

Measuring the contribution of non-financial assets to non-market production

Anne Harrison (OECD)

Executive summary

1. The 1993 SNA states that by convention there is a zero net operating surplus for non-market producers, which implies there is no return to capital on their assets. During the development of the 1993 SNA it was proposed to change this and the proposal has recurred now in the light of work to integrate the capital services approach to the contribution of non-financial assets to production.

2. The Canberra II Group has considered the issue and proposes the following changes to the SNA:

- a. A return to capital should be estimated for non-financial¹ assets of non-market producers (principally but not exclusively those owned by government) whether they are
 - i. of the type used by employees in the course of their work (e.g. computers, vehicles),
 - ii. those which provide a service to the economy at large (e.g. roads),
 - iii. those which provide a service to the community at large (e.g. recreational facilities such as a city park);
- b. This return to capital should reflect the value of the asset; if the asset has an elevated value because it is rich in historical or cultural associations, the return to the asset will reflect this higher value;
- c. The capital services corresponding to these returns to capital should be used instead of consumption of fixed capital in calculating the value of output of non-market producers when this is estimated as the sum of costs incurred;
- d. The definition of an asset needs to be clarified to ensure that assets which provide benefits to the economy or community as a whole and not just to the owner of an asset are included.

3. The Group considered that assets falling into all the three classes (a(i), (ii) and (iii)) should be deemed to provide capital services and that estimates of these services should be used in place of consumption of fixed capital in the measurement of output of non-market production when it is estimated as the sum of costs incurred. However, the Group noted that the first priority was to include capital services for those assets used by employees of a non-market producer in the normal course of their work.

¹ All references to assets in this paper should be taken to be to non-financial assets.

A second priority would be to extend this to assets providing benefits throughout the economy generally, such as roads. It may be difficult to place a value of the third type of assets, such as city parks and historical monuments, and incorporating capital services for these should be seen not only as a lower priority but also possibly infeasible in practice. If it has been possible to calculate consumption of fixed capital for these assets, there would be little difficulty to changing this to an estimate of capital services, but in some cases where there are no estimates of the value of these assets, neither may be possible.

4. All of these are significant changes to the SNA, and they will lead to a significant increase in both GDP and NDP. The consequence is that interpretation of the contribution of non-financial assets to production and the decline in their value caused by their use in production will be more soundly based on economic theory and normal accounting conventions. All the proposed changes have been approved by a large majority of the members of the Canberra II Group.

5. The Canberra II Group is still considering its recommendations for the derivation of capital service estimates, and they will not be submitted to the ISWGNA for consideration by the AEG until 2005.

6. Does the AEG agree with these proposals?

Background and reasons for change

7. Since the publication of the 1993 SNA, much more consideration has been given to the incorporation of the theory of capital services into the SNA. For assets used by market producers, this allows identification of the capital services rendered with [part of] gross operating surplus and of the return to capital with [part of] net operating surplus. This is consistent with the stated position of the SNA that the value of an asset is, in theory, equal to the net present value of the future income streams coming from it where the stream of income from the use of the asset can be equated to the stream of capital services the asset provides. This approach also allows a value of the asset at any point in time to be estimated and the value of the consumption of fixed capital to be calculated as the change in the value of the asset between the start and end of the accounting period, excluding the change of value due to changes in prices.

8. When these principles are applied to assets owned and used in non-market production, the convention in the 1993 SNA that the net operating surplus for non-market production is exactly zero means that the rate of return for these assets is zero, or in other words, that non-market producers have a social rate of discount of zero. Because this means discounting is not applied in calculating the net present value of such an asset, its value is the simple sum of the capital services remaining. While this position is tenable from some points of view it produces anomalies in the values to be ascribed to assets which are otherwise similar but where one is used by a market producer and one by a non-market producer.

9. Consider two assets, identical in all respects except that one is owned and used in the course of non-market production and one is owned and used in the course of market production. If one is subject to discounting and the other not, then the two assets have different values in the periods after their initial purchase, even though the second hand value of each must be equal. This equality can be achieved by placing a different value on the capital services rendered by the asset of the non-market producer to those rendered by the market producer's asset, though the technical characteristics are identical. This anomaly is avoided if both assets are assumed to produce the same rate of return as that owned and used by a market producer.

10. This assumption amounts to saying the cost of capital is the same for both producers. The proposition that this should be the case was considered in the course of the revision leading up to the 1993 SNA and until the very last stages it was proposed to include a return to capital on government assets in

that version of the SNA. The consequences arising from the greater application of capital service theory therefore simply reinforce the case made during the revision process prior to 1993.

Recommendations for change

11. The Canberra II Group reviewed the issue and considered three groups of public assets, (i) those such as buildings, computers and vehicles which are used by civil servants in the course of their work, (ii) assets such as roads which contribute to increased productivity of other industries, and (iii) assets such as city parks which have no consequences for productivity in any other industry..

12. The Group considered that assets falling into all these classes should be deemed to provide capital services and that estimates of these services should be used in place of consumption of fixed capital in the measurement of output of non-market production when it is estimated as the sum of costs incurred. However, the Group noted that the first priority was to include capital services for those assets used by employees of a non-market producer in the normal course of their work. A second priority would be to extend this to assets providing benefits throughout the economy generally, such as roads. It may be difficult to place a value of the third type of assets, such as city parks and historical monuments, and incorporating capital services for these should be seen not only as a lower priority but also possibly infeasible in practice. If it has been possible to calculate consumption of fixed capital for these assets, there would be little difficulty to changing this to an estimate of capital services, but in some cases where there are no estimates of the value of these assets, neither may be possible.

13. If an asset, for example a building, has the same functionality as another building but a higher value because of historical or cultural associations, then the value of net operating surplus will reflect this increased value. This is consistent with the proposition that historical monuments are included in the category of produced assets.

14. The Group also noted that a clarification to the definition of an asset is needed in respect of assets in the second and third classes since the benefits accrue not just to the owner of the asset but to the economy and population at large.

Implications of the changes for the System

15. Including an estimate of capital services instead of consumption of fixed capital will increase the value of output, gross and net value added for non-market production. The net value added of non-market production will no longer be zero but will be equal to the value of capital services less consumption of fixed capital².

² Non-market producers may also have some net operating surplus arising from a market establishment or from the rent accruing on non-produced assets.

16. The Canberra II Group is still considering its recommendations for the derivation of capital service estimates, and they will not be submitted to the ISWGNA for consideration by the AEG until 2005. However, in order to give some indication of the impact of the proposed changes on GDP approximate estimates have been derived³ of a return to capital for the general government sector for the United States and Australia, using an ex ante approach with an exogenous rate of return. In 2002 the increase in the level of GDP is estimated to be approximately 1.8% for the US and for 1.5% for Australia. Given that the capital stock of general government tends to change at a modest rate from year to year then if the expected real rate of return does not change very much over time either, it is unlikely that the proposed changes would have a significant impact on constant price GDP growth rates.

17. The changes proposed affect the value to be estimated for gross operating surplus for non-market producers. The consequences for the subsequent balancing items in the accounts follow automatically.

Other issues

18. These recommendations ensure that assets owned and used in non-market production are valued in the same way as assets owned and used in market production. It is a change to the 1993 SNA but one which makes for greater internal consistency in the valuation of assets and recognition of their role in production.

19. There are implications for the OECD manuals on the measurement of capital stock and the measurement of productivity as well as for the GFSM.

20. When balance sheet estimates exist for the value of the stock of public assets, there will be no feasibility problems in the case of implementing this proposal for assets used by non-market producers as a part of their own production process. When such estimates do not exist, there is already a feasibility problem in respect of estimating values of consumption of fixed capital for these estimates. For assets providing services to the public at large, such as roads, there should be few problems of implementation. For assets with historical and cultural associations and those providing recreational facilities, valuation of the stock of the asset and its associated capital services may take some time to establish initially, but valuation of such assets is required to complete the balance sheets so this proposal represents very little of an extra burden of compilation.

³ The chain volume estimate (reference year 2000) of general government fixed assets in the US totalled \$4 440.3 billion at the end of 2001. Assuming a real rate of return of 4% implies a real return to capital of \$177.6 billion in 2002. At current prices this is \$184.1 billion or 1.8% of GDP (\$10 480.8 billion). Calculated this way the level of GDP is increased by either 1.7% or 1.8% in each year from 1992 to 2002. In the case of Australia, the chain volume estimate (reference year 2001-02) of government fixed assets at 30 June 2001 totalled A\$ 264.2 billion. Assuming a real rate of return of 4% implies a real return to capital of A\$10.6 billion in 2001-02. At current prices it (the same value, A\$10.6 billion) is 1.5% of GDP (A\$714.4 billion) in 2001-02.

Two points are worth noting. First, land and inventories should also be included in the calculation, so the impact on GDP would be a little higher than indicated here. Second, the US estimates of fixed assets include all military assets, including weapon systems, whereas the capital stock estimates for Australia exclude weapons systems.

Paragraphs of the SNA which need revising

21. There are three distinct topics where this recommendation has implications for the text of the SNA. The first concerns the measurement of output of non-market producers in chapters 2, 3, 4, 6 and 15. The second concerns the valuation of assets in chapters 10 and 13. The third topic is the calculation of the consumption of fixed capital and affects chapters 6 and 10.