

7<sup>th</sup> Meeting of the Advisory Expert Group on National Accounts, 23-25 April 2012, New York

**Agenda item) : II**

- : Current research issues and the provision of further guidance on the implementation of the 2008 SNA**
- : Other issues (part I)**

**Issues regarding the definition and measurement of capital services  
by the Australian Bureau of Statistics**



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**Paper Prepared by the Macroeconomics Research Section, ABS**

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## Issues regarding the definition and measurement of capital services

### I. Introduction

1. Strong global demand for mineral resources has attracted significant investment in many countries, including Australia. Much of this investment is tied up in infrastructure which is costly and can take many years to produce. However, gross fixed capital formation is recorded when ownership is transferred and capital services are immediately recognised regardless of the asset's utilisation. This raises questions about the definition and measurement of capital services which were introduced in the 2008 System of National Accounts.

2. The Australian Bureau of Statistics (ABS) notes that further work could be done on the clarification of:

- a. The nature of capital services provided by assets contributing to production, inventories and assets not contributing to production.
- b. The SNA recommendation that gross fixed capital formation be measured progressively on a change of ownership basis for buildings and structures but not for other assets which take a long time to produce.

### II. 2008 SNA treatment of capital services and incomplete assets

3. The 2008 SNA introduced the measurement of capital services into the System of National Accounts. Although linking national accounting and capital services is not a new idea, this was a timely acknowledgement that the two are related and a range of benefits can be had from incorporating the measurement of capital services into the national accounts framework. Capital services provide an explicit link between the stock of capital in an economy and its use in the process of production.

4. Capital services are used in productivity statistics to represent the contribution of capital to the process of production. Unlike labour or intermediate inputs, there is no observable flow measure of capital services. In its absence, productive capital stock is used as a basis for capital service measurement (OECD 2001, p. 52):

*Because flows of the quantity of capital services are not usually directly observable, they have to be approximated by assuming that service flows are in proportion to the stock of assets after each vintage has been converted into standard “efficiency” units. The so-computed stock is referred to as the “productive stock” of a given type of asset. Thus, the importance of capital stock measures in productivity analysis derives from the fact that they offer a practical tool to estimate flows of capital services – were the latter directly observable, there would be no need to measure capital stocks.*

5. In most countries, productive capital stock estimates are compiled indirectly using the Perpetual Inventory Model (PIM) based on assumptions about the decline in an asset’s contribution to production over time. Net additions to capital stock during an accounting period are based on the concept of gross fixed capital formation:

*SNA10.32 Gross fixed capital formation is measured by the total value of a producer’s acquisitions, less disposals, of fixed assets during the accounting period plus certain specified expenditure on services that adds to the value of non-produced assets.*

6. The change of ownership basis of this concept creates capital service measurement problems where production of an asset takes place over a number of accounting periods. While a building, structure or other significant asset may not be contributing to production, the SNA recommends that gross fixed capital formation be recorded progressively as production of the asset takes place.

7. In addition, OECD (2001, p.76) recommends the inclusion of inventories in the productive capital stock. The question which arises is if the nature of capital services provided by assets contributing to production, inventories and assets not contributing to production are all the same.

8. In times of rapid increase in capital formation with long lead times, such as in the mining boom currently being experienced by Australia, the inclusion of capital services provided by assets which are not yet contributing to production leads to productivity results which are difficult to interpret.

9. The ABS believes that further work could be done on the clarification of the nature of these capital services.

### **III. 2008 SNA treatment of progressive gross fixed capital formation**

10. The SNA principle for the treatment of production which takes place over more than one accounting period is that this output is recognised as work-in-progress of the producing unit.

11. However, this output is treated as progressive gross fixed capital formation if produced as own gross fixed capital formation. It may also be treated as progressive gross fixed capital formation if ownership of the asset changes progressively.

12. The following SNA passage recommends restriction of the progressive change of ownership to buildings and structures (emphasis added):

*SNA 6.140 When a contract of sale is agreed in advance for the construction of buildings and structures, **but not for other production spreading over several periods**, the output produced each period is treated as being sold to the purchaser at the end of each period, that is, as a sale rather than work-in-progress.*

13. The application of the change of ownership principle to a specific asset type is at odds with the conceptual basis of the SNA. A building or structure will be recognised progressively as gross fixed capital formation and deemed productive as it is being produced. However, the similarly lengthy and expensive production of machinery and equipment such as a ship or floating oil rig may be recognised as work-in-progress for years prior to its completion.

14. The ABS suggests consideration be given to the clarification of this recommendation.

### **IV. Issues for discussion**

15. The AEG is requested to consider:

- a. The clarification of the nature of the 2008 SNA treatment of capital services of incomplete assets
- b. The clarification of the 2008 SNA treatment of progressive gross fixed capital formation.

## References

European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations and World Bank 2009, *System of National Accounts 2008*, New York.

OECD 2001, *The OECD Productivity Manual, A Guide to the Measurement of Industry-Level and Aggregate Productivity Growth*, OECD.