Measuring the Allocation of Australia Post's Reserved Service Productivity Dividend

Report prepared for
Australia Post

6 July 2009

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EXECUTIVE SUMMARY

The results of this study show that most of the benefits from Australia Post's reserved service productivity improvements over the past 12 years, and considerably more than all of the benefits over the last seven years, have been passed on to consumers in the form of real price reductions. In fact, around 180 per cent of the benefit from cumulative productivity improvements over the last seven years was passed on to consumers in 2009.

At the same time, Australia Post has been faced with a rapid escalation in contractor prices resulting from stiff competition for contractor services and increased fuel prices. By 2009 Australia Post's owner's position deteriorated by more than two and a half times the available reserved service productivity dividend for cumulative productivity improvements since 2002.

The methodology used allows changes in a firm's real gross return to capital to be broken down into effects due to productivity change, real output and real input price changes and growth in the firm's size (as measured by the real capital stock employed).

The average real price of Australia Post's reserved service output declined by 7 per cent over the last 7 years while the real price it pays for contractors increased by 60 per cent and the real price it pays for labour increased by 12 per cent. Reserved service total factor productivity increased by 3.5 per cent over the same period.

In 2002 Australia Post's reserved service real gross return to capital was $303 million (expressed in 2009 prices). By 2009 the gross return to capital had fallen to $107 million. The total productivity dividend in 2009 for productivity change since 2002 was $65 million. The distribution of this cumulative productivity dividend was a benefit of 118 million passed on to consumers, a benefit of around $18 million passed on to Australia Post's reserved service labour and a benefit of around $115 million passed on to reserved service contractors. Since these benefits far exceed the available productivity dividend, Australia Post's owners were worse off by $186 million.

The ACCC price review in 2002 would have ensured that Australia Post was not earning excess returns on its reserved services at that time. But Australia Post's real returns are now much lower as there has not been a reasonable sharing of the benefits from productivity improvements over the last seven years.

This uneven distribution of the productivity dividend reduces Australia Post's incentives to invest further in the reserved service business and meet future needs – or to commit the time and effort required to achieve further reforms and efficiency improvements. Only by ensuring there is a more even distribution of benefits among stakeholders will a more sustainable position be maintained going forward.

1 INTRODUCTION

In this report we apply the methodology of Lawrence, Diewert and Fox (2006) and Lawrence and Richards (2004) to determine the contribution of productivity and price changes to changes in the profitability over time of Australia Post's reserved services. This enables us to calculate the distribution of the benefits of Australia Post's reserved service productivity improvements – its reserved service 'productivity dividend' – between the three key stakeholder groups: consumers, input suppliers (including employees) and Australia Post's owners.

Services reserved to Australia Post under the *Australia Postal Corporation Act* are described as follows:

> '… Australia Post has the exclusive right to carry letters within Australia, whether the letters originated within or outside Australia.
>
> The reservation of services to Australia Post … extends to:
>
> - The collection, within Australia, of letters for delivery within Australia; and
> - The delivery of letters within Australia.
>
> Australia Post also has the exclusive right to issue postage stamps within Australia.'

If all the benefits from productivity improvements are passed on to customers then Australia Post will have no incentive to invest further in the business and meet future needs – or to commit the time and effort required to achieve further reforms. Conversely, if Australia Post keeps all the benefits then users will be dissatisfied and pressures will mount for change. If the reform process is to provide ongoing benefits to the Australian economy then it is important that there be a reasonable distribution of benefits among stakeholders so that it is a 'win–win' situation which forms the basis for future cooperation.

The key profitability concept used in this report is the gross return to capital. This is the difference between the revenue from Australia Post's reserved service outputs produced and the cost of its corresponding non–capital inputs (labour, materials, services, etc). The gross return to capital has to cover the cost of depreciation and provide a residual return on Australia Post's reserved service assets. Changes over time in the value of a firm's gross return to capital can arise from three sources:

- growth in the size of the enterprise – as the capital stock becomes larger, a larger dollar value return to capital will be necessary just to maintain a constant rate of return;
- improvements in productivity – more output is produced from a given quantity of inputs leading to more revenue and more profits; and

- price changes – if output prices increase by less than input prices then the firm's gross return to capital will fall (with the benefit going to the firm's consumers and/or input suppliers).

In reality, these three factors usually all occur at the same time making it difficult to attribute changes in the value of the gross return to capital to a particular cause. Furthermore, in the presence of inflation, we need to conduct the analysis in terms of real price changes to estimate the full extent of benefits passed on to consumers and input suppliers. This is because consumers and input suppliers benefit from the extent to which their price changes diverge from the rate of inflation, not to the extent of their nominal price changes.

In this report we present results for the last 12 years from 1998 to 2009[1] for which reserved service data are available and for the seven years since Australia Post's reserved service price notification in 2002. The results show that over 70 per cent of the benefits from Australia Post's reserved service productivity improvements over the last 12 years have been passed on to consumers in the form of real price reductions and over 80 per cent has been passed on to input suppliers in the form of real price increases. This is far more pronounced over the last seven years with around 180 per cent of the benefit from cumulative productivity improvements being passed on to consumers in 2009. A further 205 per cent of the benefit from cumulative productivity improvements over the last seven years was passed on to input suppliers in 2009, making Australia Post's owners worse off to the extent of 284 per cent of the cumulative productivity improvements over the last seven years. Australia Post's owners have received a large negative share of the available productivity dividend for each of the last five years.

In the following section we briefly review Australia Post's reserved service productivity performance over the past 12 years and changes in its output and input prices. In the third section we examine what Australia Post's last reserved service gross return to capital would have been if each of the above sources of change had occurred in isolation. In particular, we estimate what the gross return to capital would have been if Australia Post had retained all the benefits from its reserved service productivity improvements. Finally, we draw our conclusions in the fourth section and briefly outline the methodology in a technical appendix.

[1] We adopt the convention that financial years are referred to by the year in which they end.

2 AUSTRALIA POST'S RESERVED SERVICE GROWTH, PRODUCTIVITY AND PRICE CHANGES

Lawrence (2007) developed detailed total factor productivity (TFP) models for Australia Post's aggregate operations and its reserved service operations. The models were an update and expansion of those in the earlier Lawrence (2002) report prepared for the Australian Competition and Consumer Commission (ACCC). The Lawrence (2007) analysis has recently been updated in Economic Insights (2009). The reserved service database contains prices and quantities for 5 outputs and 4 inputs covering the years 1998 through to 2009. The 5 reserved letters output components are:

- small fullrate
- small presort
- large fullrate
- large presort
- international inwards

The 4 inputs are labour, contractors, materials and services, and capital. We use this detailed database to decompose Australia Post's reserved service gross return to capital and measure the allocation of the productivity dividend.

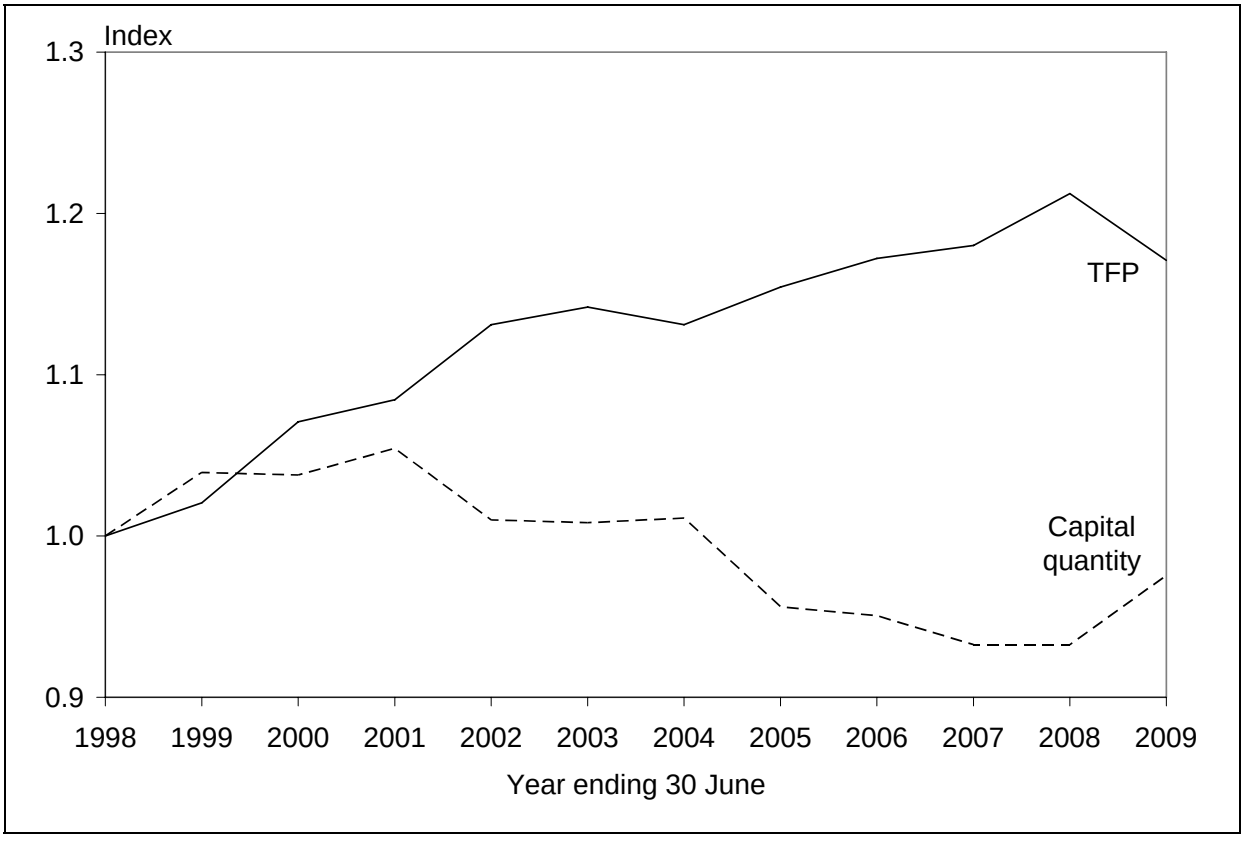
Estimating the economic quantity and user cost of the capital stock of a large, network based enterprise like Australia Post is always problematic. In the database used here we estimate the quantity of the capital stock by using the perpetual inventory method to update and backdate the point estimates of reserved service asset stocks developed by the ACCC for the year 2001 during its 2002 pricing review. These point estimates were updated and backdated using real asset purchases and retirements series and assumed depreciation rates. We included four asset groups: land, buildings, plant and equipment, and motor vehicles. Real investment and retirement series were obtained by deflating the current price series by the National Accounts Implicit Price Deflator for the net capital stock of non–dwelling construction for land and buildings and by that for plant and equipment for the other two asset classes (ABS 2009, Table 56). An index of the total quantity of capital inputs was then formed from the four separate capital stock estimates using the Fisher ideal index and current price stock values as weights.

The annual cost of using capital inputs is taken to be the gross return to capital (the difference between the revenue from outputs produced and the cost of the non–capital inputs of labour, contractors, and materials and services). The gross return to capital has to cover the cost of depreciation and provide a residual return on the firm's assets.

Our estimate of the quantity of Australia Post's reserved service capital stock increased by 6 per cent between 1998 and 2001 before declining and then finishing up in 2009 at around 2 per cent below its 1998 level (see figure 2.1 and table 2.1). If all else remained constant, Australia Post's reserved service gross return to capital could have decreased marginally over this period and still provided the same rate of return it was achieving in 1998.

Australia Post's reserved service TFP measures the efficiency with which inputs are converted into outputs. It is measured as an index of total output quantity relative to total input quantity. Changes in the quantities of individual outputs and inputs are combined using revenue and cost shares, respectively. From figure 2.1 and table 2.1, we see that Australia Post's reserved service TFP increased by 21 per cent between 1998 and 2009. This means that in 2009 a typical unit of Australia Post's reserved service input mix was able to produce 21 per cent more output than it was 11 years earlier in 1998.

Figure 2.1: **Australia Post's reserved service total factor productivity and capital quantity, 1998–2009**



Reserved service TFP grew by a trend rate of 1.7 per cent per annum over the 12 years to 2009. TFP trend growth in the period to 2002 was somewhat higher at 3.1 per cent per annum. This strong TFP performance then reduces to a trend growth rate of 0.8 per cent per annum for the last seven years. This lower growth in TFP performance is attributable to virtually unchanged and then recently declining output levels as the reserved services have

faced increasing competition from the internet. The increase in the quantity of capital in 2009 had little impact on reserved service TFP due to the relatively low capital intensity of postal services. In fact, overall input usage fell marginally in 2009. Rather, the fall in TFP in 2009 was entirely due to reduced demand for reserved services.

Table 2.1: **Australia Post's reserved service TFP, average nominal output and input price indexes, 1998 to 2009**

Year Ending 30 June	*Capital quantity*	*Total Factor Productivity*	*Total Output Price*	*Labour Price*	*Contractor Price*	*Consumer Price Index*
1998	1.000	1.000	1.000	1.000	1.000	1.000
1999	1.039	1.021	1.014	1.051	1.064	1.013
2000	1.038	1.071	0.994	1.108	1.190	1.037
2001	1.054	1.085	0.941	1.113	1.197	1.070
2002	1.010	1.131	0.930	1.171	1.185	1.101
2003	1.008	1.142	0.971	1.223	1.247	1.135
2004	1.011	1.131	0.999	1.235	1.385	1.161
2005	0.956	1.154	0.997	1.316	1.573	1.190
2006	0.951	1.172	0.999	1.326	1.683	1.228
2007	0.933	1.180	0.994	1.362	1.874	1.264
2008	0.933	1.212	0.989	1.390	2.105	1.306
2009	0.975	1.171	1.051	1.448	2.328	1.346

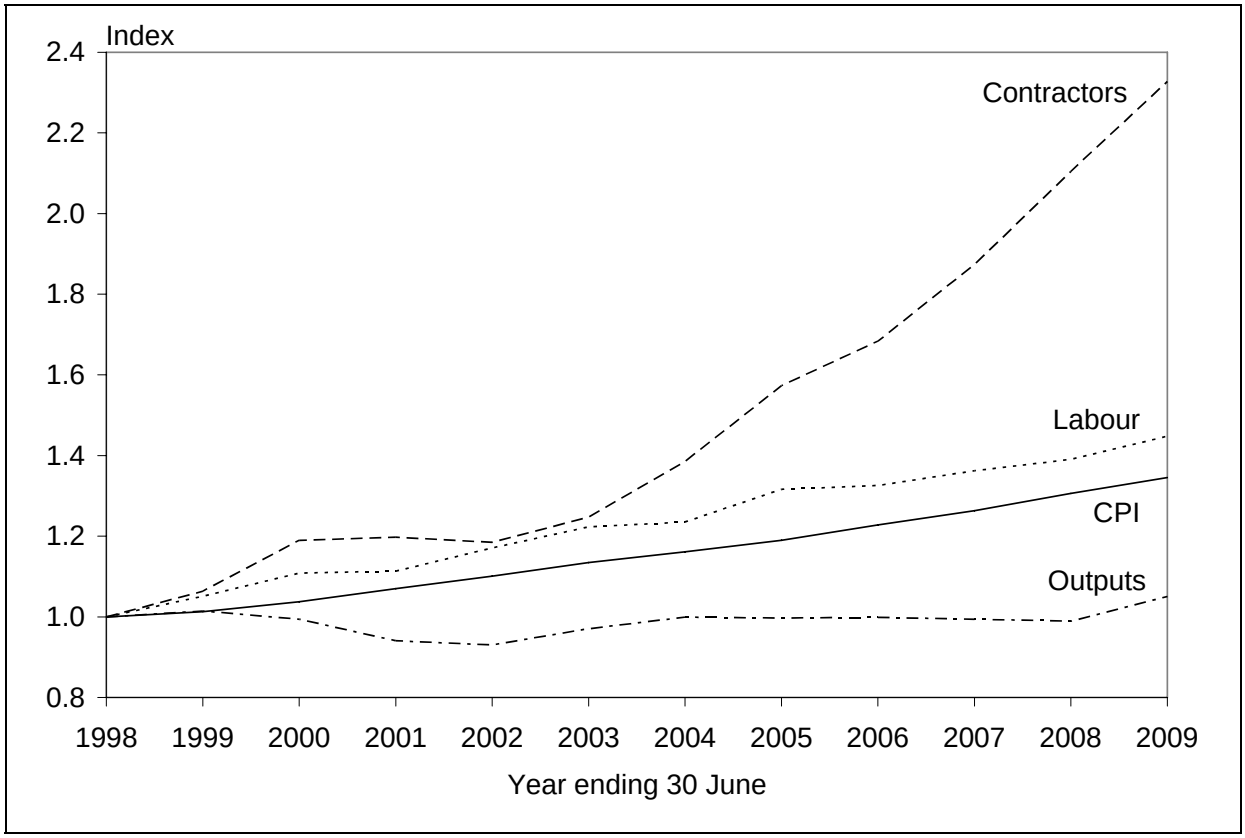
However, Australia Post's reserved service TFP growth was still considerably higher than the productivity growth for the economy as a whole. If all the benefits of this above average level of productivity growth had been retained by Australia Post it would have led to a sizable increase in Australia Post's reserved service gross return to capital. However, the effects of regulation have led to little change in Australia Post's reserved service output prices in nominal terms with only relatively modest increases in 2003 and 2009.

We present changes in Australia Post's reserved service average nominal output and input prices in figure 2.2 and table 2.1. Our estimate of the overall price Australia Post receives for its reserved service output decreased by 7 percent between 1998 and 2002 before increasing to regain its 1998 level in 2007 and finish up 5 per cent above its 1998 level in 2009. Over the same 12 year period, the consumer price index (CPI) increased by 35 per cent. This means that our estimate of the average real price of Australia Post's reserved service output – the overall price it charges relative to the rate of inflation – has declined by around 22 per cent over the last 12 years.

At the same time our estimates of Australia Post's reserved service nominal non–capital input price changes have considerably exceeded estimated output price changes. Australia Post's

reserved service materials and services price index is assumed to be the same as the CPI and so its real price remains unchanged. Australia Post's labour price index increased by 10 percentage points more than the CPI over the 12 year period leading to an 8 per cent increase in the real price of labour. However, the price Australia Post pays its reserved service contractors has increased by nearly 100 percentage points more than the CPI over the 10 year period leading to a 73 per cent increase in the real price of contractors.

Figure 2.2: **Australia Post's average nominal output and input prices, 1998 to 2009**



Australia Post employs a large contractor workforce in addition to its own staff. Contracts are let through competitive public tender. In the past few years the cost of the contracts has risen strongly. Two factors are mainly responsible. First, many contractors are owner–drivers and the contracts have fuel price escalation clauses, which result in rising oil prices affecting the contract rates. Second, the tightening labour market has resulted in shortages of contractors, pushing contract rates up independent of the oil price factor. This situation is not expected to ease over the medium term.

If Australia Post had passed on the full extent of its average reserved service non–capital input price increases to consumers then, all else unchanged, its reserved service gross return to capital would clearly have been much higher over the past 12 years.

3 SOURCES OF CHANGE IN AUSTRALIA POST'S RESERVED SERVICE GROSS RETURN TO CAPITAL

It is clear from the preceding section that, other things being equal, the size of Australia Post's reserved service real gross return to capital over the last 12 years will have:

- decreased marginally from growth in the size of the reserved service asset base;
- increased substantially from reserved service productivity growth;
- decreased substantially from changes in reserved service average real output prices; and
- decreased substantially from changes in the average real price Australia Post pays for its reserved service non–capital inputs.

Until now, however, there has been no accurate way of separating and quantifying these influences. People have tried to approximate the contribution of price changes by looking at what the gross return to capital would have been this year using last year's prices applied to this year's quantities. However, this simple approach still confuses the contributions of growth and relative price changes and will be more inaccurate the longer the time period considered due to flaws in the assumed indexing procedure.

To provide accurate measures of the contribution of growth, productivity and changes in output and input prices to changes in Australia Post's reserved service gross return to capital, we apply the economic methodology of Lawrence, Diewert and Fox (2006) and Lawrence and Richards (2004). This is based on the work of Diewert and Morrison (1986) and Fox and Kohli (1998) which explained changes in an economy's GNP resulting from productivity and terms of trade changes and changes in factor endowments. Lawrence, Diewert and Fox (2006) translated this to the firm level to explain changes in the firm's real gross return to capital due to growth in the quantity of the firm's capital stock[2], productivity change, and changes in real output and real input prices. The methodology is outlined briefly in the technical appendix.

As noted above, the database used here is based on Australia Post's reserved service physical and financial data. A range of assumptions were made to divide dollar value data into their price and quantity components and to form consistent estimates of the economic quantity of the capital stock. The analysis is undertaken in real terms and it should be noted that figures reported in the remainder of this report are expressed in constant 2009 prices rather than nominal terms.

[2] The methodology is based on a constant returns to scale, translog profit function. This permits the derivation of indexing procedures which have a rigorous microeconomic foundation and overcome the so–called 'index number problem' associated with simpler approaches.

Since we deal with the actual quantity of capital, labour and materials and services each period, there will be an approximate one–to–one correspondence between the changes in the gross return to capital we report for each of the scenarios and pre–tax profits. This is because none of the scenarios involve changes to the quantity of inputs and hence depreciation always remains the same. Changes to output quantities and prices (and labour prices) are then directly translated into changes in the gross return to capital and, because depreciation is unchanged, (approximately) into pre–tax profits.

Table 3.1: **Contributors to Australia Post's annual change in reserved service real gross return to capital, 1998 to 2009**

	Change in real gross	*Change in real return to capital solely due to:*				
Year ending	*return to capital*	*Growth*	*Productivity*	*Real output price*	*Real labour price*	*Real contract price*
30 June	*%*	*%*	*%*	*%*	*%*	*%*
1999	2.80	3.93	10.15	0.72	–9.76	–1.20
2000	–8.74	–0.14	27.44	–19.81	–8.29	–2.49
2001	–26.72	1.58	8.00	–39.85	10.02	0.94
2002	-9.64	–4.20	32.49	–23.22	–8.91	1.79
2003	7.98	–0.17	6.65	8.42	–5.57	–0.94
2004	–0.23	0.28	–5.99	3.95	5.67	–3.65
2005	–29.70	–5.44	18.12	–18.85	–17.66	–5.82
2006	–2.40	–0.58	14.90	–23.84	15.14	–2.56
2007	–30.30	–1.88	8.30	–30.22	1.09	–7.01
2008	–12.99	–0.02	43.48	–40.16	12.16	–9.63
2009	–21.44	4.59	–42.13	63.60	–11.58	–10.28
Average	–11.94	–0.19	11.04	–10.84	–1.61	–3.71

Looking at the 12 year period up to 2009, we present year–to–year percentage changes in the real gross return to capital in table 3.1 along with the change which would have occurred from each of the four sources in isolation. In other words, the third column of table 3.1 shows the percentage change in the real gross return to capital which would have occurred from year to year solely from changes in our estimates of the size of Australia Post's reserved service capital stock, assuming both the level of productivity and real output and input prices remained constant. Similarly, the fourth column shows the year to year percentage change in real gross return to capital attributable to productivity change had the size of Australia Post's reserved service capital stock remained the same and its real output and input prices remained constant. The fifth column of the table shows the percentage change in the real gross return to capital from year to year attributable solely to changes in real output prices assuming the size

of the capital stock, productivity levels and real labour prices all remained constant. Finally, the last column of the table shows the percentage change in the real gross return to capital from year to year attributable solely to changes in real labour prices assuming the size of the capital stock, productivity levels and real output prices all remained constant[3].

Over the 12 year period the real gross return to capital decreased on average by nearly 12 per cent per annum. If there had been no productivity change and no change in real output, labour and contractor prices but the same change in the size of the capital stock occurred then the real gross return to capital would have decreased on average by around 0.2 per cent per annum. This means the actual decrease in real gross returns to capital has far exceeded the decrease in the size of the capital stock on average.

If all the benefits from reserved service productivity growth had been retained by Australia Post and there had been no growth in the capital stock and no change in real output, labour and contractor prices then the real gross return to capital would have increased on average by 11 per cent per annum. Conversely, in the absence of growth in the capital stock, productivity changes and real labour and contractor price changes, then reserved service real gross returns would have been reduced annually by nearly 11 per cent on average given the actual pattern of real output price changes. Finally, real labour and real contractor price changes in the absence of any other changes led to annual reductions in the real gross returns to capital of 1.6 and 3.7 per cent on average, respectively.

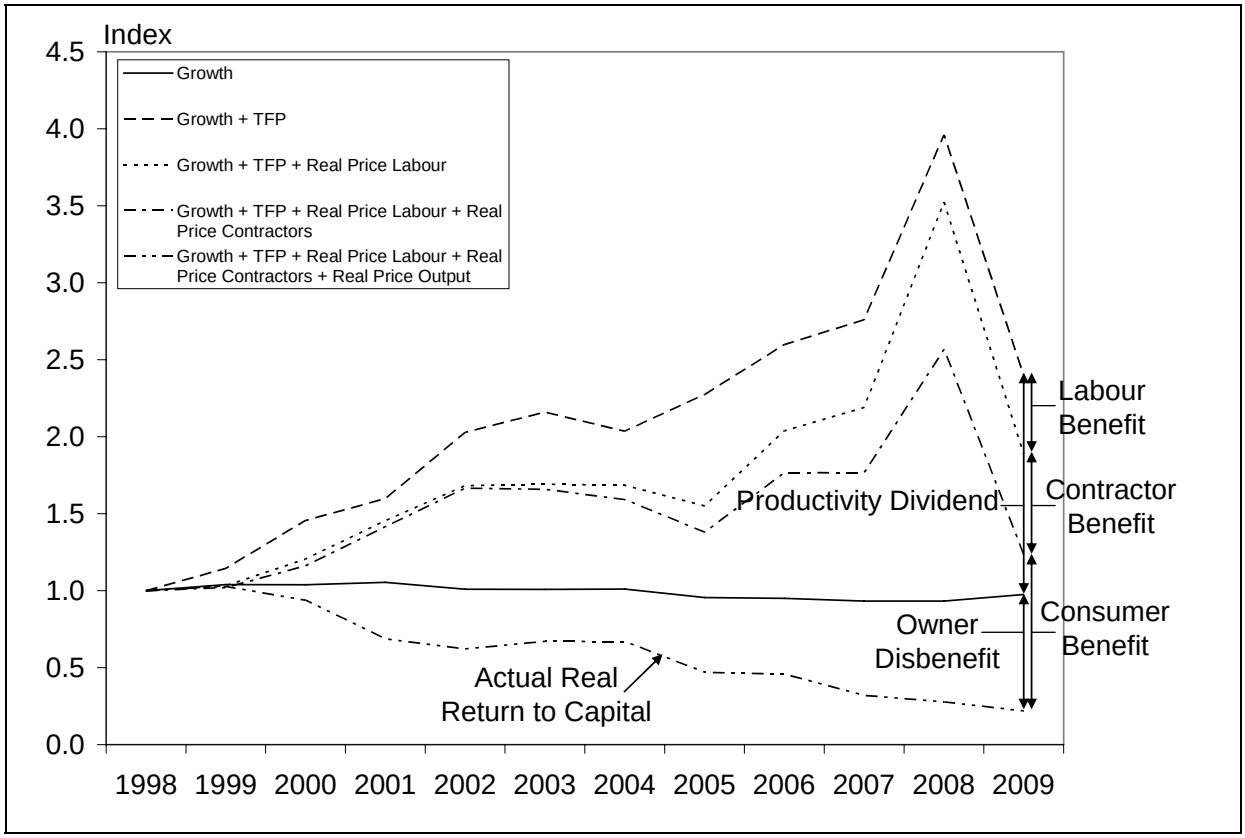
The cumulative impact of growth, productivity and real price changes on real gross returns to capital is shown in figure 3.1. Here we take the real gross return to capital in 1998 as the base and look at the cumulative effect of the actual annual changes in each of the three sources of change and also look at the progressive impact of the sources of change on the real return to capital. The solid line near the bottom of the figure shows what would have happened to the real gross return to capital over the 12 years if there had been no productivity change and no changes in real labour, contractor and output prices but the observed change in the size of the capital stock occurred – by 2009 the annual real return to capital for that year would have been 2.5 per cent lower.

The large dashed line at the top of the figure shows what would have happened to the real gross return to capital over the 12 years if there had been both the observed levels of growth in the capital stock and productivity change but no change in either real labour, real contractor or average real output prices – by 2009 the annual real gross return to capital for that year would have been 140 per cent higher. Note it was considerably higher in 2008 but fell considerably in 2009 with the fall in productivity due to reduced output. The small

[3] The price of Australia Post's reserved service materials and services inputs are assumed to change in line with the consumer price index and hence their real price remains constant.

dashed line near the top of the figure shows what would have happened to the real gross return with growth in the capital stock, productivity and real labour price changes but no change in the real contractor and real output prices.

Figure 3.1: **Cumulative contribution to changes in Australia Post's reserved service real gross return to capital, 1998 to 2009**



The combination dashed line third from the top of the figure shows what would have happened to the real gross return with growth in the capital stock, productivity, real labour price and real contractor price changes but no change in the real output price. Finally, the combination dashed line at the bottom of the figure shows the cumulative effect of all five contributors to changes in the real gross return to capital. This line coincides with the actual observed change in Australia Post's reserved service real gross return over the period.

The gap between the 'growth' and 'growth plus TFP' lines indicates the size of the potential contribution to Australia Post's reserved service real gross return to capital from productivity improvements from 1998 onwards. We name this the 'productivity dividend'. The gap between the top two lines shows the extent to which the benefits from Australia Post's reserved service productivity growth has been passed on to its labour force in the form of higher real wages. As real wages progressively increased up to 2007, this gap tended to increase somewhat but has narrowed since with reduced growth in real wages. The temporary

widening of this gap in 2005 is also noteworthy. Australia Post has large balance sheet liabilities for long service leave and workers compensation. These are calculated as the present value of future payments, with the discount rate being the Commonwealth long term bond rate. Between June 2004 and June 2005 the 10 year bond rate fell by three quarters of a percentage point, thereby increasing the provisions. The impact on the provisions, and therefore the associated labour expense, was a one-off cost of around $12 million.

The gap between the small dashed line and the upper combination dashed line shows the extent to which the benefits from Australia Post's reserved service productivity growth has been passed on to its contractors in the form of higher real contract prices. As real contract prices have escalated rapidly over the last few years, this gap has correspondingly widened.

The large gap between the upper and lower combination dashed lines indicates the size of the benefit Australia Post has passed on to its reserved service consumers over the period in the form of lower real prices. The size of the benefits passed on to consumers has more than exhausted the potential contribution of productivity improvements to Australia Post's reserved service real gross return to capital for the whole period once real input price increases are allowed for. In fact, consumers have obtained over 70 per cent of the available productivity dividend in the form of lower real prices. Labour has obtained 36 per cent of the productivity dividend in the form of higher real wages and contractors have obtained 46 per cent of the productivity dividend in the form of higher real contract prices. This means Australia Post's owners had a negative share of 53 per cent the available productivity dividend – or a 'disbenefit'. The residual going to owners is given by the gap between the lower combination dashed line and the solid line reflecting growth alone.

We now convert these contributions to changes in the real gross return to capital into dollar amounts expressed in 2009 prices. In 1998 Australia Post's reserved service real gross return to capital was around $488 million (expressed in 2009 prices). Table 3.2 shows how this has changed over the subsequent 11 years. By 2009 the gross return to capital had fallen to $107 million. In the absence of other changes, growth in the size of the capital stock would have taken this figure to $476 million. Growth plus TFP improvement would have taken it to $1,170 million in the absence of real price changes while growth, TFP improvement and real labour price changes would have taken it to $920 million.

The total 'productivity dividend' in 2009 for productivity change since 1998 was, thus, $694 million. The distribution of this cumulative productivity dividend was a benefit of $495 million passed on to consumers, a benefit of $249 million passed on to Australia Post's reserved service labour and a benefit of $319 million passed on to reserved service contractors. Since, these benefits far exceed the available productivity dividend, Australia Post's owners were worse of by $369 million. Another way of looking at this result is that, in

2009, if Australia Post had not passed practically all of the benefits of productivity improvement over the last 10 years on to consumers and absorbed all of its real input price increases, then all else being equal its pre–tax profit would have been around $694 million higher.

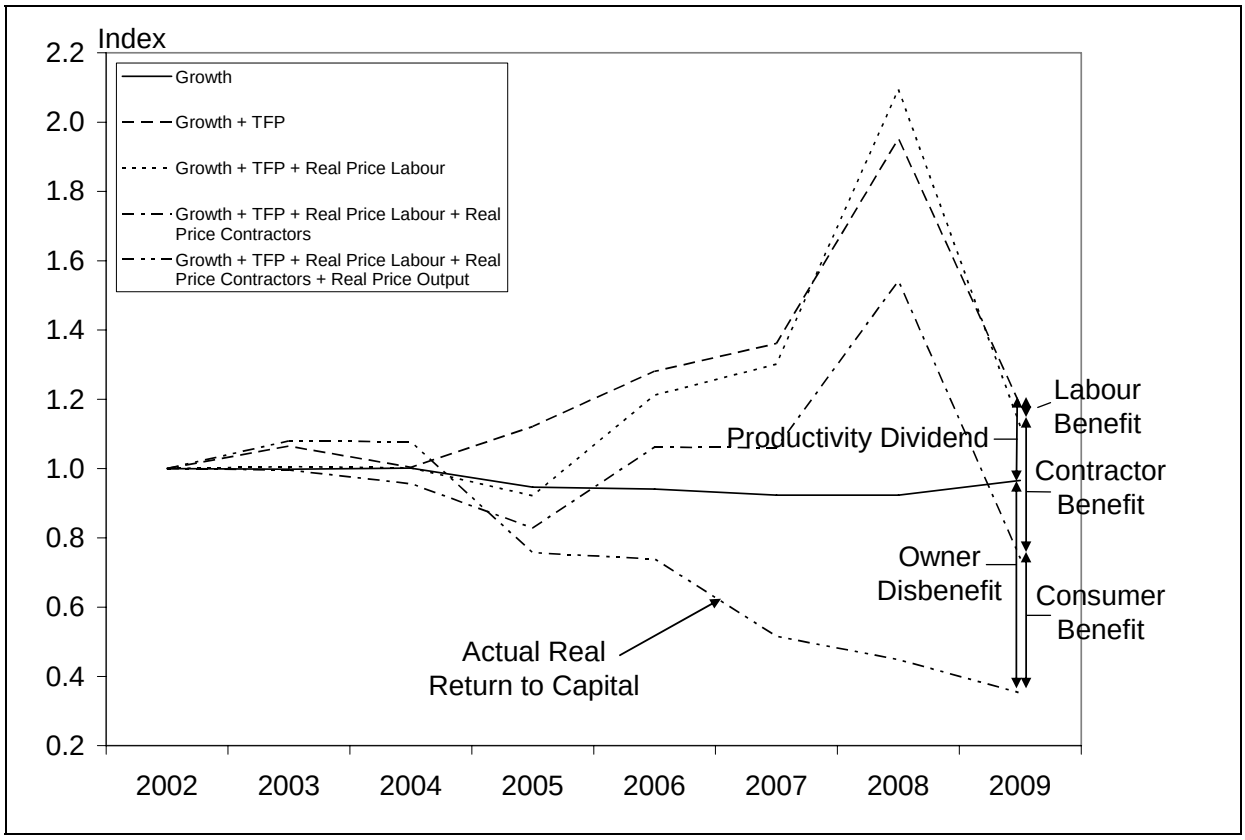
Table 3.2: **Australia Post's reserved service real gross return to capital and cumulative productivity dividend, 1998 to 2009**

Year ending 30 June	*Cumulative real return due to:*				
	Growth	*Growth plus TFP*	*(2) plus real price labour*	*(3) plus real price contractors*	*(4) plus real price output*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
	$2009m	*$2009m*	*$2009m*	*$2009m*	*$2009m*
1998	488	488	488	488	488
1999	507	559	504	498	502
2000	506	711	588	567	458
2001	514	780	710	691	335
2002	493	990	821	813	303
2003	492	1,054	826	809	327
2004	493	994	822	777	327
2005	467	1,110	756	673	230
2006	464	1,268	995	862	224
2007	455	1,347	1,069	861	156
2008	455	1,932	1,719	1,253	136
2009	476	1,170	920	601	107

	Productivity dividend				
Year ending 30 June	*Total*	*To labour*	*To contractors*	*To consumers*	*To owners*
	(6)=(2)-(1)	*(7)=(2)-(3)*	*(8)=(3)-(4)*	*(9)=(4)-(5)*	*(10)=(5)-(1)*
	$2009m	*$2009m*	*$2009m*	*$2009m*	*$2009m*
1999	51.4	54.5	6.0	–3.6	–5.5
2000	204.4	122.5	21.5	109.0	–48.6
2001	265.4	69.7	19.6	355.1	–178.9
2002	497.0	168.8	8.4	509.6	–189.7
2003	561.9	228.4	16.1	482.1	–164.7
2004	500.2	171.2	45.5	450.3	–166.8
2005	643.2	353.4	83.4	443.4	–237.0
2006	803.9	272.9	132.3	638.4	–239.8
2007	891.9	278.4	207.1	705.3	–298.9
2008	1,477.3	213.0	466.7	1,116.8	–319.1
2009	693.7	249.4	318.7	494.7	–369.2

We now turn to look at the distribution of the benefits of reserved service productivity growth over the last seven years since the ACCC review of reserved service prices in 2002.

Figure 3.2: **Cumulative contribution to changes in Australia Post's reserved service real gross return to capital, 2002 to 2009**



From figure 3.2 we see that the allocation of the productivity dividend has become much more skewed towards consumers and contractors and away from Australia Post's owners. Labour now receives a share of 28 per cent of the cumulative productivity dividend in 2009 from productivity change since 2002. However, the size of the productivity dividend in 2009 is much smaller than that in 2008 due to the fall in productivity in 2009 due to reduced output. Also note that labour would have received a negative share of the 2008 productivity dividend as wages had not kept pace with inflation. Contractors receive a much larger share of 176 per cent of the cumulative productivity dividend over this shorter period reflecting the rapid increase in contractor prices over the last few years resulting from higher fuel prices and the tight market for contractor services. Consumers also now receive more than the entire productivity dividend with lower real prices giving them a 180 per cent share of the available productivity dividend for the last seven years. This leaves the Australia Post owner with a negative share of the productivity dividend of 284 per cent.

Table 3.3: **Australia Post's reserved service real gross return to capital and cumulative productivity dividend, 2002 to 2009**

Year ending 30 June	*Cumulative real return due to:*				
	Growth	*Growth plus TFP*	*(2) plus real price labour*	*(3) plus real price contractors*	*(4) plus real price output*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
	$2009m	*$2009m*	*$2009m*	*$2009m*	*$2009m*
2002	303	303	303	303	303
2003	303	323	305	302	327
2004	303	304	304	290	327
2005	287	340	279	251	230
2006	285	388	367	322	224
2007	280	413	395	321	156
2008	280	592	635	467	136
2009	293	358	340	224	107

	Productivity dividend				
Year ending 30 June	*Total*	*To labour*	*To contractors*	*To consumers*	*To owners*
	(6)=(2)–(1)	*(7)=(2)–(3)*	*(8)=(3)–(4)*	*(9)=(4)–(5)*	*(10)=(5)–(1)*
	$2009m	*$2009m*	*$2009m*	*$2009m*	*$2009m*
2003	20	18	3	–25	25
2004	1	1	14	–37	23
2005	53	61	28	21	–57
2006	103	21	46	98	–61
2007	133	18	73	165	–124
2008	312	–43	168	331	–144
2009	65	18	115	118	–186

Converting these contributions to changes in the real gross return to capital into dollar amounts expressed in 2009 prices, in 2002 Australia Post's reserved service real gross return to capital was around $303 million (expressed in 2009 prices). Table 3.3 shows how this has changed over the subsequent 6 years. By 2009 the gross return to capital had fallen to $107 million. In the absence of other changes, growth in the size of the capital stock would have taken this figure to $293 million. Growth plus TFP improvement would have taken it to $358 million in the absence of real price changes while growth, TFP improvement and real labour price changes would have taken it to $340 million.

The total productivity dividend in 2009 for productivity change since 2002 was, thus, $65 million. The distribution of this cumulative productivity dividend was a benefit of $118 million passed on to consumers, a benefit of around $18 million passed on to Australia Post's

reserved service labour and a benefit of around $115 million passed on to reserved service contractors. Since these benefits far exceed the available productivity dividend, Australia Post's owners were worse of by $186 million.

The methodology used in this report looks at changes in the real gross return to capital over time, rather than at absolute levels of the real return. The ACCC price review in 2002 would have ensured that Australia Post was not earning excess returns on its reserved services at that time. The deterioration in Australia Post's owner's position since 2002 indicates that the real returns now being earned from the reserved service are much lower. This is because reserved service prices remained largely constant in nominal terms between 2004 and 2008 despite significant increases in the prices of the three non–capital inputs. Australia Post has not been able to absorb all of these real price changes. There has, hence, not been a reasonable sharing of the benefits from productivity improvements over the last seven years. Indeed, the owner's position has deteriorated by more than two and a half times the full amount of the available productivity dividend.

4 CONCLUSIONS

The results of this study show that most of the benefits from Australia Post's reserved service productivity improvements over the past 12 years, and considerably more than all of the benefits over the last seven years, have been passed on to consumers in the form of real price reductions. In fact, 180 per cent of the benefit from cumulative productivity improvements over the last seven years was passed on to consumers in 2009. This benefit to consumers amounted to $118 million in 2009 prices. At the same time, Australia Post has been faced with a rapid escalation in contractor prices resulting from stiff competition for contractor services and increased fuel prices. In 2009 Australia Post's owner's position deteriorated by more than two and a half times the available productivity dividend for cumulative productivity improvements since 2002.

This uneven distribution of Australia Post's reserved service productivity dividend over the last 12 years, and the last seven years in particular, reduces Australia Post's incentives to invest further in the reserved service business and meet future needs – or to commit the time and effort required to achieve further reforms and efficiency improvements. Only by ensuring there is a more even distribution of benefits among stakeholders will a more sustainable position be maintained going forward.

APPENDIX: DECOMPOSITION METHODOLOGY

Diewert and Morrison (1986) and Fox and Kohli (1998) developed a method for explaining changes in an economy's GNP resulting from productivity and terms of trade changes and changes in factor endowments. Lawrence, Diewert and Fox (2006) translated and adapted this methodology to the level of the individual firm to examine the distribution of benefits from productivity improvements among the three principal stakeholder groups: customers, employees and the firm's owners. This paper applies the Lawrence, Diewert and Fox decomposition method.

We start by defining the following index of productivity change between periods *t–1* and *t*:

$$(1) \qquad R^{t,t-1} = \left[\frac{\pi(p^{t-1},k^{t-1},t)}{\pi(p^{t-1},k^{t-1},t-1)} \frac{\pi(p^{t},k^{t},t)}{\pi(p^{t},k^{t},t-1)} \right]^{0.5}$$

where π is the firm's profit function, p are net output prices and k is the quantity of capital. Net outputs cover outputs and variable inputs with variable input quantities being allocated a negative sign. The productivity index (1) can be interpreted as the geometric mean of Laspeyres and Paasche productivity indexes. The firm's profit function is generally not known and so (1) cannot be calculated directly.

A common assumption regarding π is the following flexible translog functional form:

$$(2) \qquad \ln \pi = \alpha_0 + \sum_{i=1}^{N} \alpha_i \ln p_i + 0.5 \sum_{i=1}^{N} \sum_{j=1}^{N} \alpha_{ij} \ln p_i \ln p_j + \ln k$$

where $\alpha_{ij} = \alpha_{ji}$ and the following restrictions ensure the technology exhibits constant returns to scale: $\sum \alpha_i = 1 \text{and} \sum \alpha_{ij} = 0.$ If π has the translog functional form then it can be shown that the productivity index (1) can be calculated from the data alone as follows:

$$(3) \qquad R_{t,t-1} = \frac{\Gamma^{t,t-1}}{P^{t,t-1} \cdot K^{t,t-1}}$$

where:

$$(4) \qquad \Gamma^{t,t-1} = \frac{\sum p_{i,t} y_{i,t}}{\sum p_{i,t-1} y_{i,t-1}};$$

with the y being the net output quantities (positive for outputs and negative for variable inputs) and:

$$(5) \qquad P^{t,t-1} = \exp\left[\sum 0.5(s_{i,t} + s_{i,t-1}) \ln \frac{p_{i,t}}{p_{i,t-1}} \right];$$

$$(6) \qquad K^{t,t-1} = k_t / k_{t-1};$$

and where:

(7) $$s_{i,t} = \frac{p_{i,t} y_{i,t}}{\sum p_{i,t} y_{i,t}}.$$

From the above information we can now decompose the year to year change in profits into terms due to productivity change, net output price changes and changes in the capital stock as follows:

(8) $$\Gamma^{t,t-1} = R^{t,t-1} \cdot P^{t,t-1} \cdot K^{t,t-1}$$

The net output price term can be further divided into multiplicative terms isolating the effects of different combinations of net outputs.

In the real price change analysis reported here, both the left hand side of (8) and the net output price term on the right hand side are divided by the following term:

(9) $$CPI^{t,t-1} = cpi_t / cpi_{t-1}$$

where *cpi* is the consumer price index.

REFERENCES

Australian Bureau of Statistics (2009), *Australian System of National Accounts, 2007–08*, Cat. No. 5204, Canberra.

Diewert, W.E. and C.J. Morrison (1986), "Adjusting output and productivity indexes for changes in the terms of trade", *The Economic Journal* 96, 659–79.

Fox, K.J. and U. Kohli (1998), "GDP growth, terms of trade effects and total factor productivity", *The Journal of International Trade and Economic Development* 7(1), 87–110.

Economic Insights (2009), *Australia Post's Aggregate and Reserved Service Productivity – 2009 Update*, Report prepared for Australia Post, Canberra, 1 July.

Lawrence, Denis (2002), *Australia Post – Past and Forecast Productivity Growth*, Report by Meyrick and Associates for the Australian Competition and Consumer Commission, Canberra, 27 August.

Lawrence, Denis (2007), *Australia Post's Aggregate and Reserved Service Productivity Performance*, Report by Meyrick and Associates for Australia Post, Canberra, 22 November.

Lawrence, D., W.E. Diewert and K.J. Fox (2006), "The Contribution of Productivity, Price Changes and Firm Size to Profitability", *Journal of Productivity Analysis* 26, 1–13.

Lawrence, Denis and Anya Richards (2004), "Distributing the Gains from Waterfront Productivity Improvements", *The Economic Record* 80, S43–S52.