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Productivity in the construction industry

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TAI

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Executive summary

Construction is an important industry in Australia, with sales accounting for $327 billion or some 21 per cent of GDP and its contribution to value added being 7.6 per cent of GDP. Australian Bureau of Statistics (ABS) data allow us to examine and estimate the productivity magnitudes involved in this industry and its components; building construction, heavy and civil engineering construction and construction services. These components account for 35, 23 and 43 per cent of the industry respectively.

The word productivity is often used loosely in ordinary language – here we use it strictly as a quantitative relationship between industry output and the labour and capital inputs. As a measure of output, we use the 'value added' created by the industry. In the case of labour inputs, the best measure is hours worked – however, for some purposes we are forced to use simple head counts. Productivity of Australian labour is critically important, being one of the drivers of living standards in the long run.

Generally we find that construction is a productive industry with a value added per worker above the average of all industries and well above the average, if extremely productive industries such as mining are excluded. Some parts of construction such as heavy and civil engineering are very productive, generating productivity 53 per cent higher than the Australian average.

While current productivity is important, so is productivity growth over time. Here we find that since 1994-95, the first year for some of the relevant data series, construction has kept pace over time with the rest of the market sector in Australia. However, when we use the multifactor productivity measure, we find that productivity growth in construction has outpaced the market average by a factor of 35.6 to 10.7 per cent. Part of the reason for this is that capital productivity slumped by 27 per cent in the rest of the economy, while the evidence presented here shows that it increased by 11 per cent in construction.

Over the period since 2007-08 it is possible to examine the productivity performance of the sub-sectors. While the market sector as a whole registered an average annual increase in labour productivity of 3.52 per cent, the average for construction was a healthy 4.81, up to a very high 6.38 per cent for building.

Limited evidence is available that would permit useful international comparisons. However, the information available confirms the present findings – that Australian construction is a highly productive industry displaying solid productivity growth. Recent Treasury figures suggest Australian construction's labour productivity is twice the US figure.

The profitability of the construction industry is a related issue addressed here. The results show that the profit share – using the wide measure 'gross operating surplus' – is a bit under the national average for all industries. This is what we might expect in an industry that is much less capital-intensive than the average. As it happens, when profitability is measured as a return on the industry's capital, stock construction is by far the most profitable industry. It has a rate of return of 107 per cent compared with the next highest (finance and insurance) at 61 per cent and an industry average of 22 per cent.

When changes over time are plotted, it is clear that the construction industry has witnessed a large shift in incomes towards profits and a subsequent large shift in income away from labour.

Introduction

'Productivity' refers to the ability to generate outputs from a set of inputs. In general language we talk about the productivity of different land or natural resource deposits or the productivity of hard-working individuals. Here we discuss productivity in a limited way – as the quantitative relation between labour and other inputs in production and the consequent output of goods and services. 'Labour productivity', for example, refers to how many units of output we obtain per unit of labour. The absolute magnitude may not always mean terribly much but if, over time, more output can be obtained from the same labour inputs, we can talk about improvements in labour productivity.

The aim of this paper is to present the evidence on how the construction industry has performed in terms of this definition of productivity in the recent past. Productivity in the industry will be examined in terms of both how productive construction is now as well as how productivity growth has performed over time. That discussion will also involve comparing productivity in construction with developments elsewhere in the Australian economy.

Construction is a major industry in its own right, with total sales and service income of $327 billion in 2012-13,[1] or some 21 per cent of GDP.[2] Of course, value added as a share of GDP at 7.6 per cent is much smaller than total sales, since a lot of the work of the construction industry involves assembling materials into buildings and other structures. Value added abstracts from the value of the materials and other inputs used in construction.

It is inevitable that, as such a large industry, its performance is of interest to all Australians and that productivity in the industry is therefore an ongoing issue. In this paper we will rely heavily on the ABS definitions of the construction industry and its components.[3] The ABS splits the industry into two sub-divisions:

1. General construction – which is further split into building and non-building construction, with the latter often also referred to as 'heavy and civil engineering'. Building is sometimes further split into residential and non-residential (offices, factories etc.).
2. Construction services – which has a meaning made clear by its five groups: site preparation services, building structure services, installation trade services, building completion services and other construction services.

In terms of sales figures, building construction generated $113 billion in 2012-13, heavy and civil engineering construction generated revenue of $74 billion, while construction services generated sales of $140 billion. Those numbers, along with sales figures for other recent years, are given in Table 1.

[1] ABS (2014) *Australian industry, 2012-13*, Cat no 8155.0, 28 May.
[2] GDP from ABS (2013) *Australian System of national accounts, 2012-13*, Cat no 5204.0, 1 November. Note that value added as a share of GDP is a more modest 7.6 per cent of GDP.
[3] ABS (2013) *Information paper: Experimental estimates of industry multifactor productivity, Australia, 2007*, Cat no 5260.00.55.001, 7 September.

Table 1: Sales and service income: Construction and its components ($ million)

	Building	Heavy and civil engineering	Construction services	Total
2007–08	98,419	42,325	113,076	253,820
2008–09	102,458	43,921	113,775	260,154
2009–10	109,353	52,840	119,376	281,569
2010–11	106,606	57,508	133,983	298,098
2011–12	110,361	63,897	140,185	314,443
2012–13	113,080	73,977	140,252	327,309

Source: ABS (2014) *Australian industry, 2012-13*, Cat no 8155.0, 28 May.

Construction services is clearly the largest sub-industry, with 43 per cent of the industry income. Building comes next, with sales covering 35 per cent of the industry – just over a third. Heavy and civil engineering sales comprised 23 per cent of the industry.

Productivity is important – it is the source of increases in living standards over time. That is why economic policy makers have an interest in the productivity performance of all major industries in the Australian economy. As Nobel Prize-winning economist, Paul Krugman, said:

> *Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.*[4]

Productivity estimates

A relatively new statistical series by the ABS, beginning in 2007, provides estimates for simple labour productivity and multifactor productivity.[5] However, since the ABS estimates are based on earlier data collections, most series go back to at least 1994-95 – this gives us almost two decades of data. The latest figures cover the period to 2012-13.

'Productivity' refers to the degree to which inputs can be turned into outputs. For example, labour productivity refers to the units of output per unit of labour. We can talk about improvements in labour productivity if, over time, more output can be obtained from the same labour inputs, or to put it differently, productivity is higher if output per unit of input increases over time.

In addition to labour productivity, the ABS also calculates capital productivity estimates based on its measure of the capital services used in production, as well as multifactor productivity. Multifactor productivity can be thought of as a combination of the labour and capital productivity measures, with each being weighted by their share of value added.

The estimates reported here use 'value added' as the measure of output where value added is, as the ABS defines it, 'the total value of products produced in an industry minus the value of intermediate inputs used during the production process'.[6] The need to deduct the value of the inputs is clear if we consider comparing the productivity of a petrol station with a hairdresser. Both may employ four people, but sales at the petrol station might be around

[4] Krugman P (1994) *The age of diminishing expectations: US economic policy in the 1990s*, p 11.
[5] The latest publication in this series is ABS (2013) *Estimates of industry multifactor productivity*, Cat no 5260.0.55.002, 6 December.
[6] ABS (2013) Australian System of national accounts, 2012-13, Cat no 5204.0, 1 November.

$3,750,000 compared with $300,000 for the hairdresser. Yet both businesses may generate an income of $200,000, which is split between the owner and the workers. Sales-per-head are vastly different – but the additional value they add to the inputs they use are the same. It is the $200,000 that we refer to as 'value added'.

The inputs of labour can be measured either by head count or hours worked. Using employment numbers we can calculate output per worker to give simple labour productivity. However, when we use 'hours worked' we filter out the complications that arise as a result of part-time workers and other factors that influence the hours worked per worker. We begin the next section with a brief discussion of the labour productivity figures based on calculations using hours worked.

While productivity measures are an important summary statistic, they are an average measure and like any average they have their limitations. For example, over the recent past consumers have been purchasing more hand-crafted items such as cups, saucers, plates and bowls. Those have much greater labour inputs than the mass-produced varieties and so have the effect of reducing labour productivity. But no one would conclude that we are worse off as a result of the consumer taste for craft goods. While this is not the place to provide a full examination of the strengths and weaknesses of productivity measures, it should be remembered that they have limitations.

How productive is construction?

Using simple labour productivity measures we can calculate that value added per worker in construction was $96,838 in 2012-13.[7] It is useful to compare the figure for construction against other industries in Australia. For this exercise we use the ABS measures, which include industries and parts of industries in the market sector. Those calculations are made and presented in the second column of Table 2. The third column calculates the employment share of the various selected industries.

On these figures, output-per-head in construction ranks ninth out of 18 industries. However, that may be a bit misleading given that some of the top-ranking industries are very small employers – this can be seen by inspecting the third column of Table 2. In addition, construction has a value added per worker of just over the average of the selected industries – but again, the industry average figure is biased upwards by the very high values in mining particularly, but also electricity, gas, water and waste services. If those high-value low-employment outlier industries are excluded, the Australian average falls to just $84,781 – which makes construction look much more productive than the industry norm.

[7] ABS (2013) *Australian System of national accounts, 2012-13,* Cat no 5204.0, 1 November.

Table 2: Labour productivity in selected industries

	Labour productivity: Value added per worker ($)	Share of total employment (%)
Mining	602,331	1.79
Electricity, gas, water and waste services	366,414	1.09
Information Media and Telecommunications	209,375	1.58
Rental, hiring and real estate services	155,296	3.72
Transport, postal and warehousing	117,188	5.32
Manufacturing	109,358	8.45
Professional, scientific and technical services	108,060	9.09
Wholesale trade	107,687	5.36
Construction	**96,838**	**9.87**
Health care and social assistance (private)	64,522	9.44
Public administration and safety (private)	63,444	0.76
Other services	63,426	4.12
Education and training (private)	60,264	3.42
Arts and recreation services	55,960	1.88
Administrative and support services	54,918	8.27
Retail trade	54,868	12.38
Agriculture, forestry and fishing	52,132	4.70
Accommodation and food services	39,298	8.75
Total selected industries	**94052**	**100.00**

Source: ABS (2013) *Australian System of national accounts, 2012-13*, Cat no 5204.0, 1 November.

The fact that construction industry productivity is a bit above the average may seem somewhat puzzling given that, as IBISWorld points out, the construction industry has a capital intensity that is about a third of Australian industry as a whole.[8] That measure is based on the units of capital employed in the industry per unit of labour. Historically, increasing investment in capital has been associated with improving output per unit of labour. Industries with large capital intensity, such as mining and electricity, are the ones that tend to have high labour productivity because the capital assists labour in undertaking the work involved in producing goods and services. It is therefore unusual to find a high productivity but low capital-intensive industry. On the face of it productivity in construction appears much higher than it should be.

[8] Kelly A (2014) *IBISWorld Industry report E: Construction in Australia*, May. The information is presented in a graph so it is not possible to give a more precise estimate.

Of course averages are just that and some parts of construction are much more productive than others. Another series published by the ABS gives employment and value added for construction and three subsectors: building construction, heavy and civil engineering construction, and construction services.[9] Table 2 is reworked to show how the various sub-sectors of construction would appear in a ranking of industries by labour productivity.

Table 3 repeats the information in Table 2 but splits construction into building, heavy and civil engineering and construction services. Those sub-industries are shown in the shaded cells of Table 3.

Table 3: Labour productivity in selected industries compared with construction sub-industries

	Labour productivity: Value added per worker ($)
Mining	602,331
Electricity, gas, water and waste services	366,414
Information Media and Telecommunications	209,375
Rental, hiring and real estate services	155,296
Heavy and civil engineering construction	143,684
Transport, postal and warehousing	117,188
Building construction	116,609
Manufacturing	109,358
Professional, scientific and technical services	108,060
Wholesale trade	107,687
Construction services	81,179
Health care and social assistance (private)	64,522
Public administration and safety (private)	63,444
Other services	63,426
Education and training (private)	60,264
Arts and recreation services	55,960
Administrative and support services	54,918
Retail trade	54,868
Agriculture, forestry and fishing	52,132
Accommodation and food services	39,298
Total selected industries	**94052**

Source: ABS (2013) *Australian System of national accounts, 2012-13*, Cat no 5204.0, 1 November.

[9] ABS (2014) *Australian industry, 2012-13*, Cat no 8155.0, 28 May.

From Table 3 it is clear that heavy and civil engineering and the building construction sub-industries are very productive compared with the other Australian industries. They have 53 and 24 per cent higher productivity than the Australian average on this measure, even when the outliers such as mining are included in the average.

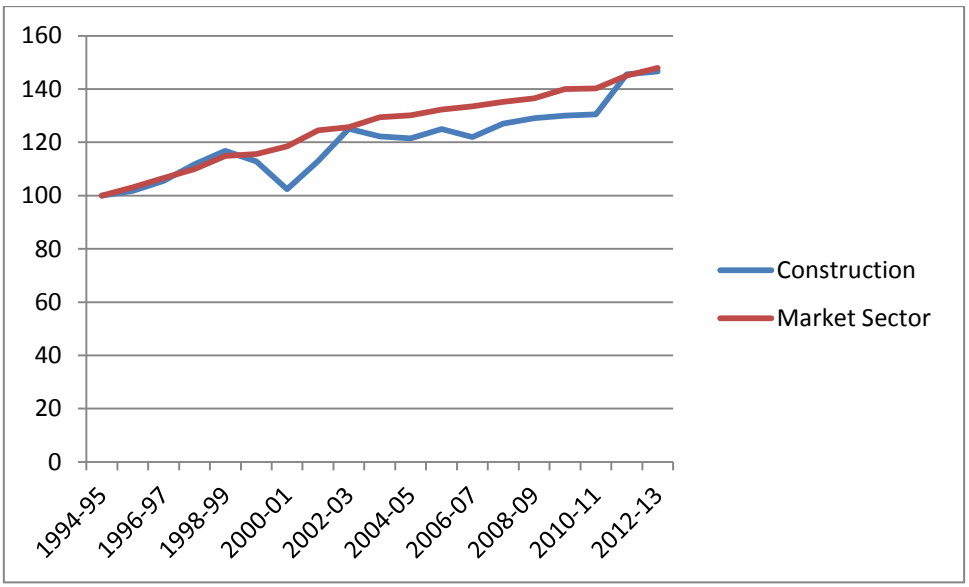
Of course there are many influences on the absolute level of productivity in the construction and other industries. However, it is important to observe that few critics of the construction industry's productivity bother to mention just how productive the industry is in terms of the value of the outputs per unit of input.

Instead the focus is usually on productivity growth, which is of course an important issue in the present policy debates. We now turn to examine the issue of how productivity has been moving over time.

Productivity growth

Figures 1 and 2 compare productivity in the construction industry with that in the rest of the economy. Figure 1 gives the results for labour productivity, while Figure 2 gives the results for total factor productivity. Both graphs compare the construction industry with the ABS series 'market sector',[10] which includes all those industries the ABS regards as being included in the market sector. Figures 1 and 2 go back as far as the ABS series for the market sector goes. The data in the Figures have been reset to a base of 1994-95 = 100 so that, reading from left to right, we can appreciate the changes in productivity over time. It also means for example that if, as Figure 1 shows, the final figure for labour productivity in 2012-13 for construction is 147, compared with 100 for the initial figure, then we can say there has been a 47 per cent increase in productivity over the period 1994-95 to 2012-13.

Figure 1: Labour productivity: Construction industry and market sector (1994-95 = 100)



Source: ABS (2014) *Australian industry, 2012-13*, Cat no 8155.0, 28 May.

[10] The full list goes from 'A Agriculture' to 'S Other services'. Some are sectors with a large publicly-owned component so they are split into public and private and only the private is included in the ABS figures.

Labour productivity in construction increased by 47 per cent over the period to 2012-13. Figure 1 clearly shows that productivity in the construction industry increases in a rather volatile manner but labour productivity in construction seems to keep pace with the other industries over the whole period that the ABS allows us to examine. Over the same period labour productivity in the market sector as a whole increases by 48 per cent – well within any likely margin of error. Expressed as an average over the period, the construction industry is exceeded by the market sector by a mere 0.001 per cent, the difference between 1.319 and 1.320 per cent per annum.[11] Such differences cannot be regarded as significant.

The data in Figure 1 and elsewhere show a marked downturn in 2000-01. The ABS makes it clear that this was due to a slump in output, which in turn was 'due to building activity being brought forward to counter the introduction of the GST'.[12]

On the macroeconomic figures it is impossible to identify any problem in the Australian construction industry compared with the rest of the market sector in Australia insofar as labour productivity performance is concerned. We now turn to estimates of multifactor productivity, which are presented in Figure 2.

Figure 2: Multifactor productivity: Construction industry and market sector (1994-95 = 100)

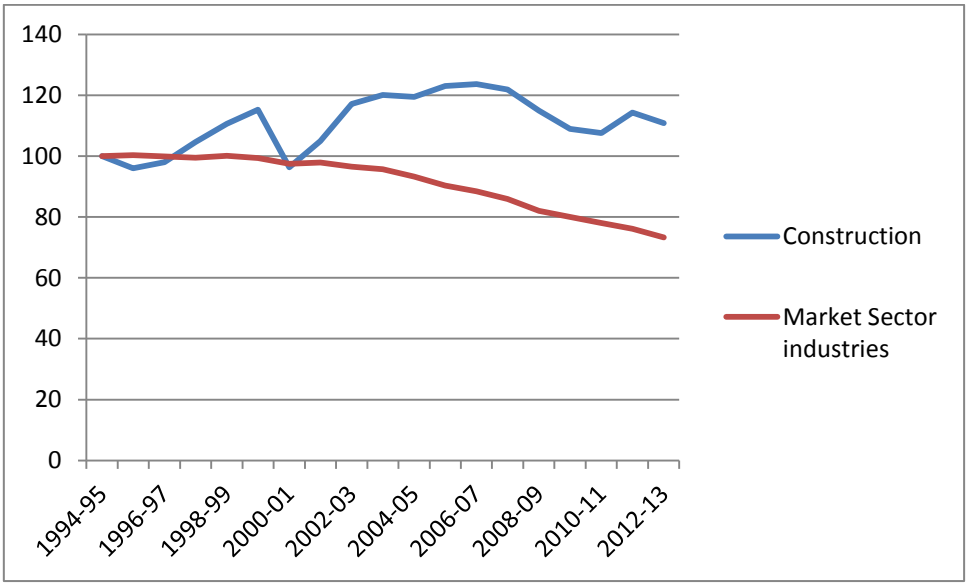
Source: ABS (2013) *Estimates of industry multifactor productivity*, Cat no 5260.0.55.002, 6 December.

From Figure 2 it is clear that construction productivity appears quite superior to the rest of the market sector when it is expressed in terms of multifactor productivity. Construction productivity ends the period higher by 35.6 per cent compared with only 10.7 per cent for the market sector as a whole. In annual terms, the figures average 1.71 per cent productivity growth for construction compared with 0.57 per cent for the market sector as a whole.

For completeness we include Figure 3 below, which shows the capital productivity in construction compared with the market sector as a whole.

[11] These figures have to be expressed to three decimal points before there is any difference.
[12] ABS (2007) *Information paper: Experimental estimates of industry multifactor productivity, Australia 2007*, Cat no 5260.0.55.001, 7 September p. 49.

Figure 3: Capital productivity: Construction industry and market sector (1994-95 = 100)

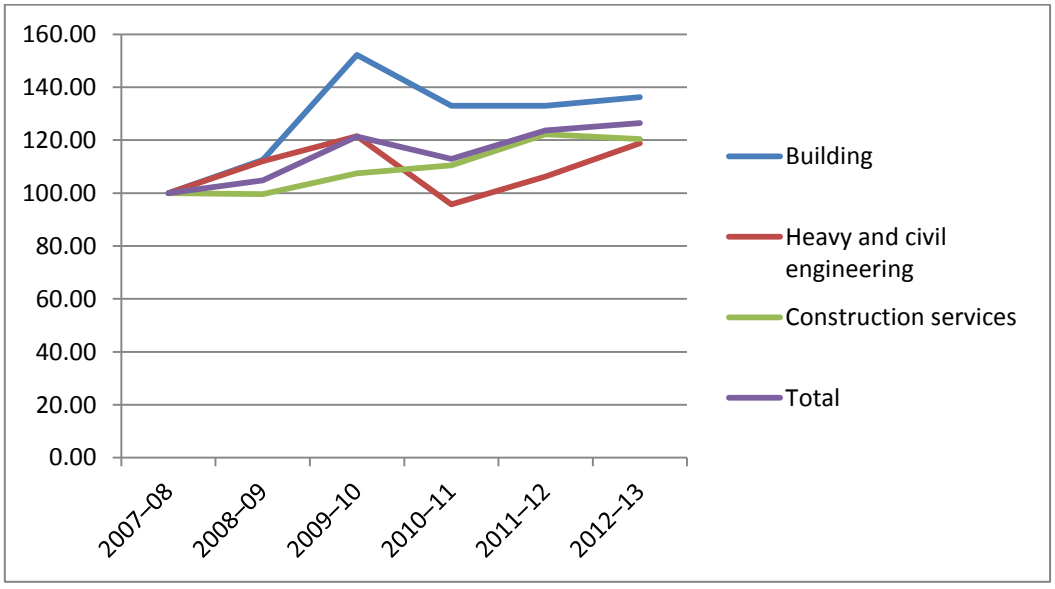


Source: ABS (2013) *Estimates of industry multifactor productivity*, Cat no 5260.0.55.002, 6 December.

Figure 3 shows that capital productivity has been volatile but ends the period up 11 per cent compared with the market sector as a whole, which ends the period down by 27 per cent. On the face of it, capital productivity has been much higher in construction than the economy at large.

We do not intend here to give much weight to capital productivity or multifactor productivity. The quote from Krugman made it clear that it is output per worker that is the most important measure when it comes to the implications for national living standards. However, we are able to look at the sub-industries within construction to throw some further light on construction productivity. In contrast to the data reported so far, the data set used for Figure 4 only gives figures for 2007-08 to 2012-13. In addition, we have to rely on a head count of workers in the industry rather than hours worked.

Figure 4: Labour productivity: Construction industry sub-sectors (index 2007-08 = 100)



Source: TAI estimates based on ABS (2014) *Australian industry, 2012-13*, Cat no 8155.0, 28 May.

Bearing in mind the qualification expressed above, Figure 4 shows that the performance of each construction sub-sector is positive, with productivity increases that range from 18.9 per cent for heavy and civil engineering to 36.3 per cent for building. Expressed in annual terms those figures range from 3.51 per cent to 6.38 per cent for those same two industries. The total for construction is a healthy 4.81 per cent.

For comparison with the data in Figure 4, note that the average productivity growth for all industries selected by the ABS in the same format had an estimated average productivity growth of 3.52 per cent over the same period. That is basically the same as heavy and civil engineering but is significantly less than building and construction services.

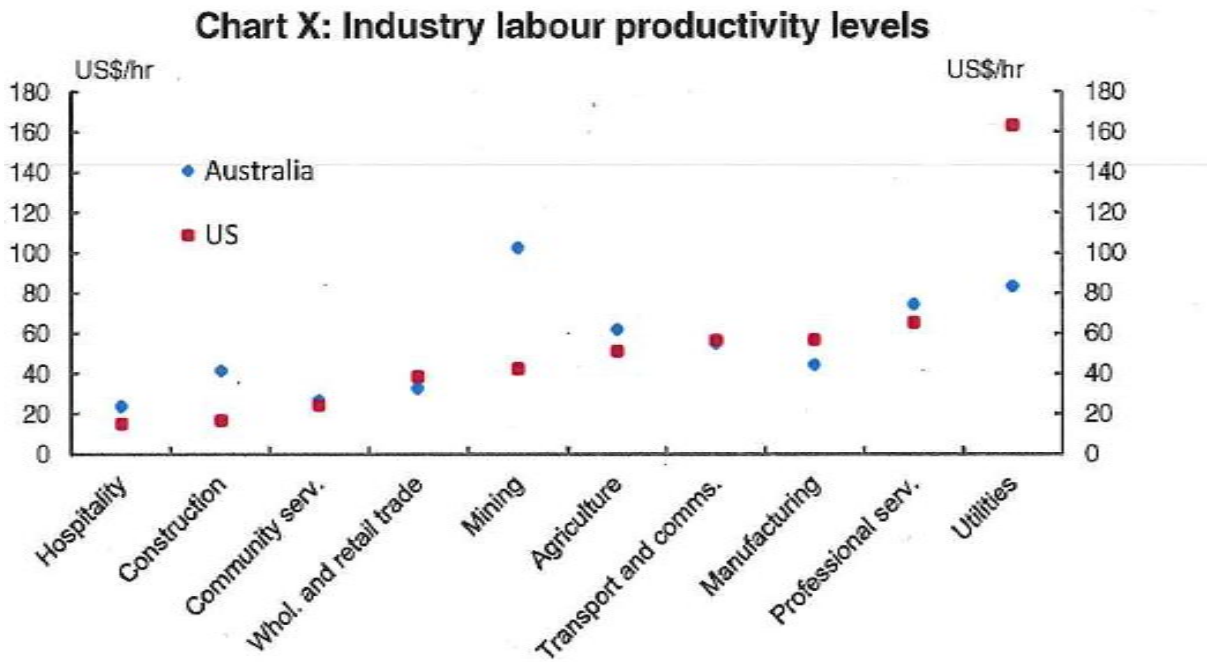
The present paper does not attempt to examine the Australian construction industry's productivity performance relative to other countries. However, a few brief comments are warranted given the view of the Business Council of Australia (BCA) that 'We are becoming a high-cost and thus high-risk place to invest, and low labour productivity compared to other nations has reduced the competitiveness of our project delivery.'[13]

Those comments were on the occasion of the release of a study purporting to show that project costs in Australia are much more expensive than in the US.[14] By contrast, the Productivity Commission notes that 'there is no conclusive evidence that Australian levels of productivity in construction are significantly different from other developed countries'.[15] A graph just released under a freedom-of-information request of Treasury also throws some light on this question.[16] The graph is reproduced here, as Figure 5 below, and apparently refers to the year 2007. Unfortunately that is all the information we have and we do not know for example whether the figures for US$/hr reflect current exchange rates or purchasing power parities.

The data in Figure 5 are very interesting, suggesting that most Australian industries are close to the US productivity levels but that construction and mining have productivity levels of more than twice the US figure. These results stand in stark contrast to the BCA's assertions of low Australian productivity. Incidentally, the figures for the utilities in Figure 5 look very curious. According to the data in Table 2, output per worker in electricity, gas, water and waste services was $366,414 – which should be over $180 per hour worked even expressed in US dollars. We cannot account for the utility figures in Figure 5.

[13] Shepard T (2012) 'New research uncovers what's at stake if we don't get it right on major projects' BCA Media Release, 7 June.
[14] For the full report see Business Council of Australia (2012) *Pipeline of pipe dream? Securing Australia's investment future*.
[15] Productivity Commission (2014) *Public Infrastructure: Productivity Commission Inquiry Report*, 27 May, p 2.
[16] Treasury (2014) 'Graphics and graphs for possible inclusion in Budget papers,' *FOI disclosure log*, 28 July.

Figure 5: Treasury graphical analysis of Australian v US productivity by industry



Source: Treasury (2014) 'Graphics and graphs for possible inclusion in Budget papers' *FOI disclosure log*, 28 July.

The Productivity Commission

The Productivity Commission has just published its final report on public infrastructure. Its graphs are essentially the same as here and use the same sources. However, it failed to take advantage of the breakdown of construction provided by the ABS in its publication dealing with industry and sub-industry characteristics.[17]

The Productivity Commission insists that there is a productivity problem in the construction industry – for example, in its summary it says that 'Until recently, labour productivity growth in the construction sector generally has been sluggish'.[18] The Productivity Commission asserts that industrial relations issues contribute to the perceived problems and suggests industrial relations in construction are 'problematic'. On the other hand, the Productivity Commission is very critical of the studies to date that imply that industrial relations issues have had an important influence on productivity. It suggests that the industrial relations issues would have had an effect but not enough to show up in aggregate studies. The Productivity Commission suggests that the 'use of unconvincing evidence of a large effect may undermine the credibility of proposals for industrial relations policy change'.[19] The Productivity Commission also believes that:

> *It [apparent but unconvincing evidence of large IR effects] may also distract policymakers from other factors important for productivity in the construction industry*[20]

[17] ABS (2014) *Australian industry, 2012-13*, Cat no 8155.0, 28 May.
[18] Productivity Commission (2014) *Public Infrastructure: Productivity Commission Inquiry Report*, 27 May, p 2.
[19] Productivity Commission (2014) *Public Infrastructure: Productivity Commission Inquiry Report*, 27 May, p 773.
[20] Productivity Commission (2014) p 773.

That suggests that, in the opinion of the Productivity Commission, those interested in productivity itself have better places to look than industrial relations. Those other factors that the Productivity Commission regards as important are spelt out a little more when it says:

> *The most significant future productivity challenges within the industry identified by stakeholders included:*
>
> • *project definition and procurement approaches*
> • *firm level project management*
> • *prefabrication*
> • *design*
> • *labour utilisation and workplace relations (discussed in chapter 13)*
> • *incentives for innovation*
> • *regulation and competition.*[21]

We have already noted the Productivity Commission's views on industrial relations. The first four issues depend on the abilities of the owners and managers in the industry while the last two depend on government policy. The policy issues are also developed further by the Productivity Commission but a discussion is beyond the present brief.

Profitability

The profitability of the construction industry is also a concern for many in the industry. Indeed, many people seem to confuse productivity and profitability. Industry measures of profitability can be measured by the share of profits in value added or by estimating the rate of return by dividing profits by the ABS series for the capital stock of the industry. Table 4 presents our first measure of profitability the profit share of the value added generated by the various industries. Profit here refers to the gross operating surplus as a share of value added. Gross operating surplus corresponds closely to earnings before interest, taxation and depreciation and amortisation.

Table 4 shows that construction profit is 34 per cent of value added, which is just below the national average. Of course the share of value added accounted for by profits is a very inadequate measure. Some industries require high capital-to-labour ratios and we would expect those industries to display high profit shares. That tends to explain the results in Figure 4, because we know, for example, that mining and electricity, gas, water and waste services have high capital requirements.[22] IBISWorld points out that the construction industry has a much lower capital intensity than the rest of Australian industry. More than most other industries, construction relies on the skills of its workforce. Machines, tools and other plant and equipment have limited scope to replace raw labour power.[23]

[21] Productivity Commission (2014) p 408.
[22] Agriculture also shows a high profit share but that may also reflect the high levels of incomes in farming that include the implicit wages of the farmers.
[23] Kelly A (2014) *IBISWorld Industry report E: Construction in Australia*, May.

Table 4: Profit share in various industries

	Profit share of value added (EBIT divided by VA - %)
Electricity, gas, water and waste services	67.9
Agriculture, forestry and fishing	64.3
Mining	60.1
Information Media and Telecommunications	54.2
Transport, postal and warehousing	41.5
Arts and recreation services	36.1
Construction	34.0
Retail trade	33.7
Accommodation and food services	32.1
Manufacturing	31.0
Wholesale trade	30.0
Health care and social assistance (private)	29.1
Professional, scientific and technical services	27.6
Public administration and safety (private)	22.3
Administrative and support services	16.3
Education and training (private)	13.6
Other services	11.5
Total selected industries	**38.9**

Source: ABS (2013) Australian System of national accounts, 2012-13, Cat no 5204.0, 1 November.

We now examine profits in each industry expressed as a return on the capital employed in the industries. Those are assembled in Table 5, which uses national accounting figures to estimate the rates of returns in different industries using the gross operating surplus and mixed income in various industries and expressing that as a rate of return on the estimated net capital stock in the same industries. The advantage of using gross operating surplus and mixed income instead of profit itself is that the gross operating surplus is not affected by the financial leverage in the various industries.[24] By contrast, actual profit depends on how the company is financed and therefore how much of the operating surplus is shared with the creditors. Unfortunately the downside is that the inclusion of gross mixed income contaminates the measure by including the implied labour income of owners and family in the non-corporate sector. Bearing these qualifications in mind we turn to the results in Table 5.

[24] Ordinary profit is net of any interest costs so that actual profitability depends on the degree of borrowing. However, the gross operating surplus does not deduct interest costs and can be thought of as showing all the non-labour income associated with an enterprise.

Table 5: Estimated rates of return on capital by industry

	Gross Operating Surplus as return on capital (%)
Construction	107.0
Financial and insurance services	60.9
Professional, scientific and technical services	53.6
Other services	49.7
Retail trade	32.6
Administrative and support services	25.5
Wholesale trade	25.4
Agriculture	20.0
Information media and telecommunications	19.4
Manufacturing	19.0
Mining	17.5
Accommodation and food services	17.5
Health care and social assistance	13.1
Transport, postal and warehousing	8.7
Rental, hiring and real estate services	8.6
Arts and recreation services	8.3
Electricity, gas, water and waste services	7.2
Public administration and safety	6.4
Education and training	5.4
All Industries	**21.8**

Source: ABS (2013) *Australian system of national accounts, 2012-13*, Cat no 5204.0, 1 November.

Clearly Table 5 shows that construction is very profitable when expressed as gross operating surplus as a return on the industry capital stock and exceeds all other industries in the ABS classification. Indeed on this measure construction is almost five times as profitable as the average of all industries in Australia. Construction with a rate of return of over 100 per cent seems extraordinarily high, but of course a finding of very high profitability does not imply all companies in the industry are always profitable.

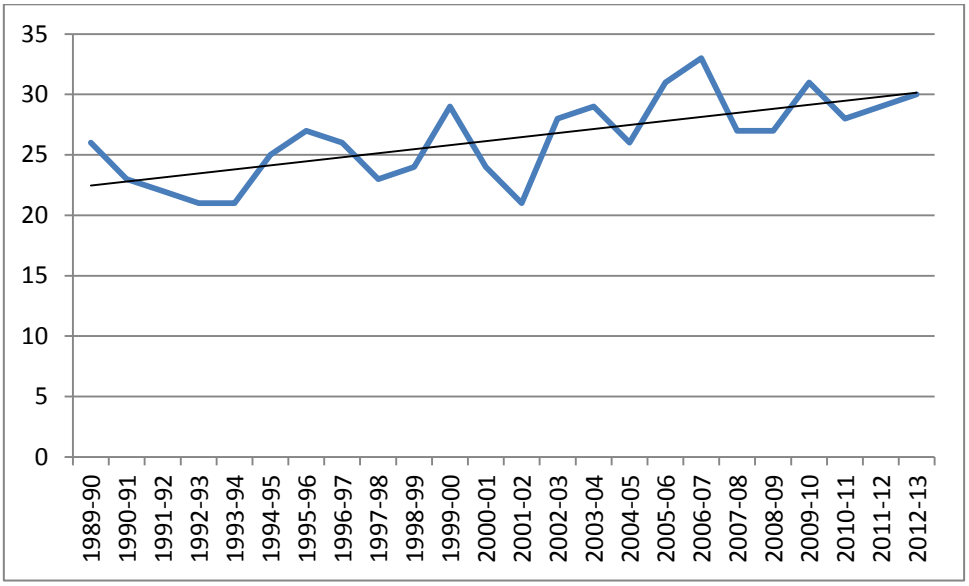
One of the major companies, Leighton Holdings, reported a serious loss of $405.7 million in 2010-11. The chief executive's review noted that the financial results 'were heavily impacted by the poor financial performance of the Airport Link and Victorian Desalination Plant projects, and extreme weather conditions in Queensland, Victoria and Indonesia'.[25] Those appear to be genuine one-offs that do not upset our overall observations. Indeed, it is worth noting that in 2012-13 Leightons recorded a pre-tax profit of $736.1 million, which implies a

[25] Leighton Holdings (2011) *Concise annual report, 2010-11*.

pre-tax return on equity of 25 per cent – a very high return.[26] Using earnings before interest, taxes, depreciation, and amortisation (EBITDA) gives a high rate of return of 66 per cent.[27]

It is also useful to look at how the profit and labour shares in the construction industry have behaved over the recent past. Using the ABS multifactor productivity database we can calculate the profit share of value added back to 1989-90. Those calculations are presented in Figure 6.

Figure 6: Profit share of value added in construction (%)

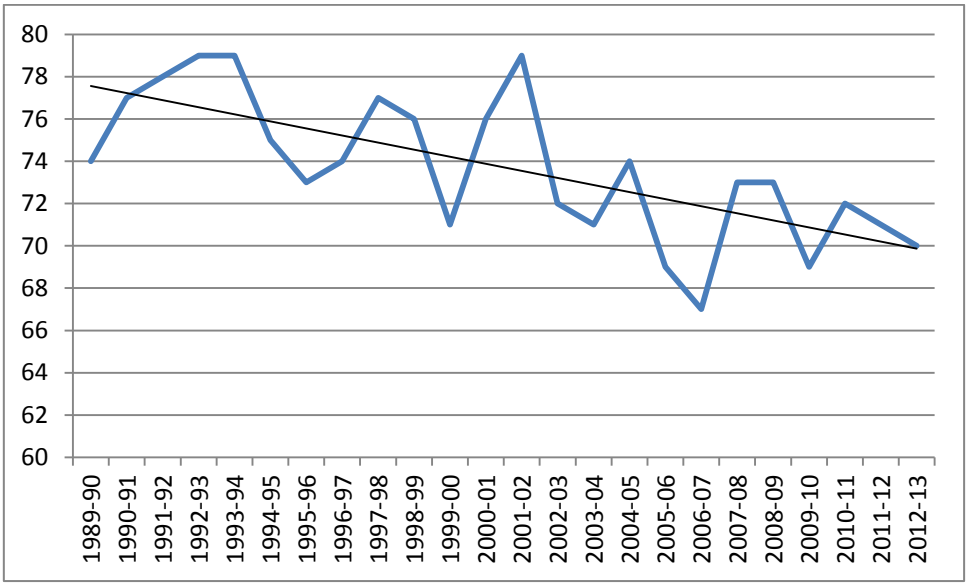


Source: ABS (2013) *Estimates of industry multifactor productivity*, Cat no 5260.0.55.002, 6 December.

The data in Figure 6 clearly show a strong upward trend in profitability despite a good deal of volatility in the year-to-year movements. To aid in the interpretation of the data, a trend-line was included in the graph in Figure 6 and that suggests a trend increase of around eight per cent of value added going to the profit share over the period since 1989-90. It is also important to illustrate what that means for the labour share of value added in construction. That data is presented in Figure 7.

[26] By contrast the 10-year government bond rate is presently around 3.5 per cent.
[27] Leighton Holdings (2011) *Concise annual report, 2013.* EBITDA approximates the national accounts concept of gross operating surplus referred to above.

Figure 7: Labour share of value added in construction (%)



Source: ABS (2013) *Estimates of industry multifactor productivity*, Cat no 5260.0.55.002, 6 December.

Figure 7 is virtually the mirror image of Figure 6 and again, while it shows some fluctuations in the short term, the overall trend is clear. The labour share of income in construction has been steadily falling over time. The large shift towards profits is confirmed in the downward shift in the labour or wages share of income. These findings confirm the views expressed by the Productivity Commission's draft report on infrastructure when it said that labour's share of income in construction has been decreasing. That was reinforced in the final report, which said 'there has been a long-run reduction in the labour cost share relative to capital'.[28]

Conclusions

The issue of productivity is often used for political purposes in Australia. Claims of poor productivity performance are used to advance various agendas. It is not surprising that from time to time specific industries are singled out for attention. The purpose of this brief is not so much to enter that debate but to present some of the facts on the issue.

By way of introduction this brief noted that construction is a large industry in Australia accounting for 7.6 per cent of GDP, while its total sales and service income is a rather large 21 per cent of GDP.

Turning to productivity itself we noted that productivity in construction is relatively high, with a value added per worker of $96,838 per annum compared with the Australian industry average of $94,052. Even then, the industry average is biased upward by a couple of very high industries. Productivity is therefore relatively high in construction overall, and when we looked at individual components of construction it appeared that heavy and civil engineering and the building construction sub-industries are very productive, being 53 and 24 per cent higher than the Australian average.

In some ways productivity growth is more important than productivity itself. As it happens productivity growth in construction from 1994-95 to 2012-13 was almost exactly the same as the market sector as a whole. However, comparing multifactor productivity growth and capital

[28] Productivity Commission (2014) p.356. Draft reports are not supported on the Productivity Commission web site when the final report is issued.

productivity growth we found that construction outperforms the rest of Australian industry by a wide margin. For multifactor productivity, growth is more than three times higher in construction than the rest of industry. For capital productivity, growth was 11 per cent from 1994-95 to 2012-13, while it was a negative 27 per cent for Australian industry as a whole.

The high productivity growth in construction is confirmed for the sub-industries over the period since 2007-08. Over that period heavy and civil engineering had a productivity growth of about the industry average of 3.52 per cent, while building was a very high 6.38 per cent.

Recent discussion by the Productivity Commission suggests that productivity growth has been sluggish. The Productivity Commission is inclined to put some of the blame on industrial relations issues but believes the orders of magnitude are too small to be picked up by the aggregate studies that have been cited in the literature. It also argues that there are other factors that are more important, at least for the future of productivity growth in the industry.

Profitability is also an important and related issue in the productivity debate. In terms of the share of value added going to profits, construction is slightly below average. That is to be expected in an industry that is not very capital intensive compared with the rest of Australian industry. However, when we compare the profitability of construction as a return on capital (gross operating surplus relative to net capital assets) it becomes the most profitable industry of those the ABS allows us to measure. Construction shows an exceptional rate of return of 107 per cent, which far exceeds the Australian industry average of 21.8 per cent.

All in all we have to conclude that in construction we are considering a productive industry that achieves a level of profitability disproportionate to the capital intensity of the industry. In particular, heavy and civil engineering and building are very productive and have displayed very high productivity growth rates.

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