D Sensitivity testing

This appendix details the sensitivity testing undertaken on the growth accounting results from chapter 5. The appendix is split into three sections. The first section tests the results using a different methodology for calculating the internal rate of return for the capital stock. The second section tests different values for other parameters in the rental price equation. The third section tests the growth accounting results with different investment estimates for the new intangible assets.

D.1 Internal rate of return

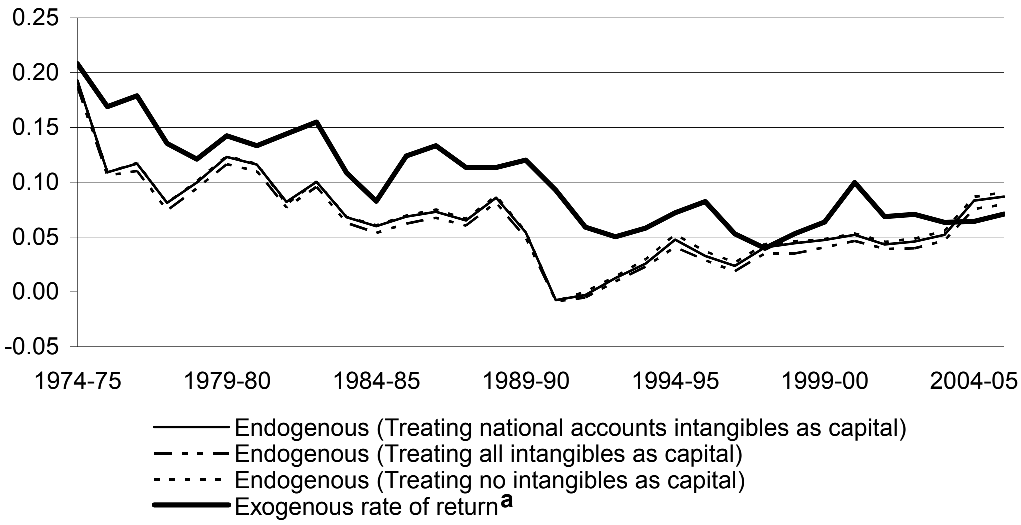
This paper applies the hybrid Australian Bureau of Statistics (ABS) methodology for calculating the internal rate of return on capital (see appendix C). The methodology uses an endogenous rate of return unless the rate falls below an exogenous rate equal to consumer price index (CPI) growth plus 4 per cent. If the rate falls below this floor level, the exogenous rate is used. In practice the rate of return, which is constrained to be the same across all assets, fell below this mark in most years when calculated for the aggregate market sector. Therefore, the rate of return used in this paper is mainly exogenous. Because this differs from the Corrado, Hulten and Sichel (CHS 2006) methodology, which used an endogenous rate of return, the Australian results have been re-estimated with an endogenous rate of return[1] for the purposes of international comparison. This section compares the Australian growth accounting results with an endogenous rate of return with those using the ABS hybrid method (as reported in chapters 5 and 6).

There is a considerable difference between the exogenous rate of return and the endogenous rates calculated for the three definitions of capital (figure D.1). In particular, the endogenous rate of return is negative for 1990-91 and 1991-92. The figure also shows there is only a small difference between the average endogenous rates of return for the three definitions of capital. Because the stock of intangibles is small relative to tangibles (and intangible investment is a small share of total capital

[1] It should be noted that the internal rates of return used in this paper relate to the specific context of calculating rental prices and take into account factors (such as taxes and asset revaluations) that may not be included in rates of return calculated for other purposes (see appendix C).

income), the capitalising of intangibles has only a small effect on the equalising internal rate of return across all assets.[2]

Figure D.1 **Comparison of endogenous and exogenous rates of return**



[a] Exogenous rate of return (CPI growth plus 4 per cent), used as the floor rate of return in the ABS hybrid methodology (which is an endogenous rate unless it falls below an exogenous floor rate of return).

Data sources: Authors' estimates; ABS unpublished national accounts data.

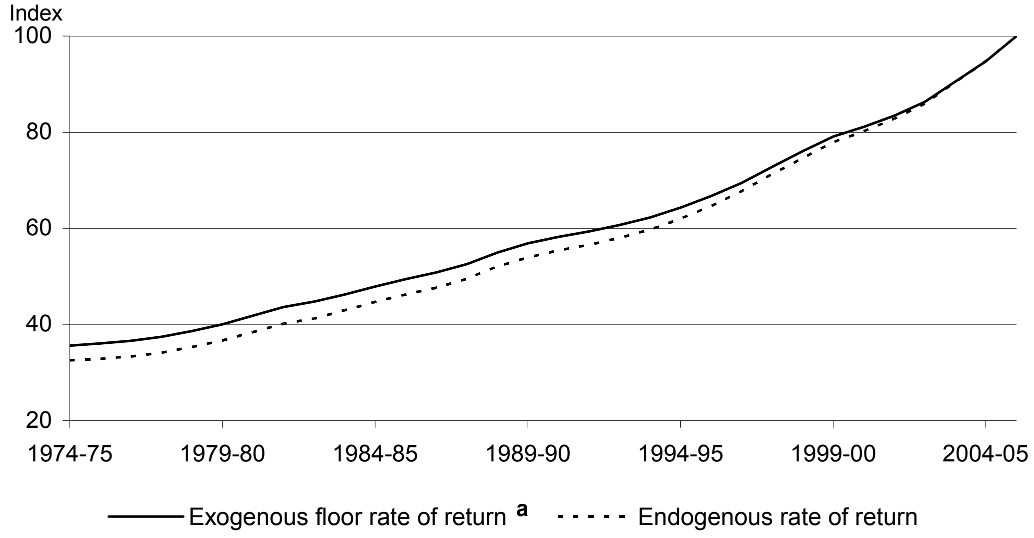
A change in the rate of return will alter the rental prices of all assets. And because the rental prices are used as weights to aggregate together the growth rates in the individual capital stocks to create an aggregate capital services index, a change in the rental prices can also affect the growth rate of the capital services index.

Figure D.2 shows a comparison of capital services indexes using an endogenous rate of return and an endogenous rate of return subject to an exogenous floor rate of return. Using the endogenous rate of return increases the growth in the capital services by an average of around 0.3 of a percentage point a year over the series for the all intangibles case.

[2] In CHS (2006, table 4) capitalising intangibles also changes the equalising rate of return for all assets by only a small amount, slightly changing income accruing to tangible capital.

Figure D.2 **Capital services, alternative internal rates of return, all intangibles treated as capital**

Index 2005-06 = 100



a The ABS hybrid methodology has been used, which is an endogenous rate with an exogenous floor of the CPI growth plus 4 per cent. However, because in practice the endogenous IRR rarely rises above the floor rate for the market sector, the IRR is generally exogenous.

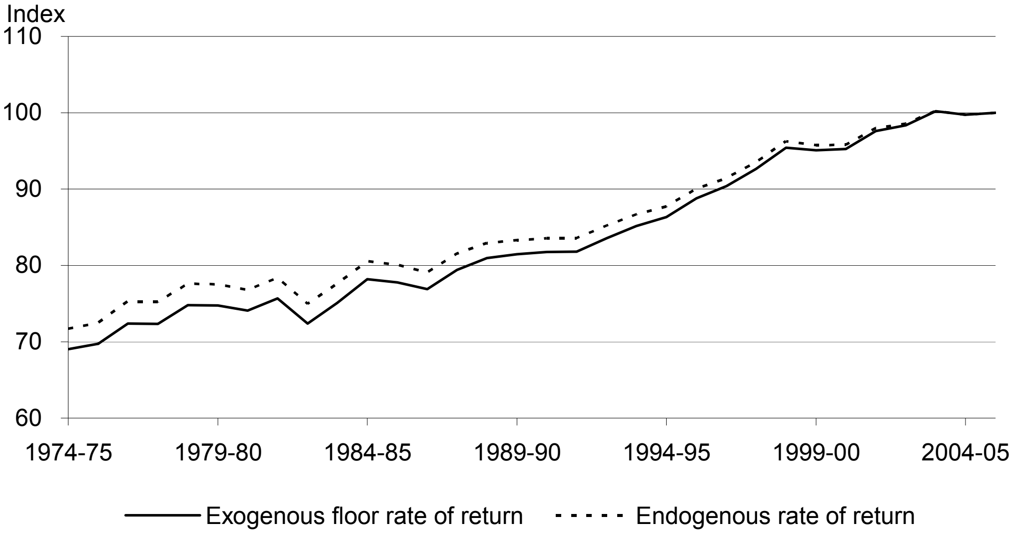
Data sources: Authors' estimates; ABS unpublished national accounts data.

The main reason a change in the rental price weights increases the growth in capital services is that the use of the endogenous rate lowers the rental price for all assets by an equivalent amount.[3] Therefore, the weight of assets with lower initial rental prices, such as land and non-dwelling construction, will decline by a relatively larger amount than those assets with higher initial rental prices, such as ICT equipment. The capital stock of assets with lower rental prices have tended to grow at a slower rate than those with relatively high rental prices — so the shift in weighting in the aggregate capital services index towards these faster growing assets increases growth in aggregate capital services.

[3] The change to an endogenous rate of return increased the number of rental prices that had to be adjusted because they fell below zero. Any rental price that drops below zero is adjusted to a very small positive number (0.001) to prevent the negative number distorting the weighting of the remaining assets. No adjustment has been made to the negative rates of return prior to the adjustment for negative rental prices. See appendix C for more information.

Figure D.3 **MFP[a] using alternate rates of return, all intangibles treated as capital**

Index 2005-06 = 100



[a] Includes labour composition change for comparability across periods.

Data sources: Published and unpublished ABS national accounts data; authors' estimates.

Using the endogenous rate of return considerably increased the growth rate of the capital services index (figure D.2), which had a corresponding downward effect on the multifactor productivity (MFP) growth estimates. For the case including all intangibles as capital, the change in the MFP index over the entire period was 10 per cent lower using the endogenous rate of return approach (figure D.3). The use of the endogenous rate did not change the productivity growth cycles.

Under all three capital definitions the rate of MFP growth fell considerably using the endogenous rate of return (table D.1) and capital deepening increased by an equivalent amount. The largest impact on MFP growth was with the all intangibles case. This was due to the larger relative weight of capital in total factor income, leading to the change in the rate of capital services growth having a larger impact on MFP growth.

Table D.1 **Comparison of MFP growth rates[a] using alternative rates of return**

Per cent per year

	1974-75 – 2005-06	1974-75 – 1984-85	1984-85 – 1994-95	1994-95 – 2005-06
Including all intangibles assets				
Exogenous floor	1.20	1.25	1.00	1.35
Endogenous	1.08	1.16	0.86	1.20
Including national accounts intangible assets				
Exogenous floor	1.26	1.30	1.02	1.45
Endogenous	1.17	1.25	0.92	1.34
Excluding all intangible assets				
Exogenous floor	1.36	1.31	1.13	1.63
Endogenous	1.31	1.26	1.09	1.55

[a] Includes labour composition change for comparability across periods.

Sources: Published and unpublished ABS national accounts data; authors' estimates.

As mentioned in chapter 5, the reason for testing the results using a purely endogenous rate of return is for comparability with the other country studies. Table D.2 shows that the Australian results using an endogenous rate of return are considerably closer to the US results than those using an exogenous floor rate of return. The effect of treating all intangibles as capital (compared with no intangibles) is also closer between the two countries when using an endogenous rate, both in absolute value terms and percentages changes.

However, it should be noted that the Australian results using an endogenous rate of return may still not be directly comparable with the US results. It is not known whether CHS (2006) found any negative rates of return or made any adjustment for them — the negative rates of return in the Australian results have not been adjusted.[4]

[4] The US Bureau of Labor Statistics methodology (as reported in Dean and Harper 2001, p. 68) is to assume a 3.5 per cent rate of return where the endogenous rate of return is negative and deduct nothing for asset revaluation in the rental price calculation. However, this is done at the industry level and mainly affects property industries. It is not known if CHS (2006) followed this methodology at the aggregate economy level.

Table D.2 **International comparisons using endogenous rate of return**
Per cent per year (Percentage share of total growth)

	Australia (exog.)[a]	*Australia (endog.)*[b]	*USA (endog.)*
	1994-95 –2002-03	*1994-95 –2002-03*	*1994-95 –2002-03*
All intangible assets			
LP growth	3.01	3.01	3.09
	(100)	(100)	(100)
Decomposition:			
Capital deepening	1.36	1.54	1.68
	(45)	(51)	(54)
Tangible	0.81	0.90	0.85
	(25)	(29)	(28)
Intangible	0.57	0.67	0.84
	(19)	(22)	(27)
Labour composition	0.24	0.24	0.33
	(8)	(8)	(11)
MFP growth[c]	1.41	1.23	1.08
	(47)	(41)	(35)
No intangible assets			
LP growth	2.90	2.90	2.78
	(100)	(100)	(100)
Decomposition:			
Capital deepening	0.92	1.02	0.98
	(32)	(35)	(35)
Labour composition	0.27	0.27	0.38
	(9)	(9)	(14)
MFP growth[c]	1.71	1.61	1.42
	(59)	(56)	(51)

[a] Using an exogenous floor rate of return (as in chapters 5 and 6). [b] Using an endogenous rate of return. [c] MFP growth adjusted for labour composition change.

Sources: CHS (2006); authors' estimates.

D.2 Growth accounting parameters

This set of tests relates to other parameters used in the calculation of the rental prices. There is a question as to whether some of the standard components included in the calculation of the rental prices are applicable to intangible assets, in particular the income tax parameter and the capital gain/loss term.

Income tax rates for intangible assets

As part of the rental price equation, a parameter for income taxes is included to reflect the impact of these on the user cost of capital. For most tangible assets and intangible assets already capitalised in the national accounts, the corporate profit tax rate is used by the ABS with adjustments made for depreciation allowances and other factors (ABS 2000, paras 27.61 – 27.71). For this paper, income tax rates for the new intangible assets were assumed to be equal to the corporate income tax rate. The exception to this was business R&D, where a tax adjustment was made to compensate for the R&D tax incentive scheme.[5] Because investment in intangibles is currently treated as intermediate expenditure rather than being capitalised, including a tax adjustment for intangibles might not be ideal.[6] Therefore it is useful to test the results using an unity tax parameter to see what impact this could potentially have on the results.

Adjusting the income tax parameter to a neutral rate of one (no net taxes)[7] for the new intangible assets marginally decreases the growth rate of the aggregate capital services index (table D.3). This has the effect of slightly reducing the impact of capitalising intangibles on MFP growth. However, there is little difference in the aggregate MFP and capital deepening results due to the small size of intangibles in total capital services growth.

Capital gain/loss term

There is a question as to whether a capital gain/loss term should be included for some intangible assets. The purpose of this function is to adjust the value of an asset to reflect holding gains. Because many intangibles are not tradeable, it could be argued that holding gains are irrelevant and therefore should not be included when estimating the rental prices.

A sensitivity test was performed by removing the capital gain/loss term from the rental price equation for the new intangible assets. The effect of removing the capital gain/loss function was a slight increase in the growth rate of capital services. As with the sensitivity test of income tax rates, the impact of this adjustment was too small to appreciably change the final growth accounting results (table D.3).

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5 Including an adjustment for the R&D tax incentive scheme lowered the average tax rate on business R&D. For more information see appendix C.

6 Under current accounting rules, corporate investment in intangibles would come from pre-tax income, not post-tax income. The tax treatment of intangible investment is important because different tax treatments can potentially change the incentive to invest in intangibles.

7 The tax parameter for business R&D is therefore assumed to be less than one (a tax credit) due to the R&D tax concession.

Table D.3 **Comparison of parameter sensitivity testing results, all intangibles treated as capital**

Per cent per year

	1974-75 –2005-06	*1974-75 –1984-85*	*1984-85 –1994-95*	*1994-95 –2005-06*
Capital services growth				
Original[a]	3.38	3.00	3.00	4.10
Neutral income taxes for new intangibles[b]	3.31	2.92	2.93	4.03
No capital gain/loss term for new intangibles[c]	3.40	3.01	3.02	4.09
Combined inputs growth				
Original[a]	1.84	1.07	2.09	2.31
Neutral income taxes for new intangibles[b]	1.81	1.04	2.06	2.28
No capital gain/loss term for new intangibles[c]	1.84	1.07	2.10	2.31
MFP growth[d]				
Original[a]	1.20	1.25	1.00	1.35
Neutral income taxes for new intangibles[b]	1.23	1.28	1.03	1.38
No capital gain/loss term for new intangibles[c]	1.20	1.24	0.99	1.35
Capital deepening				
Original[a]	1.08	1.12	0.63	1.43
Neutral income taxes for new intangibles[b]	1.05	1.09	0.61	1.40
No capital gain/loss term for new intangibles[c]	1.08	1.13	0.64	1.43

[a] These series are the main results as contained in chapter 5. [b] The neutral tax rate series uses all the same assumptions as the original results but with the income tax parameter for all of the new intangibles (except business R&D) set to one (no net taxes). [c] These series use all of the same assumptions as the original results but with the capital gain/loss term removed from the rental price equation for each of the new intangible assets. [d] Includes labour composition change for comparability across periods.

Source: Authors' estimates.

D.3 Investment and capital stock size

As detailed in chapter 5, the estimates for investment in the new intangible assets used in this paper are experimental. Therefore, the results have been tested for their sensitivity to changes in the investment and capital stock estimates for the new intangibles.

The alternative investment and capital stock estimates are based on three sets of changes:

- changing the level of investment in all new intangibles by plus and minus 50 per cent[8]

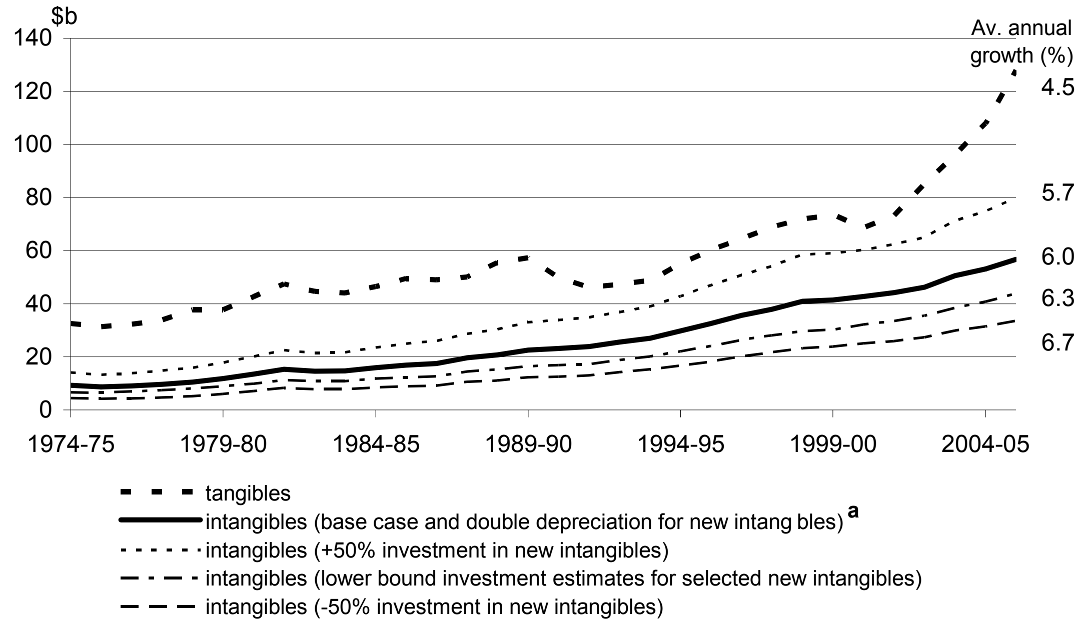
[8] This alternative can be thought of in two ways: testing underestimation or overestimation of intangible expenditure and therefore investment or, in the case of reducing investment by 50 per cent, halving the proportion of expenditure on intangibles that is assumed to be investment (as listed in table 3.1).

- reducing the investment estimates for specific new intangibles (financial R&D, architectural/engineering designs and purchased organisational capital) based on alternative data sources and assumptions[9] to create 'lower bound estimates' for new intangibles
- doubling the depreciation rate for all new intangibles (which changes the capital stock but not the level of investment).

The effect of these alternative investment estimates for new intangibles on *total intangible* investment is shown in figure D.4. For each alternative set of estimates, the ratio of total intangible to tangible investment rises — average growth in total intangible investment is higher than growth in tangible investment over the full period examined. Lowering the estimates for *new intangible* investment raises the growth rate in *total intangible* investment because of the relatively high growth rate of investment in national accounts intangibles (the other component of total intangibles).

Figure D.4 **Real investment, alternative estimates for new intangibles, market sector, 1974-75 to 2005-06**

2005-06 dollars, chain volume measures



[a] The investment level is obviously unaffected by the depreciation rate, which affects the capital stock.

Data sources: Based on ABS national accounts data and authors' estimates.

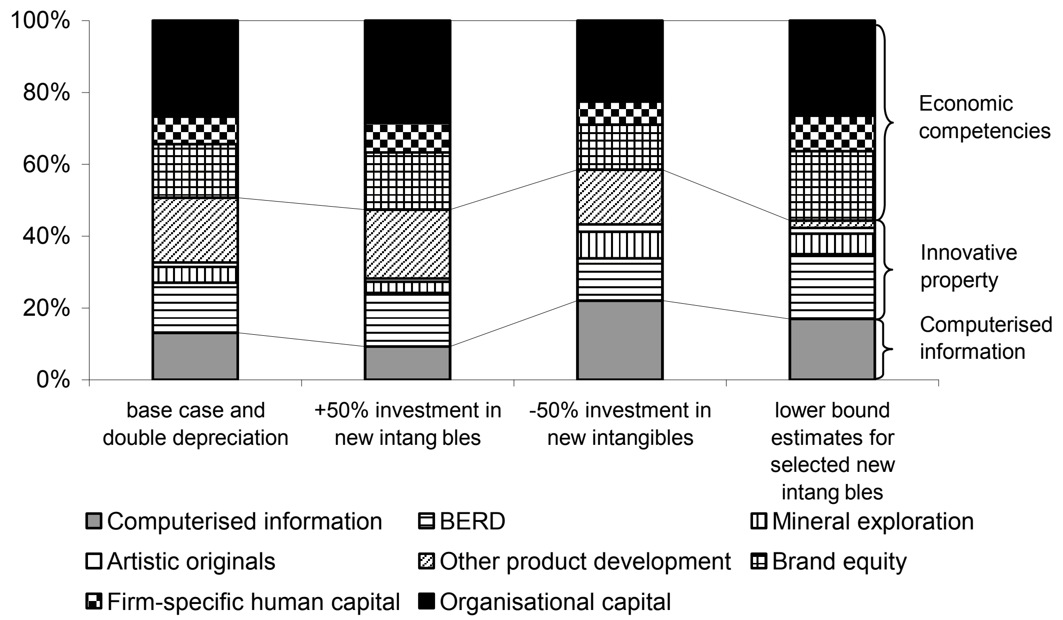
[9] The specific adjustments are detailed below in the sub-section 'Lower bound testing for selected new intangibles'.

Alternative estimates for investment in the new intangibles will obviously affect the ratio of total investment (including all intangibles) to output (shown in figure 3.2). However, for each of these alternative estimates the downward trend in the ratio of national accounts investment to output is moderated to some extent by the inclusion of investment in new intangibles.

The alternative estimates for new intangibles investment also change the composition of investment in *total intangibles* (figure D.5). Increasing the new intangibles investment by 50 per cent shifts the share of investment away from the national accounts intangibles, particularly computerised information, towards the new intangibles. The opposite is the case for decreasing the new intangibles investment by 50 per cent. The uniform percentage change in investment across all new intangibles means the relative contributions within total new intangibles are unchanged. The use of the 'lower bound estimates', which reduces other product development by the most, shifts the share of investment away from innovative property towards economic competencies and computerised information.

Figure D.5 **Shares of nominal total intangible investment, by asset type, alternative estimates for new intangibles, 2005-06**

Per cent

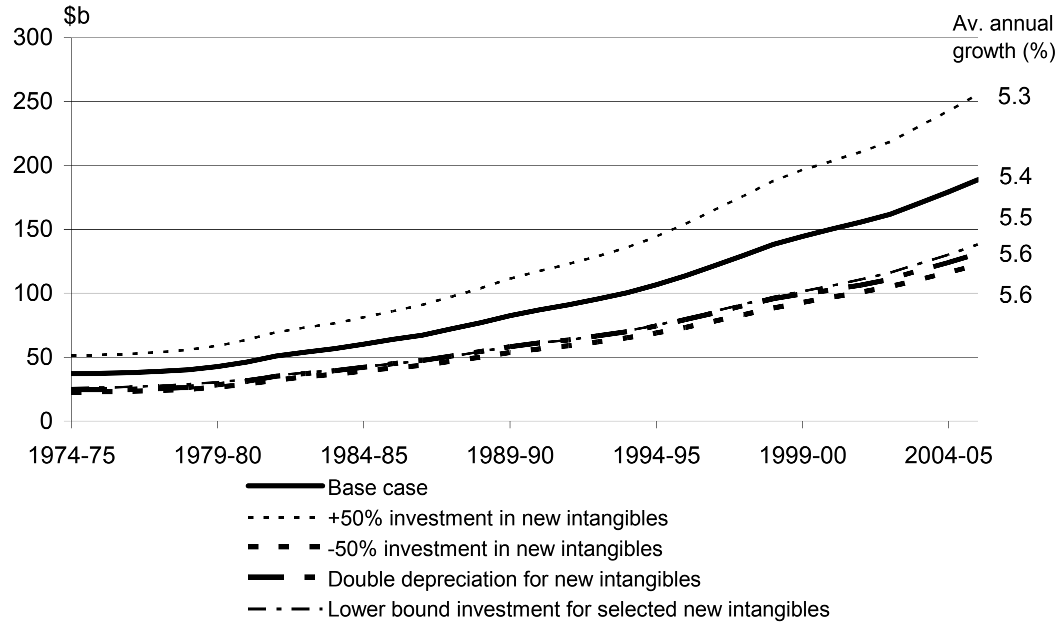


Data source: Authors' estimates.

Figure D.6 shows the effect on the *total intangible* capital stock of the alternative investment estimates and depreciation rates for new intangibles. Double depreciation has a similar effect on the capital stock to the 50 per cent decrease in investment. There is little change in average growth rate in the capital stock over the full period in each case. This is because in most cases there is a uniform percentage change over time (in either investment or depreciation rate). The 'lower bound' set of estimates is the exception (where data for two of the new intangibles are replaced with alternative data rather than adjusted by a given percentage), although in practice the actual change is also fairly uniform. Growth in capital services varies slightly more because of differences in rental prices across intangible (table D.4).

Figure D.6 **Total intangibles capital stock, alternative estimates for new intangibles, market sector, 1974-75 to 2005-06**

2005-06 dollars, chain volume measure

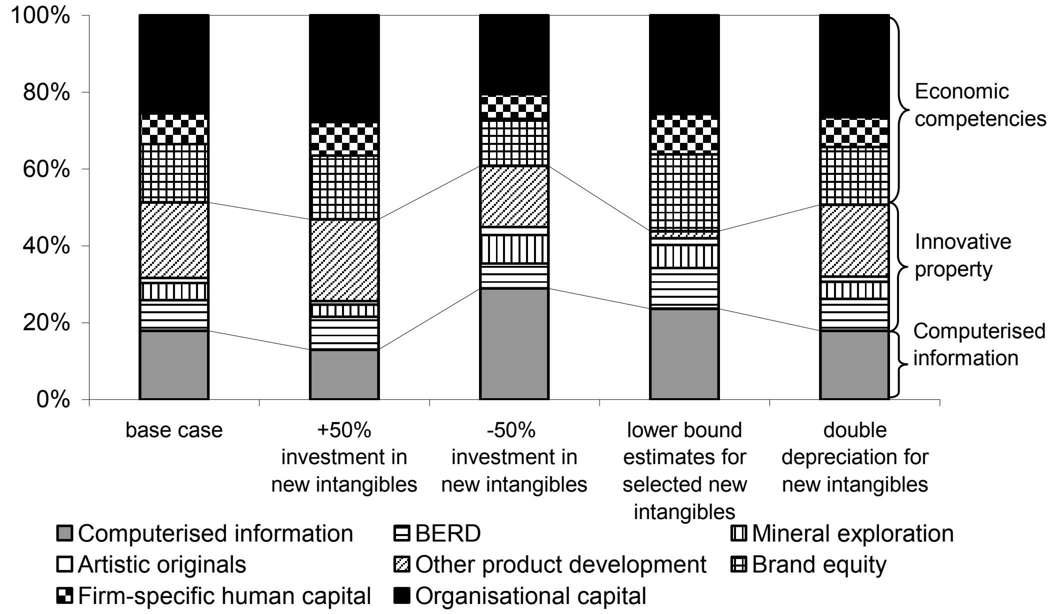


Data source: Authors' estimates.

Figure D.7 shows the difference in the composition of the service flow from intangible capital with the alternative estimates for the new intangibles. As with the changes for investment composition, the increase in investment in new intangibles shifts the composition towards the new intangibles and away from the national accounts intangibles. The opposite is the case for the decrease in investment. The lower bound estimates shift the service flow composition away from innovative property in particular. Doubling the depreciation rate for the new intangibles has very little effect on the composition of capital services because the lower capital stock is partially offset by increases in the rental prices.

Figure D.7 **Composition of total intangible capital services, alternative estimates for new intangibles, 2005-06**

Per cent



Data source: Authors' estimates.

The results of all these sensitivity tests on the components of the growth accounting are summarised in table D.4. The main results of the growth accounting are robust to these sensitivity tests. The direction of the effect of capitalising all intangibles, compared with capitalising only national accounts intangibles, is unchanged in each case — measured LP growth is increased, measured capital deepening is increased and measured MFP growth is decreased. As expected, the magnitude of these changes is affected by the estimated size of the investment and capital stock for the new intangibles. This is mainly because changes in the level of investment/capital stock for the new intangibles relative to the level of other outputs/inputs affects the weighting together of growth rates in the new intangibles and the other outputs/inputs.[10] However, within the bounds for which the estimates are varied, the magnitude of the changes in the rate of capital deepening and MFP growth is not large in percentage point terms (although a sizeable share of the small percentage point differences between the base case results for capitalising only national accounts intangibles and for capitalising all intangibles). The following sections discuss the growth accounting results for each sensitivity test in more detail.

[10] In most cases, the alternative investment/stock estimates for each new intangibles had little effect on the growth rate for that intangible because the alternative estimates were based on uniform percentage changes over time.

Table D.4 **Comparison of investment and capital size sensitivity testing results, all intangibles treated as capital**

Per cent per year

	1974-75 –2005-06	*1974-75 –1984-85*	*1984-85 –1994-95*	*1994-95 –2005-06*
Total intangible capital services growth				
Original – nat. a/cs intangibles treated as capital[a]	9.25	8.89	10.29	8.62
Original – all intangibles treated as capital[a]	5.83	5.08	6.35	6.03
50 per cent increase in new intangibles[b]	5.53	4.83	5.94	5.79
50 per cent decrease in new intangibles[c]	6.49	5.69	7.22	6.55
Lower bound for selected new intangibles[d]	5.97	5.19	6.37	6.32
Double depreciation for all new intangibles[e]	5.85	5.21	6.42	5.93
Total capital services growth				
Original – nat. a/cs intangibles treated as capital[a]	3.15	2.83	2.72	3.83
Original – all intangibles treated as capital[a]	3.38	3.00	3.00	4.10
50 per cent increase in new intangibles[b]	3.47	3.07	3.10	4.19
50 per cent decrease in new intangibles[c]	3.28	2.92	2.88	3.98
Lower bound for selected new intangibles[d]	3.30	2.93	2.88	4.02
Double depreciation for all new intangibles[e]	3.39	3.02	3.01	4.07
Combined inputs growth				
Original – nat. a/cs intangibles treated as capital[a]	1.67	0.93	1.94	2.09
Original – all intangibles treated as capital[a]	1.84	1.07	2.09	2.31
50 per cent increase in new intangibles[b]	1.91	1.13	2.16	2.41
50 per cent decrease in new intangibles[c]	1.76	1.00	2.02	2.21
Lower bound for selected new intangibles[d]	1.78	1.03	2.03	2.25
Double depreciation for all new intangibles[e]	1.84	1.08	2.10	2.30
MFP growth				
Original – nat. a/cs intangibles treated as capital[a]	1.26	1.30	1.02	1.45
Original – all intangibles treated as capital[a]	1.20	1.25	1.00	1.35
50 per cent increase in new intangibles[b]	1.18	1.23	0.99	1.30
50 per cent decrease in new intangibles[c]	1.23	1.28	1.00	1.39
Lower bound for selected new intangibles[d]	1.24	1.28	1.02	1.39
Double depreciation for all new intangibles[e]	1.20	1.24	0.99	1.36
Capital deepening				
Original – nat. a/cs intangibles treated as capital[a]	0.91	0.99	0.48	1.20
Original – all intangibles treated as capital[a]	1.08	1.12	0.63	1.43
50 per cent increase in new intangibles[b]	1.15	1.19	0.70	1.52
50 per cent decrease in new intangibles[c]	1.00	1.06	0.57	1.32
Lower bound for selected new intangibles[d]	1.02	1.08	0.58	1.36
Double depreciation for all new intangibles[e]	1.08	1.13	0.64	1.42

[a] These series are the main results as presented in chapter 5. [b] Increased investment in new intangibles by 50 per cent. [c] Decreased investment in new intangibles by 50 per cent. [d] These series have been adjusted with lower capital stock and investment estimates for some of the new intangible assets.[e] Doubled all depreciation rates for all new intangible assets except brand equity. The depreciation rate for brand equity (advertising and market research) has been increased to 0.9.

Source: Authors' estimates.

Lower bound testing for selected new intangibles

The specific variations for the lower bound estimates are:

- for financial product development, the CHS-based estimate of 20 per cent of intermediate usage of the Finance industry is replaced by financial services R&D from the ABS survey of business expenditure on R&D
- for architectural and engineering designs, it is assumed that all relevant expenditure is already capitalised as part of the associated tangible assets so no additional investment is included
- for purchased organisational capital, the proportion of the business management services industry that is included is reduced from 77 per cent (which was to exclude public relations) to 50 per cent (which aims to also exclude some other services that may not be within the scope of the CHS variable). Investment is still assumed to be 80 per cent of this reduced expenditure.

These changes all reduce the size of total new intangibles investment — the degree to which investment is reduced varies by type of intangible and over time.

- Total nominal investment in new intangibles is reduced by around a quarter (25 per cent in 1974-75 up to 28 per cent in 2005-06).
- Financial product development investment is reduced by an average of around 93 per cent (a range of 98 to 83 per cent between 1974-75 and 2005-06).
- Architectural and engineering designs investment (as separately identified) is reduced by 100 per cent in each year (to zero). The amount of expenditure already capitalised by the ABS as part of associated tangible assets cannot be separately identified.
- Purchased organisational capital is reduced by 35 per cent in each year (since it is a fixed percentage adjustment made in each year).

Incorporating these lower bound estimates into the growth accounting affects the MFP growth results by a small amount (table D.5). Compared with the original all intangibles case, the rate of MFP growth falls from 1.36 per cent a year when excluding all intangible assets, to 1.24 per cent a year rather than 1.20 per cent (a 3 per cent difference).

The change in MFP growth is small for two reasons:

- the intangible investment series that are changed contribute only a small percentage of total investment and capital services growth

- the reduction in these assets changes the individual asset weightings in the aggregate capital services index, but not by enough to appreciably alter the capital services growth rate.

Table D.5 **Comparison of MFP and capital services growth rates using lower bound intangible estimates**

Per cent per year

	1974-75 – 2005-06	*1974-75 – 1984-85*	*1984-85 – 1994-95*	*1994-95 – 2005-06*
MFP growth				
All intangible assets (original)	1.20	1.25	1.00	1.35
All intangible assets ('lower bound')	1.24	1.28	1.02	1.39
No intangible assets	1.36	1.31	1.13	1.63
Total capital services growth				
All intangible assets (original)	3.38	3.00	3.00	4.10
All intangible assets ('lower bound')	3.30	2.93	2.88	4.02
No intangible assets	2.81	2.62	2.31	3.44

Source: Authors' estimates.

Adjusting investment sizes for all new intangibles

Increasing investment by 50 per cent for new intangibles resulted in only a 0.09 percentage point increase in capital services growth (for the all intangibles case) over the full period. This is a result of a higher weighting of intangibles, which grew faster than tangible assets, in the aggregate capital services index. Decreasing investment in intangibles by the same amount had the reverse effect.

Table D.6 shows that increasing new intangibles investment by 50 per cent increases capital deepening attributable to new intangibles as a percentage of all capital deepening from 22 per cent to 29 per cent. Capital deepening attributable to all intangibles also increases, from 37 per cent to 43 per cent. When new intangibles investment is decreased by 50 per cent, capital deepening attributable to new intangibles falls to 12 per cent and total capital deepening attributable to all intangibles falls to 29 per cent.

Table D.6 **Contributions to capital deepening, all intangibles treated as capital, 1974-75 to 2005-06**

Per cent per year (Percentage share of total capital deepening)

	Original[a]	*50 per cent increase in new intangibles*[b]	*50 per cent decrease in new intangibles*[c]
All intangibles	0.41	0.51	0.29
	(37)	(43)	(29)
National accounts intangibles	0.17	0.16	0.17
	(15)	(14)	(17)
New intangibles	0.24	0.35	0.12
	(22)	(29)	(12)
Tangibles	0.69	0.67	0.71
	(63)	(57)	(70)
Total capital deepening	**1.08**	**1.16**	**1.00**
	(100)	**(100)**	**(100)**

[a] These series are the main results as contained in chapter 5. [b] Increased investment in new intangibles by 50 per cent. [c] Decreased investment in new intangibles by 50 per cent.

Source: Authors' estimates.

When intangibles investment was increased by 50 per cent, MFP growth decreased by 0.02 of a percentage point, or 2 per cent (an average of 1.20 per cent a year, down from 1.23 per cent for the all intangibles case over the full period). Decreasing intangibles investment increased MFP growth by a similar margin (table D.4).

The results from the higher and lower investment tests are as expected. A 50 per cent increase in the level of new intangibles investment increases the capital deepening effect and decreases the MFP growth effect (compared with the results in chapter 5). The reverse is true for a 50 per cent decrease.[11]

Increased depreciation rates

The results show that the growth accounting results are very robust to doubling depreciation rates for the new intangibles. This is because smaller capital stocks[12] due to faster depreciation in the perpetual inventory method are counterbalanced by rental price increases. This is consistent with the findings of MHW (2007) — doubling the depreciation rates for intangibles had little impact on their growth accounting results.

[11] However, this ignores the issue of potential complementarities between intangibles and other capital and labour inputs.

[12] For 2005-06, the estimated real net capital stock of intangibles is $189 billion for the base case and $131 billion when the depreciation rates for new intangibles are doubled (figure D.6).