of ownership and usage. Pollution does not know borders and trees sequester carbon no matter where, or by whom it is emitted.
  - ICT hardware has been increasingly replaced by many firms with cloud services: Capital services commensurately fall and intermediate consumption rises, but from a productivity perspective the same capital services are being delivered.
  - Do we need to consider how best to address this in a consistent manner?

SNA08 – para 1.54. ‘...However, while knowledge, skills and qualifications are clearly assets in a broad sense of the term, they cannot be equated with fixed assets as understood in the SNA. They are acquired through learning, studying and practising, activities that cannot be undertaken by anyone else on behalf of the student and thus the acquisition of knowledge is not a process of production even though the instruction conveyed by education services is.’
How do we think about capital which is not exclusive?

- Physical, tangible assets can be owned and exclusivity enforced, but intangible assets can be utilised in very different ways, potentially coming close to being public goods with non-rival, non-excludable qualities.

- Traditional and digital infrastructure (roads and mobile phone networks) have very similar qualities (if not perfect non-rivalry).

- Many capitals are currently being replaced with services, such as cloud-computing, that not only don’t preclude someone else using the same ICT assets, but is designed to optimise use of these across multiple users, including open-source software.

- Do we need to stand back and consider whether we need to focus more on private and non-exclusive capitals.
Does the produced / non-produced boundary help understand modern capital?

- The national accounts currently distinguish between produced and non-produced assets, but there is an increasing need to better reflect the flow of services which don’t fit neatly into a produced/non-produced dichotomy:
  - Environment
  - Data
  - Crypto-assets
  - Human Capital (Nature v nuture)
How do we tackle capital which isn’t defined by national borders?

The need to understand the relationship between the economy and the environment has never been stronger, and the need to find ways to address the full range of environmental services is becoming increasingly apparent, (but not forgetting open source software)
Business accounts are increasingly less transparent as intangible assets are not recorded. As firm’s stock market values diverge from the value of assets recorded, it is clear that many firms derive their value from intangibles (Peters and Taylor 2017), and are not always keen to reveal these.

National accounts needs this data however, particularly as intangibles represent an increasing share of gross fixed capital formation, and in some cases now form the majority of investment, particularly if we include uncapsulated intangibles.
Intangible assets
Jonathan Haskel

@haskelecon

Imperial College Business School and Bank of England
UN Beyond GDP sprint on Modern Capitals, 10th March 2022.
Views are my own.
## Intangible assets framework

<table>
<thead>
<tr>
<th>Broad category</th>
<th>Type of Intangible Asset</th>
<th>Description (from CHS)</th>
<th>Capitalised in the National Accounts?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computerised Information</td>
<td>Software and databases</td>
<td>This includes knowledge embedded in computer programmes and computerised databases.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Research and development</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Mineral exploration and evaluation</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Innovative Property</td>
<td>Entertainment, literary and artistic originals</td>
<td>This includes knowledge acquired through scientific research and development, product development and non-scientific inventive and creative activities.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Design</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Financial product innovation</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Branding</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Economic Competencies</td>
<td>Organisational capital</td>
<td>This includes knowledge embedded in firm-specific human and structural resources, including brand names.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Firm-specific training</td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

Source: UK ONS adapting Corrado, Hulten and Sichel (2005)
Intangible investment exceeds tangible investment in many countries, with uncapitalised intangibles accounting for the majority.

Share of intangible and tangible investment in GDP, 2010-2019 average, by country

Source: EU KLEMS forthcoming, authors' calculations
The four economic properties of intangibles and implications for measurement

**Scalable**
Intangible assets can often be used over & over, in multiple places, with little or no reinvestment.

**Sunk**
Once a firm makes an intangible investment, hard to sell it or recover its value.

**Spillovers**
A firm making an intangible investment will not receive all (or perhaps any) of the returns.

**Synergies**
Intangible assets are often especially valuable when combined with other intangibles and human capital.

There is likely to be a wide variation in rates of depreciation (obsolescence) for some intangibles.

Some intangibles are quasi-public goods (adding to open knowledge) while others may start as private goods and later become public.

Intangibles often don’t show up on balance sheets, and businesses do not keep data on them, as they cannot use them for collateral.

Rates of return on intangible assets may be non-linear, and depreciation rates could even be negative at times.
Measuring intangible investment is a game of two halves

<table>
<thead>
<tr>
<th>Tangible assets</th>
<th>Intangible assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>95%</td>
<td>40%</td>
</tr>
<tr>
<td>Purchased investment – a firm buys another unit’s output on the market</td>
<td></td>
</tr>
<tr>
<td>5% Mostly dwellings</td>
<td>60% 70% for only capitalised intangibles</td>
</tr>
<tr>
<td>Own-account investment – a firm develops an intangible asset in-house for its own use</td>
<td></td>
</tr>
</tbody>
</table>

Source: authors’ calculations from ONS sources
Purchased investment is ‘easy’ if you know where to look

BUT

- Is definition different from current intermediate consumption product breakdown?
- Do businesses hold such data to reliably report?
Own-account investment needs much more research, but it is possible

Wages and salaries of relevant workers

\[ \text{Multiplied by} \]

A scale-up factor for non-wage labour costs

\[ \text{Multiplied by} \]

A scale-down factor for time spent on non-investment activities

\[ \text{Multiplied by} \]

A scale-up factor for non-labour costs

\[ \text{Multiplied by} \]

A sales-adjustment factor for those industries that produce the relevant good for sale (so as to avoid double-counting with ‘purchased’ investments)

Table 1. Occupations used in own-account branding estimates

<table>
<thead>
<tr>
<th>SOC code</th>
<th>Description</th>
<th>Associated job titles</th>
<th>Responsibilities</th>
<th>Role in marketing process</th>
<th>Advertising or market research</th>
<th>Relevant (range)</th>
<th>Own-account branding time factor (range)</th>
<th>Other own-account investments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1122</td>
<td>Marketing and sales directors</td>
<td>Marketing director; sales director</td>
<td>Planning, organizing and directing market research and organizing marketing and sales policies</td>
<td>Overseeing whole process</td>
<td>Both</td>
<td>15-30%</td>
<td>10-30%</td>
<td>Organisational capital (20%)</td>
</tr>
<tr>
<td>1134</td>
<td>Advertising and PR directors</td>
<td>Account director; head of public relations</td>
<td>Planning, organizing and directing advertising and PR activity</td>
<td>Overseeing whole process</td>
<td>Mostly advertising</td>
<td>30-45%</td>
<td>10-30%</td>
<td>Organisational capital (20%)</td>
</tr>
<tr>
<td>2473</td>
<td>Advertising accounts managers and creative directors</td>
<td>Advertising manager; creative director</td>
<td>Planning and designing the advertising activities of an organization</td>
<td>Planning stage</td>
<td>Mostly advertising</td>
<td>45-40%</td>
<td>20-40%</td>
<td>Design (50%)</td>
</tr>
<tr>
<td>3421</td>
<td>Graphic designers</td>
<td>Commercial artist; graphic designer</td>
<td>Using multimedia techniques for information, entertainment or advertising purposes</td>
<td>Creative stage</td>
<td>Entirely advertising</td>
<td>15-30%</td>
<td>20%</td>
<td>Software and databases (10%)</td>
</tr>
<tr>
<td>3543</td>
<td>Marketing associate professionals</td>
<td>Market research analyst; marketing executive</td>
<td>Developing projects to elicit preferences of consumers</td>
<td>Planning and evaluation stages</td>
<td>Mostly market research</td>
<td>40-50%</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>3545</td>
<td>Sales accounts and business development managers</td>
<td>Sales manager; business development managers</td>
<td>Undertaking market research to meet marketing and sales policies</td>
<td>Planning and evaluation stages</td>
<td>Mostly market research</td>
<td>15-25%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Martin, 2019
Boundaries: human capital and training

- Management and communication skills
- How to make good charts in Microsoft Excel
- How to code in Python
- How to write effective reports

- How my organisation works
- How to fill in that form
- How to use firm-specific software
- Acronyms and terms used in my organisation

- How to make good charts in Microsoft Excel
- How to code in Python
- How to write effective reports

- How my organisation works
- How to fill in that form
- How to use firm-specific software
- Acronyms and terms used in my organisation
### Table 2.3. Borderline between R&D, innovation and other business activities

<table>
<thead>
<tr>
<th>Item</th>
<th>Treatment</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prototypes</td>
<td>Include in R&amp;D</td>
<td>As long as the primary objective is to make further improvements.</td>
</tr>
<tr>
<td>Pilot plant</td>
<td>Include in R&amp;D</td>
<td>As long as the primary purpose is R&amp;D.</td>
</tr>
<tr>
<td>Industrial design</td>
<td>Split</td>
<td>Include design required during R&amp;D. Exclude design for production process.</td>
</tr>
<tr>
<td>Industrial engineering and tooling up</td>
<td>Split</td>
<td>Include “feedback” R&amp;D and tooling up industrial engineering in innovation processes. Exclude for production processes.</td>
</tr>
<tr>
<td>Trial production</td>
<td>Split</td>
<td>Include if production implies full-scale testing and subsequent further design and engineering. Exclude all other associated activities.</td>
</tr>
<tr>
<td>Pre-production development</td>
<td>Exclude</td>
<td>All administrative and legal work needed to apply for patents and licences (delivering documentation as an outcome of R&amp;D projects is R&amp;D). However, patent work connected directly with R&amp;D projects is R&amp;D.</td>
</tr>
<tr>
<td>After-sales service and troubleshooting</td>
<td>Exclude</td>
<td>Except “feedback” R&amp;D (to be included).</td>
</tr>
<tr>
<td>Patent and licence work</td>
<td>Exclude</td>
<td>Even if undertaken by R&amp;D personnel.</td>
</tr>
<tr>
<td>Routine tests</td>
<td>Exclude</td>
<td>Except when an integral part of R&amp;D.</td>
</tr>
<tr>
<td>Data collection</td>
<td>Exclude</td>
<td></td>
</tr>
<tr>
<td>Routine compliance with public inspection control, enforcement of standards, regulations</td>
<td>Exclude</td>
<td></td>
</tr>
</tbody>
</table>

Source: Frascati Manual 2015
Boundaries: current vs capital spending

“Fixed assets are produced assets that are used repeatedly or continuously in production processes for more than one year. The distinguishing feature of a fixed asset is not that it is durable in some physical sense, but that it may be used repeatedly or continuously in production over a long period of time, which is taken to be more than one year.”

SNA 2008, 10.11
Thank you

References


Published:
22 March 2022 (UK)
5 April 2022 (US)
Modern capital – Data as an asset

John Mitchell  (National Accounts Division - OECD)

John.mitchell@oecd.org
What assets are used in the production of Digital advertising?

✓ Computer hardware  
✓ Computer Software  
✓ R & D  
✓ ...  
X Data
Modern Capital - Data as an asset

Data contributes to **improved productivity & efficiency** in a range of industries.

- Just-in-time supply chain control
- Customer loyalty programs
- Improved demand forecasts

Not just the private sector; **public sector data** has transformed many aspects of non-market output!
Data vs other assets in the National Accounts.

- Most data is produced on an own account basis.
- Data doesn’t depreciate.
- Data is extraordinarily heterogeneous, most value based on specific content and context.
- Data used in production can be non-rivalrous.
- Quantity of data is often unrelated to the value of the data.
- Service life of data is extremely varied.

Data creation by governments can be considered an input to improve government output (tax or social security databases) or as a public good itself.
Data in the National Accounts
Considerations for inclusion

- Consider data entirely the result of production.
- Value of data is based on sum-of-costs.
- Assumptions based around service life – current vs capital cost.
- Likely to be calculated at an aggregate level, examples by Statistics Canada and Goodridge et al. (Modelled rather than direct reporting).
Data in the National Accounts  
Additional thoughts

• Testing is required to set user expectations on impact of the accounts (capital formation, capital stock & GDP).
• Are we appropriately reflecting who is responsible for the value added?
• How does legislative decisions impact the treatment of ownership of data in the accounts?
Country experience: Measuring data as an asset in Australia
Data-related investment: data/database/data science

Cost-of-production approach (salary, non-direct salary and other intermediate input costs, cost of capital)

Applied lower-upper bounds for robustness

Sense-of-magnitude estimates, though they present overlap to a degree with published components.
## Data-related capital formation

### Table 1. Estimates of Data related Capital Formation (current price)

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2011</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total of all data-related categories</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lower range value</td>
<td>19,790</td>
<td>25,951</td>
<td>35,512</td>
</tr>
<tr>
<td>upper range value</td>
<td>25,543</td>
<td>33,682</td>
<td>46,728</td>
</tr>
</tbody>
</table>

### Table 2. Annual growth rates for Data related Capital Formation (current price)

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2011</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual growth rate (all data-related categories)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lower range value</td>
<td>5.6%</td>
<td>6.5%</td>
<td></td>
</tr>
<tr>
<td>upper range value</td>
<td>5.7%</td>
<td>6.8%</td>
<td></td>
</tr>
</tbody>
</table>
Preliminary estimates of net capital stock for data (databases and data science currently excluded) based on Perpetual Inventory Method.

Sensitivity test for:
- Price indexes: WPI vs. Inhouse computer software (SOI) deflator vs. weighted measure
- Asset lives: 3-year mean asset life vs. 25-year mean asset life (Stats Canada)
Net capital stock - Data

Net Capital Stock 2018

- Capital Stock (SOI) 3 year
- Capital Stock (WPI) 3 year
- Capital Stock (Avg) 3 year
- Capital Stock (SOI) 25 year
- Capital Stock (WPI) 25 year
- Capital Stock (Avg) 25 year
- Capital Stock Stats Canada

Lower range value
Upper range value
Future work

- Improve in estimates of investment in data-related assets
  - Occupation mapping (NOC – ANZSCO; 6 digit ANZSCO)
  - Reassess assumptions on share of production activities

- Refine estimates of capital stock for data-related assets
  - Expand coverage of the experimental estimates (databases and data science)
  - Reassess assumptions and collect real world information (asset lives, price indexes)

- Review overlap with existing estimates (e.g. R&D)

- Assess impact to productivity estimates
Break
Measuring natural capital and the relationship between SNA and SEEA

Bram Edens, PhD.

United Nations Statistics Division
Outline

• Context on SEEA
• Defining natural capital in SEEA
• Measuring natural capital
• Beyond GDP
The Need

- Our economy and well-being crucially depends on nature

- Recognize natural capital as asset:
  - Provide flows of benefits to people
  - Stocks that can be degraded / depleted or enhanced / restored

- Both aspects important to assess the impacts and dependencies on natural capital which is not reflected in GDP or the SNA

- Decision makers need key information necessary to effectively pursue and track sustainable development

- SEEA has been developed to address those needs
Standardization of measurement of the environment

- History goes back to 1980s: 1993 SEEA; 2003 SEEA
- SEEA Central Framework adopted in 2013 as statistical standard by UNSC
- SEEA Ecosystem Accounting adopted in March 2021
  - chapters 1-7 describing the accounting framework and the physical accounts adopted as an international statistical standard
  - chapters 8-11 recognized as describing internationally recognized statistical principles and recommendations for the valuation of ecosystem services and assets
- SEEA developed in close collaboration with numerous stakeholders, including:
  - CBD, UNCCD
  - IPBES
  - IUCN
  - Capitals Coalition and private sector (most recently TNFD)
  - Wealth accounting efforts (World Bank; UNEP)
## SEEA accounts

<table>
<thead>
<tr>
<th>SEEA-CF (Central Framework)</th>
<th>• Assets • Physical flows • Monetary flows</th>
<th>• Minerals &amp; Energy, Land, Timber, Soil, Water, Aquatic, Other Biological • Materials, Energy, Water, Emissions, Effluents, Wastes • Protection expenditures, taxes &amp; subsidies</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEEA Water; SEEA Energy; SEEA Agriculture, Forestry and Fisheries</td>
<td>Add sector detail</td>
<td>As above for • Water • Energy • Agricultural, Forestry and Fisheries</td>
</tr>
<tr>
<td>SEEA-EA (Ecosystem Accounting)</td>
<td>Adds spatial detail and ecosystem perspective</td>
<td>Extent, Condition, Ecosystem Services, Thematic: Carbon, Water, Biodiversity</td>
</tr>
</tbody>
</table>
Defining natural capital

- **SNA:**
  - Assets: stores of value which are owned that provide *economic benefits*
  - Natural capital = natural resources + land

- **SEEA CF expands SNA asset boundary**
  - Environmental assets: naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide *benefits* to humanity. (Para 2.17)
  - Provides a physical asset boundary not present in the SNA

- **SEEA EA : expands the production boundary with ecosystem services (ES)**
  - ES: contributions of ecosystems to benefits used in economic and other human activity. (para. 2.14)
  - ES: conceptualized as transaction between ecosystems assets (supply) and beneficiaries (users)
One environment, two perspectives

Measures environmental assets and individual resources and how the economy used them.

Timber  Water  Fish

Soil  Minerals

Measures ecosystems and the services they provide to economic and human activity.

Forests  Rivers  Coral reef

Wetlands
Extended measures of wealth

- SEEA EA Chapter 11
- Integrates SNA, SEEA CF+SEEA EA
- Ecosystem types based on IUCN Global Ecosystem Typology
- Prominence to natural capital (in SNA scattered across multiple categories)
- Avoids double counting, but special attention for:
  > Cultivated biological resources
  > Land (SEEA definition differs from SNA definition)
  > Renewable energy resources
- Atmosphere (special case)
Measuring natural capital

• Stock accounts (physical units)
  > Opening / closing stocks and changes during the accounting period
  > Examples: extent of ecosystems; stocks of standing timber

• Monetary asset accounts
  > Asset value = NPV of services provided
  > Revaluation; depletion and degradation (grounded in physical indicators)

• Integration in sequence of accounts
  > (net measures) and extended balance sheet

• Consistent with valuation principles of SNA
  > Clear distinction between “exchange value” + “welfare value”

• Relation to broader measures of value
  > SEEA takes an economic + instrumental perspective (focus on “use”)
  > But recognizes broader perspectives (intrinsic values; relational values)

SEEA EA recommends that physical measures to accompany monetary measures
Specific issues: ownership / borders / exclusivity / (non)-produced

• Several types of natural capital are public goods (non-exclusive / non-rival)
  > SEEA EA makes contributions to benefits (+ impacts upon them) visible
  > But necessitates using non-market valuation techniques

• Ownership: SEEA EA -> de facto all land is owned
  > Ecosystem trustee as separate subsector of general government in the sectoral accounts

• Produced/non-produced distinction:
  > SEEA perspective: gradual distinction + in Anthropocene hard to conceive of pure non-produced
  > Discussed as topic during SNA revision process
    - Other topics discussed: asset ownership, permits, depletion, biological assets as an attempt to bring the SNA closer to the SEEA.

• International dimension:
  > SEEA EA: spatial framework; ES benefit specific users; some inherently global (climate regulation)
  > Imports + exports of ES
Some challenges with measuring natural capital

• Conceptual:
  > Exchange value when doing non-market valuation; allowable non-market valuation techniques
  -> *Sub-group to discuss SNA valuation principles as part of SNA update process*

• Philosophical:
  > Nature has tremendous (welfare) value, but exchange value can be low compared to welfare value
  > SEEA EA (Chapter 12) discusses complementary approaches to valuation

• Measurement:
  > Projections of future service flows (+ discounting discussions) are inherently difficult
  > Great advances in use of Earth Observation data + development of tools / data platform

• Way forward:
  > SEEA EA implementation strategy includes development of tools + guidelines
  > Research agenda
Beyond GDP, broader framework

• SEEA can play an important role:
  > SEEA has graduated from being satellite accounts towards a system on par with the SNA
  > SNA and SEEA complementary frameworks
  > With SNA and SEEA data in many countries, comprehensive datasets can be put together

• UN Common Agenda -> calls for implementation of SEEA EA
  > SEEA status of implementation 2021: 89 countries SEEACF / 36 SEEA EA

• Trends / insights from SEEA development:
  > Growing focus on wealth as underpinning current measures of welfare
  > The importance of accounts in physical data
  > Opportunities in bringing geospatial and statistical worlds together
  > Challenges between economics (welfare) and accounting approaches
  > Seek clarity (from policy makers / users) around number of indicators
THANK YOU

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Contents

• Existing international guidance on human capital measurement
• Main current approaches and existing implementations (i.e. specific countries, some cross-country examples from OECD, World Bank, academics but no consistency)
• Outstanding conceptual concerns for incorporation – where does this guidance fall short?
• Commonalities with other capitals
Existing international guidance on human capital measurement

• 2001: The Well-being of Nations (OECD)
• 2016 Guide to Measuring Human Capital (UNECE)
  • Cost-based measures – most natural alignment with National Accounts framework
  • Income-based measures – alternative valuation welcomed by individual countries’ existing efforts
  • Indicators – range of options – e.g. World Bank Human Capital Index
• 2020 Guide to the Satellite Account on Education and Training (UNECE_
Drivers of change

• What do users want?
  • Policy, research, academia
• What are their expectations?
• What can statistical producers provide – where evidence gaps translate to future collection needs?
Current conceptual situation

- Good progress on several options for identifying (main) contributions to independent human capital valuation
- Some reference to implications to sequence of accounts from existing approaches
  - Cost-based approaches identify items relating to human capital investment
  - Income-based approaches derive estimates for transactions and concepts that may need imputation or adjustment
- Less is agreed upon in terms of consistency in measurement and valuation with other capitals
- Many conceptual issues in terms of relation to SNA framework still outstanding
Outstanding conceptual developments - framework

Existing disconnect and gap between frameworks

- Production boundary to account for human capital acquisition
- Extension of coverage of ‘economic benefits’ and ‘economic activity’
- Clarifying distinction between human capital and labour

Clear definition of human capital – e.g.s:

- skill, knowledge or other concept that can be learned or trained individually, that can/does improve person’s employment income potential for multiple period
- Individual attribute that, upon improvement or acquisition, improves associated production process over multiple periods beyond acquisition
Outstanding conceptual developments - allocations

- Accounting for ownership and resident boundaries
  - Implications from different ownership of acquisition, holding of stocks, and use in production process
  - Relatedly – timing of accounting for transactions (is most acquisition Work in Progress?)

- Knock-on indirect impacts? Examples:
  - other activities being brought into production;
  - distributional transactions to account for different sectors' use
Outstanding conceptual developments - scope

- What is human capital output?
  - Education, training, apprenticeships
- Relationship between stocks and flows
- What is the full scope of human capital investment?
  - E.g. Health, unpaid household production, independent learning etc
  - How to account for multiplicative, combinatorial nature of human capital investment?
Outstanding measurement issues

- Age-price function
- Net capital stock
- Net value added
- Return on capital
- User costs
- Capital services
- Investment
- Gross stock
- CFC
- Age-efficiency function
- Productive stock
- Retirement function
Outstanding measurement issues

If income-based measure used for stock valuation, there should still be an equivalence with the above concepts

For it to be valued as an asset, what are the:

• Acquisitions
• Different products – qualifications, knowledge and skills, competencies, others
  • Learning to read, learning arithmetic vs learning advanced quantum theory or specific method of use of machinery
• Different prices
• Life-lengths
• Age-price functions

How to square up existing monetary expenditures with real investments

• Can expenditures (e.g. on education, health, training) be split between human capital-improving and on-going current?
Other capitals’ overlaps

• Unpaid household production as input into human capital asset acquisition
• Air and water quality - health relationship → knock on to human capital
• Relative human capital valuation when combined with differing physical assets (tech-savvy engineer with appropriate software vs tech-savvy engineer working in retail)
• Multiplicative impacts to production process from human capital and organisational capital stocks in firms
Consolidation and Discussion

Richard Heys
Deputy Chief Economist
Office For National Statistics
Consolidating discussion – key points

- Do we agree there is a challenge in measuring modern capitals?
- Are there common challenges across the different types of capitals we have discussed today?
- What should we prioritise in any future work on measuring modern capitals?
Sprint Design: Five Sessions

1. **Modern Capital**: Intangible capitals (training), human capital, natural capitals, etc.

2&3. **Distributional Accounts**: SNA update issues, environment, wellbeing (Fitoussi, Stiglitz and Durand report)

4. **Population, Society, and Wellbeing**: Socio-demographic disaggregation of national accounts, vulnerability index, HDI index UN SG Beyond GDP initiative

5. **Synthesis and Next Steps**
Distributional Accounts

• Part 1: Distributional Initiatives within the Core SNA research agenda
  • Income, Consumption, and Wealth
  • Aim to share examples, strategies, and best practices from ongoing
  • Level set on current initiatives to establish baseline for Part 2 session

• Part 2: Distributional & Other Wellbeing Initiatives beyond Core SNA agenda
  • Move beyond the core SNA toward the frontier
  • Aim to learn about research and other initiatives on broader wellbeing agenda—E.g., Stiglitz, Sen, Fitoussi as well as Distributional National Accounts linked to other domains

• Plus: Closing discussion on way forward
Distributional Accounts – March 24

• Focus on initiatives associated within the Core Accounts

• Presentations by International Organizations and Country Experts
  
  • OECD-Eurostat Expert Group on Disparities in a National Accounts Framework: Jorrit Zwijnenburg, OECD
  
  • Expert Group on Linking Macro & Micro Data for Household Sectors: Pierre Sola, ECB
  
  • Distributions of U.S. Personal Income: Dennis Fixler, U.S. BEA

• Call for participants: Ideally two (2) additional country perspectives
Other Wellbeing Initiatives – April 5

- Move beyond the Core toward “the frontier”

- Presentations by International Organizations and Country Experts
  - Initiatives of the OECD Centre on Wellbeing, Inclusion, Sustainability, and Equal Opportunity: Fabrice Murtin, OECD

  - Call for participants: Ideally three (3) country perspectives for the broader wellbeing agenda beyond Distributional Accounts

- Plus, discussion on way forward
Population, Society, and Wellbeing

1. National Transfer Accounts Population Division, UN DESA

How population growth and changing population age structure influence economic growth, gender and generational equity, public finances, and other important features of the macro-economy— the generational economy by disaggregating national accounts by socio-demographic characteristics.

2. Human Development Index - UNDP

How to emphasize that people and their capabilities are the ultimate criteria for assessing the development of a country, not economic growth alone?

3. Vulnerability Index for sustainable development for Small Island Developing States (SIDS) - UNCTAD

How to recognize the socio-economic and environmental vulnerabilities of SIDS for inclusive growth and sustainable development?

4. United Nations Secretary General on Beyond GDP as part of the “Our Common Agenda” - UN Secretariat, UNSD, UNDP, and UNCTAD

How to secure a world where everyone can thrive in peace, dignity and equality on a healthy planet?
Any Questions?