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MEASUREMENT OF CAPITAL STOCKS FOR GOVERNMENT IN THE UK

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WORKING PARTY ON NATIONAL ACCOUNTS

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I. Introduction

1. The UK Office for National Statistics (ONS) is investigating a new source of capital stocks and capital consumption estimates for government, using data collected as part of the Whole of Government Accounts programme carried out by Her Majesty's Treasury (HMT – Department of Finance).

2. ONS currently uses the Perpetual Inventory Method (PIM) to estimate capital stock and consumption of fixed capital for the whole economy. The OECD (2001) handbook on Measuring Capital points out that while the PIM is cheap and convenient, it requires many assumptions and the estimates obtained are "probably less reliable than most other official statistics" [paragraph 8.1]. The OECD manual describes alternatives to the PIM. One of these is a statistical survey of capital stock and capital consumption, and this method has been used to various extents by Japan, Korea and the Netherlands. A survey of computerised asset registers, avoiding the need for on-site investigation by enumerators, was started in the UK in the late 1990s, but suspended due to resource problems. Such surveys are indeed expensive to carry out across the whole economy, but should yield more up-to-date and reliable information than using the PIM. However, the quality of the data depends on the quality of asset records maintained by respondents.

3. A development of this survey approach is the "balance of fixed assets", described in the OECD manual as follows:

> 8.33 Provided that prices are correctly revalued each year, [the "balance of fixed assets"] method can, in principle, provide suitable estimates of gross capital stock. In practice, there are severe practical difficulties in applying this method at the present time; these include growing rates of non-response, difficulties in measuring asset prices under high inflation and the over-valuation of older assets. It may, of course, be possible to overcome these problems by redesigning the surveys and improving enumeration procedures and these surveys would then be a valid alternative to the PIM.

The OECD manual also covers the use of administrative records, and states that these estimates can be preferable to the PIM:

> 8.37 Administrative records are used in several countries to estimate stocks of certain types of assets, notably road vehicles, dwellings, aircraft, and nuclear fuel rods. The stocks of publicly owned assets, including roads, public buildings and other structures may also be calculated from government records. Such estimates are usually to be preferred to estimates based on the PIM.

4. If the quality of capital consumption and capital stocks estimates calculated using the alternative approaches outlined above exceeds the quality of those calculated using the PIM, then they should be incorporated into the National Accounts. In the UK we now have access to data from the Whole of Government Accounts, which we believe may present such an alternative for the central government sector initially, and perhaps eventually the whole public sector.

II. Whole of Government Accounts (WGA)

5. In the UK, government departments started using resource accounting in the late 1990s. Resource accounts are accruals based accounts – recording expenditure when it is incurred rather than when it is paid out, and income as it is earned rather than when it is received. These accounts intend to provide a more accurate and useful picture of the government's consumption of resources, and better incentives for departments to improve their asset management. They are based on UK Generally Accepted Accounting Practice (GAAP), with some modifications, and cover income and expenditure, capital and reserves, and assets and liabilities. They are fully audited. The accounting standards for governmental resource accounts are laid down in the Government Financial Reporting Manual (FReM) and the Resource Accounting Manual (RAM).

6. WGA is a consolidation of all the audited resource accounts of government bodies. Any intra-government transactions are removed as part of the consolidation process, and the consolidation is itself audited by the National Audit Office. Under WGA, HM Treasury have carried out two pilot exercises for collecting central government accounts data (2001-02 and 2002-03) and intend to publish 2003-04 in the next few months. At present the WGA programme does not cover parts of the National Health Service, but it will be extended to cover these soon. Expanding this exercise to include local government will also start with two pilot exercises (2004-05 and 2005-06) before publication of data for 2006-07. In the future it is planned to extend the exercise to the whole public sector – i.e. including public corporations. It will never cover certain parts of central government, as defined by National Accounts, which are not subject to budgetary control by HM Treasury, such as the National Audit Office and the Houses of Parliament.

7. Internationally, New Zealand, Australia, Canada, Sweden, Iceland and the USA are all producing WGA in some form and a number of other countries are taking steps in that direction.

8. Since UK government bodies started using resource accounting, the possibility of calculating capital stock and capital consumption figures based on these accounts instead of the PIM has been under discussion. The consolidation of individual resource accounts under WGA has made this step more feasible. In considering the application of WGA to the national accounts, several issues have been identified, and are outlined below.

III. Application to the National Accounts

3.1. Valuation and depreciation

9. Under UK GAAP, resource accounting requires tangible fixed assets to be valued at the lower of replacement cost and recoverable amount, which is the higher of net realisable value or value in use. Asset values must be reviewed annually, using professional valuation on a regular basis and appropriate price indices in the intervening periods. Therefore, the "gross book value" and "net book value" figures available from WGA, are not book values in the historic cost sense, but represent a stock figure carried forward with the effects of revaluations. This means that the valuation basis is approximately right for the replacement cost values required by SNA 1993, and we propose to use these "book value" series for gross capital stock and net capital stock. Changes in valuation of an asset may lead to impairments, which are discussed below.

10. SNA 1993 defines capital consumption as:

> 6.179. Consumption of fixed capital is a cost of production. It may be defined in general terms as the decline, during the course of the accounting period, in the current value of the stock of fixed assets owned and used by a producer as a result of physical deterioration (or wear and tear), normal obsolescence or normal accidental damage. It excludes the value of fixed

assets destroyed by acts of war or exceptional events such as major natural disasters which occur very infrequently. Such losses are recorded in the System in the account for "Other changes in the volume of assets". […]

6.183. […] The value of a fixed asset at a given moment in time depends only on the remaining benefits to be derived from its use, and consumption of fixed capital must be based on values calculated in this way.

Under resource accounting, government departments depreciate their stock by "allocating the cost (or revalued amount) less estimated residual value of the assets as fairly as possible to the periods expecting to benefit from their use" (RAM 2004-05, para 3.2.29). Therefore all fixed assets are depreciated over their economic lives, unlike in business accounts when the period over which an asset is depreciated may be different to its economic life, for tax or other accounting reasons. Again, regular reviews are carried out at the end of each reporting period and the economic life of the assets is revised if significantly different from that previously reported. Such changes may lead to impairments, which are discussed below.

3.2. Coverage

11. The asset categories and concepts in both WGA and national accounts appear broadly consistent. There are a few exceptions:

- Development expenditure may be capitalised under GAAP rules whereas in National Accounts it is presently treated as current expenditure.

- Goodwill is not currently included in the national accounts, but is to be covered by SNA 2008

- Computer software and associated development costs are treated in WGA (subject to certain criteria) as tangible fixed assets with the amount capitalised being incorporated into the cost of the associated hardware. ESA 95 treats both of these as intangible fixed assets.

- Single Use Military Equipment (SUME) is at present treated as capital expenditure in WGA but as current expenditure in National Accounts. However from SNA 2008 it will also be capitalised in the National Accounts.

- Assets under construction (AuC) are a separate asset type in WGA, while at present in the UK national accounts they will be included in the GFCF of the existing asset types

- Non-produced asset types, mainly land, are included in WGA but are not covered by the concept of capital stock in national accounts. However, they are not depreciated within WGA, but included in gross book value and, therefore, net book value.

3.3. Impairments

12. One of the issues under discussion as part of this work is whether capital consumption in the national accounts should include WGA impairments as well as WGA depreciation. Within WGA, assets are valued according to the economic benefits they are expected to provide in future. In any year, audits of fixed assets can prove previous estimates of the economic benefits to have been incorrect and so an impairment is scored to show the change in value of that asset - in effect, to correct the depreciation previously recorded.

13. Comparing the concepts of national accounts and WGA, it seems that impairments which are the result of "normal wear and tear and foreseeable obsolescence, including a provision for losses of fixed assets as a result of accidental damage which can be insured against" they apply to the concept of capital consumption. The PIM incorporates a coefficient of variance to the mean life lengths of assets in an attempt to cover such damage and obsolescence, while resource accounting provides direct measures of such events. Where the impairments concept in resource accounting goes outside National Accounts definition of capital consumption is where revaluations of assets are based on fluctuations in market value. Capital consumption does not include movements relating to market forces, and impairments in this area may apply to other changes in assets (K.7, K.8, K.9, K.11).

14. A further question is whether impairments, as measured under resource accounting, could be said to be "normal" or "foreseeable". In the case of obsolescence, it is reasonable to assume that all assets will at some point become obsolescent, though for some assets that may be very far in the future. What is unforseeable is when this obsolescence occurs. If an asset is unforeseeably obsolescent, or the damage is beyond the normal range of damage, then the change in volume of that asset should be recorded in K.9 (Other volume changes in non-financial assets).

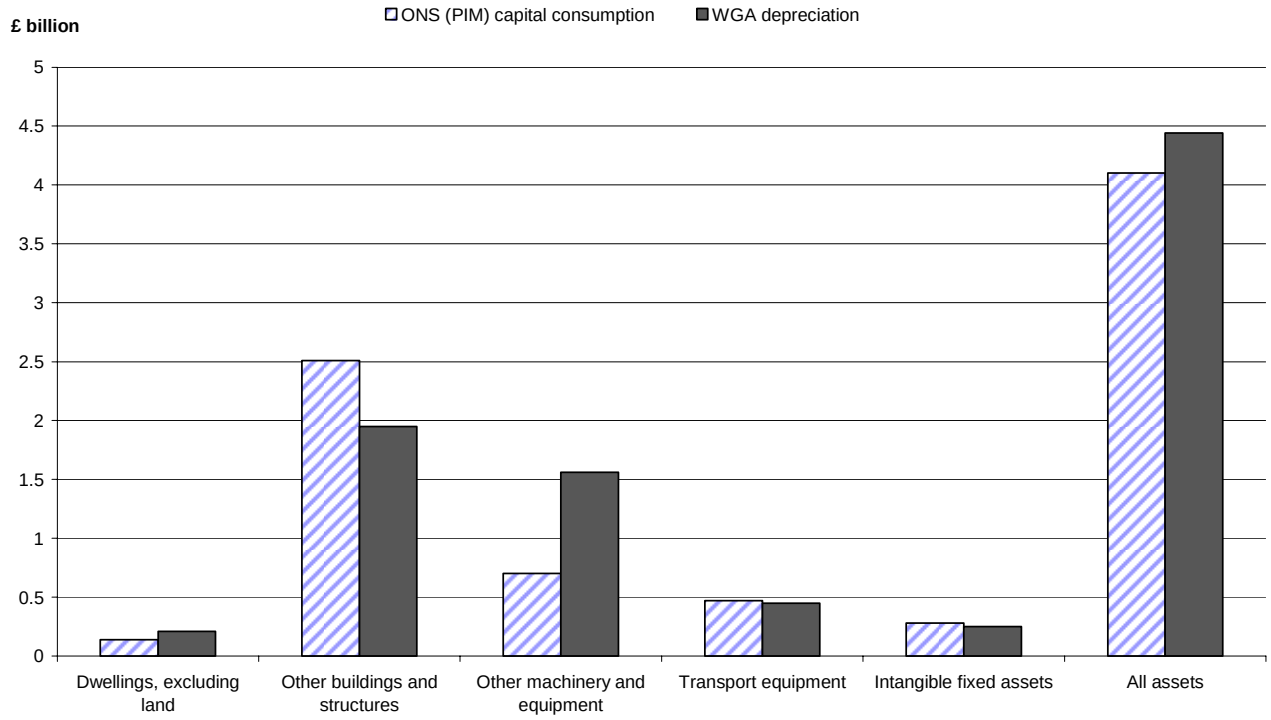
15. If ONS decides to use impairments data in calculating capital consumption, we will be working with HMT to ensure that those types of impairments which apply to capital consumption can be separately identified, or at least that the impact of unwanted impairments is minimal. Our focus will be on getting the estimates right at the macro level, as the PIM does, rather than assessing impairments on a case by case basis.

IV. Indicative data

16. Data from WGA have not yet been published. Although ONS have been allowed access to the pilot and pre-publication estimates, these have not been quality assured for National Accounts purposes. As an indication of what to expect, the 2003-04 WGA depreciation figures are presented in Chart 1 below, together with capital consumption as published in the ONS publication “Capital Stocks, Capital Consumption and Non-Financial Balance Sheets 2005”. The WGA figures do not include impairments. To put the two datasets on a comparative basis, the following steps were taken:

- Calendar year PIM capital consumption data was converted into financial year
- Capital consumption for health was excluded from PIM capital consumption as the WGA numbers do not include the whole National Health Service
- Some assets (e.g. Single Use Military Equipment, Goodwill) were excluded from the WGA numbers as the PIM does not include these assets

Chart 1 - Comparison of central government capital consumption and WGA depreciation 2004/05



17. At a total level the numbers are similar, but the individual asset types show gaps between the two datasets. Little quality assurance has been done at this stage. As more data become available, stringent quality checks will be made to identify reasons for the differences.

V. Conclusions and future plans

18. The main reasons for using WGA estimates relating to fixed assets to measure capital consumption and capital stocks for the central government sector are:

i. WGA data are collected directly from departments on an annual basis, and the life lengths used to depreciate the stock will be specific to that department's stock. This is in contrast with the PIM data which are based on historic values, updated using investment data (in the case of central government, also sourced from HMT) and standardised life lengths. Departments are in a better position than ONS to make estimates of their stock and depreciation

ii. To ensure the data are of good quality, they are audited by various bodies, including the National Audit Office, both at departmental level and when the individual departmental returns have been consolidated into the full accounts by the WGA team at HM Treasury

iii. Business accounts are not used to compile capital stock and capital consumption estimates because the estimates in company accounts may not be in current prices, and companies may depreciate assets faster for tax or other accounting reasons, so the asset is still in use but is not on the accounts. Neither of these reasons applies to data collected through the WGA programme.

19. Over the next few months in ONS, we intend to agree the concepts involved in adopting WGA figures into national accounts. If use of this new source is approved, we will then be working with HM

Treasury to quality assure the data, and proceed to incorporate WGA estimates into the UK national accounts capital stock system.

VI. Issues for discussion

20. ONS welcomes views on any of the issues mentioned in this paper, including:

- The relationship between national accounts and resource accounting/GAAP
- The use of impairments data to measure capital consumption