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AUSTRALIAN INFORMATION AND COMMUNICATION TECHNOLOGY SATELLITE ACCOUNT

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AUSTRALIAN INFORMATION AND COMMUNICATION TECHNOLOGY SATELLITE ACCOUNT

I. Introduction

1. Information and communication technologies (ICT) play an important role in the way in which we live and do business. Recently there has been considerable interest in the role of ICT as a significant driver of socioeconomic development, for example, in the way that ICT has allowed businesses to increase productivity. The measurement of these developments has provided significant conceptual and measurement challenges for official statisticians. A key part of the ABS response to these challenges has been to develop an ICT satellite account for Australia for 2002-03. This work was preceded by the release in 2003 of a 'pilot' ICT satellite account in respect of 1998-99.

II. Concept of a satellite account

2. Satellite accounts, as articulated in the international System of National Accounts 1993 (SNA93), allow for an expansion of the national accounts for selected areas of interest while maintaining links to the basic concepts and structures of the core national accounts. The ICT satellite account developed by the ABS uses the national accounts framework to present a picture of the value of transactions in ICT products within the Australian economy. The link with the national accounts enhances the usefulness of the data in analysis by ensuring comparability and consistency with key economic aggregates. However, the satellite account is not a compendium of all available ICT related information collected by the ABS nor is it a dataset which serves all purposes. For example, the satellite account does not provide an analysis of the contribution of ICT to productivity growth as it was considered that these types of analyses are best undertaken by the various specialists in this field.

ICT measures in the Australian System of National Accounts

3. The economic value of ICT activities and products are included in the Australian System of National Accounts (ASNA) in key economic aggregates such as industry gross value added, gross fixed capital formation and household final consumption expenditure. However, the detail is often hidden in larger aggregates. The classifications and the data sources used in the national accounts are not designed to systematically identify ICT products, or the industries producing or distributing those products. Similarly, the national accounts do not systematically identify the use of ICT products by businesses, government, households and for export, although some important aggregates such as business investment in computer software are separately available. One role of the ICT satellite account has been to review and, where necessary, make improvements to ICT data series in the national accounts. These new benchmarks are reflected in the 'historical revision' of the national accounts published in *Australian System of National Accounts 2004-05* (cat. no. 5204.0) in November 2005.

III. Scope of the ICT satellite account

4. The scope of the ICT satellite account is determined by the range of goods and services considered to be 'ICT'. Essentially, ICT products include computer hardware, computer software, telecommunication assets, computer services and telecommunication services. An ICT satellite account

details the supply and use of these products and also measures the direct value that ICT products add to the economy through the key aggregates ICT GDP and ICT gross value added.

IV. Framework for the ICT satellite account

5. The basic compilation framework for the ICT satellite account is the national accounts 'supply-use' system. It has been adapted to focus on ICT products and the industries producing or distributing those products. Fundamentally, the system consists of a supply table that tracks the supply of ICT products from imports and from Australian producers, and a use table that tracks the use of those products by industries, government, households and for export. It aims to be comprehensive in its coverage. Many different sources of data of varying quality are used to populate the supply and use tables. In order to satisfy the identity that the supply and use of products must equal, discrepancies due to deficiencies in the data are highlighted and must be resolved. One of the strengths of the supply-use framework is that it facilitates this data confrontation and provides a basis for optimising the quality of the overall estimates in the face of deficiencies and gaps in data coverage.

V. International standards and ICT measurement

6. Some satellite accounts use a set of recommended classifications and frameworks developed from international research and discussion over a number of years, with international agencies usually taking the lead. Satellite accounts for tourism and non-profit institutions are examples where international guidelines are available. There are no such guidelines available for an ICT satellite account, although there have been international initiatives on some aspects important to this work.

7. International experience shows that the measurement of ICT transactions is not easy, particularly given the intangible nature of software, the complexity of licensing and leasing arrangements involved and the bundling of ICT products. It was inevitable therefore that a range of significant data and other issues required close attention in producing this publication. A number of judgement calls were necessary to integrate the data and to resolve issues for which there is as yet no clear international standard. The results published in the ICT satellite account should therefore be considered 'experimental'.

8. Because of the large developmental aspect to the ICT satellite account, the ICT satellite account publication devoted considerable attention to describing the ABS response to the various challenges encountered in producing the published tables. A brief description of a selected number of these issues is provided below.

9. The 'standard' ABS ICT product definition defines a range of products making up 'telecommunication equipment' that essentially includes only telecommunication equipment. However, should spending by telecommunication service providers on construction activities that are integral to the operation of telecommunication equipment (e.g. transmission towers) also be treated as ICT output and ICT gross fixed capital formation?

10. Vendors often sell computer hardware and software together as a 'bundle', consequently the purchaser will not necessarily know what proportion of the purchase price relates to the hardware component or to the computer software component. Therefore there is a tendency for respondents to simply report the entire sale price against computer hardware. As a result, survey results tend to show some understatement of reported computer software spending and corresponding overstatement of computer hardware.

11. There are no international standards or guidelines on whether computer games should be included in the definition of 'computer software'. One reason is that the same software will drive applications run on a range of different platforms, some of which are not considered computer hardware

according to internationally accepted product definitions. Should the definition of 'computer software' include computer games?

12. Another issue concerns customised software. Customised software is generally contracted to a particular client rather than being intended for reproduction. The issue that arises here is establishing the boundary between software production and more general computer services. It has been necessary to estimate the proportion of total computer service income relating to customised software. Is there a better way of recognising and accounting customised software away from computer services?

13. Own account software is software developed in-house for an entity's own use. It is estimated at market value or, if that data is not available, by summing the costs of production. It is considered a capital item and should be regarded as gross fixed capital formation. Both own-account and customised software should be recorded as work in progress until finished and available for use. However, data constraints mean that as work progresses it will most likely be recorded as gross fixed capital formation. Insufficient data exists to reliably estimate the costs of production involved in own-account software development and subsequently the valuation falls somewhat short of a full market price equivalent.

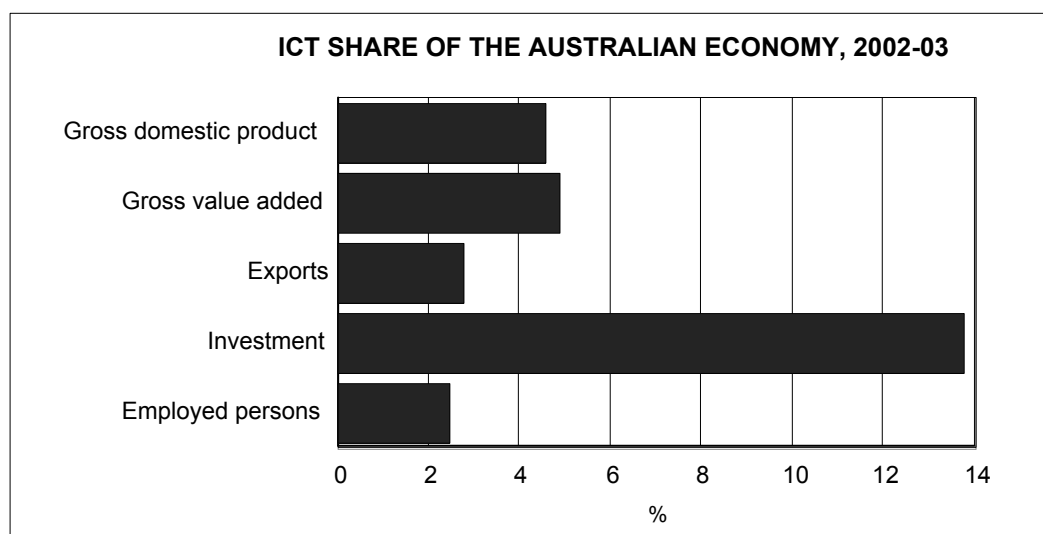
14. Software can be traded internationally and transactions may be recorded as trade in goods and services, including licence and royalty transactions. If Customs data is used on its own then there will be a significant measurement understatement.

15. Internet connection charges are difficult to measure because Household Use of Information Technology data provide only a net increase in internet connections by households, this is compounded by the fact that internet service providers frequently offer free internet connections. Additionally, there is no data available on ISP charges for 'excess' use.

16. A significant amount of ICT computer hardware are leased by their users. If both the lessee and lessor are reporting the same ICT product as capital expenditure to ABS surveys then double-counting exists. It is hoped that addressing these types of issues will encourage further thought and constructive commentary and contribute to the discussion of best practice in statistical measurement internationally.

VI. Key outputs of the ICT satellite account

17. The satellite account supports estimation of a number of important aggregates such as ICT GDP. ICT GDP is the total market value of ICT products produced in Australia after deducting the cost of goods and services used up in the process of production. ICT GDP accounted for \$36.2 billion or 4.6% of total GDP in 2002-03, while ICT gross value added was \$34.8 billion (4.9% of gross value added) in 2002-03. In the key area of gross fixed capital formation, business and government invested \$26.7 billion in ICT products in 2002-03, which made up 13.8% of total gross fixed capital formation in Australia during this period. The following graph outlines the ICT share of selected economic aggregates.



18. Of the ICT contribution to total gross value added of 4.9%, the most significant industry contributors were Telecommunication services (44.3%); Computer services (28.0%) and ICT wholesale (14.8%).

INDUSTRY CONTRIBUTION TO ICT GROSS VALUE ADDED, 2002-03

	ICT gross value added	Share of ICT gross value added
	\$m	%
ICT Specialist Industries		
Manufacturing	709	2.0
Wholesale	5165	14.8
Telecommunication services	15397	44.3
Computer services	9740	28.0
<i>Total ICT Specialist Industries</i>	<i>31011</i>	<i>89.1</i>
Other industries	3781	10.9
Total	34792	100.0

19. Australia experienced a deficit of \$9.7 billion in ICT net trade in 2002-03. That is, the level of ICT product imports (\$14.0 billion) was \$9.7 billion greater than ICT product exports (\$4.2 billion). ICT imports accounted for 8.4% of all imports while ICT exports accounted for 2.8% of exports. Computer hardware and telecommunication equipment together made up more than 70% of ICT imports. The largest ICT export items were computer hardware at \$1.3 billion and telecommunication services at \$1.1 billion.

VII. Improvements to core national accounts

20. The ICT satellite account has driven a number of important improvements to the core national accounts. As mentioned, these improvements are generally reflected in the 2005 historical revision of the national accounts. For example, the confrontation of various measures of computer software and computer hardware through a supply-use framework has resulted in time series revisions to gross fixed capital

formation for both of these important aggregates. Benchmark estimates of production of Internet service providers (ISPs) and household spending on these services have been greatly improved, as have the indicator series used to estimate these aggregates beyond the most recent benchmark. A number of other improvements have been made to ICT-related benchmark estimates and/or related indicator series.

VIII. External consultation

21. Throughout the course of this project the ABS has successfully engaged in consultations with its external ICT statistics user group. Since the release of the satellite account on 7 March 2006, general user reaction has been favourable. Internationally, the work is being recognised as an important advance in the measurement of ICT. For example, the ABS was recently invited to speak with a number of agencies in Chile on the topic of ICT satellite accounting. To our knowledge Australia and Chile are the only countries to have produced an ICT satellite account to date.

IX. Future plans

22. The ABS currently has no plans to repeat the compilation of the ICT satellite account. However, it is reasonably clear that any future ICT satellite account would require user funding, as occurs for the Tourism satellite account (ABS cat. no. 5249.0).