

Unclassified

STD/CSSP/WPNA(2014)4

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

20-Oct-2014

English - Or. English

STATISTICS DIRECTORATE
COMMITTEE ON STATISTICS AND STATISTICAL POLICY

Working Party on National Accounts

MEASURING OBSOLESCENCE IN NON-TECHNOLOGICAL FIXED ASSETS, AUSTRALIA

To be held on 5-7 November 2014
OECD Conference Centre
Beginning at 2:00 pm on the first day

This document has been prepared by Joy Swift (Australian Bureau of Statistics) and will be presented under item 19 of the draft agenda

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JT03364359

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MEASURING OBSOLESCENCE IN NON-TECHNOLOGICAL FIXED ASSETS, AUSTRALIA

**Prepared by Joy Swift
Australian Bureau of Statistics**

Abstract

In applying the concept of depreciation, it is a well-established practice to account for obsolescence in high technological assets. However, obsolescence is also a factor in other assets. Further, obsolescence must be factored into service life assumptions.

The Australian Bureau of Statistics is undertaking research into asset service lives as part of a wider review of capital measurement practices. During this research, we have discovered a particular form of obsolescence occurring in dwellings in Australia, indicating the possibility of an overestimation of expected service life in the past. This obsolescence has not been due to technological change, but it is largely due to a rise in land prices. In the Australian context, this has coincided with a rise in demolitions and a shift toward higher density residential buildings, as owners use the land more intensively.

Introduction

1. In applying the concept of depreciation, it is a well-established practice to account for obsolescence in high technological assets. However, obsolescence is also a factor in other assets. In this paper, we discuss the research that has been undertaken to measure obsolescence in non-technological assets in Australian statistics.
2. It is well established that depreciation is an important and difficult element to measure in capital measurement. It affects the measurement of costs, income, profit, factor shares, rates of return to various inputs, income tax bases, and productivity (Wykoff 2003, p1-2).
3. Over the past century, there has been rigorous academic debate surrounding the definition of depreciation. The theory of capital has been described as difficult, poorly understood, controversial and contentious (Wykoff, 2003, p3). The composition and measurement of capital is the subject of ongoing disagreement among economists. The measurement of capital is not only difficult, but important, since in practice many interesting economic problems will require capital to be measured (Hulten, 1990, p119).
4. More specifically, we draw our attention to an accurate estimation of obsolescence, and note that it is a crucial element to the accurate measurement of time series depreciation. This is because the definition of depreciation is a decline in value of an asset due to wear and tear, accidental damage and obsolescence (SNA 2008).
5. Further, obsolescence must be factored into service life assumptions. Service lives are not a measure of how long an asset can physically be used, but how long the owner found it profitable to use the assets rather than some alternative asset. As Katz (2008, p18) puts it “we do not care what causes an asset to be retired. We only care how long it is in service before it is retired”. One of the consequences of

obsolescence may be that an asset is retired before it reaches a service life attained by comparable assets of earlier vintages (Katz, 2008, p15).

6. Given the potential difference in definition of asset life, we will use the term physical life to express the time which an asset has physical potential to be useful. We will use service life to express the time which an asset was being used by its owner in practice. Service life can be shorter than physical life if, for example, the owner decides to retire the asset before it completely wears out physically. However, service life cannot exceed physical life.

7. The Australian Bureau of Statistics is undertaking research into asset service lives as part of a wider review of capital measurement practices. During this research, we have discovered a particular form of obsolescence occurring in dwellings in Australia, indicating the possibility of an overestimation of expected service life in the past. This obsolescence has not been due to technological change, but it is largely due to a rise in land prices. In the Australian context, this has coincided with a rise in demolitions and a shift toward higher density residential buildings, as owners use the land more intensively.

8. The rest of this paper discusses the standard definition of depreciation for national statistical organisations as outlined in the System of National Accounts 2008 (2008 SNA); the traditional emphasis on wear and tear in depreciation measurement and the findings of research into obsolescence in non-technological assets and provides the example of dwellings in Australia. We focus on the change in consumers' desires for modern living, the rise in importance of location, the rise in land prices and the change to higher density living in Australia. Ongoing measurement issues are highlighted and experimental estimates of capital and balance sheet measures are also presented.

Defining depreciation

9. The System of National Accounts 2008 adopts the traditional concept of definition, sometimes referred to as the time-series definition of depreciation. Depreciation or

Consumption of fixed capital is 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, normal obsolescence or normal accidental damage. (2008 SNA, 6.240)

10. Hill (1999, p6-7) offers a similar definition of time series depreciation: "the decline in the value of a fixed asset between the beginning and the end of the accounting period resulting from its use in production". It is described as the "traditional concept in both economic theory and accounting".

11. Depreciation must be measured with reference to the average prices of the type of asset of constant quality over the period and not for the purpose of writing off historic costs as is commonly practiced in commercial accounting (2008 SNA 10.156, 6.240). It is for this reason that the System of National Accounts 2008 uses the term: consumption of fixed capital. However in this paper we will use the term depreciation to refer to the same concept - that is, economic depreciation and not accounting depreciation.

12. The traditional definition of time series depreciation of an asset in one period can be represented as the following equation,

$$D = P_{1,1} - P_{0,0} \quad (1)$$

Given

D denotes time-series depreciation

$P_{s,t}$ denotes value of asset aged 's' in time period 't'

Equation (1) represents the change in value of the asset from period 0 to period 1.

13. However, there is an alternative to the time series definition of depreciation – cross-sectional depreciation. Cross-sectional depreciation is "the difference in value between two successive vintages, of ages k and $k+1$, of the same homogenous type of asset at the same point of time" (Hill, 1999, p6-7). Cross-sectional depreciation was developed largely for productivity analysis.

14. Equation (1) can be re-written as,

$$D = (P_{1,0} - P_{0,0}) + (P_{1,0} - P_{1,1}) \quad (2)$$

The first term in equation (2), $(P_{1,0} - P_{0,0})$, represents cross-sectional depreciation. This is the difference in value between assets of different ages in the same time period. The second term in equation (2), $(P_{1,0} - P_{1,1})$, represents obsolescence. This is the difference value between assets of the same age in different time periods. That is, the change in price due to the passing of time and not due to ageing. From equation (2), we can observe that time series depreciation is the sum of cross-sectional depreciation and obsolescence.

Defining Obsolescence

15. There are a variety of ways obsolescence is described. The System of National Accounts 2008 provides some examples of obsolescence: when there is a decline in the value of assets because of a decrease in the demand for their services as a result of technical progress and the appearance of new substitutes for them (2008 SNA, 6.242). According to the Australian System of National Accounts (2013, 14.29), obsolescence occurs when an event occurs which causes an otherwise useful asset to become less useful or useless. According to Wykoff (2003, pp14, 20), obsolescence is the effect of the presence of a new vintage on the price of an existing asset, for example, when new vintages of assets are introduced that embody improved quality and the (shadow) price of existing assets falls (Wykoff 2003, p3). Hill (1999, p5) also states that technical progress, advances in knowledge and changes in taste makes the demand for and the price of the services of existing asset, which are already in use, fall. Katz (2008 p15) identifies that the common thread in various definitions of obsolescence is that the "demand for the services of an existing capital asset declines sharply".

16. To model obsolescence, we first establish that the value of capital today is the present value of all future capital services delivered by the capital goods at prevailing rental prices. The current stock of capital can be represented by the following equation, (3),

$$K = \sum_{i=0}^{\infty} \frac{r_i k_i}{(1 + R)^i}$$

Given

K denotes capital stock

r_i denotes rental price in period i

k_i denotes quantity of capital services in period i

R denotes the discount rate

17. In this model, obsolescence will cause the asset's rental price to change, but not the quantity of capital services.

18. It is also useful to note that only normal, expected rates of obsolescence and accidental damage should be included in depreciation. Unexpected losses due to "war or to major natural disasters that occur very infrequently, such as major earthquakes, volcanic eruptions, tidal waves or exceptionally severe hurricanes" and "unexpected technological developments that may significantly shorten the service lives of a group of existing fixed assets" (SNA 2008, 6.244) should be recorded in the other changes in the volume of assets account.

Measuring Obsolescence in Practice

19. Discussion about obsolescence is well established for high technology assets. These assets are affected by obsolescence mainly due to technological change. Some authors believe obsolescence should be accounted for, especially in high technology assets such as computers (Hill, 1999, p5). Wykoff (2003, p4) states that

Computers and information technology capital are clear examples of assets for which obsolescence, as opposed to deterioration (pure aging), is a major part of the depreciation story.

20. Katz (2008, p17) states that the phenomenon that most people associate with obsolescence is the introduction of a capital asset that embodies a superior technology, such as a faster computer chip.

21. On the other hand, Wei and Zhao (2004, p7) have proposed that obsolescence should not be factored in separately because of the risk of double-counting.

22. However, the System of National Accounts not only includes obsolescence in depreciation, but also acknowledges its occurrence in a broader range of assets. For example,

Service lives are not determined purely by physical durability, and many pieces of equipment as well as buildings and structures are eventually scrapped because they have become obsolete. (SNA 2008, 10.157)

23. Hill (1999, p5) also warns against omitting obsolescence in non-technological assets:

obsolescence is not confined to assets such as computers. Spectacular examples of large assets retired on grounds of obsolescence are provided by railways and ocean liners. Even many structures, including housing, are eventually retired because of obsolescence.

24. The System of National Accounts (SNA, 2008, A4.61) gives an example of a shortening of expected service life and/or unforeseen obsolescence occurring if the owner neglects maintenance and repairs. Hill also notes that the price of maintenance and repairs affects the service life of an asset. He concludes that "The service life of an asset is by no means determined purely by the technical characteristics of the asset" (1999, p5).

25. Although it is acknowledged that obsolescence may occur in all types of assets and for reasons other than technological change, there remain challenges involved in measuring obsolescence in non-technology assets.

Case study: Dwellings in Australia

26. The Australian Bureau of Statistics is undertaking research into asset service lives as part of a wider review of capital measurement practices. During this research, we have discovered a particular form of obsolescence occurring in dwellings in Australia, indicating the possibility of an overestimation of

expected service life in the past. This obsolescence is not largely caused by a technological change, as in high technology assets.

27. Current estimates of mean asset service lives (See Table 1) are based on estimates from *Estimates of Depreciation and Capital Stock, Australia* (Walters and Dipplesmann, 1985), as no more recent information has been available until now (Australian System of National Accounts, 2013, 14.86). Asset service life estimates from Walters and Dipplesmann, 1985 (1985, para 170) were based on overseas estimates and *Australian Domestic Product, Investment and Foreign Borrowing* (Butlin, 1962).

28. **Table 1:** Current Mean Asset Service Lives (Years) - Dwellings by type

Dwelling type	Current estimates
Private brick homes	88
Private timber, fibro and other houses	58
Private non-house dwellings (units, flats, etc),	58
Public	58
Private alterations and additions	39

Source: ASNA Table 14.3

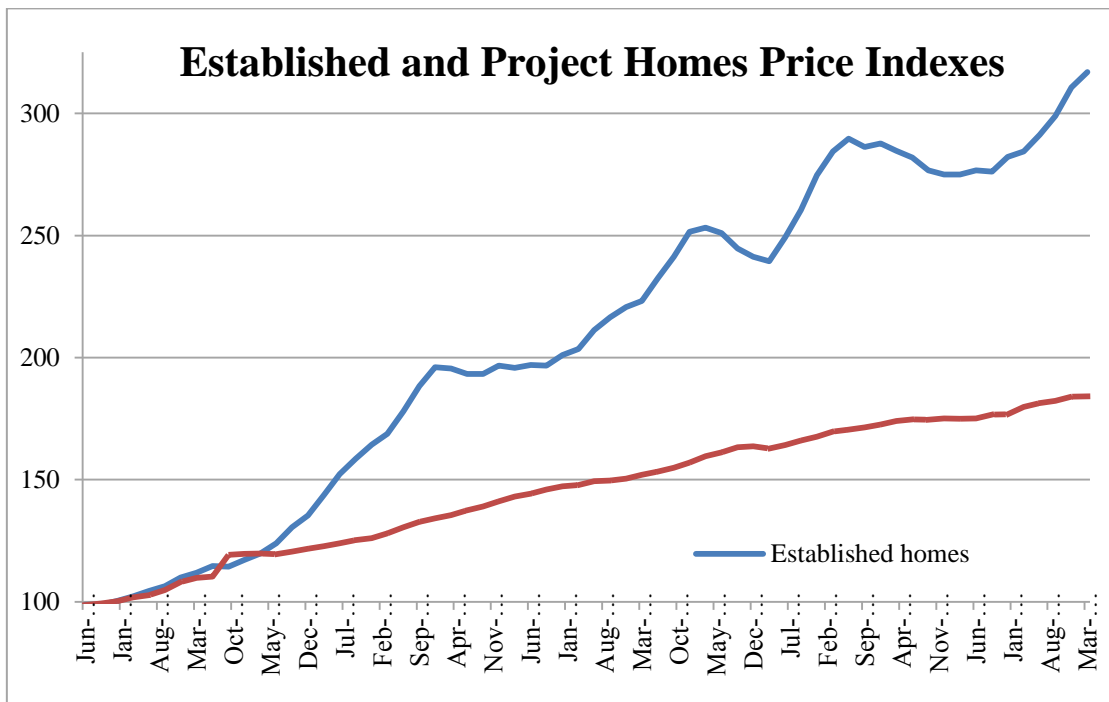
29. A reduced expected dwelling service life may result if we have not accounted for obsolescence. Consultation with Australian building bodies and planning authorities suggest an expected dwelling service life of 40-60 years¹.

A Shift in Land Prices

30. During the course of this research, we observed that the biggest influence in a decrease in dwelling mean service life was the general rise in land prices. As Katz (2008, p17) outlines, "there are many external factors that affect the demand for an asset's services ". A rise in land prices is one such external factor. It gives a greater incentive for the owner of the dwelling to increase the return on the land - by building a new dwelling and demolishing the old one.

31. The value of land in Australia over recent years has increased substantially more than the value of the physical dwelling built upon it, especially in urban areas. This can be seen in the substantial increase in the price of established houses (including land) in capital cities compared to the price of constructing a new dwelling (excluding land) (see Figure 2 & 3). The increase in the value of land in Australia has been attributed to an increase in the population, poor transport infrastructure (limiting the supply of well-located land), increase in the availability of credit to households, zoning limits in the CBD and high levels of development regulation (Reserve Bank of Australia, 2011, p8 and Housing Industry Association, 2014, p1).

¹ These include the Australian Building Codes Board (40 years), Master Builders Australia (50 years), Institute of Valuers (50 years), Western Australian Planning Commission (50 years) and life cycle analysis literature (Haynes - 25-50 years, Kapambwe 55-66 years). Moreover, analysis of the little data available on recent demolitions reveal an average demolition age of 55 years (Adelaide) and 49 years (Australian Capital Territory, South Australia – Public Housing and Western Australia – Public Housing)

32. **Figure 2:** Project and Established House Price Indexes 1998-2014²

Source: ABS cat. no. 6416.0 Residential Property Price Index, Eight Capital Cities

33. In the Australian context, this has firstly coincided with a rise in demolitions, as owners desire to maximise the return on the land. For the owner of a house on a block of land, the decision of how to best utilise the asset is largely determined by the building to land value ratios. If the land is far more valuable than the building, then the owner is more likely to demolish and rebuild the building (Haynes, 2014, *personal correspondence*).

34. Unfortunately, there is limited empirical evidence about the extent of this trend in Australia. A government study of the development in the Adelaide city area (South Australia Department of Planning, Transport and Infrastructure, 2013 p20), using CV/SV ratios³, showed that sites where the value of the dwelling(s) is only slightly higher than the land value are more attractive for redevelopment. In the study 54.8% of demolition sites had ratios less than 1.2.

35. While the reasons for this are complex, a number of possibilities can be identified. Firstly, the price of construction relative to the price of land has decreased and therefore, ignoring market frictions, the relative amount of construction demanded will generally respond with an increase. For the owner, it has become relatively less expensive to demolish and rebuild a house than it is to buy an equivalent established block and house somewhere else. There has also been a reduction in the opportunity cost of demolishing a house when it has a relatively lower value than the land.

² Note: There is a series break for the Established homes index in 2002 and short term movements in the period should be interpreted with caution.

³ The report states that the CV/SV ratio ... measures the value of the capital improvements (i.e. a dwelling) relative to the land value.

36. Also, building value is more easily influenced than land value. By making improvements to a structure on a block of land, owners can (relatively) easily improve the overall property.

37. Lastly, it is also less risky to knock down a building with relatively lower value. If the land value is high, it provides a safety buffer to the high risk venture of rebuilding. While demolitions remain cyclical, the building industry expects an upward long term trend to be maintained (Master Builders Australia, 2014, *personal correspondence*).

38. Haynes (2003, p13) expands on this idea:

Australian houses are rarely demolished due to surpassing their design life or becoming structurally unsafe. More so they are demolished and re-developed to meet current aesthetic trends and fashions. Typically, spec built homes in Australia may only last 25 - 50 years before being re-developed. Strata developments with shared walls or floor and ceilings dramatically reduces the chance of early re-development as would be developers must purchase all strata units. Consideration of the quality of design and the location's probability of redevelopment is also made in determining likely life span. Despite these factors, the durability ceiling is rarely used as the expected life span.

39. An example of redevelopment occurring due to land values rising is found in the Adelaide area, where almost 50 percent or 5,371 houses and 57.3 per cent or 2,933 of public housing demolished were of houses constructed between 1950 and 1959. The report (South Australia Department of Planning, Transport and Infrastructure, 2013, p 25) outlines that this is because the houses were constructed during the post-World War II building boom. These houses were built predominantly in the middle-ring suburbs and situated on relatively large blocks of land. The recent rise in land values has made them attractive for redevelopment.

40. This describes a picture of the early obsolescence of houses. The service lives for houses do not commonly coincide with the physical deterioration of the asset. This early obsolescence is most likely to show up in a lower service life for dwellings today.

A Shift to a Better Location

41. Another trend observed in Australian housing is the priority given to living closer to the city centre – where most amenities and working opportunities are situated. This trend has been exasperated by the increase in population, placing pressure on land supply and causing higher use of shared transport infrastructure.

42. The Reserve Bank of Australia has recently noted,

land prices are high when there is a ‘shortage’ of well-located land. We cannot do much about the physical supply of land, but investment in transportation infrastructure – by making it easier to move around the city – can increase the supply of ‘well-located’ land. (Lowe, 2013)

43. In a city with high transport costs, households have a stronger incentive to live closer to the city centre. The city size is significantly smaller as a result. To accommodate the denser population, building heights are higher and dwelling sizes are smaller (Kulish, Richards & Gillitzer, p8, 2011). This could also explain the rising popularity in multi-unit buildings over detached housing in recent years (See section ‘A Shift to Higher Density Living’).

A Shift to Modern Living

44. An obvious factor that can be seen to cause obsolescence in existing houses is the change in modern lifestyles. Households today demand higher quality housing, that is, more capital services from their dwelling. This may include features such as a double garage, multiple bathrooms and a more energy efficient design. This has contributed to the incentive to demolish houses that no longer deliver adequate capital services, but are still physically durable buildings.

45. In our model, this can be attributed to a fall in rental price, r , in equation (3) for existing houses relative to “modern” housing. That is, while the original house is still producing the same quantity of housing services to its owner, there is a fall in price of these services due to a shift in demand towards other “modern” services. It also contributes to depreciation, in the term $(P_{1,0} - P_{1,1})$ in equation (2). There is a price change due to the passing of time and ignoring changes from the ageing of the dwelling. Specifically, over time the preferences of owners have changed their desires towards “modern” living, which has meant a fall in price of older dwellings.

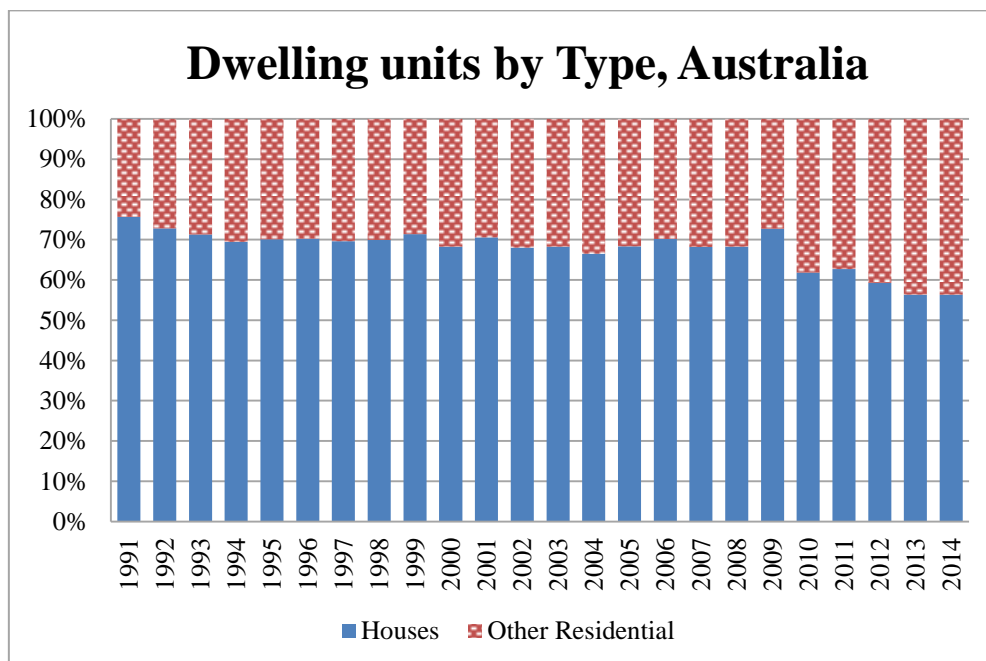
46. An example of this is shown in the research by the Reserve Bank of Australia (Ellis, 2006, p8, 23), which has noted that there has been surge in the demand for housing due to low interest rates in Australia⁴. This surge in demand has increased housing prices. This is partly because existing households try to express their increased demand for housing services by moving to more desirable housing. If newly built properties on new land developments are of the currently desired quality but existing properties are not, then some households will be induced to sell their existing home and move to a newly built one. Vacancy rates in the established areas rise as a result, with the older, lower-quality homes either renovated or demolished and replaced over time.

A Shift to Higher Density Living

47. The rise in land prices has not only increased the incentive to demolish existing buildings, but also the incentive to build higher density dwellings. The share of detached houses (by number) of total new dwelling commencements has decreased from 73% in 1992 to 56% in 2013. Conversely, the share of other residential housing has increased from 24% to 44% in the same period (ABS 8731.0 Building Approvals, Australia, Table 20). See Figure 2.

⁴ Ellis notes that when credit availability increases, household formation rates (and the demand for a higher quantity of housing) may well increase in the face of an increase in the capacity to pay, but this would be a small effect compared with a change in the demand for housing services by existing households.

48. **Figure 2:** Number of Dwelling Approvals by Type 1991-2014, Australia



Source: ABS cat. no. 8731.0 Building Approvals, Australia

49. This has been supported by commentary from the industry association for housing, which identified that over the past few decades, the proportion of new dwellings accounted for by multi-units rather than houses has steadily increased (Housing Industry Association, 2014). Median lot sizes have also decreased by around 150-200 square metres in most capital cities, except Hobart, from 1998 to 2013 (Housing Industry Association, 2013, p22).

50. A government study of the Adelaide city area has revealed an increased incentive to move to higher density living. "The total replacement rate on demolition sites equates to 1.7 dwellings for every one dwelling demolished" (South Australia Department of Planning, Transport and Infrastructure, 2013, p3). Also, a similar study in Melbourne showed that most dwelling replacements were from one dwelling to two (Housing Development Data, 2008, "Graph Eight Residential Dwelling Yield Range 2004 to 2008").

51. While there are many factors contributing to this change in dwelling buildings density, high land prices from supply/demand imbalances, has contributed substantially by forcing a more intensive use of land.

Effect of Changes on ABS Statistics

52. Applying a measure of obsolescence to dwellings and their service lives would improve the capital stock measures at the ABS. However, there remain some challenges in applying these changes in practice. In this section we present one such challenge and some empirical results.

Volatility of a service life driven by obsolescence

53. As outlined in the section ‘Defining Depreciation’, the effect of wear and tear on an asset is not time dependent, but age dependent. Wear and tear may differ due to rates of use and environmental factors, but not by the passage of time. Obsolescence on the other hand is time dependent and not age dependent.

54. This means that a service life which is affected by obsolescence due to land price will be potentially more volatile over time than a service life that is purely determined by wear and tear. Prices of assets, including land, will depend on the economic cycle and long term trend as well as many other factors that change over time.

55. The task for researchers is not complete at the discovery of an accurate dwelling service life at a single point in time. A pattern for the change in dwelling service life and a time frame for this change will also need to be established.

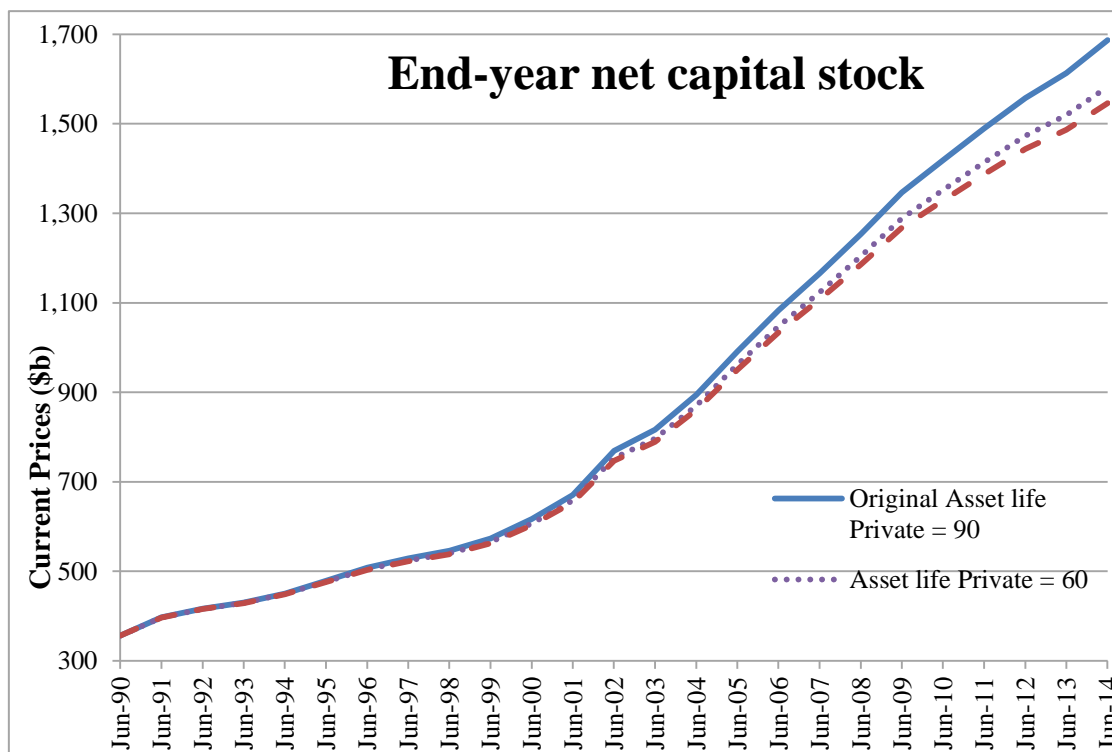
56. This will make the task of measuring the service life of dwellings more tedious and costly in the future. It is not expected that the service life of dwellings affected by obsolescence will be constant, but dynamic. In order to accurately measure the effects of obsolescence on dwelling stocks, close monitoring of time dependent factors must be done. This will involve more data and research on a timely basis and presents a challenge to the ABS.

Empirical results

57. To demonstrate the potential magnitude of a change in the service life of dwellings, testing of capital and balance sheet measures were conducted under scenarios of different service life assumptions for Private Brick Homes. Experimental measures of End year Net Capital Stock (NKS) are shown in Figure 3. A full presentation of the values of NKS and Consumption of Fixed Capital (COFC) are presented in Table 2.

58. Land values are also affected by a change in service life of dwellings when accounting for this obsolescence. A lower service life for dwellings will mean a lower stock of dwellings in the long run, all other factors held constant. The ABS measures land as a residual between Value of Residential Buildings (ABS *Residential Property Price Indexes: Eight Capital Cities*, cat. no. 6416, Table 6), which is a measure of the combined value of the structure and land; and the Dwelling Net Capital Stock (ABS *Australian System of National Accounts*, cat. no. 5204, Table 56), which measures only the value of the structure. Therefore with a reduction in expected dwelling service life because of the effect of accounting for expected occurrence of obsolescence, land estimates would increase. This suggests that the current land estimates are underestimated. Experimental estimates of land are also presented in Table 2.

59. **Figure 3:** Experimental measures of End year Net Capital Stock (NKS) with Different Mean Asset Lives (Years) for Private Brick Homes from 1990 – 2013 (Current Prices, \$b)⁵



⁵ Only the service life for Private Brick Homes has been altered in these estimates, for the period 1990-2013. Private Brick Homes have the highest service life of all dwelling types. Currently, gross fixed capital formation for Private brick houses contributes a major portion of total detached housing.

60. **Table 2:** Experimental Capital Measures with Different Mean Asset Lives (Years) for Private Brick Homes from 1989 – 2013 (Current Prices, \$b)⁶

Service Life	End year NKS			COFC			Land		
	90 years ⁷ (original)	60 years	40 years	90 years (original)	60 years	40 years	90 years (original)	60 years	40 years
Jun-89	356.3	356.3	356.3	7.5	7.5	7.5	421.2	421.2	421.2
Jun-90	397.1	397.0	397.0	8.7	8.8	8.8	444.5	444.6	444.6
Jun-91	416.5	416.2	416.1	9.4	9.6	9.7	456.4	456.7	456.9
Jun-92	430.0	429.3	429.0	9.7	10.1	10.3	478.7	479.5	479.8
Jun-93	450.6	449.2	448.7	10.1	10.7	10.9	495.1	496.4	497.0
Jun-94	478.7	476.6	475.7	10.7	11.5	11.8	556.9	559.1	559.9
Jun-95	508.0	504.8	503.5	11.4	12.4	12.8	577.5	580.7	582.0
Jun-96	528.6	524.2	522.4	12.0	13.2	13.7	595.9	600.4	602.1
Jun-97	546.5	540.7	538.3	12.4	13.8	14.3	710.4	716.2	718.6
Jun-98	573.2	565.8	562.8	12.9	14.5	15.1	757.4	764.8	767.8
Jun-99	616.7	607.2	603.5	13.6	15.4	16.1	840.7	850.2	854.0
Jun-00	670.9	658.7	654.0	15.0	17.1	17.9	958.0	970.1	974.9
Jun-01	769.5	753.2	746.8	17.4	20.1	21.1	1044.8	1061.1	1067.5
Jun-02	816.6	796.8	789.1	18.3	21.2	22.3	1303.5	1323.3	1331.0
Jun-03	894.5	870.2	860.9	19.6	22.9	24.1	1594.3	1618.5	1627.9
Jun-04	991.2	961.5	950.2	21.8	25.6	27.0	1820.7	1850.4	1861.7
Jun-05	1083.3	1047.6	1034.1	23.9	28.3	29.8	1936.9	1972.6	1986.1
Jun-06	1165.5	1123.4	1107.7	25.9	30.8	32.4	2175.7	2217.7	2233.5
Jun-07	1253.4	1204.1	1185.9	27.7	33.0	34.8	2485.7	2535.0	2553.2
Jun-08	1346.4	1288.8	1267.7	30.1	35.9	37.9	2581.5	2639.1	2660.1
Jun-09	1418.7	1352.6	1328.6	32.1	38.6	40.7	2385.4	2451.6	2475.5
Jun-10	1489.2	1414.1	1387.2	33.8	40.7	42.9	3029.6	3104.7	3131.6
Jun-11	1557.5	1473.3	1443.5	35.7	43.1	45.5	2999.2	3083.4	3113.2
Jun-12	1613.0	1519.6	1486.9	37.0	44.9	47.3	2844.1	2937.4	2970.1
Jun-13	1686.8	1582.3	1546.1	38.4	46.7	49.2	3035.3	3139.8	3176.0

⁶ Only the service life for Private Brick Homes has been altered in these estimates, for the period 1990-2013. Private Brick Homes have the highest service life of all dwelling types. Currently, gross fixed capital formation for Private brick houses contributes the major portion of total detached housing.

⁷ Although the methodology outlines Private Brick Homes have a service life of 88 years, in practice, the life is set to 90 year distribution as the best approximation.

Conclusion

61. In this paper we consider the task of factoring obsolescence into capital service life assumptions.

62. Research undertaken by the Australian Bureau of Statistics has revealed that dwellings are more subject to obsolescence than traditionally thought for a non-technological asset. Conversely, the effect of wear and tear may be less prevalent than previously believed. This influencing factor must be accounted for in their service lives, to avoid an upward bias in their estimation.

63. It appears that the rising land prices in Australia have largely driven this obsolescence in dwellings. This differs significantly from assets such as computers, which are often subject to obsolescence due to technological progress. Dwelling owners seem driven by a desire for modern lifestyles, a central location and investment opportunities as they make decisions about the demolition of existing houses. As land increases in value, so does the incentive to increase the return on land through redevelopment and subdivision. This effect can be observed in the increased proportion of multi-unit dwellings compared to detached housing in the past 20 years.

64. The empirical results show that the impact of favouring obsolescence in dwellings over wear and tear is significant on published capital measures. It is unfortunate that there is so limited data collected on dwelling service lives in Australia. However, it remains important to establish the main drivers of the disposal of dwellings, whether it is wear and tear and/or obsolescence, and how large a part they each play. If we can better understand the behaviour of the owners of dwellings, we are closer to an accurate ongoing measurement of this capital asset.

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