

Distr.
GENERAL

CES/AC.68/2000/6
28 February 2000

ENGLISH ONLY*

STATISTICAL COMMISSION and
ECONOMIC COMMISSION FOR EUROPE

ORGANISATION FOR ECONOMIC
CO-OPERATION AND DEVELOPMENT (OECD)

CONFERENCE OF EUROPEAN STATISTICIANS

COMMISSION OF THE EUROPEAN
COMMUNITIES (EUROSTAT)

Joint ECE/Eurostat/OECD
Meeting on National Accounts
(Geneva, 26-28 April 2000)

COMPILATION OF BALANCE SHEETS IN AUSTRALIA

Invited Paper submitted by the Australian Bureau of Statistics**

Introduction

1. The Australian Bureau of Statistics (ABS) publishes balance sheets for Australia and for each sector of the Australian economy in its annual publication *Australian System of National Accounts* (ABS Cat. no 5204.0). These balance sheets are compiled in accordance with the recommendations of SNA93, although not all of the assets recognized by SNA93 are included. The reference point for Australia's balance sheets is 30 June, which is the last day of the Australian financial year.

2. This paper outlines the history of balance sheet compilation in Australia, describes the structure and content of the Australian balance sheets, summarises the sources and methods used in their compilation, and concludes with some ideas on future directions.

* Due to the late submission, the paper could not be translated before the Meeting.

** Prepared by Mr. Peter Harper, National Accounts Branch. For more information on Australia's balance sheets, contact Peter Harper (e-mail peter.harper@abs.gov.au) or Sean Thomson (e-mail sean.thomson@abs.gov.au).

History

3. The first national balance sheets for Australia compiled by the ABS were released in 1995. These balance sheets covered the years 1989 to 1992. Prior to then, the ABS had published estimates for some of the components of the balance sheet, such as stocks of tangible fixed assets and the international investment position. The 1995 publication was the first attempt by the ABS to pull together all of the (available) balance sheet information. It introduced estimates of the value of cultivated fixed assets, land, sub-soil assets, and forests. Because of the difficult valuation issues associated with natural resources, the balance sheet estimates were labelled "experimental".

4. In 1997, updated balance sheets, covering the period 1989 to 1995 were released. Improvements were made to the methods used to value natural resources. Also, sectoral balance sheets were introduced to complement the national balance sheet.

5. In 1998 the time series for the balance sheets was extended to 1996. In April 1999, the balance sheets were presented as an integral component of the national accounts for the first time in the 1997-98 issue of *Australian System of National Accounts*. (Prior to then, the balance sheet estimates had been released in their own publication.) The most recent (1998-99) issue of *Australian System of National Accounts* was released in November 1999, and it contains balance sheet estimates for the years 1991 to 1999. Estimates for the years 1989 and 1990 are available from the ABS's electronic data service.

Structure and content

6. The structure of the Australian balance sheets is similar to that shown SNA93 Table 13.1. Assets are set out separately from liabilities, with net worth shown as a balancing item. Assets are broken down into non-financial and financial components. Liabilities and financial assets are classified by financial instrument. Non-financial assets are split into produced and non-produced components, with each of these disaggregated further. Attachment 1 shows the full amount of detail available in the Australian balance sheets.

7. Four memorandum items accompany the balance sheets. These items show the value of consumer durables, foreign investment in Australia, Australian investment abroad and non-rateable land.

8. Sectoral balance sheets are produced for the financial corporations, non-financial corporations, general government, household (including non-profit institutions serving households) and external sectors. The balance sheet for the external sector is a mirror image of Australia's international investment position which is published in the ABS's balance of payments and international investment position publications. The definitions of each of the sectors are very similar to those in SNA93. The only difference of substance is that only certain types of non-financial quasi-corporations are included in the non-financial corporations sector. Most non-financial quasi-corporations are included in the household sector. The reason for this is that, for the most part, it is very difficult to determine which non-financial unincorporated enterprises qualify as quasi-corporations

9. As mentioned above, not all of the SNA93's assets are reflected in the Australian balance sheets. The major omissions are valuables, water resources and intangible non-produced assets. Lack of source data is the main reason for their exclusion. Furthermore, even though land is included in the balance sheets, its coverage is not complete. Freehold and leasehold land plus land owned by Commonwealth Government business enterprises is included. Excluded is land held by the Commonwealth, State and local governments, as well as land owned by State and local government business enterprises. Again, lack of data is the reason for the exclusions.

10. There are three other aspects of the content of the Australian balance sheets worth noting. First, financial assets and liabilities in relation to unfunded pension schemes for general government employees are included. This is contrary to the recommendations of SNA93, which recommends that these positions be shown as memorandum items. However, as argued in the paper "The Treatment of Pension Funds in the Australian National Accounts", which was presented to the 1999 OECD Meeting of National Accounts Experts, the ABS believes that the claims that households have on governments as a result of these schemes is sufficiently certain to warrant their inclusion in the balance sheets. Second, there is no asset shown for mineral exploration as part of intangible fixed assets component of the balance sheet (although mineral exploration is regarded as an asset in the flow accounts). This is because, in the ABS's view, the value of mineral exploration is reflected in the net present value of sub-soil assets, which are known to exist as the result of exploration activity. Recording the value of exploration activity along with the value of sub-soil assets would imply double counting. Third, ownership transfer costs are not reflected in the balance sheet values. These costs are treated as gross fixed capital formation in the flow accounts, but the full amount of the costs is treated as consumption of fixed capital in the period in which the costs are

incurred. This is an interim treatment pending the outcome of the current international discussions on this issue.

11. As a supplement to the balance sheets, the ABS publishes an extensive range of information on the quantities and values underlying the livestock, land, sub-soil assets and forest estimates. Also, more detailed information than that shown in the balance sheet for tangible fixed assets, private non-farm inventories, and financial assets and liabilities are published in national accounts and other ABS publications.

Sources and methods

Fixed assets

12. The estimates of fixed assets shown in the balance sheet are essentially derived using the perpetual inventory method (PIM). Key features of the Australian PIM include:

- . estimates are produced in respect of 11 asset types: dwellings, other building and structures, road vehicles, other transport equipment, industrial machinery and equipment, computer and computer peripherals, electronic and electrical machinery and equipment, other plant and equipment, software, livestock and artistic originals
- . assets are assumed to be retired according to a Winfrey distribution function
- . an age-efficiency profile is specified for each asset type, and these profiles are used to derive relevant age-price profiles (which are in turn used to derive the net capital stock estimates that are used in the balance sheet)
- . generally, hyperbolic age-efficiency profiles are used. However, for computer and computer peripherals and software a "one-hoss shay" profile is assumed
- . estimates are generated for each of the four domestic sectors
- . the "core" PIM aggregates are derived in volume terms, and revalued (using appropriate price indexes) to produce current-price estimates.

13. The expenditure data that are used in the PIM come from a range of sources, including the ABS's quarterly Survey of New Fixed Capital Expenditure, the ABS's quarterly Survey of Building Activity, the ABS's quarterly Survey of Engineering Construction, the ABS's annual Economic Activity Survey, Commonwealth and State government financial reports and data provided by the Australian Taxation Office. The annual expenditure estimates are confronted within a supply-use framework (since 1994-95). A variety of price indexes are used to revalue the various PIM aggregates, including the CPI, various building price indexes, various manufacturing output price indexes, the import price index and the US BEA's computer price index.

14. SNA93 recommends the inclusion of historical monuments in "other buildings and structures". However, because of a lack of data, estimates for these structures are not included in the Australian balance sheets.

15. The livestock estimates produced by the PIM relate only to sheep and cattle. Estimates for other animals are obtained from other sources, including the ABS's annual agricultural census and various industry publications. Minor holdings of animals (e.g. zoo animals) are not included in the estimates due to a lack of suitable data.

Inventories

16. Inventories are broken down into six broad components: private non-farm, farm, public marketing authorities, other public authorities, livestock and plantation standing timber.

17. The principle source of data for private non-farm inventories is the ABS' quarterly Survey of Inventories, which measures the book values of inventories held by private businesses (other than farms) at the end of each quarter. (Because of the generally frequent turnover of inventories, book value is considered to be a good proxy for market values.) Estimates of farm inventories are derived from a number of sources and in some cases modeling techniques are used. Australia has a number of marketing authorities for various agricultural commodities (e.g. wool, wheat) and the inventory levels for these authorities have been estimated using the perpetual inventory method, based on estimates of changes in inventories provided by the marketing authorities themselves. (Most of the public marketing authorities were "privatised" on 1 July 1999, so in future balance sheet estimates for inventory levels for these units will be obtained from the Survey of Inventories.) The perpetual inventory method is also used to estimate inventory levels for other public authorities. The data underlying the estimates are obtained from the ABS's public finance system. Of interest here may be the treatment of the Sydney Olympic Games Organising

Committee (SOCOG) in the national accounts. The excess of SOCOG's output over the consumption of that output for the periods leading up to the 2000 Olympic Games is being treated as an increase in inventories. The accumulated inventories will be then run down during the period in which the Olympics are actually held.

18. Estimates of livestock inventory levels are obtained from a variety of sources, including the ABS's annual agricultural census and various industry publications. Estimates for plantation forests are generally compiled by applying insurance schedules (by tree age) for each hectare to the numbers of hectares (classified by average tree age) under plantation forest. The schedules are determined by the Australian Forest Growers Association. Information on the numbers of hectares under plantation forest is obtained from the Bureau of Resource Sciences.

Land

19. Estimates of the land values are provided to the ABS by the Valuer General for each State and Territory government. While each jurisdiction's approach is different, the data are standardised to make them comparable. The estimates represent the site value of rateable land and are split according to land purpose. As mentioned above, the land holdings of the Commonwealth Government and State and local government business enterprise are excluded from the estimates as this land is "non-rateable". However, this land is thought to account for only about five percent of the total land value.

20. The data underlying the land estimates are compiled primarily for the purposes of raising revenue from rates (land taxes) and transactions in land (land transfer taxes). There is a certain arbitrariness in the derivation of land values in areas where there are a few transactions in vacant lots. A further problem is that invisible improvements (such as clearing) are included in the site value estimates. As these improvements are treated as gross fixed capital formation, they will have been included in the produced assets estimates. The extent of the double counting is not known but it is not considered to be significant.

Sub-soil assets

21. The net present value (NPV) approach is used to value sub-soil assets. This approach involves calculating the expected future net annual income flows generated by an asset, and then discounting these flows by an appropriate interest rate. Net income is estimated by deducting costs (including a normal return to mining capital) from the value of gross output (price multiplied by production). This difference is taken to be the equivalent of economic rent,

and it is assumed to remain constant (in real terms) over the expected life of the asset. Consequently, a real, as opposed to a nominal, rate of discount is appropriate. This interest rate is determined by subtracting the annual change in the weighted average of the purchasers' prices of the inputs to the mining industry from the corporate borrowing rate for large businesses. The expected life of each asset is calculated by dividing annual production into the economically-demonstrated reserves. (Economically-demonstrated resources include proven plus probable resources, whereas the SNA suggests that only proven resources be included.)

22. Data on production and economically-demonstrated reserves are provided by the Bureau of Resource Sciences. Estimates of production costs are provided by a private consulting firm. Output prices are, for the most part, obtained from direct observation although in some cases proxy prices, such as export unit values are used. Changes in input prices are obtained from the ABS's producer price indexes. Returns to capital are derived from the ABS's capital stock system.

23. In order to minimise the impact of short-term fluctuations, the output price and annual production components are averaged over the five years.

24. The NPV approach described above is considered to be the most appropriate for Australia. It is, however, based on a number of assumptions, including constant extraction rates, constant output prices (in real terms) and constant production costs (in real terms). Also, the choice of an appropriate discount rate is by no means clear cut and there has been considerable debate internationally about this issue. For these reasons, the ABS labels its estimates of sub-soil assets as "experimental" and users are advised to view them with caution. To assist users in analysing the monetary measures extensive physical information is provided as a supplement.

25. It should also be noted that the economic rents that are derived as part of the process differ significantly from the royalties received by the general government sector from subsoil assets. (In Australia, all subsoil assets are owned by government.) More work needs to be undertaken on the reasons for these differences and what, if any implications, there are for the balance sheets and/or flow accounts.

Native forests

26. The NPV approach is also used to value native forests. Information on the (net) value of production is provided by State forestry departments and, for

those States where this information is unavailable, derived from data on the volume of production and relevant prices. Forest "lives" are determined by taking account of average rotation cycles, which are based on information provided to the ABS by State forestry departments. As with subsoil assets, a real discount rate is used, which is calculated by subtracting the annual change in the weighted average of the purchasers' prices of the inputs to the forestry industry from the corporate borrowing rate for large businesses.

27. The valuation of native forests only considers trees that are currently in existence. No account is taken of future natural growth. It may be, for example, that production from some forests exactly equals natural growth, in which case production at the same rate could occur forever. It could be argued, therefore, that the "lives" of such forests should be considered to be infinite for the purposes of valuation. This is an area that requires further investigation.

Financial assets and liabilities

28. The financial assets and liabilities shown in the national balance sheet relate to positions between Australian residents and the rest of the world. The main data source for these estimates is the ABS's Survey of International Investment. This survey collects, among other things, information on the levels of Australia's financial assets and liabilities. For the most part, data are collected at market values. However, for some data items (e.g. portfolio investment in Australian securities held through Australian nominees), data are collected at face value and are converted to market values using various techniques. Where possible, this is done on a security by security basis.

29. The Survey of International Investment covers government as well as non-government positions. It does not, however, cover official reserves. Data on levels of official reserves (at market values) are provided to the ABS by the Reserve Bank of Australia (RBA).

30. A variety of data sources are used to compile the financial asset and liabilities shown in the sectoral balance sheets. Some of the more important are the RBA's collection of balance sheet information from banks, data provided by the RBA and the Commonwealth Government on the Commonwealth Government's Treasury bond and note liabilities, the ABS's public finance collections and the ABS's Survey of Financial Information. However, the data sources used do not provide estimates for the financial assets and liabilities for all sectors. As a result, in some cases counterpart information is used to estimate a particular sector's financial position. For example, information on household's deposits

with banks is obtained from information reported by banks. In other cases, a choice is often possible because different data sources provide alternative measures of the same item. For example, most borrowing by State-owned non-financial corporations is reported by the State central borrowing authorities as assets and by the non-financial corporations themselves as liabilities. The data will generally not agree because the ABS does not survey all State owned non-financial corporations. In this case, the data from the central borrowing authorities are therefore used to estimate both the asset and liability aspects of these borrowings.

31. The ABS is aware of the following deficiencies in its financial data:

- . balance sheet information is not collected from small non-financial corporations, solicitors' and similar trust funds, and financial auxiliaries (such as stock brokers), some of which buy securities on their own account. Estimates are made for these unreported assets using partial information reported by fund managers.
- . stock lending, repurchase agreements, and short selling in securities markets—and inconsistent treatment of these practices by respondents—are causing some double counting of asset records for some types of securities.
- . derivative and synthetic financial products are not always treated consistently.
- . the estimates of the stock of issued shares of unlisted private non-financial corporations are very poor.
- . the estimates of other accounts/payable receivable for small corporations and the household sector are also very poor.

Future directions

32. Future work on Australia's balance sheets will be focussed on filling the gaps in coverage.

33. With regard to intangible non-produced assets, questions were added to the 1998/99 Economic Activity Survey (EAS) to obtain information on the value of these assets. The collected information will need to be analysed for its fitness for incorporation into the balance sheets. As no information exists for earlier years, it is unlikely that it will be possible to compile historical estimates. The 1998/99 EAS also collected information on trade credits, which is expected to be useful for improving the estimates of other accounts payable/receivable in the sectoral balance sheets.

34. With regard to valuables, there has been little progress in identifying a suitable data source. As these assets are most likely to be owned by households, adding questions to a household survey may be one way to measure them. However, it is unlikely that there will be a suitable survey in the ABS's program of household surveys for the foreseeable future. Another source that could be investigated is insurance records.

35. With regard to water resources, the ABS is in the process of finalising a set of water accounts which will provide physical measures of the various types of water storages. We are hopeful that this physical data can be combined in some way with price data in order to estimate the value of those water assets that satisfy the SNA's asset criteria. More work is required on choosing the appropriate price measures.

36. With regard to non-rateable land, it is hoped that the recent move to accrual accounting by State and Commonwealth Governments will lead to the provision of useful estimates. As part of accrual accounting, the various governments are required to produce balance sheets, with assets valued regularly. Further work is required to assess these balance sheets to determine how useful they will be for national accounts purposes.

37. The ABS will continue to keep across international developments on the valuation of assets, particularly subsoil assets.

38. At some stage in the future, consideration may be given to producing quarterly balance sheets. Quarterly data on stocks of financial assets and liabilities (by sector) are already produced by the ABS. For stocks of non-financial assets, quarterly data exists for some components such as inventories. For other components, it may be possible to develop techniques to extrapolate/interpolate annual data in order to derive reasonable estimates. Before any serious work was done, however, there would need to be demonstrated user interest in quarterly balance sheets. At the moment, users are only just becoming used to the availability of annual balance sheets.

Attachment 1**Structure of Australia's Balance Sheets****Assets***Non-financial assets*Produced assets

Fixed assets

Dwellings

Other buildings and structures

Machinery and equipment

Livestock

Computer software

Entertainment, literary and artistic originals

Inventories

Private non-farm

Farm

Public marketing authorities

Other public authorities

Livestock

Plantation standing timber

Non-produced assets

Land

Subsoil assets

Native standing timber

Financial assets

Monetary gold and SDRs

Currency and deposits

Securities other than shares

Loans and placements

Shares and other equity

Insurance technical reserves

Unfunded superannuation

Other accounts receivable

Liabilities

Currency and deposits

Securities other than shares

Loans and placements

Shares and other equity

Insurance technical reserves

Unfunded superannuation

Other accounts payable

Net worth