



An update on recording and measuring data

An issues paper, utilising theoretical scenarios

Advisory Expert Group, 6-9 April, 2021
John Mitchell



AEG summary

The AEG asked for more research on

“how to account for the intrinsic value of observable phenomena in the national accounts”

as this may provide more insights into

“a valuation of (the intrinsic value of) observable phenomena in data; the possible recording of transactions relating to observable phenomena as rentals or rent; and an empirical example covering the sequence of accounts including balance sheets”



What's in the paper?

- Provides a recommendation on how OP might be **conceptually treated and practically recorded** in the national accounts
 - Not recorded on balance sheets (for pragmatic reasons), value of OPs perhaps included within the value of the data asset.
- Outlines the **different scenarios** that the information from **OP are obtained by firms** for inclusion in data assets
- Discussed how **different options** are available for recording and measuring the production of data, **depending on:**
 1. If the asset is considered entirely produced or a mixture of produced & non-produced
 2. What expenditure to include/exclude in sum of cost approach
 3. If explicit transactions are recorded as a purchase of NPA or rent payment
 4. How the total value of the asset is derived, sum-of-costs or net present value
- Applied these different options to the different scenarios, (Pros & Cons of options)



Guiding principles for the recording of Data

- The paper **does not make a recommendation** on a preferred treatment, but does support some basic principles:
 - A preference for a “prudent” estimation methodology for any produced data asset, no significant or open-ended changes to GFCF and GDP.
 - A preference for not recording any extension of the production boundary, when it comes to the emergence of OPs, especially within the household sector.
 - A preference for a practically feasible methodology, when it comes to implementation.



Definition of Data

Old

*“Data is information content that is produced by **collecting**, recording, organizing and storing observable phenomena in a digital format, which can be accessed electronically for reference or processing”*

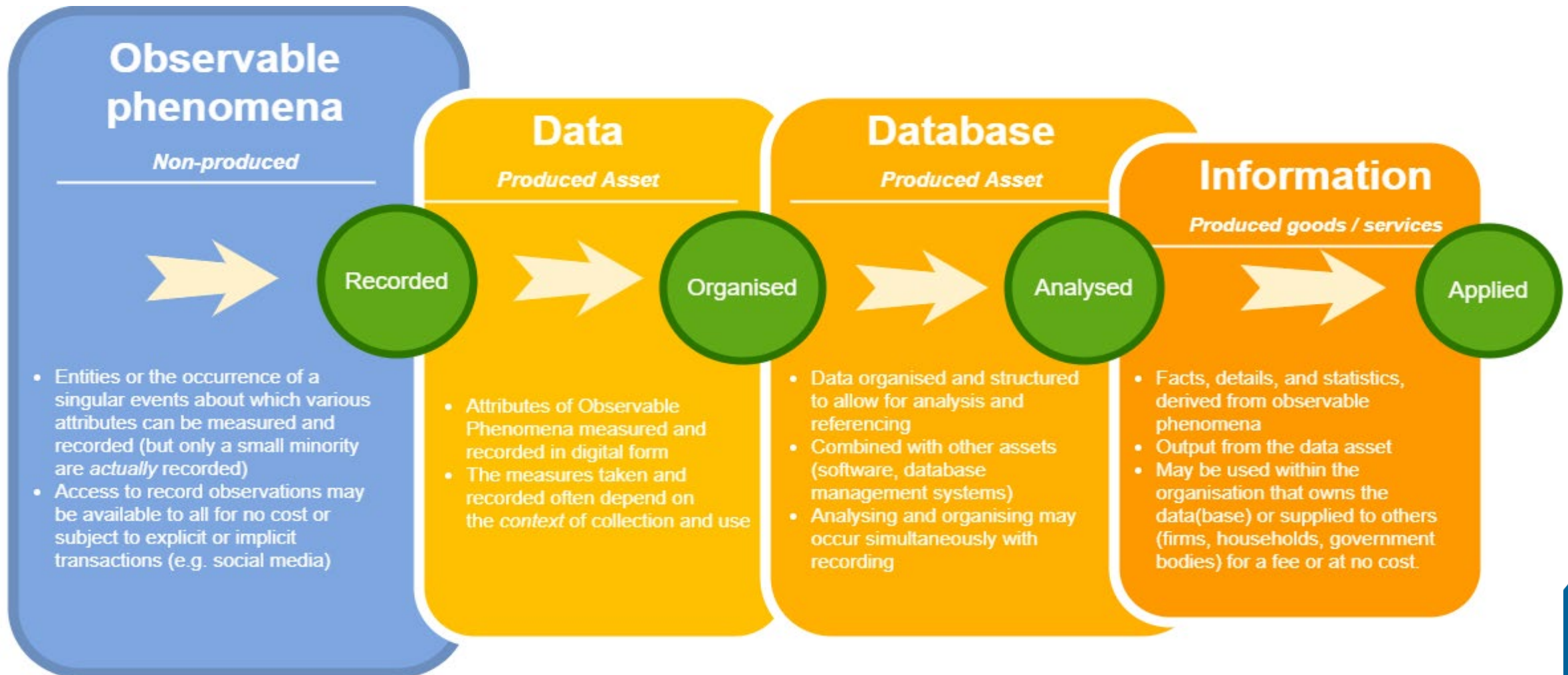
New

*“Data is information content that is produced by **accessing and observing** phenomena; and recording, organizing and storing **information elements** from these phenomena in a digital format, which can be accessed electronically for reference or processing”*

- Conceptually it is **not always possible** to “collect, record, organize and store” observable phenomena
 - *It is raining*
 - *I am wearing a blue shirt*
 - *The local boulangerie sold 100 baguettes.*
- You may not **“collect”** the OP, rather you **access** the OP so you can record and then organise and store the “information elements”



The OP – Data pathway





Questions for AEG

- **Should the sum of cost approach**, when used to value data assets, **be limited** to just the recording, storing, and analysing of OPs, **or be expanded** to include those costs paid by the firm that enable the OP to be accessed for observations?

If expanded;

- should the inclusion of OP procurement costs **be restricted** to those acquired on the basis of an **outright purchase**? Or should a **broader range of costs** associated with getting access to observable phenomena be applied?
- **how to delineate the specific costs** involved in procuring the OPs, particularly in the case of **dual use of an asset** (notably procuring OPs and showing advertisement)?
- should they be considered as **produced or as non-produced**?

Additionally,

- In the case firms **explicitly pay** for (getting access to) OPs, should these payments be recorded as **acquisitions of non-produced assets**, even if the firms don't become the sole economic owner, or should they be **recorded as rent**?



WHAT COSTS TO INCLUDE



Delineating costs of producing data

*“Data is information content that is produced by **accessing & observing phenomena** and **recording, organizing and storing** information elements from these observable phenomena in a digital format, which can be accessed electronically for **reference or processing**”*

- **Recording and processing costs**

- appears consensus that these should be considered as an act of production.

- **OP procurement costs**

- Current SNA explicitly states to exclude “*the cost of acquiring or producing the data*”.

- The previous TT GN stated that the value of own account data should *include “the costs of collecting or acquiring observable phenomena”*.

- What does acquire actually mean ?



Obtaining access to OP

Three basic ways in which firms acquire (access to) OPs:

- **in exchange for free services;**

(Social media, free phone apps)

- **by explicitly purchasing them;**

(Coinout, Amazon, consumer research)

- **as a by-product of the primary production process.**

(Retail, financial services, logistics)



Obtaining access to OP

Three basic ways in which firms acquire OPs:

- **in exchange for free services;**
(Social media, free phone apps)
- **by explicitly purchasing them;**
(Coinout, Amazon, consumer research)
- **as a by-product of the primary production process.**
(Retail, financial services, logistics)

Lots of OP procurement costs

Some OP procurement costs

No OP procurement costs



OP procurement costs (Additional considerations)

- These costs sometimes involve **input of labor and capital**, sometimes are **simply purchased** (treat differently?)
- The costs involved **often have second benefit**, on top of access to OP (how to separate the return on capital?)
- The costs are **likely already captured** in other assets, i.e., R & D, software (how to separate, which asset takes “priority”?)



Different treatments in the examples

| | Example | Produced component equal to | Non-produced component equal to |
|--------------------------------------|-----------|-----------------------------|---------------------------------|
| Mixture of Produced and non-produced | 1a (SOC) | R & P only | N/A |
| | 1b* (SOC) | R & P only | OP Procurement |
| | 1c* (SOC) | R & P only | OP Procurement |
| Entirely produced | 1d (SOC) | R & P + OP procurement | N/A |

* 1b & 1c differ by treatment of explicit payment to access OP



What costs to include - example of results

1a) Valued using sum-of-costs, recording and processing costs only as GFCF

| | | Year T | Year T + 1 |
|---|--------------|------------|----------------|
| GVA | | 200 | 250 |
| GFCF | | 45 | 45 |
| COFC of produced assets | | -30 | -45 |
| OCV-Emergence of non-produced assets | | 0 | 0 |
| OCV-Depletion of non-produced assets | | 0 | 0 |
| | End Year T-1 | End Year T | End Year T + 1 |
| Stock of Produced assets | 90 | 105 | 105 |
| Stock of non produced assets | 0 | 0 | 0 |
| Financial assets | 50 | 115 | 230 |
| Net worth | 140 | 220 | 335 |

Decisions on which costs to include impact estimates of **GVA**, **GFCF & capital stock** regardless if all produced

1d) Valued using sum-of-costs, recording and processing costs and OP procurement costs as GFCF

| | | Year T | Year T + 1 |
|---|--------------|------------|----------------|
| GVA | | 243 | 293 |
| GFCF | | 88 | 88 |
| COFC of produced assets | | -30 | -60 |
| OCV-Emergence of non-produced assets | | 0 | 0 |
| OCV-Depletion of non-produced assets | | 0 | 0 |
| | End Year T-1 | End Year T | End Year T + 1 |
| Stock of Produced assets | 90 | 148 | 176 |
| Stock of non produced assets | 0 | 0 | 0 |
| Financial assets | 50 | 115 | 230 |
| Net worth | 140 | 263 | 406 |



What costs to include?

- Is it **easier to leave OP procurement costs out?**
- If we do so, are we ignoring **where the value comes from?**

“access to capital is no longer the biggest problem for startups. It is access to data.”

- These costs are likely to **become more fundamental** to the creation of a data asset.



Produced vs Non-Produced



Produced Vs Non-Produced

- To allow for the **different intrinsic values** of the information within the OPs, to be represented in the value of the data asset they are underpinning (create more heterogeneity in the value of the data).
- The option of a **more prudent recommendation** if it is agreed that we must properly acknowledge the additional cost in creating the data asset, i.e. providing free service in return for (access to) OPs.
- **Is it a problem? Is it feasible?**



Example of results – Produced vs Non-Produced

1a) Valued using sum-of-costs, recording and processing costs only as GFCF

| | | Year T | Year T + 1 |
|---|--------------|------------|----------------|
| GVA | | 200 | 250 |
| GFCF | | 45 | 45 |
| COFC of produced assets | | -30 | -45 |
| OCV-Emergence of non-produced assets | | 0 | 0 |
| OCV-Depletion of non-produced assets | | 0 | 0 |
| | End Year T-1 | End Year T | End Year T + 1 |
| Stock of Produced assets | 90 | 105 | 105 |
| Stock of non produced assets | 0 | 0 | 0 |
| Financial assets | 50 | 115 | 230 |
| Net worth | 140 | 220 | 335 |

Decisions on produced/non-produced impact estimates of **net worth**

1b) Valued using sum-of-costs, recording and processing costs only as GFCF; OP procurement costs as non-produced asset

| | | Year T | Year T + 1 |
|---|--------------|------------|----------------|
| GVA | | 200 | 250 |
| GFCF | | 45 | 45 |
| COFC of produced assets | | -30 | -45 |
| OCV-Emergence of non-produced assets | | 43 | 43 |
| OCV-Depletion of non-produced assets | | 0 | -15 |
| | End Year T-1 | End Year T | End Year T + 1 |
| Stock of Produced assets | 90 | 105 | 105 |
| Stock of non produced assets | 0 | 43 | 71 |
| Financial assets | 50 | 115 | 230 |
| Net worth | 140 | 263 | 406 |



Explicit payments



Explicit payment

- Intermediate consumption, rental, COE **are not options.**
- Purchase of NPA
 - Would **require the non-produced asset to then be recorded** on the firms balance sheet. Therefore, not a choice for those that favour the asset to be 100% produced.
 - SNA states “assets is limited to those assets which are subject to ownership rights” Can the **information elements of OP be subject to ownership rights?** Often they are limited to one entity due to the nature of their collection but not comparable to other assets
- Rent payment
 - Can be **“ignored” in regard to any capitalisation**, even if used as a proxy for the value of the information elements of the OP.
 - Dependent on **acknowledgement of another asset** (OP’s), even if not recorded in the accounts
 - Enters the accounts in the income account, **does this accurately reflect its contribution?**
- Third alternative,
 - **Change the SNA**, allowing intermediate consumption of non-produced input.



Questions – Explicit payment

How to treat the explicit payment.

- Should a fundamental assumption be made that **rules out any production coming from the household sector** in relation to OPs and data?
- Should firms be considered as purchasing a non-produced asset, even if they don't become the sole economic owner, or should the purchase be recorded as rent? **Is there another option?**



Remaining points for resolution

- The guidance note listed the following conceptual issues as remaining open:
 - Possible multiple economic ownership of licensed data; **How is data sold?** (provision of a service, sale of an asset, license)
 - Ownership of data derived from personal observations, in the light of privacy legislation and GDPR. **(Perhaps made clearer?)**
 - Treatment of short-lived data.
 - Need to further **reflect on terminology**



Questions for AEG

- **Should the sum of cost approach**, when used to value data assets, **be limited** to just the recording, storing, and analysing of OPs, **or be expanded** to include those costs paid by the firm that enable the OP to be accessed for observations?

If expanded;

- should the inclusion of OP procurement costs **be restricted** to those acquired on the basis of an **outright purchase**? Or should a **broader range of costs** associated with getting access to observable phenomena be applied?
- how to **delineate the specific costs** involved in procuring the OPs, particularly in the case of **dual use of an asset** (notably procuring OPs and showing advertisement)?
- should they be considered as **produced or as non-produced**?

Additionally,

- In the case firms **explicitly pay** for (getting access to) OPs, should these payments be recorded as **acquisitions of non-produced assets**, even if the firms don't become the sole economic owner, or should they be **recorded as rent**?