ECONOMIC ANALYSIS OF BUILDING AND CONSTRUCTION INDUSTRY PRODUCTIVITY

This report was prepared for the
Office of the Australian Building and Construction Commissioner
by Econtech Pty Ltd.

16 July 2007

CANBERRA HEAD OFFICE

Econtech
P.O. Box 4129
Kingston ACT 2604
Phone: (02) 6295-0527
Fax: (02) 6295-8513
E-mail:office@econtech.com.au

SYDNEY OFFICE

Econtech
Suite 304, 66 Berry Street
North Sydney NSW 2060
Phone: (02) 9929-4700
Fax: (02) 9929-4793
E-mail: sydney@econtech.com.au

Web-site: www.econtech.com.au

CONTENTS

Executive Summary

Introduction

The Building Industry Taskforce was established on 1 October 2002, following the Cole Royal Commission's findings that the building and construction industry was characterised by a widespread disregard for the law. The Building Industry Taskforce (the Taskforce) was established as an interim body to secure the law in the industry prior to the establishment of a national agency. The Taskforce operated for three years, until the establishment of the Office of the Australian Building and Construction Commissioner (ABCC) on 1 October 2005.

Since its launch, the ABCC has established itself as an active regulator of the building and construction industry. The ABCC is now looking to assess its impact on the industry. To this end, the ABCC has commissioned Econtech to undertake a study which examines the impact of the ABCC (including the interim Taskforce) on productivity in the building and construction industry. Furthermore, this study also estimates the flow-on effects to the wider economy of any construction productivity impacts.

Previous Study

In 2003, Econtech prepared a study for the Department of Employment and Workplace Relations (DEWR) that analysed the cost differences for the same standard building tasks between commercial buildings and domestic residential buildings. Using Rawlinson's authoritative quantity surveyor data, Econtech found that building tasks such as laying a concrete slab, building a brick wall, painting and carpentry work cost an average of 10 per cent more for commercial buildings than domestic residential housing. This difference was mainly attributed to differences in work practices between the commercial and domestic residential building sectors. The 2003 study went on to model the economy-wide benefits of reducing the cost gap through reform to work practices in the commercial building sector.

A CFMEU-sponsored study by Toner (2003) criticised Econtech's report and argued that the cost gap between the commercial and domestic residential building sectors was due to structural factors, not restrictive work practices. The structural factors suggested were greater on-site complexities, higher capital intensity and higher profit margins in the commercial building sector compared with domestic residential building. Nonetheless, if the hypothesis presented by Toner that the cost gap was due to structural factors were true, then the cost gap would be expected to persist.

This Study

This study provides an up-to-date assessment of the cost gap. After averaging 10.7 per cent in the 10 years to the end of 2002, the cost gap has recently closed dramatically to be only 1.7 per cent at 1 January 2007. This is not consistent with claims that the cost gap was due to structural factors. Rather, closing of the cost gap has coincided with the operation of the ABCC and its predecessor the Taskforce.

This leads to the hypothesis that the cost gap has closed because of a lift in productivity in commercial building due to improved work practices associated with the activities of the ABCC. It is important to check the robustness of this hypothesis. This study uses case studies to identify whether the hypothesis is confirmed by the experiences of specific projects in different areas of the construction industry in and in different states.

As a further cross-check, we examined labour productivity data. This was to check whether the improvement in construction industry labour productivity inferred from the closing of the cost gap was consistent with actual developments in construction industry productivity.

Finally, Econtech examines the timing of the closing of the cost gap. It compares this with the timing and nature of changes in industrial relations policies and the timing and nature of the operations of the ABCC and the Taskforce. This further supports the conclusion that the ABCC has played an essential role, but its effectiveness has depended on industrial relations reforms.

The productivity improvements are then introduced into Econtech's MM600+ economy-wide model to estimate the impacts of the ABCC activities on the construction industry and the Australian economy as a whole. This modelling provides estimates of the permanent long-term gains in activity in the construction industry and other industries from having a more productive construction industry. It also estimates the permanent long-term flow-on benefits to consumers in the form of lower prices.

The ABCC and Industrial Relations Reforms Need to Be Considered Jointly

The analysis of the evolution of the cost differences between tasks in the commercial and domestic residential building sectors and labour productivity data indicates that the activities of the ABCC and the Taskforce are likely to have had a significant impact on labour productivity in the construction industry.

Prior to the establishment of the Taskforce there was no evidence that the industrial relations reforms implemented from the early 1990s were improving productivity in the non-residential construction sector, relative to the domestic residential building sector. However, once the Taskforce and subsequently the ABCC were given appropriate monitoring and regulatory powers and their activities were underway, benefits in terms of labour productivity improvements are clearly evident. In this respect, it is important to recognise that general industrial relations reforms provided an enabling environment for productivity improvements. Nonetheless, it was the existence of the reforms together with the activities of the Taskforce and the ABCC and supporting legislation that made a noticeable difference. Clearly, it is the joint existence of industrial relations reforms and the ABCC that have led to labour productivity improvements in the non-residential sector of the building and construction industry.

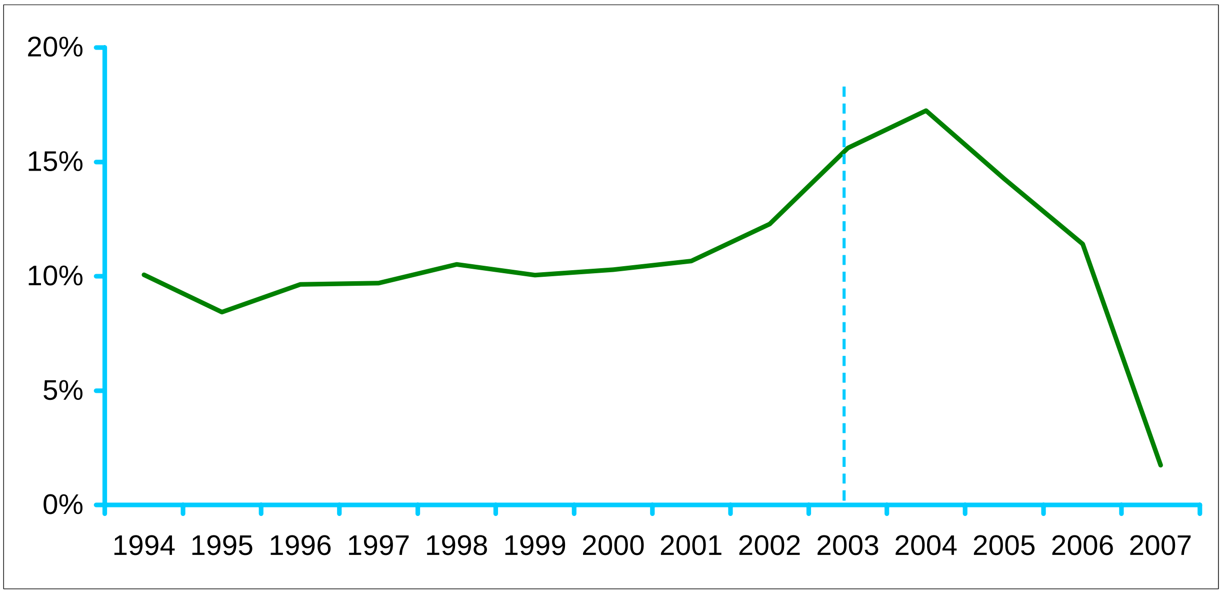
Cost Differences between Commercial Building and Domestic Residential Building for Standard Building Tasks

A useful way of determining the extent to which industrial relations reforms have impacted on productivity in the construction industry is by comparing the costs for the same building tasks in commercial building, with those for domestic residential buildings. The general changes in industrial relations policies and institutions and the activities of the ABCC are expected to have their main impact in the non-residential sector of the construction industry and in the larger multi-unit part of the residential sector. This is the sector where traditionally there were more industrial disputes and higher costs for specific tasks relative to the domestic residential sector of the construction industry. In addition, the residential sector for single domestic buildings is considered to be more flexible than the commercial sector as a result of the involvement of many small, independent owner-operators and the extensive use of piece rates for work performed.

Quantity surveyor data were used to estimate the cost differences between the two sectors for eight standard building tasks in five states for each of the years from 1994 to 2007. The average percentage cost differences for the standard tasks for the five states during this period are shown in Chart 1.

The data show that over the ten year period prior to the introduction of the Taskforce in October 2002, the average difference between the costs of completing identical tasks in commercial building and domestic residential building across Australia was 10.7 per cent. Until recently, the cost differentials were the largest in Victoria and Western Australia, the states where restrictive work practices in commercial building were generally acknowledged to be most pervasive. As noted earlier, the previous Econtech 2003 study for DEWR reached similar conclusions for this period.

Chart 1
Average Cost Differences between Commercial Building and Domestic Residential Building for the Same Tasks for 5 States, 1994 – 2007 (per cent)



Source: Econtech calculations from Rawlinsons data.

After remaining around 10 per cent from 1994 to 2001, the average difference increased considerably to peak in 2004 before declining sharply in 2005 and 2006 to a small difference at the start of 2007. There is no evidence of a general pattern of significant reductions in cost differences across the different states until after the start of 2004. However, during 2005 and 2006 all states observed substantial reductions in the cost differences between the two sectors for the eight standard building tasks.

The Taskforce was established in October 2002 but it lacked enforcement powers. The ABCC was established in October 2005 and WorkChoices was implemented on the 27 March 2006. Given the timing and the extent of the decline in the cost difference for the same eight building tasks across the two sectors, it is considered that the ABCC is likely to have had a significant impact in contributing to the decline.

Significant industrial relations reforms to encourage enterprise bargaining were introduced in 1993. Further changes were introduced in 1996 to reinforce the incentive for enterprise bargaining as well as reduce the scope for industrial action. However, these changes did not appear to have any effect in terms of reducing the cost differences for the eight tasks across the two sectors until after the Taskforce was put in place in October 2002 and in particular after 2004.

It is important to recognise that the industrial relations reforms provided a more productivity-friendly environment. However, the cost difference data suggest that effective monitoring and enforcement of the general industrial relations reforms and those that relate specifically to the building and construction sector were necessary before the reforms could lead to substantial labour productivity improvements. Therefore, it is considered that separate attribution of labour productivity improvements to the ABCC and industrial relations reforms is not possible because, to be effective, they both need to operate together.

The analysis of labour cost data suggests that it is reasonable to conclude that improvements in labour productivity were the main factor contributing to the substantial reduction in the cost differences across the two sectors by the start of 2007. As labour represents about 51 per cent of total costs in non-residential building, the cost difference for labour was on average 21 per cent for the period 1994-2003 and 3.4 per cent at the start of 2007. The same cost difference was assumed to apply for the multi-unit residential sector and approximately half of the cost difference was assumed to apply to the engineering sector. The cost difference estimates for each sector of the building and construction industry are shown in Table 1. The last column of this table shows the cost changes that were used in the economy-wide modelling. There is no change in the domestic residential building sector since all of the cost differences are measured relative to this sector. The cost differences can be interpreted as labour productivity gaps that were reduced by the activities of the ABCC and the industrial relations reforms.

Table 1
Labour Productivity Gaps Compared with Domestic Residential Construction (per cent)

	Average 1994-2003	2007	Change
Total non-residential construction	15.0	2.4	12.6
Non-residential building	*21.0*	*3.4*	*17.6*
Engineering construction	*10.5*	*1.7*	*8.8*
Total residential building	6.3	1.0	5.3
Domestic residential building	*0.0*	*0.0*	*0.0*
Multi-unit residential building	*21.0*	*3.4*	*17.6*
Total construction	**11.2**	**1.8**	**9.4**

Source: Econtech estimates.

For the economy-wide modelling, the estimate of the gain in labour productivity for the construction industry as a whole is 9.4 per cent (11.2 minus 1.8). Later in this study we check whether this productivity impact is consistent with aggregate data for construction industry productivity.

Case studies

The case study analysis examined different projects before and after the existence of the Taskforce and subsequently the ABCC in two different areas of the construction industry. These areas are office building and high density residential construction. Four case studies were undertaken for the period before and after the Taskforce and the ABCC. The information was provided by two leading construction companies.

The main findings from the case studies were that the reforms have meant:

- a significant reduction in days lost in the industry due to industrial action;
- less abuse of OH&S issues for industrial purposes;
- proper management of OH&S issues;
- proper management of inclement weather procedures;
- improvement of rostering arrangements (additional flexibility in rostering has effectively increased the number of working days per annum); and
- cost savings stemming from the prohibition on pattern bargaining.

Generally, the people interviewed suggested that there have been three main streams of influence in the construction industry:

- the BCII Act which establishes various prohibitions (outlined in Section 2 of the report);
- the ABCC's extensive powers of investigation and prosecution; and
- the National Code of Practice for the Building and Construction Industry, which provides a powerful commercial incentive to comply with the principles of freedom of association.

The interviewees suggested that this framework has produced significant improvements in productivity in the industry. Furthermore, all the people interviewed for this report believe that both the ABCC and the current construction industry regulatory framework are critically important components for the construction industry.

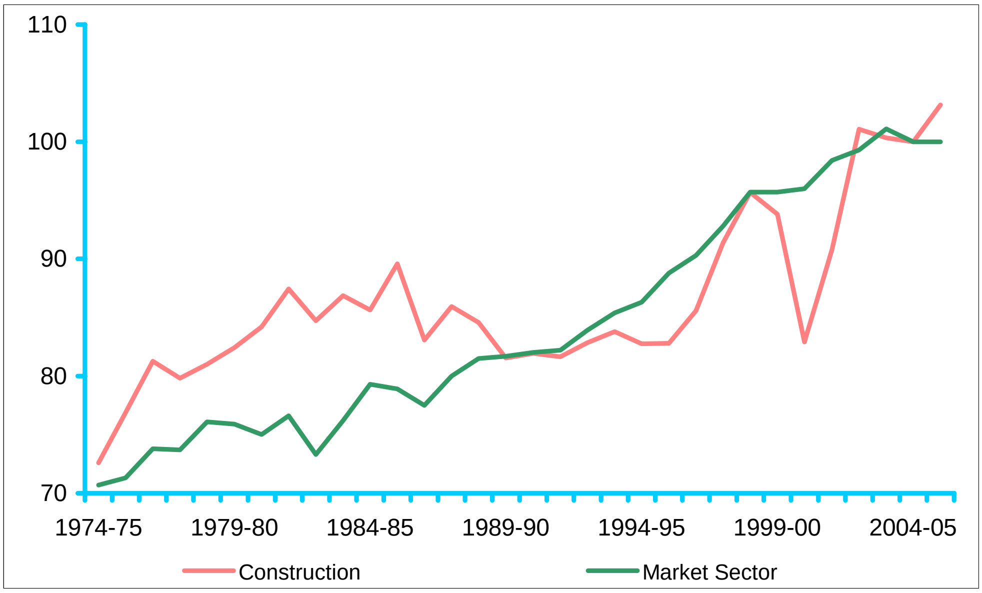
In general, the case study findings support the findings from the analysis of the quantity surveyor data that the existence of the ABCC and the supporting regulatory framework have led to significant improvements in labour productivity.

Labour Productivity in the Construction Industry

To check whether the conclusions from the analysis of the quantity surveyor data and the case studies are broadly consistent with aggregate labour productivity outcomes for the construction industry, Econtech examined trends in aggregate construction industry data. While this aggregate productivity data is useful for providing a broad picture of trends, because it refers to the entire construction industry it is subject to compositional effects. For example, an upswing in the relatively labour-intensive residential building component, or a downswing in the relatively capital-intensive engineering component, will reduce the measured labour productivity of the construction industry as a whole, even if underlying productivity does not change.

Chart 2 compares multifactor productivity (MFP) in the construction industry with MFP in the market sector as a whole from 1974-75 to 2005-06. MFP measures the ratio of output to combined inputs of labour and capital. While productivity for the market sector has followed a fairly steady upward trend, productivity in the construction industry was fairly flat through the 1980s and 1990s. However, construction industry productivity then strengthened considerably to achieve a higher level for the four years from 2002-03 to 2005-06.

Chart 2
Construction Sector Multifactor Productivity, 1974-75 to 2005-06 (2004-05 = 100)



Source: Productivity Commission 2006, *"Productivity Estimates to 2005-06"* and ABS *"Australian System of National Accounts 2005-06".*

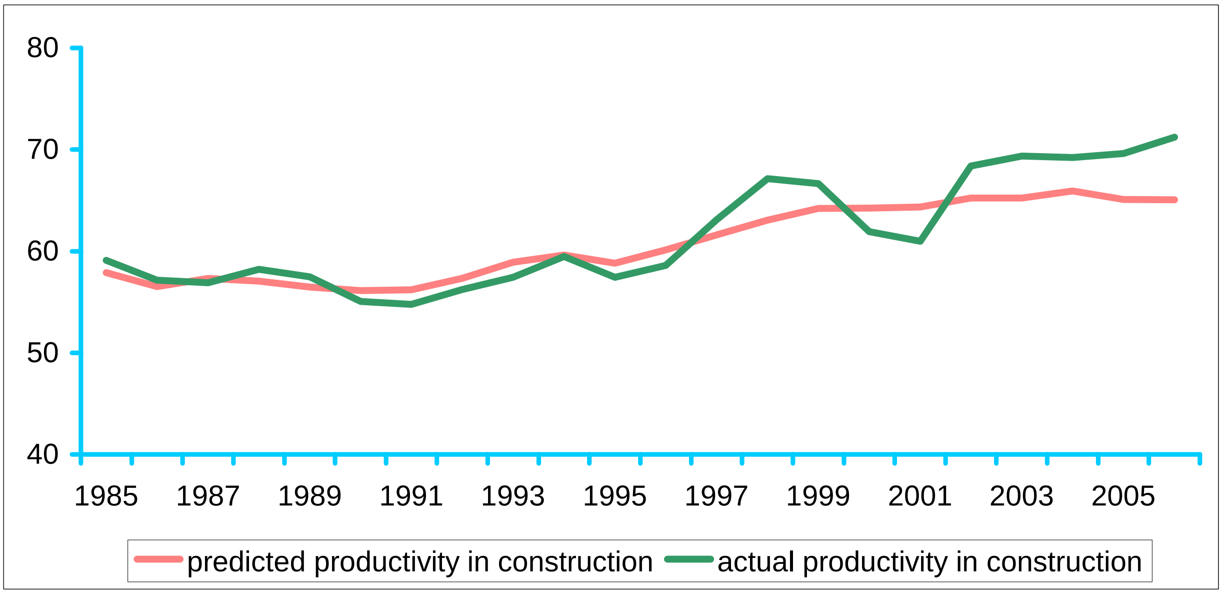
As noted before, the analysis of movements in the cost gap suggests that the activities of the ABCC, supported by industrial relations reform, have resulted in a gain in construction industry labour productivity of 9.4 per cent. This gain is cross-checked against aggregate labour productivity data in Chart 3.

Chart 3 shows, like Chart 2, that construction industry productivity has been noticeably stronger in recent years. Specifically, actual construction industry labour productivity outperformed predictions based on historical performance[1] by 9.5 per cent, which is very similar to the identified labour productivity impact of 9.4 per cent. This lends further support to basing the economy-wide modelling on the assumption that the ABCC and

[1] The historical performance benchmark is based on historical trends to 2002 for construction industry productivity relative to productivity in the economy as a whole.

industrial relations reform have added about 9.4 per cent to construction industry labour productivity.

Chart 3
Construction Industry Labour Productivity compared with a Prediction based on an Historical Benchmark (1985-2006)



Source: Econtech estimates

Economic Impact of Improving Productivity in the Building and Construction Industry

Econtech used its highly detailed MM600+ model of the Australian economy to model the long-term economy-wide impact of the activities of the ABCC. This was done by estimating the differences between the following two scenarios:

- a “Baseline Scenario” where the ABCC does not exist; and
- an “ABCC Scenario” which reflects a situation where the ABCC does exist.

The key aggregate long-term economic effects under the ABCC scenario, when compared to the Baseline Scenario, are shown in Table 2.

Table 2
Summary of Economy-Wide Effects of the Impact of ABCC

	Impact of ABCC Scenario
Consumer Price Index (CPI)	-1.2%
Real Consumption	0.8%
Annual Economic Welfare Gain ($billion)	3.1
GDP	1.5%
GNP	0.8%

Source: Econtech MM600+ simulation
Note: The above results refer to permanent effects on the levels, not growth rates, of indicators relative to what they otherwise would be. For example, ABCC Scenario shows a gain of 1.5% in the level of GDP relative to what it would otherwise be, and not its annual growth rate.

The modelling results suggest that the improvements in labour productivity outlined in the ABCC Scenario have lowered construction costs, relative to what they would otherwise be. This has in turn reduced business costs across the economy, as all industries are significant users of commercial building or engineering construction. Lower business costs mean lower consumer prices. As shown in Table 2, the Consumer Price Index is an estimated 1.2 per cent lower than what it would otherwise be under the Baseline Scenario. Furthermore, as shown in Table 2, due to the ABCC activities, consumers are better off by $3.1 billion on an annual basis.

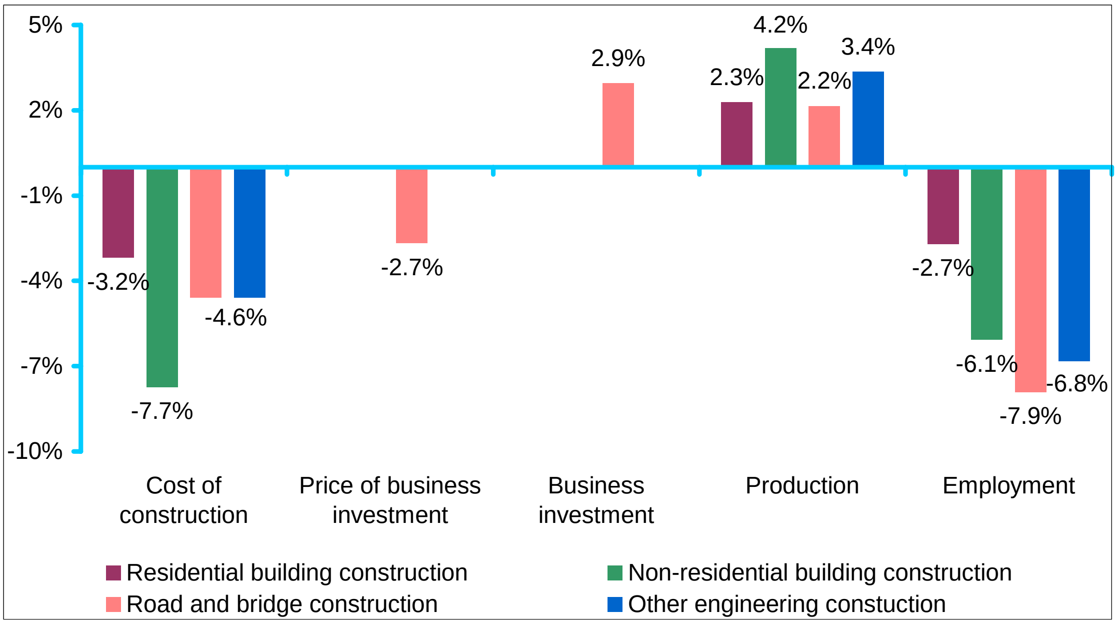
The ABCC scenario confirms that higher productivity in the construction industry has lowered its costs, leading to lower prices for new construction. This has stimulated demand for new construction, leading to a significant permanent gain in construction activity of 2.9 per cent. This comprises a gain of 2.3 per cent for residential construction and 2.8 per cent for non-residential construction.

Higher productivity has boosted activity in the main categories of non-residential construction relative to the situation in the absence of the reforms. The long-term gains range from 2.2 per cent for roads and bridges to 3.4 per cent for other engineering and 4.2 per cent for non-residential building, where the productivity gain is largest. The gain in non-residential construction underpins a long-term lift in business investment of 2.9 per cent. Chart 4 summarises these effects.

At the same time, the reforms cause some shifting of jobs away from construction and towards other industries compared to the situation in the absence of the reforms. Higher labour productivity reduces labour demand in construction and this effect is only partly offset by an increase in labour demand from higher construction activity. Overall, as shown in Chart 5, employment in construction is estimated to be 5.3 per cent lower than in the baseline. However, this loss in employment in construction is fully offset by gains in employment in other industries. Further, this loss is relative to a baseline scenario without reform and does not mean that there is a fall in construction employment from one year to the next. Indeed, construction employment has actually grown strongly in every year from 2001-02 onwards during the reform process.

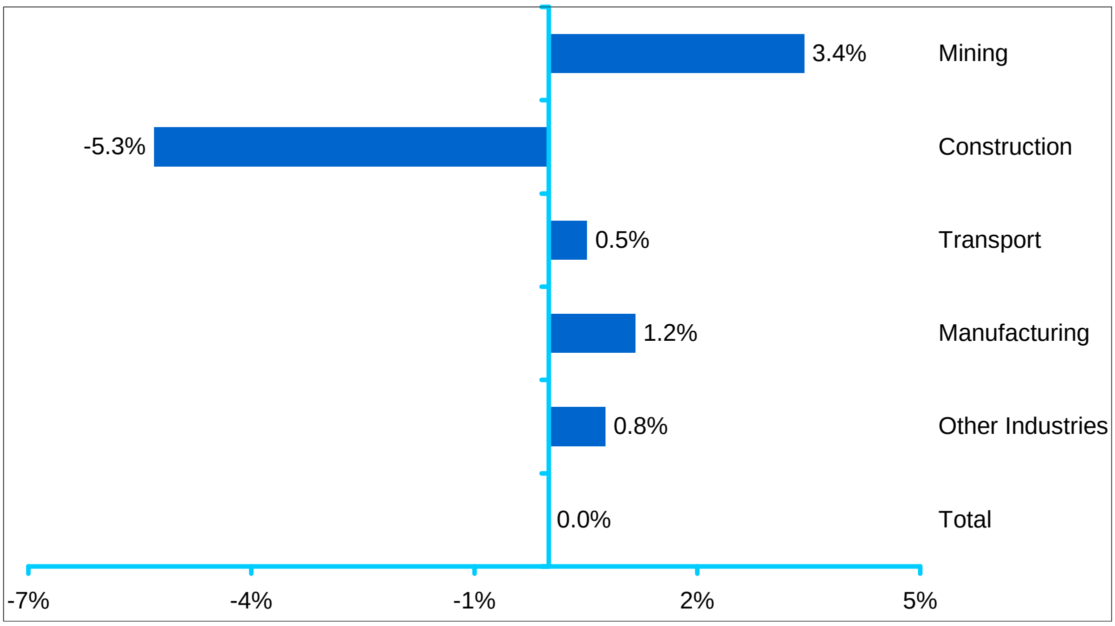
This reallocation of employment means a more efficient allocation of labour between industries, underpinning the permanent gains to consumers from the activities of the ABCC. The modelling assumes that the number of people employed in Australia is unchanged by the reforms in the long-term. While the modelling results show no change in the overall level of employment, this is conservative. In fact, the activities of the ABCC have the potential to reduce unemployment and raise employment on a permanent basis, by adding to the flexibility of the construction labour market.

Chart 4
Effect of Increased Efficiency on Residential and Other (Non-Residential) Construction (% deviation from baseline)



Source: Econtech MM600+ simulation

Chart 5
Effect of Increased Efficiency in the Construction Industry on Employment In Selected Industries (% deviation from baseline)



Source: Econtech MM600+ simulation

1. Introduction

The Building Industry Taskforce was established on 1 October 2002, following the Cole Royal Commission's findings that the building and construction industry was characterised by a widespread disregard for the law. The Building Industry Taskforce (the Taskforce) was established as an interim body to secure the law in the industry prior to the establishment of a national agency. The Taskforce operated for three years, until the establishment of the Office of the Australian Building and Construction Commissioner (ABCC) on 1 October 2005.

The ABCC's role is to ensure workplace relations laws are enforced in building and construction industry workplaces. To promote proper conduct, the ABCC also educates industry participants on their rights and obligations. In broad terms, the jurisdiction of the ABCC includes all of the construction industry, as defined by the ABS, except for domestic housing and mining.

Since its launch, the ABCC has established itself as an active regulator of the building and construction industry. The ABCC's Commissioner, John Lloyd, has noted a number of ways that the organisation has already improved the workplace relations framework of the building and construction industry over the last nine months.[2] These include:

- investigating possible contraventions of relevant laws, the National Code of Practice and industrial instruments;
- instituting proceedings against those who contravene the law;
- promoting appropriate standards of conduct; and
- providing advice and assistance to building and construction industry participants.

The ABCC is now looking to assess its impact on the industry. To this end, the ABCC has commissioned Econtech to undertake a study which examines the change in building and construction industry productivity since the ABCC (including the interim Building Industry Taskforce) was established.

In particular this report assesses the extent to which productivity improvements in the building and construction industry are attributable to the role of the ABCC and the Taskforce, compared with other industrial relations reforms and normal productivity growth.

It then uses this information in Econtech's MM600+ economy-wide model to estimate the impacts of the changes on the Australian economy as a whole. This modelling provides estimates of the permanent long-term gains in activity in the construction industry and other industries stemming from the activities of the ABCC. It also estimates the permanent long-term flow-on benefits to consumers in the form of lower prices and changes in the industry pattern of employment.

This report is structured as follows.

- Section 2 provides and overview of the Australian building and construction industry.

---

[2] ABCC Media Statement, *ABCC's first annual report tabled in Parliament today*, 19 October 2006.

- Section 3 provides an overview of changes in Australia's industrial relations reforms, focussing on the key elements of the major policy and institutional reforms, including those relating specifically to the construction industry.
- Section 4 provides and overview of the role and activities of the ABCC and the Taskforce.
- Section 5 analyses labour productivity in the construction industry by: examining quantity surveyors' estimates of the costs of the same tasks in the commercial buildings and domestic residential building sectors; and undertaking case studies to isolate the impact of key policy and institutional changes. It also reviews aggregate labour productivity trends in the construction industry to check whether the interpretation of the impact of the industrial relations reforms is consistent with the aggregate data. It uses the findings of the analysis of labour productivity and the timing and nature of key changes in industrial relations policies to assess the extent to which productivity changes are attributable to the role of the ABCC and the Taskforce.
- Section 6 describes the MM600+ model, its main assumptions, and the scenarios that are modelled.
- Section 7 presents and explains the results of modelling the impact of productivity gains in the building and construction industry, attributable to ABCC and the Taskforce on the Australian economy.

While all care, skill and consideration has been used in the preparation of this report, the findings refer to the terms of reference of the ABCC and are designed to be used only for the specific purpose set out below. If you believe that your terms of reference are different from those set out below, or you wish to use this report or information contained within it for another purpose, please contact us.

The specific purpose of this report is to examine the change in building and construction industry productivity resulting from the activities of the ABCC (including the interim Building Industry Taskforce) and the flow-on effects to the wider economy.

The findings in this report are subject to unavoidable statistical variation. While all care has been taken to ensure that the statistical variation is kept to a minimum, care should be taken whenever using this information. This report only takes into account information available to Econtech up to the date of this report and so its findings may be affected by new information. Should you require clarification of any material, please contact us.

2. The Australian Building and Construction Industry

This section presents an overview of the Australian building and construction industry and its contribution to the Australian economy.

The contribution of an industry to the overall production of goods and services in the economy is measured by gross value added (GVA). In 2005-06, the construction sector contributed around $62.4 billion in GVA to the Australian economy (measured in real terms at 2004-05 prices). As shown in Table 2.1, this represents around 6.8 per cent of Australia's GDP in 2005-06.

Table 2.1
Contribution of the Construction Sector to GDP
($ billion, 2004-05 prices)

	Gross Value Added Construction Sector	**GDP** Australia	**Contribution** to GDP (%)
1989-90	33.8	554.8	6.1%
1990-91	31.6	551.2	5.7%
1991-92	28.9	551.5	5.2%
1992-93	30.6	571.9	5.4%
1993-94	32.5	595.3	5.5%
1994-95	34.3	622.1	5.5%
1995-96	34.8	647.7	5.4%
1996-97	35.7	673.1	5.3%
1997-98	39.3	703.3	5.6%
1998-99	42.8	739.6	5.8%
1999-00	45.5	769.0	5.9%
2000-01	39.1	784.0	5.0%
2001-02	43.8	813.5	5.4%
2002-03	51.0	839.2	6.1%
2003-04	54.4	873.2	6.2%
2004-05	56.9	896.6	6.4%
2005-06	62.4	922.6	6.8%

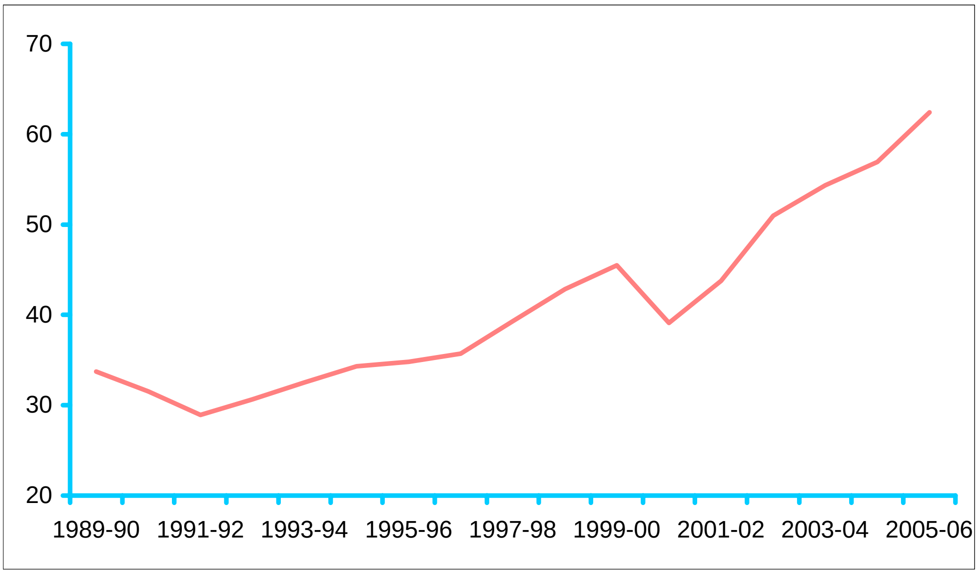
Source: ABS

Chart 2.1 shows that the production of the construction industry, as measured by GVA, generally increased during the period 1989-90 to 1999-2000. However, the industry experienced a decline in 2000-01, after activity was brought forward to 1999-00 to "beat the GST". Since 2000-01, construction production has grown strongly.

In Australia, both the private and public sectors undertake construction activities. The private sector operates in the three main areas of activity of the construction industry[3], but plays a major role in residential and non-residential building activity. In contrast, the public sector plays a major role in engineering construction and in non-residential building activity (particularly for the health and education industries).

[3] The construction industry engages in three broad areas of activity: residential building, non-residential building and engineering construction.

Chart 2.1
Construction Sector Gross Value Added
($ billion, 2004-05 prices)

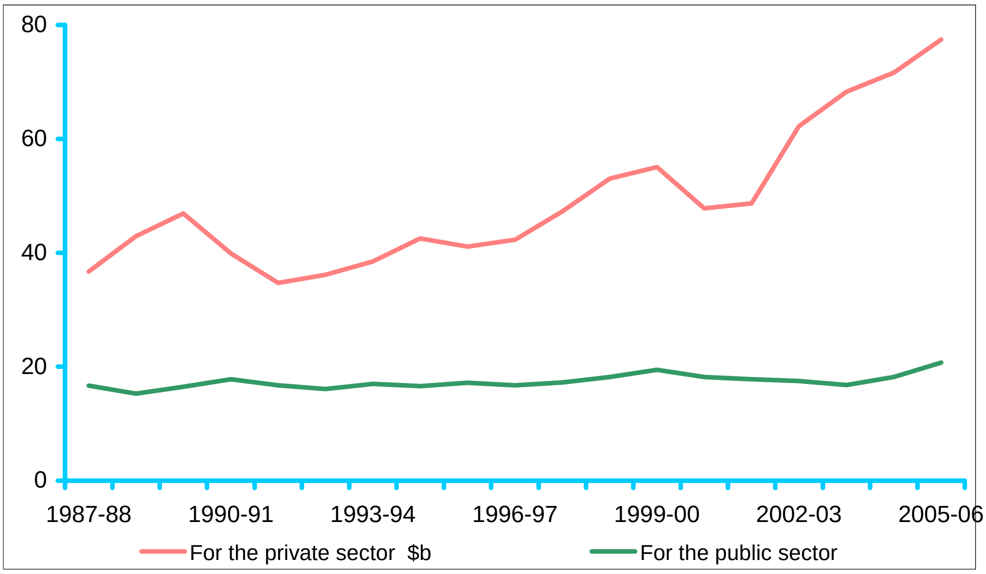


Source: ABS

In comparison with Chart 2.1, which shows the Gross Value Added (GVA) of the construction sector, Chart 2.2 shows construction work done. Work done measures the gross value of the sector’s production, whereas GVA is measured net of construction’s use of intermediate inputs from other sectors. Both the GVA and work done estimates presented here are chain volume estimates that eliminate the effects of price changes and therefore only reflect volume changes.

Chart 2.2 shows the value of construction work done for the private and the public sectors from 1987-88 to 2005-06. As shown in the chart, construction for the private sector is much more variable than construction for the public sector. Furthermore, private sector construction has experienced two sharp declines, most recently in 2000-01 because of the timing effects on construction activity from the introduction of GST. However, construction for the private sector has been steadily increasing since 2001-02. In contrast, public sector construction has remained relatively flat since 1987-88.

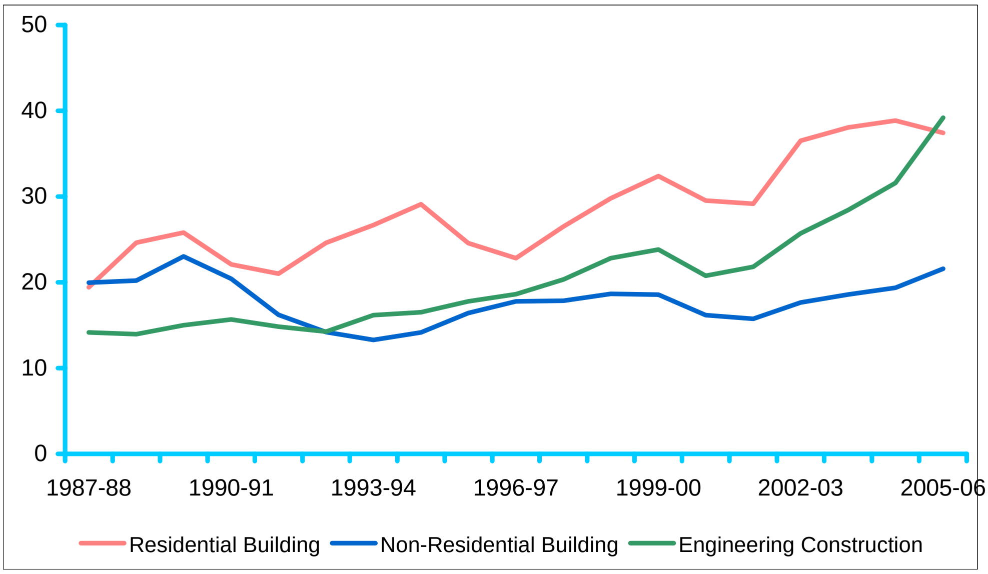
Chart 2.2
Value of Construction Work Done by Sector
($ billion, 2004-05 prices)



Source: ABS
Note: Reference year for Chain Volume Measures is 2004-05.

Chart 2.3 shows the value of construction work done by type of activity from 1987-88 to 2005-06. As shown in the chart, engineering construction has boomed in recent years, lead by a hyper-boom in mining construction and supported more recently by an upswing in public infrastructure.

Chart 2.3
Value of Construction Work Done by Type of Activity
($ billion, 2004-05 prices)



Source: ABS

By comparison, the pattern of residential and non-residential building activity has been more cyclical.

Non-residential building activity plunged in the early 1990s recession, before experiencing a mini boom and bust associated with the timing of the Sydney 2000 Olympics. Activity has since grown steadily to reach a healthy level.

Residential building activity has been even more cyclical. There have been three sharp declines during the period 1987-88 to 2005-06; one in 1990-91, one in 1995-96 and the other in 2000-01. More recently activity rose to a high peak in 2003/04, but has since eased back.

3. Australia's Industrial Relations Environment and the Construction Sector

This section identifies the main changes in the industrial relations environment from 1988 to date that have had an impact in the building and construction sector. The information provided in this section will be used to help determine the main drivers behind the productivity changes in the building and construction industry (i.e. to assign productivity changes to different sources).

Over the last two decades, the Australian Government has implemented comprehensive reforms to improve workplace relations in the building and construction industry and industrial relations in general. The aim of these reforms is to have more flexible wage and employment conditions and safer work environments that will lead to higher labour productivity and better employment outcomes.

The workplace relations arrangements of the building and construction industry have been predominantly regulated by the federal industrial relations system. Recent legislative changes have extended the reach of the federal system.

3.1 Moving to a Less Centralised System

For most of the period from 1904 to the late 1980s, the Australian industrial relations system was characterised by a highly centralised and regulated approach. Wages and conditions of work for most categories of labour were specified by a complex system of highly specific, centrally determined awards. These awards were based on compulsory arbitration by the Australian Industrial Relations Commission (AIRC) or by individual tribunals at the state level. The awards tendered to promote a relatively high degree of wage uniformity across industries or occupations and emphasized the setting of minimum wages and conditions rather than a specific concern for the impact on unemployment. There was also a multiplicity of minimum wages for different occupations rather than a single minimum wage.

Between the late 1980s and mid 1990s, several reforms increased flexibility, in particular by providing greater room for bargaining over working conditions, including wages, at the enterprise and individual level. For instance, the Industrial Relations Act 1988 created a formal stream of enterprise bargaining through 'Certified Agreements'. These agreements allowed trade unions and individual firms to determine enterprise level wages and work conditions as long as they were certified by the AIRC to be of public interest. However, there were still barriers to decentralised bargaining for smaller and medium sized firms.[4]

The Industrial Relations Act 1993 (IR Act), which came into effect in March 1994, further extended the scope for enterprise bargaining by introducing Enterprise Flexibility Agreements (EFAs). These allowed workplace agreements to be negotiated in non-unionised workplaces. EFAs did not require unions to be parties to agreements but unions could challenge their ratification. Furthermore, the AIRC had to be satisfied that the terms and conditions in an agreement did not disadvantage employees when compared with the relevant award. The IR Act also included provisions based on International Labour

[4] OECD (2003). "*OECD Economic Surveys – Australia*", Vol. 4, pg. 1-238.

Organisation Conventions (equal pay, anti-discrimination, unfair dismissal).[5]

In 1996, there was reform of the workplace through the Workplace Relations Act 1996 (WR Act), which started operation on 1 January 1997. The main developments under this Act were: that individual agreements known as Australian Workplace Agreements (AWAs) could be struck directly between employers and employees without union involvement and with more flexibility; the award system was simplified; and the role, rights and involvement of unions with respect to bargaining and strike action were reduced.

In the period between the introduction of the Workplace Relations Act 1996 and the Workplace Relations Amendment (WorkChoices) Act 2005, which commenced in 2006, numerous laws relating to industrial relations were introduced but many were blocked in the Senate. Bills that were not passed covered aspects of termination of employment, particularly for small business, award simplification, agreement making and secret ballots prior to industrial action.

However, in 2001 unfair dismissals laws were eased slightly. An amendment was passed that required new employees to be employed for three months (a standard which could be varied by written agreement) before they could claim unfair dismissal compensation. The amendment also required the AIRC to take into account the different sizes of businesses when assessing whether their dismissal procedures were reasonable and the degree to which the absence of dedicated human resource management specialists would be likely to impact on the procedures followed in effecting the termination.

Amendments were also passed in 1999 which made separate wage rates for youths more widely available and exempt from the age discrimination provisions of the WR Act.

Further changes were made to restrict industrial action. In 2002 an amendment was passed with the main purpose of helping the AIRC to suspend or terminate a bargaining period on the grounds that the notifying party is not genuinely trying to reach agreement. In 2004 a new law empowered the AIRC to make interim orders to stop or prevent industrial action.

The main theme of these changes was to encourage a greater emphasis on setting wages and conditions based on the circumstances of the enterprise. This was achieved through a greatly simplified award system, the introduction of AWAs, and a reduced role for unions in the bargaining and arbitration process.

At the same time, unfair dismissal protection remained largely intact, a ‘global no-disadvantage’ test remained and the AIRC retained substantial powers particularly with respect to minimum wages and conditions and unfair dismissal provisions. Thus, the legislative changes provided an enabling environment for pay and conditions to be negotiated to better reflect individual circumstances and significantly reduced the scope for unions to take industrial action that disrupted the work process. However, the changes also permitted a continuation of the status quo for many aspects of the determination of wage and employment conditions.

[5] Isaac, J. E. (1998), *“Australian Labour Market Issues: an Historical Perspective”*, Journal of Industrial Relations, v. 40(4), p. 690-715.

3.2 WorkChoices

The WR Act 1996 was amended by the Workplace Relations Amendment (WorkChoices) Act 2005, which commenced operation on 27 March 2006. The WorkChoices legislation is the most comprehensive change to industrial relations in Australia for almost a century.

The key developments associated with WorkChoices are: the creation of a national system of industrial relations; the establishment of a new, independent body to set minimum and award classification wages (but not other employment conditions which have been set by government); a greatly simplified agreement making and lodgement process; and a significant relaxation of unfair dismissal provisions.

Under the new system, the Federal industrial relations system will replace the State systems for most corporations and most employees. As the States, except for Victoria, are unwilling to refer their industrial relations powers, the Federal Government will rely on the corporations power to extend the existing Federal system to cover most corporations.

In relation to **pay and conditions and the simplification of awards**, the key changes introduced by WorkChoices are as follows.

- A national system that will cover up to 85 per cent of employees (OECD 2006, p.124). There will be a transitional period of 3-5 years depending on the status of corporations and Federal/State coverage.
- The new Australian Fair Pay Commission will replace National Wage Cases at the Australian Industrial Relations Commission. The primary objectives of the Commission are to consider: (i) the capacity of the unemployed to obtain and remain in employment; (ii) employment and competitiveness across the economy; and (iii) providing a safety net for the low paid, for young people and the disabled. The requirement to specifically take into account the unemployed was a new development.
- The government has set minimum conditions for annual leave, other leave and maximum ordinary hours of work. These conditions, together with the wages set by the Fair Pay Commission, constitute the Australian Fair Pay and Conditions Standard. More generous provisions in awards will be preserved and overtime pay will continue to be set in awards.
- A simpler agreement approval process will apply. Agreements have to be lodged with the Office of the Employment Advocate with an attestation that the Agreement was negotiated in compliance with the Fair Pay and Conditions Standard, but a formal approval process will not apply.
- The new workplace agreements and contracts of employment must not contain provisions that are less favourable than the Australian Fair Pay and Conditions Standard and (under recent amendments) workers on less than $75,000 must receive “fair compensation”.
- Contains provisions for union and employer ‘greenfield agreements’ that would apply to new projects. Greenfield agreements allow for the negotiation and registration of agreements with relevant unions prior to the commencement of work on a particular new project.
- Allows comparable terms and conditions to apply across contractors and sub-contractors engaged on major projects.

- Freedom of association provisions are also retained which will also continue to facilitate the take up of AWAs.
- A Workplace Authority and Workplace Ombudsman have been established to assist employers and employees in making agreements and resolving disputes at the workplace level.
- The AIRC will be responsible for simplifying awards, supervising protected industrial action and playing a role in relation to the termination of employment. It will not be able to make new awards and will only be able to vary awards within specified parameters.

The scope to use **'greenfield agreements'** will be of particular benefit to construction companies because they will allow developers to plan construction labour costs with a higher degree of certainty. This is because labour rates and conditions can be negotiated and agreed in advance of a project's approval and/or commencement, thereby reducing the potential for industrial action over terms and conditions of employment. The risk of industrial action will be reduced because the lodging of the agreement with the Workplace Authority (formerly OEA) will greatly reduce the scope for industrial action for the period to which the agreement applies.

In addition to the above features, changes were made in relation to **unfair dismissal laws** and **the scope for industrial action** that are likely to be particularly important for the construction industry. The key developments were as follows:

- Unfair dismissal laws were eased significantly. Businesses up to and including 100 employees will be exempted from unfair dismissal laws but will be covered by rules relating to unlawful determination which generally relate to discrimination. For employers with more than 100 employees, both unlawful termination and unfair dismissal laws remain, but exceptions will be allowed based on 'operational grounds'.
- The process of pattern bargaining[6] is restricted.
- A secret ballot must be held before protected industrial action can be taken and the role of unions in agreement making has been clarified.
- In relation to union right of entry, unions may only enter a workplace to investigate a breach of an award or collective agreement if a member of the union is carrying out work at the premises and the suspected breach affects a union member. If all employees are on AWAs or there is a collective agreement to which the union is not a party, a union does not have a right of entry. Furthermore, Workchoices establishes that union officials must have a permit from the Australian Industrial Registrar to enter a workplace. The Registrar can only issue a permit if satisfied that the union official is a fit and proper person.
- Under Workchoices, the AIRC will continue to supervise protected industrial action. It retains the power to issue orders to prevent or stop unprotected industrial action. This includes (as introduced in 1996) the prohibition of industrial action during the

[6] 'Pattern Bargaining' is defined as when a person who is a negotiating party for two or more collective agreements seeks common wages or conditions in two or more of those agreements, by engaging in a course of conduct that extends beyond a single business. Source: www.workplaceinfo.com.au (accessed 08/06/2007)

period of an agreement's operation and a requirement to notify proposed industrial action outside the period of an agreement.

- Under WorkChoices, three new grounds have been added to prevent or stop a bargaining period. These are:
  - suspension or termination if pattern bargaining is taking place;
  - a cooling off suspension where this would assist the parties to resolve the dispute; and
  - a suspension where third parties are directly threatened with significant harm from the industrial action.
- The Minister for Employment and Workplace Relations can issue a declaration where protected industrial action threatens the welfare of the population or part of it or is likely to cause significant damage to the economy or an important part of it. A declaration will terminate all relevant bargaining periods and authorise the Minister to issue written directions to reduce or remove the threat including directing specified negotiating parties to take or refrain from taking specified actions. The dispute will be referred to a full bench of the AIRC to settle the matters at issue by a workplace determination.

The above changes are expected to have a significant impact in reducing industrial action that disrupts the workplace and creates tensions between employers and employees. In addition the ability to reduce the differences in contractor and sub-contractor terms will also help in reducing industrial disputation, as this has been an important factor in contributing to industrial disputation in the past.

3.3 Construction Industry Developments

In the construction industry arena, there have also been comprehensive reforms aimed to improve workplace relations. The Commonwealth, State and Territory Governments developed a National Code of Practice for the Construction Industry (the Code) in 1997. The Code establishes a set of principles and standards of behaviour that are expected to apply in dealings between clients, their representatives and members of the construction industry. It emphasises the maintenance of the highest ethical standards in all construction-related activities.

The Code applies to all Commonwealth and State and Territory construction projects, with the private sector encouraged to adopt the Code on a voluntary basis. The Code is a key element in the Federal Government's strategy to reform workplace relations in the construction industry and achieve compliance with the WR Act. The industrial relations elements of the Code cover workplace arrangements, over-award payments, project agreements, freedom of association, dispute settlement procedures, strike pay and the impact of industrial disputes.

Furthermore, the Code promotes more effective choice and flexibility for parties in reaching agreements and encourages employers and employees to take greater responsibility for their own workplace relations. The Code prohibits direct or indirect coercion in relation to workplace agreements and protects subcontractors from pressure to agree to arrangements put in place by contractors and unions on construction projects.

In August 2001, the Cole Royal Commission into the Building and Construction Industry (the Royal Commission) was established to inquire into the nature, extent and effect of any unlawful or inappropriate conduct in the building and construction industry[7].

The Government's legislative response to the Cole Royal Commission into the building and construction industry was the Building and Construction Industry Improvement Act 2005 (BCII Act). Generally, the BCII Act modifies the workplace relations law about the taking of unlawful industrial action in relation to 'building work', especially in establishing significant civil penalties for failures to comply with requirements of the BCII Act. Also criminal penalties apply for failure to comply with requirements of the Act and a maximum penalty of imprisonment for six months. It also prohibits coercive and discriminatory industrial behaviour associated with building work. The essential elements of the BCII Act are as follows.

- *Industrial Relations.* The Act prohibits unlawful industrial action and enables it to be injuncted[8]. This was done through the creation of civil penalties for "unlawful industrial action". This is defined as extending to any industrially motivated action in relation to building work which involves[9]:
  - delayed performance of building work in relation to an industrial dispute;
  - refusing to accept or offer work on the legally prescribed terms or on the basis of an industrial dispute; and
  - failure of employees to attend for building work or to perform work while attending.

  This broader definition of "unlawful industrial action" practically prohibits every conceivable form of industrial action until the existing industrial instrument has expired. Importantly, this definition excludes conduct agreed to by the other party and conduct undertaken on the basis of a reasonable concern about health and safety.

  Additionally, the BCII Act substantially increased strike penalties and entitled compensation for financial loss due to unlawful industrial action.

- *Occupational Health and Safety (OH&S).* The Act establishes, through an accreditation scheme overseen by the federal Safety Commissioner, improved OH&S regulation and stipulates that only persons accredited under the OH&S accreditation scheme will qualify for Commonwealth Government work. This accreditation will be by the new Federal Safety Commissioner.

- *Illegal conduct.* With regards to illegal conduct, the BCII Act strengthens coercion provisions, in particular it expressly outlaws:
  - a person organising or taking or threatening to take action with intent to coerce a person to employ or not to employ a building employee or building contractor or to allocate such person particular responsibilities or duties;
  - a person taking or threatening to take or not to take any action with the intent to coerce or apply undue pressure to another person to make, vary terminate or extend a building agreement;

[7] ABCC, *"ABCC Backgrounder"*

[8] An injunction is an equitable remedy in the form of a court order, whereby a party is required to do, or to refrain from doing, certain acts.

[9] Source: Mallesons Stephen Jaques (www.mallesons.com)

- an employer coercing an employee or applying undue pressure on an employee not to make or to withdraw a request that the union meet and confer with the employer about a proposed building agreement; and
- a person taking or threatening to take or not to take any action with the intent to coerce a building employee or employer to nominate or pay contributions into a given superannuation fund.

Some other particular provisions of the BCII Act are:

- establishes the ABCC to enforce Commonwealth workplace relations law in the building industry. In particular, this legislation gives power to the ABCC to commence court proceedings, enter worksites, intervene in court proceedings and interview;
- increases penalties to reflect the seriousness of the offences;
- reduces sham safety stoppages;
- establishes the Federal Safety Commissioner and sets out the Commissioner's functions, including the establishment of an occupational health and safety accreditation scheme in relation to persons that contract with the Commonwealth;
- establishes that courts may award damages for employers where an employee or union breaches return to work orders;
- restricts project site allowances; and
- defines and outlaws strike pay.

The ABCC's jurisdiction as set by the legislation is broad. It covers construction and restoration work in all sectors of the industry and extends to preparatory and rendering work and the prefabrication of components for building work. The ABCC's jurisdiction does not cover:

- housing construction of four dwellings or less; and
- the extraction of minerals, oil and gas.

Importantly, the BCII and the ABCC framework could not operate effectively in the absence of the Workplace Relations Amendment (Workchoices) Act 2005 (which commenced in March 2006). This is because, as mentioned before, the WR Act contains crucial provisions in relation to right of entry, unlawful industrial action, pattern bargaining, freedom of association, payment for lost time, secret ballots and prohibited content. All these provisions are essential for the effective regulation of the construction industry. Additionally, the WR Act provides for all requisite agreement making processes, and gives the industry the ability to use AWAs and Employer Greenfield Agreements, which are important tools for achieving productivity improvements in the industry.

After the BCII Act, the Building and Construction Industry Improvement Regulations 2005 were issued. These Regulations give effect to the Act by prescribing certain authorised persons and setting out various forms of identifications, forms and notices required by the Act.

The National Code of practice has been supplemented by Guidelines that provide guidance to clients and contractors on adhering to the requirements of the Code. The Guidelines have been the subject of a number of changes over the years. The Implementation Guidelines provide guidance on workplace relations and related elements of the National Code. The current version of the Guidelines was issued in June 2006. Guidelines identified as the Industry Guidelines were discontinued in December 2006.

Finally, in 2006 the Government introduced legislation to protect independent contractors' status. The Independent Contractors Act 2006 and the Workplace Relations Legislation Amendment (Independent Contractors) Act 2006 establish a single national scheme for the review of contractor arrangements. State and territory laws dealing with this area have been excluded, with a three year transitional period. Additionally, this Act prohibits sham arrangements and introduces penalties for parties who enter into sham contracting arrangements[10].

These independent contractor laws protect the status of independent contractors by freeing them from the constraints of industrial and employment law. To achieve this, the laws[11]:

- stop state laws from requiring independent contractors to be treated as if they were employees;
- establish a three-year 'transitional' period during which existing state laws may still apply to existing contracts;
- replace New South Wales and Queensland unfair contracts laws with a new federal unfair contracts jurisdiction;
- make it illegal for an employer to disguise an employment relationship as an independent contracting arrangement; and
- make it illegal for employers to threaten or mislead employees to get them to change their status to independent contractors.

Table 3.1 provides a summary of the major reforms have affected the building and construction sector.

Table 3.1
Summary of Major Industrial Relations Reforms for the Construction Industry

Reform	Description
Industrial Relations Act 1988	Created a formal stream of enterprise bargaining through 'Certified Agreements'. These agreements allowed trade unions and individual firms to determine enterprise level wages and work conditions as long as they were certified by the AIRC to be of public interest.
Industrial Relations Act 1993	Extended the scope for enterprise bargaining by introducing Enterprise Flexibility Agreements (EFAs). These allowed workplace agreements to be negotiated in non-unionised workplaces. EFAs did not require unions be parties to agreements but unions could challenge their ratification.

[10] A sham arrangement is where an employer attempts to disguise an employment relationship as an independent contracting relationship, usually for the purposes of avoiding responsibility for paying legal entitlements due to employees.
[11] Source: The Executive Connection (TEC), www.tec.com.au, accessed 01/06/2007.

Reform	Description
Workplace Relations Act 1996 (WR Act)	One of the principal objects of the WR Acts was to give the primary responsibility for industrial relations and agreement-making to employers and employees at the enterprise and workplace levels. Individual agreements known as Australian Workplace Agreements (AWAs) could be struck directly between employers and employees without union involvement and with more flexibility; the award system was simplified; and the role, rights and involvement of unions with respect to bargaining and strike action were reduced.
National Code of Practice for the Construction Industry (The Code) 1997	The Code establishes a set of principles and standards of behaviour that are expected to apply in dealings between clients, their representatives and members of the construction industry. It emphasises the maintenance of the highest ethical standards in all construction-related activities.
Building and Construction Industry Improvement Act 2005 (BCII Act)	The BCII Act is the Government's legislative response to the Cole Royal Commission into the Building and Construction Industry. Generally, the BCII Act modifies the workplace relations law about the taking of unlawful industrial action in relation to 'building work', especially in establishing greater penalties. Importantly, the BCII Act also establishes the ABCC and gives power to the ABCC to commence court proceedings, enter worksites, intervene in court proceedings and interview.
Building and Construction Industry Improvement Regulations 2005	These Regulations give effect to the Act by prescribing certain authorised persons and setting out various forms of identifications, forms and notices required by the Act.
Implementation Guidelines for the National Code of Practice for the Construction Industry (the Guidelines), 2005	The Guidelines provide guidance for the construction industry and government agencies on how the Code is to be interpreted and implemented. The Guidelines were revised in September 2005, re-issued in June 2006 and took effect from 1 November 2005.
Workchoices Act 2005	The WorkChoices Act amended the Workplace Relations Act 1996 and commenced operation on 27 March 2006. It represents the most comprehensive change to industrial relations in Australia for almost a century. The key developments associated with WorkChoices are: the creation of a national system of industrial relations; the establishment of a new, independent body to set minimum and award classification wages (but not other employment conditions which have been set by government); a greatly simplified agreement making and lodgement process; and a significant relaxation of unfair dismissal provisions.
Independent Contractors Act 2006, Workplace Relations Legislation Amendment (Independent Contractors) Act 2006	This Act establishes a single national scheme for the review of contractor arrangements. State and territory laws dealing with this area have been excluded, with a three year transitional period. Additionally, this Act prohibits sham arrangements and introduces penalties for parties who enter into sham contracting arrangements.

Summing Up

Australia's industrial relations reforms represent substantial efforts to establish a system of work place relations focussed on the circumstances of individual enterprises complemented by provisions that greatly reduce the scope for unproductive industrial action. The reforms have:

- reduced and in some cases removed coercive and unlawful activities;
- increased cooperation and certainty in the construction industry;
- promoted flexible work practices and behaviour;
- streamlined the workplace agreement making process;
- simplified the national system, decreasing transaction and compliance costs of the industry's participants; and
- increased scope for direct negotiation between employee and employer.

Certainly, these changes have had important economic consequences in the construction sector and in the broader national economy. These potential economic effects are examined in Sections 5 and 7 of this report. In particular, this report examines productivity changes in the construction industry that can be attributable to the activities of the ABCC and supporting legislation and their impact on the economy as a whole.

4. The Office of the Australian Building and Construction Commissioner

As outlined in the previous section, the Office of the Australian Building and Construction Commissioner (ABCC) was established under the Building and Construction Industry Improvement Act 2005. This section provides information on the history, role and performance of the ABCC. In particular, Section 4.1 provides an overview of history and role of the office of the ABCC, while Section 4.2 analyses the performance of the office of the ABCC and highlights its main achievements.

4.1 Overview of the ABCC

In August 2001, the Cole Royal Commission into the Building and Construction Industry (the Royal Commission) was established to inquire into the nature, extent and effect of any unlawful or inappropriate conduct in the building and construction industry[12].

The Final Report of the Commissioner Cole found that the building and construction industry was characterised by a widespread disregard for the law. Furthermore, the Royal Commission found that existing regulatory bodies had insufficient powers and resources to enforce the law.

In response to the Royal Commission's findings, the Building Industry Taskforce (the Taskforce) was established on October 2002 as an interim body to secure the law in the industry, prior to the establishment of a national agency. The Taskforce was established as a separate unit within the Department of Employment and Workplace Relations (DEWR) and had powers available to it under the Workplace Relations Act 1996 (WR Act). The Taskforce operated for three years, until the creation of the ABCC on October 2005.

The ABCC's key objective is to ensure that workplace relations laws are enforced in building and construction industry workplaces. Further, the ABCC is required to devote considerable time and resources to promoting proper conduct through educating industry participants on their rights and obligations under relevant legislation.

The ABCC has prime responsibility for the following matters in respect to the building and construction industry[13]:

- investigating suspected contraventions of the *Building and Construction Industry Improvement Act 2005*, the *Workplace Relations Act 1996*, the *Independent Contractors Act 2006*, workplace agreements, orders and awards;
- instituting proceedings against industry participants contravening the relevant Acts, agreements, orders and awards
- intervening in matters before the Australian Industrial Relations Commission or court proceedings that involve a building industry participant or building work;
- monitoring, promoting and securing compliance with the National Code;
- providing advice and assistance to industry participants regarding their rights and

[12] ABCC, *"ABCC Backgrounder"*
[13] Portfolio Budget Statements 2007-08 Employment and Workplace Relations Portfolio Budget Related Paper No. 1.6.

obligations;

- disseminating information about the relevant Acts, the national Code and promoting appropriate standards of conduct by industry participants; and
- if appropriate, referring matters to other Commonwealth, State or territory bodies including the Australian Competition and Consumer Commission, the Australian Taxation office, and the Australian Federal Police.

4.2 Performance of the ABCC

This section discusses the performance of the ABCC and highlights its main achievements. The section is divided in two subsections. The first subsection highlights the achievements of the Building Taskforce as at 31 August 2005[14]. The second subsection describes the achievements of the ABCC as at 30 June 2006[15].

Performance of the Building Taskforce

From October 2002 to August 2005, the Taskforce placed 29 matters before the courts. Four of these matters involved both unions and employers, nine matters involved only employers, 15 matters involved only unions and one matter involved the Victoria Government. As at 31 August 2005, 16 of these court actions were completed and 11 additional briefs of evidence were being considered for prosecution by either the Taskforce's legal team or external legal providers. These prosecutions were mounted as a result of complaints made to the Taskforce's hotline which led to extensive investigations by the Taskforce. All matters were put before the court based on recommendations from both internal legal advisors and external law firms.

Of all investigations conducted by the Taskforce, 24 per cent related principally to threats, intimidation, coercion and violence. The other major issues related to threatening behaviour, hindering and obstructing, demanding, paying and receiving strike pay, failure to comply with dispute resolution procedures, and unlawful industrial action. Many also contained secondary elements of threats, intimidation, coercion and violence.

Importantly, although the performance of the Taskforce can not be measured only by the number of matters it brought before the courts or by the fines handed down by the courts (the mandate of the Taskforce was not only to secure lawful conduct but also to bring about long term cultural change), these statistics provide an important indicator of the achievements of the Taskforce during its operation.

Performance of the ABCC

This subsection describes the achievements of the ABCC during its first nine months of operations (1 October 2005 to 30 June 2006). Although this timeframe is too short to make a detailed assessment of the performance of the ABCC, the information contained in this

---

[14] The information presented in this subsection is mainly sourced from the Building Industry Taskforce (2005), *"Upholding the Law- Findings of the Building Industry Taskforce"*

[15] The information presented in this subsection is mainly sourced from the Office of the Australian Building and Construction Commissioner (2006), *"Annual Report 2005-06"*

subsection provides an important indication of how ABCC's work has contributed to change the conduct and culture of the building and construction industry.

From 1 October 2005 to 30 June 2006, the ABCC pursued 125 investigations into suspected contraventions of workplace laws and 132 reports were subject to preliminary investigation. Interestingly, the major breaches investigated by the ABCC were industrial action, coercion and agreement/dispute resolution.

A significant difference between the Taskforce and the ABCC is a change in its powers. In contrast to the limited powers of the Taskforce (which restricted the effectiveness of its operations), since 1 October 2005, the ABCC has compliance powers that enable it to require a person to provide information or documents or to answer questions under oath or affirmation. The powers were modelled on those of the Australian Competition and Consumer Commission (ACCC) and are similar to those of other regulatory agencies such as the Australian Securities and Investments Commission (ASIC), the Australian Taxation Office (ATO) and the Australian Prudential Regulatory Authority (APRA).

In the exercise of these compliance powers, the ABCC issued 29 notices to attend and answer questions during the period 1 October 2005 to 30 June 2006. It is the ABCC's view that the compliance powers have proven to be an effective method of obtaining information from reluctant witnesses and the use of these powers has assisted investigations which would otherwise have stalled.

With regards to penalty procedures, in its first nine months of operation, the ABCC had 26 penalty proceedings before the courts. 19 of these proceedings were initiated by the Taskforce prior to 1 October 2005 and the remaining seven were instituted by the ABCC. These proceedings centred on recurring issues in the building industry, such as coercion, strike pay and unlawful industrial action. Interestingly, the objectives of these proceedings are to penalise those who contravene the law and to change the practices of building industry participants by showing to the industry that the law will be enforced on building sites.

Also, from 1 October 2005 to 30 June 2006, the ABC Commissioner intervened in 21 proceedings before the Australian Industrial Relations Commission (AIRC). From these interventions, 13 related to applications for orders to stop industrial action, four to certification or termination of agreements, and four to interpretation of agreements. According to the ABCC annual report 2005-06, the vast majority of these cases were resolved quickly and on a satisfactory basis. Furthermore, ABCC's annual report suggests "that anecdotal evidence from building industry participants suggests that the ABCC's power to intervene has been a positive force in this regard"[16].

To date, the ABCC has been in operation around 18 months and the results it has achieved indicate that it will be a significant agent for long-term cultural change and improved productivity in the building and construction industry. Some examples of actions that the ABCC has undertaken that could improve productivity in the industry are the following.

- Law enforcement - by striving to enforce the law, the ABCC can facilitate changes in the practices of the building and construction industry participants, making them more transparent and efficient and improving the industry's productivity.

[16] Office of the Australian Building and Construction Commissioner (2006), *"Annual Report 2005-06"*, page 40.

- Restraining industrial action - by preventing unlawful industrial action, the ABCC can contribute to better productivity outcomes.
- Avoidance/reduction of stoppages of work - by avoiding/reducing disruption to day-to-day activities in the building and construction industry, the ABCC can contribute to better productivity outcomes.
- Faster conflict resolution - the ABCC helps reduce the time taken to resolve a conflict. Resolving conflicts more quickly will mean higher productivity in the building and construction industry.

5. Analysis of Productivity in the Construction Industry

This section examines changes in productivity in the construction industry. Econtech analyses labour productivity performance in the building and construction industry by two methods:

- an examination of cost differences for building tasks in the commercial building and domestic residential building sectors; and
- case studies of the impacts of the reforms.

It also reviews aggregate labour productivity trends in the construction industry to check whether the interpretation of the impact of the industrial relations reforms is consistent with the aggregate data.

Based on the findings of the analysis of labour productivity and the timing and nature of changes in industrial relations policies and institutions generally and in the construction sector specifically, an assessment is made of the extent to which productivity improvements are attributable to the ABCC and its precursor the Taskforce. In this step productivity gains are identified for the ABCC taking account of the impact of other industrial relations reforms and the impact of normal productivity growth.

The estimates of the productivity changes attributable to ABCC are used to estimate the impact on the economy as a whole in Section 7 of this report.

Section 5.1 examines quantity surveyor data on the costs of construction industry tasks. Section 5.2 presents the results for the case studies of individual construction companies. Section 5.3 analyses aggregate construction industry data from the Productivity Commission (PC) and the Australian Bureau of Statistics (ABS).

5.1 Quantity Surveyor Data

This section examines changes in productivity in the construction industry using quantity surveyors data to compare the costs for the same building tasks between domestic residential building and commercial building across years and regions of Australia.

The general changes in industrial relations policies and institutions and the activities of the ABCC are expected to have their main impact in the construction industry in the non-residential sector of the industry and in the larger multi-unit part of the residential sector. This is the sector where traditionally there were more industrial disputes and higher costs for specific tasks. The residential sector for single domestic buildings is considered to be more flexible than the commercial sector reflecting the involvement of many small, independent operators and the extensive use of piece rates for work performed.

Thus, a useful way of determining the extent to which the ABCC and the industrial relations reforms have impacted on productivity in the construction industry is by comparing the costs for the same building tasks in commercial building[17] with those for domestic residential

---

[17] Commercial building includes larger-multi-unit dwellings, offices, retail, industrial and other buildings besides domestic residential building. It excludes engineering construction (roads, bridges, rail,

buildings[18].

The building tasks used in this cost comparison of commercial building with domestic residential building are as follows:

- concrete to suspended slab;
- formwork to suspended slab;
- 110 single skin face brick wall;
- corrugated zinc roof;
- 10mm plasterboard wall;
- painting (sealer and two coats);
- hollow core door; and
- carpentry wall.

Table 5.1 shows that until recently, the average costs of completing the same tasks in the same states have been generally materially higher in the commercial building sector than in the domestic residential building sector. The average difference at the national level is also plotted in Chart 5.1.

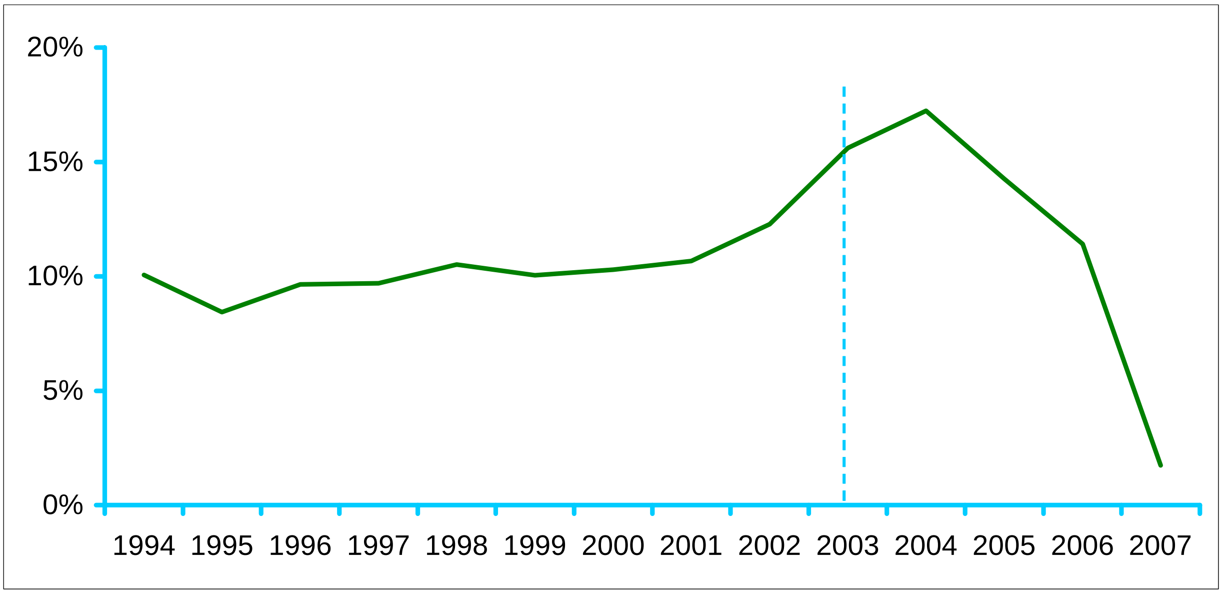
Table 5.1
Cost Differences between Commercial Building and Domestic Residential Building for the Same Tasks in the Same State, 1994 – 2007 (per cent)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Ave. 1994-2003	2004	2005	2006	2007
SA	8.4	8.8	8.8	9.0	7.0	6.6	4.8	6.4	6.6	11.1	7.7	9.7	5.1	6.5	-0.1
Qld	8.1	8.2	9.9	9.4	7.9	6.4	7.4	6.1	6.1	13.6	8.3	21.5	16.6	13.6	2.8
Vic.	10.1	9.1	9.5	10.5	10.2	9.9	12.3	13.9	19.1	16.2	12.1	19.1	18.9	14.3	1.9
WA	17.0	14.5	15.2	14.4	14.5	15.8	14.8	13.6	14.0	17.9	15.2	14.7	8.7	5.3	-0.9
NSW	8.9	5.7	7.5	7.5	11.6	10.9	9.9	10.9	11.8	16.3	10.1	15.3	13.1	11.1	2.2
Aust. Ave	10.1	8.4	9.7	9.7	10.5	10.1	10.3	10.7	12.3	15.6	10.7	17.2	14.3	11.4	1.7

Source: Rawlinsons Australian Construction Handbook, 1994 – 2007[19]
Notes:
(1) Aust. Average is weighted according to turnover on a state-by-state basis.
(2) Dates indicate beginning of each calendar year, for example 2003 refers to January 2003.

telecommunications and other infrastructure).
[18] The domestic part of residential building includes all dwellings except larger multi-unit dwellings.
[19] Rawlinsons is a construction cost consultancy in Australia and New Zealand. The Rawlinsons Australian Construction Handbook is the leading authority on construction costs in Australia.

Chart 5.1
Average Cost Differences between Commercial Building and Domestic Residential Building for the Same Tasks for 5 States, 1994 – 2007 (per cent)



Source: Econtech estimates.

Over the ten year period prior to the introduction of the Taskforce[20], the average difference between the costs of completing identical tasks in commercial building and domestic residential building across Australia was 10.7 per cent. Until recently, the cost differentials were the largest in Victoria and Western Australia, the states where restrictive work practices in commercial building were generally acknowledged to be most pervasive. The average difference was around 10 per cent from 1994 to 2001, but then increased considerably to peak in 2004 before declining sharply in 2005 and 2006 to a small difference at the start of 2007.

There are a number of reasons why these cost differentials between the two sides of the building industry might exist as follows.

1. The costs of materials and transportation might differ between the commercial building and domestic residential sectors.
2. There may be different costs of doing business in certain states because of taxation laws, market structures and other local issues.
3. There may be differences from economies of scale between the two sectors.
4. There may be differences in the nature of sites between the two sectors. In particular there could be greater on-site logistical and engineering complexity of non-residential projects such as multi-storey units, hospitals and educational institutions.
5. There may be differences in labour costs due to differences in wage rates or labour productivity.

---

[20] The Taskforce was established in October 2002 but it is reasonable to expect a lag before its activities started to make an impact. The data also relate to January of each year so that for 2003 the data are for January 2003.

The first four of these factors can be largely eliminated as the explanation for higher costs in commercial building compared with domestic residential building.

First, transport and material costs do not differ greatly between the two sides of the building industry. Both the commercial building and domestic residential building sectors source their materials from the same large suppliers, so differences in materials costs are minimal. Also, the comparisons made above are for tasks completed on an average site in the greater metropolitan district of the capital cities of each state. Transport differences are therefore also expected to be minimal.

Second, the comparisons made are on a state-by-state basis. For example, the costs of completing certain tasks in the commercial building side of the industry in NSW are compared with the costs of completing those same tasks in the domestic residential side of the industry in NSW. As such, state differences in taxation laws, market structures and other issues that can influence costs in any interstate comparison are not present.

Third, the larger scale of many projects in commercial building compared with domestic residential building provides potential for cost savings from using more capital-intensive construction methods. For example, the use of cranes, hoists, jump-forms, concrete pumps, precast concrete panels and other capital intensive equipment and techniques is more prevalent in commercial building than in domestic residential building. Yet, despite the greater economies of scale available in commercial buildings, the costs of identical tasks are generally higher than in domestic residential building.

Fourth, the comparisons are unit cost comparisons for specific tasks and this would reduce cost differences that arise because of site differences.

Fifth, if there was a valid structural reason for unit costs of specific tasks to be higher in the commercial sector, it would not be possible for the difference to narrow as significantly as it has since 2004 and compared to the average for the period 1994-2003.

This leaves the fifth and final factor of labour costs as the main explanation for the higher costs in the commercial building seen in Table 5.1. Labour costs may be higher due to high wage rates or lower labour productivity.

However, as noted, Table 5.1 and Chart 5.1 show the gap has now reduced substantially and as of 2007 there was little difference between the costs averaged across the eight building tasks and across states in the two sectors. There is no evidence of a general pattern of significant reductions in cost differences across the different states until about the start of 2004. At that time, reductions were observed for South Australia, Western Australia and to a lesser extent New South Wales but increases were observed in Queensland and Victoria. However in the subsequent years to the start of 2007 all states observed substantial reductions in the cost differences across the eight building tasks for the two sectors.

The Taskforce was established in October 2002 but it lacked enforcement powers. The ABCC was established in October 2005 and WorkChoices was implemented on the 27 March 2006. Given the timing and the extent of the decline in the cost difference for the same eight building tasks across the two sectors, it is considered that the ABCC is likely to have had a significant impact in contributing to the decline.

Interestingly, there was a substantial decline in the average difference in the period from the beginning of 2004 to the beginning of 2006 and this followed a significant rise in the average difference in 2002 and 2003. Significant industrial relations reforms to encourage enterprise bargaining were introduced in 1993. Further changes were introduced in 1996 to reinforce the incentive for enterprise bargaining as well as reduce the scope for industrial action. However, these changes did not appear to have any effect in terms of reducing the cost differences for the eight tasks across the two sectors until after the Taskforce was put in place in October 2002. This supports the interpretation that it was the activities of the Taskforce and more importantly the ABCC (given its enforcement powers) when it was established in October 2005 that made a major difference. It is important to recognise that the industrial relations reforms provided a more productivity-friendly environment. However, the cost difference data suggest that effective monitoring and enforcement of the general industrial relations reforms and those that related specifically to the building and construction sector were necessary before the reforms could lead to substantial labour productivity improvements. Thus, it is considered that the most appropriate conclusion is that separate attribution of labour productivity improvements to the ABCC and industrial relations reforms is not possible because to be effective they both need to operate together.

The Role of Labour Costs

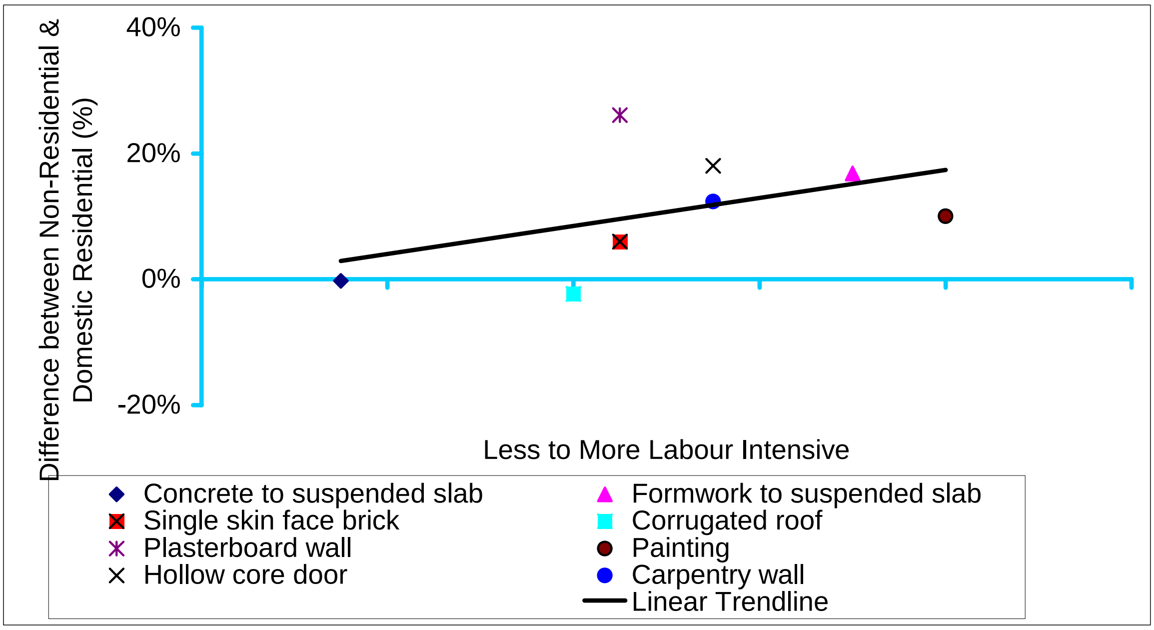
The cost comparisons made here between the two different sectors are not affected by the site and other particular allowances often associated with non-residential construction. These allowances are paid separately by builders and are not part of the costs referred to in Table 5.1. These costs can add significantly to the overall cost of labour and, therefore, to the overall costs of projects. As such, this will mean that the total cost differentials in Table 5.1 are understated. However, the purpose of this section is to analyse the differences in labour productivity between domestic residential and commercial building construction. For this purpose, it is not appropriate to include differences that are due to higher pay rates, including those made through site and other allowances.

Another factor that could contribute to cost differences between the two sectors is higher rates of pay for overtime hours in the non-residential construction sector. However, one of the key elements of enterprise bargaining was the introduction of flexibility in the setting of terms and conditions of employment. Thus, where overtime rates were unreasonable relative to productivity it could be expected that there would be some pressures for this difference to be reduced as the industrial relations reforms began to operate effectively. As such, some part of the reduction in the cost difference could be due to enterprise bargaining arrangements having an impact. However, there was no evidence of this in the cost difference data from 1993 when enterprise bargaining was introduced to 2004 and no evidence after 1996 when additional reforms were made to further encourage enterprise bargaining. In addition, the cost differences relate to the unit costs for standard tasks and so overtime costs are not likely to be a major factor in explaining cost differences.

Then, in terms of this study the main issue is the extent to which enterprise bargaining was a contributing factor in explaining the decline in the cost difference for the same eight tasks across the two sectors. However, again given the timing of effects it is suggested that enterprise bargaining by itself had little influence and that the major reason was the activities of the ABCC and the industrial relations reforms considered collectively.

The remainder of the difference in prices between the identical tasks is expected, therefore, to be due to labour productivity differences between the two sectors. This conclusion is also supported by Chart 5.2, which shows that in general the more labour intensive a particular task is, the greater the cost disadvantage for commercial building. The black line is based on a simple linear regression where the cost difference is related to the share of labour costs in total costs.

Chart 5.2
Correlation between Labour Intensity and the Cost Disadvantage for Commercial Building (Australian Averages 1994-2007)



Source: Econtech estimates.

Table 5.2 uses the total cost difference between commercial building and domestic residential building and the share of labour in total costs to calculate the cost difference for labour, assuming that all of the cost difference arises because of differences in labour costs. For example given a total cost gap of 10.7 per cent and a share of labour costs in total costs of 51 per cent, the labour cost gap for labour would be 21 per cent. The percentage point difference between the estimate for the labour cost gap at the start of 2007 of 3.4 per cent and the average for the 1994-2003 period of 21 per cent is 17.6 percentage points.

Table 5.2
Average Labour Cost Differences between Commercial Building and Domestic Residential Building, 1994-2007 (per cent or percentage points)

	Average 1994-2003	2007	Change
Total Cost Gap	10.7	1.7	9.0
Labour Cost Gap	21.0	3.4	17.6

Source: Econtech estimates
Notes:
(1) Based on the estimate that labour accounts for 51 per cent of total costs.
(2) Excludes Site & Other Allowances, which may understate both cost gaps and the difference due to higher pay rates, but will not affect the labour cost gap estimate.

Table 5.3 uses the information in Table 5.2 and additional information and assumptions to estimate the gains in labour productivity within the construction industry from the closing of cost gaps with domestic housing. This enables estimates to be made of productivity gains for total non-residential construction, total residential construction and hence total construction.

Table 5.3
Implied Gains in Labour Productivity from Closing of Cost Gaps (per cent)

	Average 1994-2003	2007	Change
Total non-residential construction	14.6	2.4	12.2
Non-residential building	*21.0*	*3.4*	*17.6*
Engineering construction	*10.5*	*1.7*	*8.8*
Total residential building	6.3	1.0	5.3
Domestic residential building	*0.0*	*0.0*	*0.0*
Multi-unit residential building	*21.0*	*3.4*	*17.6*
Total construction	**11.2**	**1.8**	**9.4**

Source: Econtech estimates

Domestic residential building is a useful cost benchmark for commercial building because of the many tasks that they have in common. However, there are many tasks that the commercial sector does not share with the domestic residential sector. For the purposes of this report, it has been assumed that the labour cost differential identified in the identical tasks examined earlier is representative of the cost differential for those tasks that cannot be benchmarked against domestic residential activity.

Domestic residential building is less useful as a cost benchmark for engineering construction, which largely involves other, unrelated tasks. For the purposes of this analysis, it is assumed that the cost gap for engineering construction is one-half of that identified for commercial building i.e. 10.5 per cent compared with 21 per cent. Whilst restrictive work practices and reduced productivity are an issue in engineering construction, as confirmed by the case studies of section 3.2, nonetheless they do not exist to the same extent as they do in commercial building.

The labour cost difference for residential building depends on the gap for both the domestic and larger multi-unit sides of this sector. Domestic residential building is the benchmark used here. So, by definition its labour cost difference is zero. On the other hand, larger multi-unit residential building is part of the commercial building sector, where the labour cost difference is estimated above at 21 per cent. Multi-unit dwellings account for about 30 per cent of residential building. Consequently, the cost gap is estimated at 6.3 per cent for total residential building, being 30 per cent of the commercial building difference of 21 per cent.

All of the cost gaps are measured relative to the domestic residential sector. These estimated cost gaps are converted to differences in labour productivity for the purposes of the economic modelling reported in Section 7. As explained above, all of the reduction in the cost difference that has been observed, compared to the average for the period 1994 to 2003, is attributed to the activities of the ABCC and industrial relations reforms operating collectively. The reforms are not considered to be likely to have had any significant impact without the operation of the ABCC.

For the economic modelling, the estimate of the productivity gain is 9.4 per cent for the construction sector as a whole, as calculated in Table 5.3. This is the difference between the average labour cost difference of 11.2 per cent for the period 1994 to 2003 and the observation of 1.8 per cent at the start of 2007.

5.2 Case Studies

Section 5.1 found that labour productivity in commercial construction has increased in the last three years. This finding is supported by a number of case studies undertaken by Econtech as part of this study. The objective of these case studies is to provide further understanding of the sources of productivity changes in the construction industry. The key advantage of the case studies is that they allow a more detailed examination of particular experiences across different companies in the construction industry.

The aim of this analysis was to examine different projects before and after the existence of the Taskforce and the ABCC in two different areas of the construction industry. These areas are office building and high density residential construction.

The information for the case studies was provided by two leading construction companies. For confidentiality reasons, these companies are referred to in this report as Company 1 and Company 2. A general description of each of these companies is presented below.

- **Company 1** is a construction company that offers services such as (but not limited to) building construction, commercial construction and tower building construction.
- **Company 2** is a large construction company that offers diverse construction services across the building and engineering sectors. It has an operating turnover in excess of $7 billion and more than 20,000 employees.

The following summarises the case studies that have been undertaken for this report.

- 2 high density residential projects in Queensland, 1 pre-ABCC activity and 1 post-ABCC activity.
- 2 office projects, one pre-ABCC project and one post-ABCC project in Victoria.

A brief general description of each of the projects is presented in Table 5.4. For confidentiality reasons, the projects are referred to in this report as Project 1, Project 2, etc.

Table 5.4
General Description of Case Studies' Projects

	Construction Industry Area	Approximate size of the project	Approximate Cost of the project	Location
Project 1	Office building	40,000 m^2 office space + retail space + car parks	+$300 million	Victoria
Project 2	Office building	2 office towers + retail space	+$500 million	Victoria
Project 3	High Density Residential	112 residential units+ common areas + car parks	+$45 million	Queensland
Project 4	High Density Residential	258 residential units + common areas+ retail space+ car parks	+$40 million	Queensland

Source: Information provided by Companies 1, 2 and 3.

The analysis of the case studies is divided in two parts. The first part of the analysis provides a summary of the views of the construction companies interviewed with respect to the influence that the ABCC and the industrial relations reforms have had in the construction industry, and in the performance of their companies. The second part of the analysis provides some general indicators of how the ABCC has influenced the individual performance of different construction projects.

Perceived Influence of the ABCC and the Industrial Relations Reforms on the Construction Industry

After meeting with representatives of four construction companies, Econtech identified some of the main impacts that these companies believe the ABCC and the industrial relations reforms have had on the construction industry. Whilst being as comprehensive as possible, the list of impacts contained in this report is by no means exhaustive. However, the impacts presented in this section represent the issues that were most commonly raised by the people interviewed. These impacts are outlined below.

- Significant reduction in days lost in the industry due to industrial action.
- Less abuse of OH&S issues for industrial purposes.
- Proper management of OH&S issues.
- Proper management of inclement weather procedures.
- Improvement of rostering arrangements (additional flexibility in rostering has effectively increased the number of working days per annum).
- Cost savings stemming from the prohibition on pattern bargaining.

Generally, the people interviewed suggested that there have been three main streams of influence in the construction industry:

- the BCII Act which establishes various prohibitions (outlined in Section 2 of the report);
- the ABCC's extensive powers of investigation and prosecution; and
- the National Code of Practice for the Building and Construction Industry, which provides a powerful commercial incentive to comply with the principles of freedom of association.

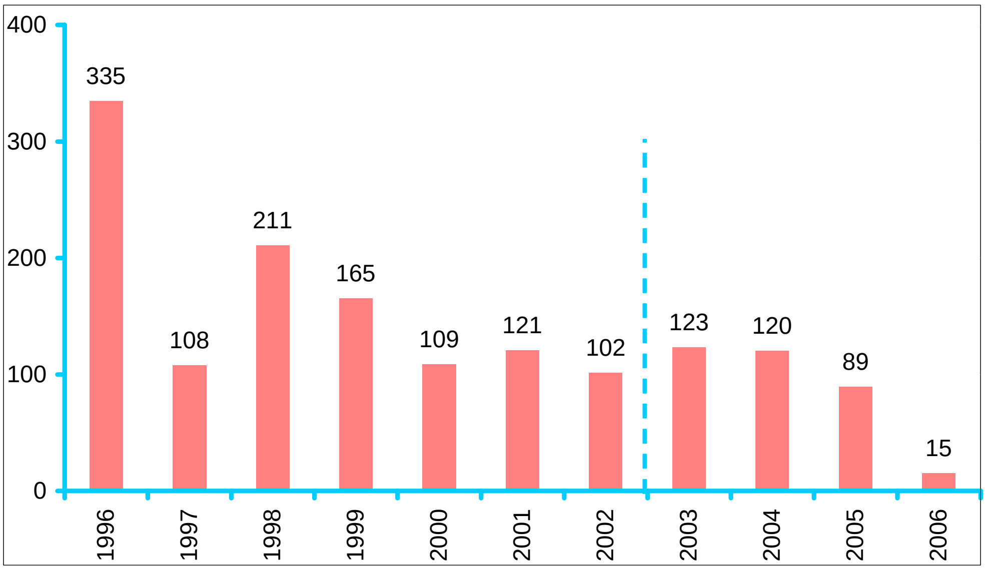
The interviewees suggested that this framework has produced significant improvements in productivity in the industry. Furthermore, all the people interviewed for this report believe that both the ABCC and the current construction industry regulatory framework are critically important components for construction industry productivity.

Influence of the ABCC on the Performance of Selected Construction Projects

This part of the analysis provides some general indicators of how the ABCC has influenced the individual performance of different construction projects. The calculations presented in this section are prepared using data provided by Companies 1 and 2.

The first indication of the influence of the ABCC, across the construction industry as a whole, is a considerable decrease in the number of days lost due to industrial action. This improvement can be shown at two different levels, using aggregate ABS data and using individual project data. Chart 5.3 shows ABS data on the number of working days lost in the construction industry due to industrial disputes. The average number of working days lost each year for the period 1996 to 2006 was 136,000. In contrast, the chart shows that since 2003 the number of days lost in the industry has been decreasing. 2003 was the full first year of operation of the Taskforce, which started operations in October 2002. The ABCC started its operations in October 2005. After just over one year of operation of the ABCC, the annual number of working days lost in the industry was down to only 15,000.

Chart 5.3
Working Days Lost in Construction due to Industrial Disputes ('000)



Source: Industrial Disputes, Australia, ABS (Cat. 6321.0.55.001).

This information is further supported by individual project data. Table 5.5 shows the average project days lost per year in four different projects. This table shows that projects undertaken post-ABCC activity had considerable fewer project days lost per year than the projects undertaken pre-ABCC activity. Note that Table 5.5 refers to project days while Chart 5.3 refers to working days.

Table 5.5
Lost Time in Case Studies' Projects Due to Industrial Action

	Type of Project	Pre/Post ABCC?	Av. Days Lost (per year)
Project 1	Office building	Post	1.1
Project 2	Office building	Pre	20.7
Project 3	High Density Residential	Post	1.7
Project 4	High Density Residential	Pre	29.4

Source: Information provided by Companies 1 and 2.
Notes: Assumes 1 day= 8 hours.

Furthermore, additional information provided for Project 3 and 4 shows that the additional cost of Project 4 due to lost days, compared to project 3, is $2.71 million. This figure includes additional site overheads and the liquidated damages and lost income for late performance.

The Impact of Reforms on the Costs of Eastlink

An additional comparison of two major construction projects in Victoria further demonstrates how the industrial arrangements and behaviours that preceded the ABCC adversely impacted the construction industry. A study by Phillips (2006) of the Institute of Public Affairs (IPA)[21] estimated the **additional costs of the Eastlink[22] project** if this project would have been constructed under industrial agreements outside the ABCC and the WorkChoices environment. The study found significant cost differentials, amounting to **$295 million** in direct costs and toll revenue losses by not opening on time. This estimate was calculated by considering the industrial relations costs that were imposed on the CityLink[23] project, which were not imposed on EastLink. The estimate was found to be about 11.8 per cent of the total construction cost.

CityLink was constructed entirely before the federal reforms to industrial relations occurred and suffered significant industrial relations problems, particularly as a result of spurious OH&S campaigning by unions. In contrast, EastLink is being constructed using industrial agreements and laws arising from, or influenced by, WorkChoices together with the enforcement powers of the ABCC. Significantly, as of July 2006, EastLink construction was

[21] Phillips, Kent (2006), *"Industrial Relations and the Struggle to Build in Victoria"*, Institute of Public Affairs, Briefing Paper, November 2006.
[22] The EastLink project is a 40 kms road construction project linking Mitcham and Frankston and the Eastern, Monash and Mornington Peninsula Freeways in Victoria. This is a $2.5 billion project (2004 figures) that is expected to take four years to complete.
[23] CityLink was one of the largest infrastructure projects undertaken in Australia. It covers 22 kms of road, tunnel and bridge works linking the north-western and south-eastern suburbs of Melbourne. Construction commenced in April 1996 and CityLink became fully operational in December 2001. The estimated total cost of the project was $2 billion.

reported as running a year ahead of schedule. This is considered to be mainly the result of industrial relations peace.[24]

Importantly, the $295 million cost differential between CityLink (pre-ABCC/BuildingCode/ WorkChoices) and EastLink (post-ABCC/Building Code/WorkChoices) estimated by Phillips includes the following components.

- Cost of union delegates employed but not working: $58.5 million. This figure includes union delegate's direct wages, site overheads, forgone toll revenue and direct wages of additional employees.
- Cost of non-working and non-productive days: $184 million. This figure includes costs of pre-ABCC rostering arrangements and forgone toll revenue. Additional overheads are not included in this figure.
- Cost of disruption due to agreement renewal $9.2 million. This figure includes the forgone toll revenue for late completion, caused by production disruption during the period of agreement renewal. Additional overheads are not included in this figure.
- Cost of spurious OH&S claims: $31 million. This figure includes additional direct labour costs and forgone toll revenue for late completion of the project. Additional overheads are not included in this figure.
- Cost of misuse of allegations of inclement weather: $12.3 million. This figure includes additional direct labour costs and forgone toll revenue for late completion of the project. Additional overheads are not included in this figure.

In conclusion the case study findings support the findings from the analysis of the quantity surveyor data that the existence of the ABCC and the supporting regulatory framework have led to significant improvements in labour productivity.

[24] The Age, 11/7/06.

5.3 Productivity in the Construction Industry

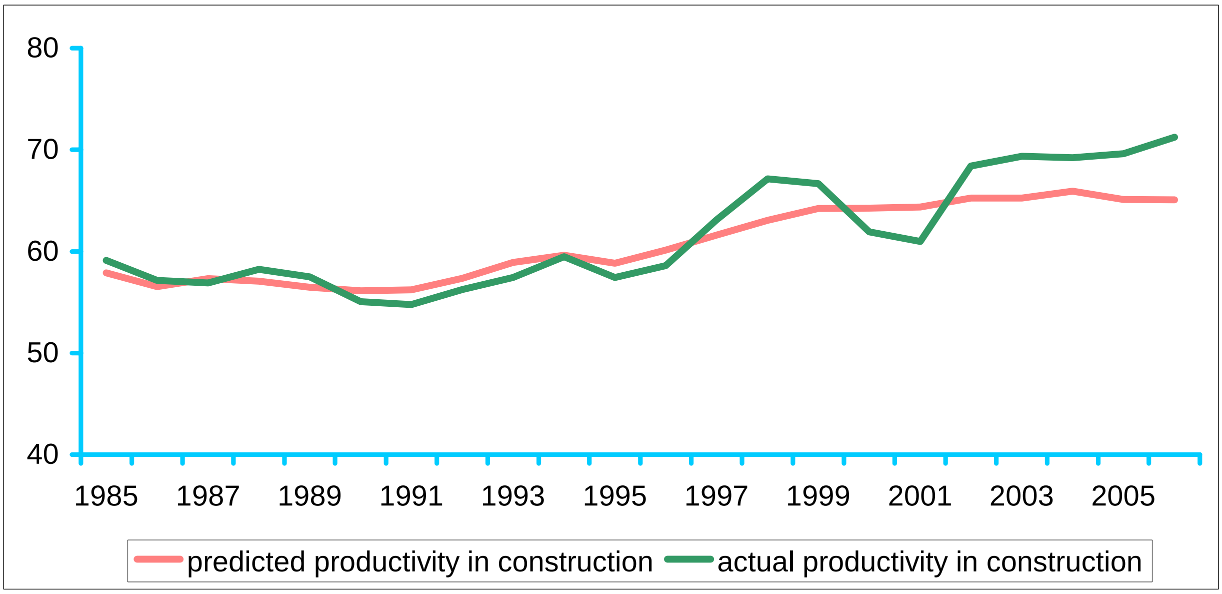
This section reviews trends in productivity in the construction industry. It begins by using aggregate construction industry labour productivity data to cross-check the productivity gain estimated in section 5.1. There it was inferred from cost gap data that the activities of the ABCC, supported by industrial relations reform, have resulted in a gain in construction industry labour productivity of 9.4 per cent. This section then reviews productivity trends in the construction industry using an alternative productivity concept.

Comparison of Estimates of Labour Productivity Gain

The analysis in section 5.1 of movements in the cost gap between commercial building and domestic housing suggests that the activities of the ABCC, supported by industrial relations reform, have resulted in a gain in construction industry labour productivity of 9.4 per cent. This gain is now cross-checked against aggregate labour productivity data in Chart 5.4.

Chart 5.4 shows that construction industry labour productivity has been noticeably stronger in recent years. Specifically, by 2006 actual construction industry labour productivity outperformed predictions based on historical performance[25] by 9.5 per cent, which is very similar to the identified labour productivity impact of 9.4 per cent. This lends further support to basing the economy-wide modelling on the assumption that the ABCC and industrial relations reform have added about 9.4 per cent to construction industry labour productivity.

Chart 5.4
Construction Industry Labour Productivity compared with a Prediction based on an Historical Benchmark



Source: Econtech estimates

[25] The historical performance benchmark is based on a regression to determine historical trends to 2002 for construction industry productivity relative to productivity in the economy as a whole.

Measuring Building and Construction Industry Productivity

There are a number of alternative approaches to measuring an industry's productivity. The most common measures are labour productivity, capital productivity, multifactor productivity and total factor productivity. Each one of these measures is shortly described below.

- *Labour Productivity.* Labour productivity is the ratio of real output produced to the quantity of labour employed. Labour productivity is typically measured as output per person employed or per hour worked. Changes in labour productivity can reflect the joint influence of changes in capital, intermediate inputs, as well as technical, organisational and efficiency change within and between firms, the influence of economies of scale and varying degrees of capacity utilisation.
- *Capital Productivity.* Capital productivity is measured as output per unit of capital. This ratio shows the time profile of how productively capital is used to generate output. Capital productivity reflects the joint influence of labour, intermediate inputs, technical change, efficiency change, economies of scale and capacity utilisation.
- *Multifactor Productivity (MFP).* MFP is defined as the ratio of output to combined inputs of labour and capital. MFP is a more comprehensive productivity measure because it identifies the contribution of both capital and labour to output. Changes in MFP can reflect the influence of factors such as technical progress, improvements in the work force, improvements in management practices and economies of scale.
- *Total Factor Productivity (TFP).* TFP is the ratio of output to the combined inputs of labour, capital and intermediate inputs (such as fuel, electricity and other material purchases).

Both labour and capital productivity are partial performance measures because they each relate output to only one of the inputs necessary to produce that output. Hence, the main limitation of labour and capital productivity measures is that the changes in efficiency that are attributable to all factors of production are attributed to one factor of production only – labour or capital.

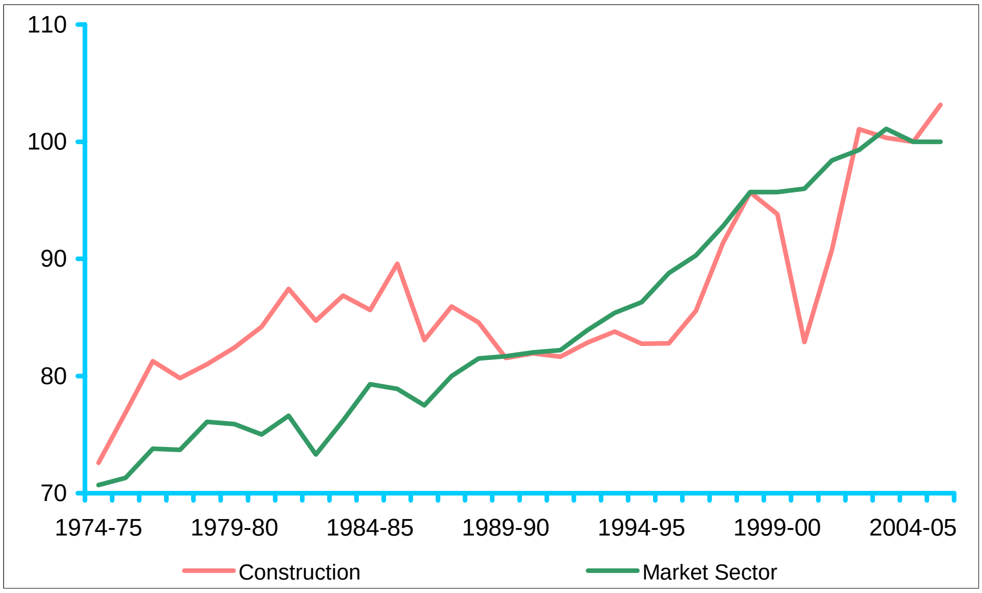
In contrast, MFP and TFP are more holistic measures of productivity because they identify contributions of different inputs to output. MFP identifies the contributions of both capital and labour to output. Further, it takes into account changes in the mix of capital and labour overtime. TFP measures the contributions of all inputs – labour, capital and intermediate inputs.

Multi-Factor Construction Industry Productivity

This section examines changes in multi-factor productivity (MFP) in the construction industry using aggregate data from the Productivity Commission (PC) and the ABS. The PC calculates indexes of productivity in 12 industry sectors. The estimates are based on unpublished data provided by the ABS.

Chart 5.5 compares multifactor productivity (MFP) in the construction industry with MFP in the market sector as a whole from 1974-75 to 2005-06. While productivity for the market sector has followed a fairly steady upward trend, productivity in the construction industry was fairly flat through the 1980s and 1990s. However, construction industry productivity then strengthened considerably to achieve a higher level for the four years from 2002-03 to 2005-06. This confirms the strong construction industry productivity performance of recent years already seen using labour productivity in Chart 5.4.

Chart 5.5
Construction Sector Multifactor Productivity, 1974-75 to 2005-06 (2004-05 = 100)



Source: Productivity Commission 2006, *"Productivity Estimates to 2005-06"* and ABS *"Australian System of National Accounts 2005-06".*

The aggregate productivity measures examined in this section provide useful information about the overall changes in the construction sector's productivity. Nonetheless, it is important to recognise that a limitation of the productivity measures reported in this section is that they refer to the entire construction industry. As such, annual variations in productivity not only reflect changes in underlying productivity, but also compositional changes in the construction industry between residential building, non-residential building and engineering. For example, an upswing in the relatively labour-intensive residential building component, or a downswing in the relatively capital-intensive engineering component, will reduce the measured labour productivity of the construction industry as a whole, even if underlying productivity does not change.

Even after taking account of these limitations, the trends in the aggregate productivity data are considered to be broadly consistent with the positive impacts attributable to the activities of the ABCC and the supporting regulatory framework.

6. Modelling the Impacts of the ABCC

This section provides details of the modelling approach used to estimate the economy-wide impacts of the activities of the ABCC. The section is structured as follows. Section 6.1 summarizes a previous study on the scope for productivity gains from industrial reforms in the construction industry. Section 6.2 outlines the scenarios that are simulated using MM600+ to quantify the economic contribution of the activities of the ABCC. Section 6.3 outlines the main data inputs that Econtech uses to build the alternative scenario and describes how these inputs are derived. Section 6.4 discusses the main features of the economic model (MM600+) that is used to estimate the economic contribution of the activities of the ABCC.

6.1 Previous studies

In February 2003, Econtech prepared a report for the Department of Employment and Workplace Relations (DEWR) titled "Economic Analysis of the Building and Construction Sector". This report estimated the scope for improving the productivity of the building and construction industry through workplace reform initiatives and the economy-wide impact of those improvements in productivity.

The 2003 Econtech study analysed the cost differences for the same standard building tasks between commercial buildings and domestic residential buildings. Using Rawlinson's authoritative quantity surveyor data, Econtech found that building tasks such as laying a concrete slab, building a brick wall, painting and carpentry work cost an average of 10 per cent more for commercial buildings than domestic residential housing. This difference was mainly attributed to differences in work practices between the commercial and domestic residential building sectors.

A CFMEU-sponsored study by Toner (2003) criticised Econtech's report and argued that the cost gap between the commercial and domestic residential building sectors was due to structural factors, not restrictive work practices. The structural factors suggested were greater on-site complexities, higher capital intensity and higher profit margins in the commercial building sector compared with domestic residential building. Nonetheless, if the hypothesis presented by Toner that the cost gap was due to structural factors were true, then the cost gap would be expected to persist, whereas this report showed in section 5.1 that it has largely closed in recent years.

The 2003 Econtech report showed that there was significant scope to increase productivity in the building and construction sector of the economy through initiatives such as workplace reforms. In particular, the analysis found that:

- bringing workplace practices in the construction of commercial buildings in line with those applying in domestic residential building had the potential to increase labour productivity in the construction of commercial buildings by around 13 per cent, which would reduce construction costs for commercial buildings by about 6 per cent;
- similar workplace reforms in the engineering construction sector had the potential to increase labour productivity by around 6.5 per cent and reduce engineering construction costs by around 3 per cent; and

- bringing workplace practices more into line with international best practice had the potential to improve productivity even further.

In comparison with the 2003 study, this Econtech study uses a similar methodology to examine the change in building and construction industry productivity that can be attributed to the activities of the ABCC (including the interim Building Industry Taskforce). That is, while the 2003 study estimated the *potential* gains that could be achieved through workplace reform initiatives, this report estimates the *actual* gains that can be attributed to the activities of the Taskforce and the ABCC.

6.2 Scenarios

To simulate the economic impacts of the activities of the ABCC, the following two scenarios are modelled:

- a "Baseline Scenario" where the ABCC does not exist; and
- an "ABCC Scenario" which reflects a situation where the ABCC does exist.

Differences in economic outcomes between the ABCC Scenario and the Baseline Scenario are calculated to determine the economic contribution of the activities of the ABCC.

The main inputs for each of the scenarios are discussed in detail below.

6.3 Model Inputs

As explained in section 5, from the recent closing of the cost gap between commercial building and domestic housing, the estimated gain in construction industry labour productivity attributed to the activities of the ABCC and industrial relations reforms is 9.4 per cent. The estimated gains in labour productivity for the various sectors of the building and construction industry are shown in Table 6.1. More details can be seen in Table 5.3.

Table 6.1
Simulated Gains in Labour Productivity (per cent)

	Scenario 1
Total non-residential construction	12.2
Non-residential building	*17.6*
Engineering construction	*8.8*
Total residential building	5.3
Domestic residential building	*0.0*
Multi-unit residential building	*17.6*
Total construction	**9.4**

Source: Econtech estimates

6.4 MM600+ Model

The economy-wide contributions of the activities of the ABCC and of the industrial relations reforms were estimated using the MM600+ model.

MM600+ is a long-term computable general equilibrium (CGE) model of the Australian economy that models a long-run equilibrium (approximately 5 to 10 years). It distinguishes

108 industries that produce 672 products, making it six times more detailed than any comparable model. In particular, the model contains two construction industries producing eight products. The eight construction products in the model are:

1. residential building construction;
2. repair and maintenance of residential buildings;
3. non-residential building construction;
4. repair and maintenance of non-residential buildings;
5. road and bridge construction;
6. repair and maintenance of roads and bridges;
7. engineering construction other than roads and bridges; and
8. repair and maintenance of engineering construction other than roads and bridges.

The model has many other features that make it well suited for this analysis. Some of these features are detailed below.

- It estimates the effects of productivity changes on key macroeconomic aggregates such as GDP, exports, imports, consumption and investment.
- It breaks down the effects of productivity changes into 108 industries and 672 products. This means that the model is able to estimate the impacts of productivity gains in the building and construction industry and other industries and products.
- For each industry and product, it produces comprehensive results including for production, employment, consumption, trade flows and prices.
- It provides valid measures of changes in consumer welfare or living standards based on compensating and equivalent variations so that policy changes can be correctly evaluated in terms of the public interest.

The alternative scenarios modelled in this report are based on the standard long-run closure of the MM600+ model. Thus, the long-run closure shows the long-term effects of policy changes, after the economy has fully responded. This is fitting because economic policies should be judged against their lasting effects on the economy, not just their effects in the first one or two years. Some of the assumptions underlying the MM600+ long-term closure are as follows:

- Profit maximisation: the representative business in each industry chooses inputs and outputs to maximise profit subject to prices and a production function exhibiting constant returns to scale.
- Labour market equilibrium: in the long-run the labour market is assumed to attain equilibrium, so that an economic shock has no lasting effect on total employment.
- External trade balance: in the long-run, external balance is assumed to be achieved, so that trade shocks have no lasting effect on the trade balance.
- Budget balance: in the long-run fiscal policy must be sustainable, and in MM600+ this is achieved by assuming budget balance.
- Private saving: in the long-run the level of private sector saving and associated asset accumulation must be sustainable.

More detailed information about MM600+ is presented in Attachment A.

7. Economic Impact of the Activities of the ABCC

The previous section described the scenarios that were simulated using MM600+, outlined the main data inputs that Econtech used to build the scenarios and described how these inputs were derived. This section provides the results of modelling the economic impacts of the activities of the ABCC at three different levels, as follows.

- Section 7.1 describes the detailed economic impacts on the building and construction industry.
- Section 7.2 describes the wider industry impacts of the activities of the ABCC.
- Section 7.3 presents the average annual economy-wide impacts of the activities of the ABCC.

Importantly, the results presented in this section refer to permanent effects on the levels, not growth rates, of indicators relative to what they otherwise would be. This means, for example, that a gain of 1.5% in the level of GDP is interpreted as the increase in GDP relative to what it would otherwise be, and not the annual growth rate.

7.1 Building and Construction Industry Effects

This section presents the economic impacts on the building and construction industry of increased labour productivity in the industry stemming from the activities of the ABCC.

On considering the effects on the construction industry itself of higher construction productivity due to the ABCC activities, it is important to distinguish between residential construction and non-residential construction.

Chart 7.1 shows the estimated long-term effects on residential construction. These effects are driven mainly by the assumed increase in labour productivity in residential construction of 5.3 per cent which is solely attributable to increased labour productivity in the multi-unit component of the residential construction sector.

The boost in labour efficiency in the residential construction sector reduces the costs of production in this sector relative to what they would otherwise be. While labour efficiency rises by 5.3 per cent, there is no change in the efficiency of the other inputs of capital and materials, leading to an overall cost reduction of 3.2 per cent, as shown in Chart 7.1. The price of dwellings falls by a similar percentage.

Lower prices lead to an increase in the demand for residential building construction. This, in turn, boosts construction activity in this industry. Indeed, Chart 7.1 shows a long-term increase in construction activity of 2.3 per cent in this sector relative to what it would otherwise be.

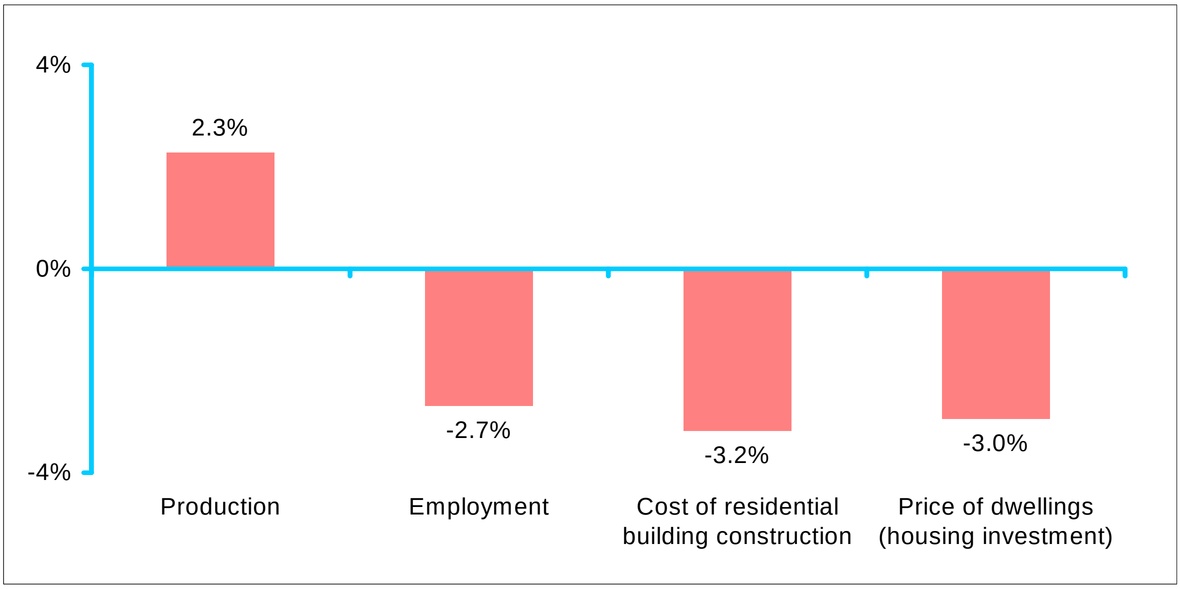
Employment in residential construction is affected by three separate factors.

- The assumed gain in labour efficiency of 5.3 per cent reduces employment by a similar percentage, for an unchanged level of activity (“labour saving effect”).
- The rise in activity of 2.3 per cent adds a similar percentage to employment (“output effect”).

- The gain in labour efficiency makes labour cheaper, inducing some substitution of labour for capital ("substitution effect").

The negative effect on employment of the labour saving effect dominates the positive effects of the output and substitution effects, leaving a net loss of 2.7 per cent in residential building employment in the long-term. However, there is no net impact on national employment, which is assumed to be unchanged as a standard long-run assumption of the model, as explained in section 6.4. Therefore, there are short-term adjustment costs from job shifting from construction to other industries, but there is no long-term loss in national employment.

Chart 7.1
Effect of Increased Efficiency on Residential Construction
(% deviation from baseline)



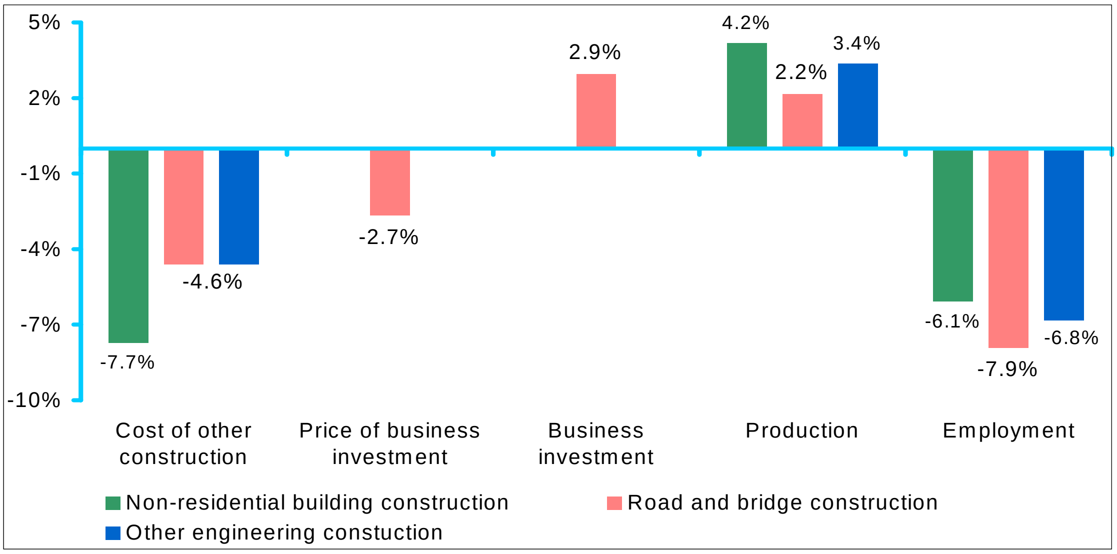
Source: Econtech MM600+ simulation

The effects on the non-residential side of the construction industry are shown in Chart 7.2. As shown in Table 6.1, these effects are based mainly on assumed increases in labour efficiency of 17.6 per cent for non-residential building and 8.8 per cent for engineering construction, giving an overall increase for non-residential construction of 12.2 per cent in the long-term relative to the situation in the absence of the reforms.

Because of its larger assumed gain in labour efficiency, the cost reduction for non-residential building is larger than for engineering construction, including both roads and bridges and other engineering construction. Because construction represents a major part of business investment, this flows through to a significant fall of 2.7 per cent in the overall cost of business investment, as seen in Chart 7.2.

Cheaper business investment stimulates a lift in the overall level of business investment of 2.9 per cent, which includes a rise in construction. Cheaper construction provides a further boost to construction activity, by shifting the composition of business investment in favour of construction. The resulting long-term gains in construction activity range from 2.2 per cent for roads and bridges to 3.4 per cent for other engineering and 4.2 per cent for non-residential building, as shown in Chart 7.2.

Chart 7.2
Effect of Increased Efficiency on Other (Non-Residential) Construction
(% deviation from baseline)



Source: Econtech MM600+ simulation

Similar to residential construction, the increase in labour efficiency in non-residential construction affects employment in three separate ways. Again, only about one-half of the negative labour saving effect is offset by positive output and substitution effects. This leaves net employment losses in non-residential construction of 6 or 7 per cent. As with residential construction, there is no net impact on national employment, which is assumed to be unchanged as a standard long-run assumption of MM600+. Rather, there are short-term adjustment costs from job shifting from construction to other industries.

Overall, the results presented in this section show that the increase in productivity stemming from the activities of the ABCC has provided significant permanent gains to the construction industry. These gains range from 2.3 per cent for residential building to 2.2 per cent for road and bridge construction, 3.4 per cent for other engineering construction and 4.2 per cent for non-residential building. At the same time, these permanent long-term gains in construction activity have been accompanied by short-term adjustment costs due to job shifting from construction to other industries.

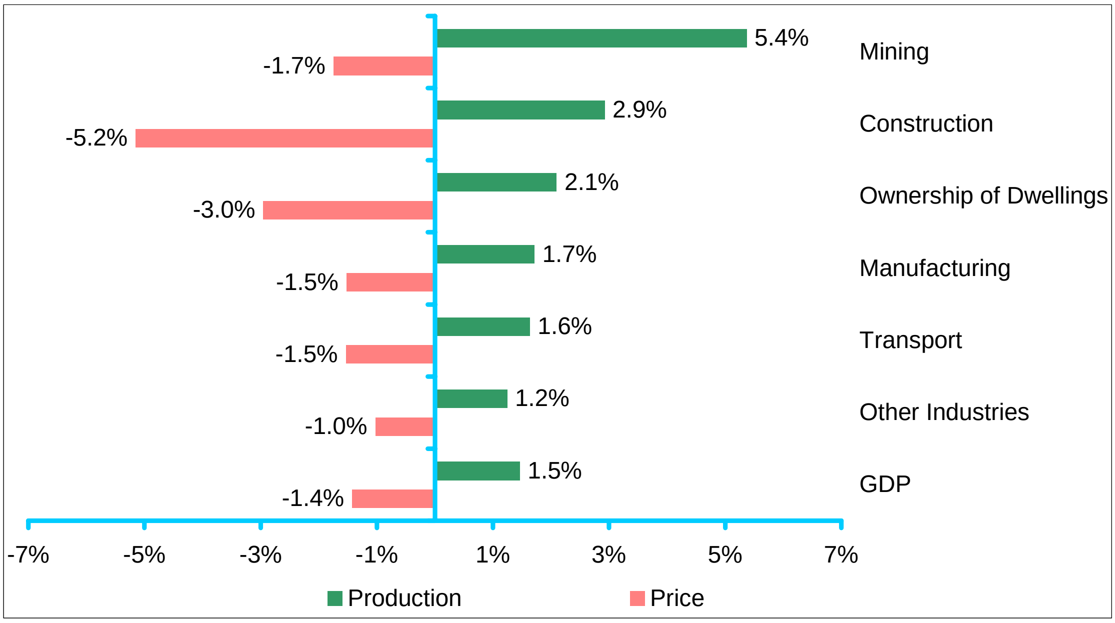
Note that the loss in construction industry employment is relative to a baseline scenario without reform and does not mean that there is a fall in construction employment from one year to the next. Indeed, construction employment has actually grown strongly in every year from 2001-02 onwards during the reform process.

7.2 Wider Industry Effects

The change in activity in the building and construction industry is expected to affect activity in other industries. This section outlines the simulated wider industry production impacts of the activities of the ABCC on other industries. These effects are presented in Chart 7.3.

As discussed in Section 7.1, higher labour productivity reduces the price of dwellings by around 3 per cent (also shown in Chart 7.3), which flows through to a similar fall in the cost of housing services. This stimulates a long-term rise in demand for housing services ("ownership of dwellings") of 2.1 per cent, relative to what it otherwise would be, as shown in Chart 7.3.

Chart 7.3
Effect of Increased Efficiency in the Construction Industry on Production in Other Industries (% deviation from baseline)



Source: Econtech MM600+ simulation

The detailed effects within the construction industry itself were discussed in Section 7.1. These effects add up to an average fall in construction costs of 5.2 per cent and a rise in construction activity of 2.6 per cent, as shown in Chart 7.3. These are average effects only. As explained before, the production gains are lower for residential building and road and bridge construction, and higher for non-residential building and other engineering.

As discussed in the previous section, the price falls for construction flowing from productivity gains reduce the overall cost of new business investment by 2.7 per cent. This is of particular benefit to relatively capital intensive sectors. Chart 7.3 shows that mining and transport receive cost savings that reduce prices by 1.7 and 1.5 per cent respectively. Because of the price-sensitive nature of demand for these industries products, this price reduction leads to significant production gains.

For the economy as a whole, production costs are down 1.4 per cent, while production volumes are up 1.5 per cent, relative to what they would otherwise be. The long-term production gains are widespread but largest in the construction industry itself.

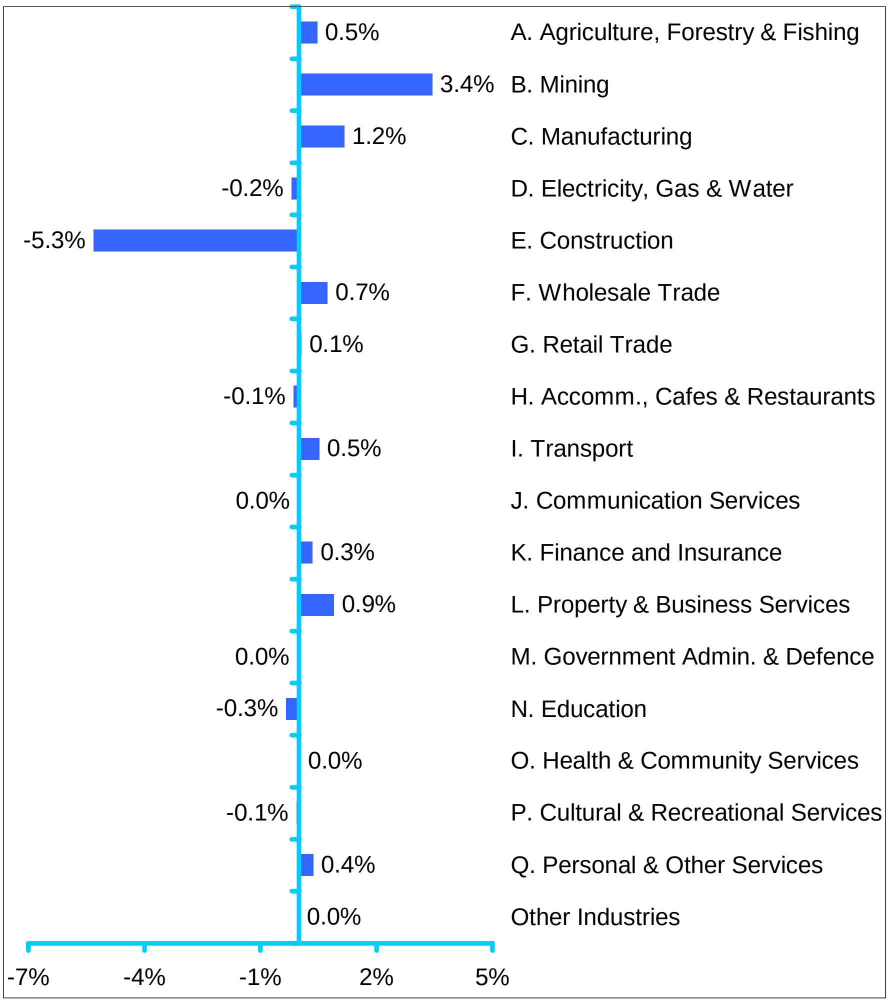
Chart 7.4 shows the pattern of industry job shifting induced by higher productivity in the construction sector. While employment in construction is down, the effect of this on national employment is fully offset by employment gains in other industries.

The biggest employment gain is in the mining industry, which rises by 3.4 per cent. This is a direct effect of the gains in production discussed above. The second highest percentage gain is a 1.2 per cent rise in employment in the manufacturing industry, which is also a result of the boost in production in this industry shown in Chart 7.3 above.

As discussed in Section 7.1, employment in the construction industry is expected to fall, with the negative labour saving effect only partly offset by the positive output and substitution effects in this industry. Minor reductions are also expected in employment in some of the other industries. These reductions are the result of labour moving away from these industries and towards the industries that achieve greater production gains as a result of the cheaper business investment.

Chart 7.4 also shows that, overall, there is no change in the level of employment in the economy. As explained in Section 6.4, national employment is assumed to be unchanged as a long-term modelling assumption. This is a conservative assumption. In fact, the activities of the ABCC have the potential to reduce unemployment and raise employment on a permanent basis, by adding to the flexibility of the construction labour market.

Chart 7.4
Effect of Increased Efficiency in the Construction Industry on Employment in Other Industries (% deviation from baseline)



Source: Econtech MM600+ simulation

7.3 National Macroeconomic Effects

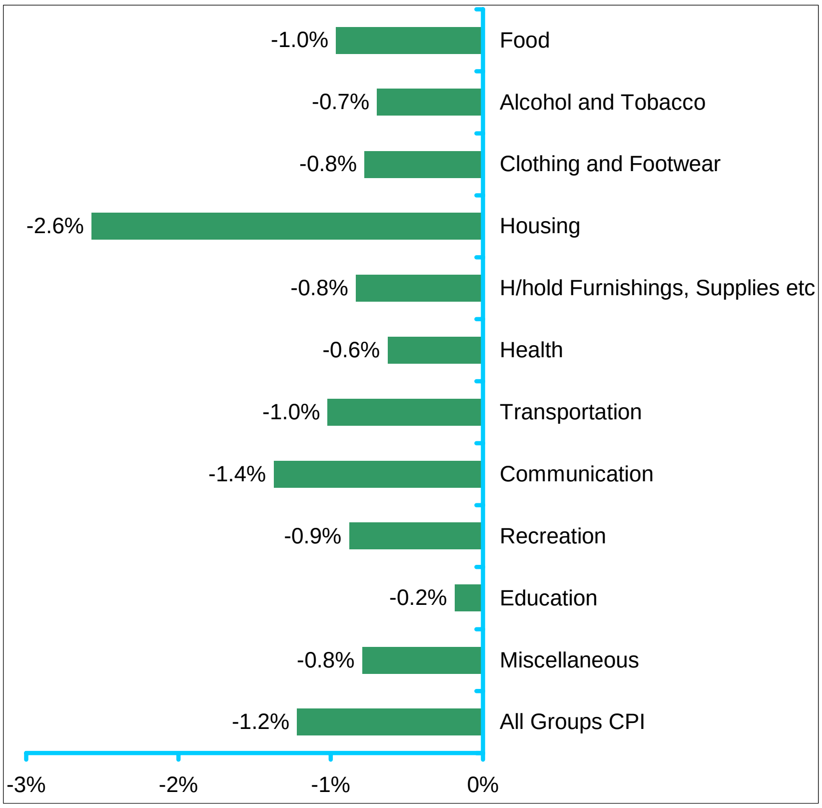
As explained in the previous sections, higher construction productivity leads to lower construction prices. This flows through to savings in production costs across the economy, because all industries are reliant on construction to some extent as part of their business investment. As shown in Chart 7.3, the average saving in production costs is reflected in a reduction in prices of 1.4 per cent.

This flows through to similar savings in consumer prices. Chart 7.5 shows a fall in the Consumer Price Index (CPI) of 1.2 per cent, resulting from the gains in construction productivity. It also shows the long-term price falls for each of the groups that make up the CPI.

The biggest saving is in the price of housing services, which falls by 2.6 per cent in the long-term. This is a direct effect of gains in labour productivity on the multi-unit side of the residential construction industry. The second biggest saving is a fall of 1.4 per cent in the communication services group of the CPI. Construction costs, including laying telecommunications cables and building mobile phone towers, account for a large share of the cost of providing communication services.

There are also price falls for every component group of the CPI. The smallest fall, of 0.2 per cent, is for education services, because education services are generally produced using methods that are labour-intensive rather than capital-intensive.

Chart 7.5
Effects on Consumer Prices (% deviation from baseline)

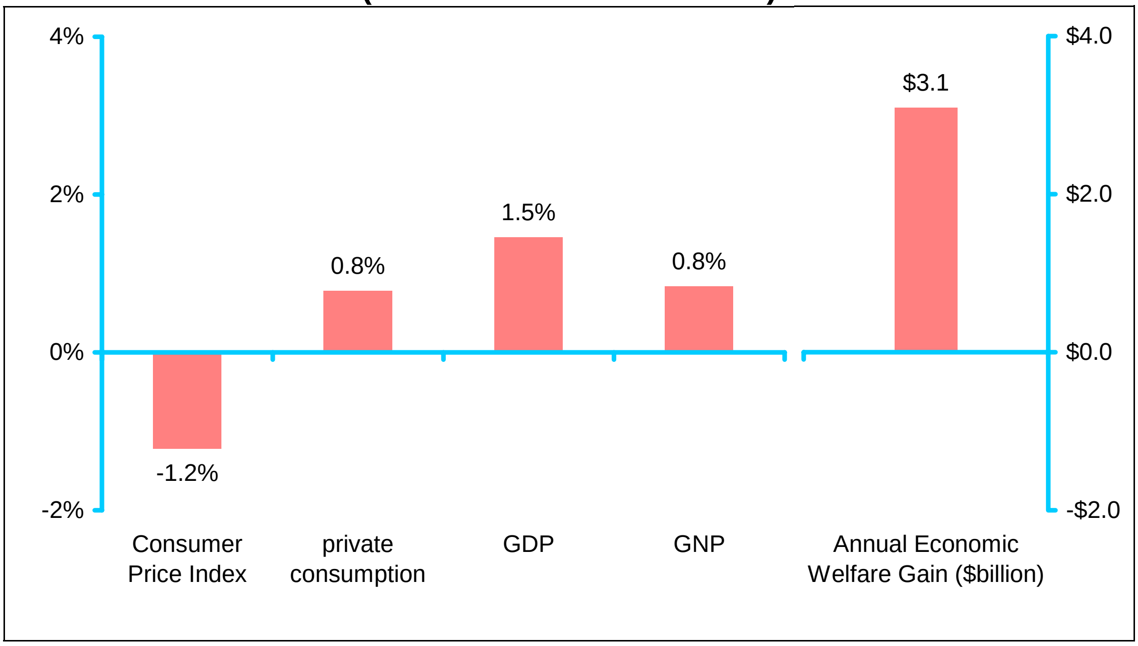


Source: Econtech MM600+ simulation

Chart 7.6 shows the effects of higher construction productivity on other economy-wide indicators. The fall of 1.2 per cent in the CPI leads to a gain in real consumption of 0.8 per cent. That is, lower living costs lead to higher living standards.

This gain in living standards is more rigorously measured as an annual gain in consumer welfare. MM600+ provides estimates of the change in annual economic welfare by using the compensating variation and equivalent variation methodology from welfare economics. These are alternative measures of the gain in real consumption. Chart 7.6 shows the higher construction productivity leads to an increase in consumer living standards (the annual economic welfare gain) of about $3.1 billion.

Chart 7.6
National Macro-economic Effects
(% deviation from baseline)



Source: Econtech MM600+ simulation

Chart 7.6 also shows a 1.5 per cent increase in the level of GDP in the long-term, relative to what it otherwise would have been in the absence of the reforms. This gain was reported earlier in Chart 7.3 as the gain in production for all industries added together. Production gains for individual industries can be seen in the same chart. Real GNP is estimated to rise by a little less at about 0.8 per cent.

Attachment A – A Guide to Econtech's Murphy Model 600 Plus (MM600+)

This Appendix provides a guide to Murphy Model 600 Plus (MM600+).

Type of Model

MM600+ can be compared with MM2, Econtech's economic forecasting model. Econtech first forecasting model was MM, developed in 1987/88, followed by two versions of MM2, the first in 1994 and the second in 1996. These models are based on quarterly data. Comprehensive dynamic structures are used in generating quarter-by-quarter forecasts of the economy extending nine years into the future. Econtech distributes MM2 in MM Simulator for Windows software, which is widely used by businesses and governments to produce their own forecasts and scenarios for the Australian economy.

Econtech's first industry model, MM303, was developed in 1997/98. It was then upgraded to MM600+ in 1999/00 under a contract to the Australian Competition and Consumer Commission. These models are based on a very detailed picture of the industrial structure of the economy that can only be found in the input-output tables published by the ABS. MM600+ uses the unpublished version of these tables to distinguish the production of 672 products by 108 industries. MM600+ is currently implemented in Excel and is used by Econtech in project consulting engagements for businesses and governments.

In developing two different types of economic models for forecasting and industry work, Econtech has followed a "horses for courses" approach. The forecasting model, MM2, provides quarter-by-quarter results but only distinguishes 18 industries. The industry model, MM600+, distinguishes 672 products, but only provides short-term and long-term results. It is not practicable to integrate both models into a single "super" model that provides quarter-by-quarter results for 672 products because quarterly ABS data are not available at that fine level of product detail.

MM600+ can be compared with other industry models such as the PRISMOD model of the Department of the Treasury and the Monash Model of the Centre of Policy Studies at Monash University in three key areas:

- detail;
- coverage; and
- time dimension.

MM600+ has a high level of detail in terms of both products and indirect taxes.

In MM600+, 108 industries produce 672 products. The other two models distinguish about 110 products.

MM600+ distinguishes 24 types of existing indirect taxes plus a GST of any design. This is similar to PRISMOD, while Monash has less tax detail with three types of existing indirect taxes and no GST.
Turning to economic coverage, MM600+, like Monash, is a computable general equilibrium (CGE) model, giving it wide coverage of the Australian economy. While PRISMOD covers only industry costs and prices, MM600+ and Monash also cover industry production and employment.

The third and final area of model comparison is the time dimension. As explained in sections 6 and 7, MM600+ provides estimates of both short-term and long-term effects. By comparison, PRISMOD provides estimates of long-term effects only. While Monash does not provide estimates of long-term effects, it does provide estimates of year-by-year effects.

Table A.1
Model Comparison

Model	MM600+	PRISMOD	Monash
Products	672	107	about 110
Indirect taxes	25	similar	3
Coverage	prices, production	prices	prices, production
Time dimension	short & long term	long-term	annual

CGE modelling is well-established in Australia due mainly to the pioneering work of Peter Dixon in developing the ORANI model and then the Monash Model.

While some Australian CGE models are adaptations of Dixon's ORANI model, MM303/MM600+ was developed from scratch. At the same time, there are similarities between the models.

This is partly because ORANI and MM600+ are both in the CGE family, and therefore model computable, market-clearing outcomes under optimising behaviour. Similarly they both inevitably rely on input-output tables published by the ABS.

It is also because Dixon's work, as reported in Dixon, Parmenter, Sutton and Vincent (1982) and Dixon, Parmenter, Powell and Wilcoxen (1992), was an important source of ideas for MM600+ such as:

- import demand for each commodity is modelled in three categories: intermediate goods, consumption goods, and investment goods; and
- there is a detailed treatment of distribution margins.

The ORANI model also has some ideas not found in MM600+, including some refinements specific to agriculture. Equally, MM600+ has some ideas not found in ORANI/Monash, including an extended range of economic choices or behavioural responses, as discussed in section 5.

Beyond these similarities and differences in ideas, the main differences between the two models are in the areas of detail and time dimension, as already summarised in Table A.1.

Implementation of Model

Implementing MM600+ involved constructing a database, choosing a software environment, setting up a baseline simulation, and then putting the model into action performing simulations of actual or proposed economic shocks.

Econtech obtained a special series of the input-output tables from the ABS. In these unpublished tables, 107 industries produce about 1,000 products, compared with the published tables which only distinguish 107 products i.e. one product per industry. The unpublished tables also include a series of special tables containing extra detail on indirect taxes.

In constructing the database for MM600+, the ABS input-output data were manipulated to give an exactly-balanced, economically meaningful database. This included the following adjustments:

- aggregating from about 1,000 products to 672 products;
- treating "Sales by Final Buyers" as sales of used cars;
- constructing a travel composite commodity, used in modelling export demand for inbound travel in Australia;
- identifying household and business import demand for Australian travel overseas.
- balancing industry usage with product supply;
- imputing labour income to employers and self-employed; and
- allocating inventory investment.

Turning to the topic of software environment, MM600+ is implemented in Excel. The database is constructed in a series of workbooks linked backed to raw ABS data, which is also in the form of Excel workbooks. This implementation gives easy access to all model inputs, outputs and equations. Thus all inputs and equations can be altered and all outputs can be viewed.

MM600+ is specified in levels as a non-linear system, not in changes as a linear system, so model solutions are always exact. It is solved iteratively in Excel using Excel's standard iterative method for resolving "circular references". A model simulation in Excel under a very tight convergence criterion[26] takes about 30 minutes and involves about 500 iterations of the model.

Simulations of economic shocks involve varying the values of one or more model inputs relative to their baseline values. With open access to all model inputs, a wide variety of shocks can be conducted. These can involve virtually any shift in technology, tastes, foreign demand or taxation.

To enable more sophisticated analysis of the welfare effects of taxation and other reforms, the model provides for positive/negative externalities in consumption for each product, the values for which can be set by the model user.

Product Detail

As noted in the previous section, in the input-output tables published by the ABS, 107 industries produce 107 products.

In building MM600+, Econtech decided to incorporate a higher level of product detail than found in the published input-output tables. This is available in unpublished input-output tables that we obtained in electronic form from the ABS. The ABS derives the published tables by aggregating from these more detailed unpublished tables.

[26] For example, for convergence, annual GDP, which is about $500,000,000,000, can change by no more than $1,000 from the previous iteration, implying a precision of 1 in 500,000,000.

While the unpublished tables include about 1,000 detailed products, some aggregation was necessary because some data for detailed products are censored by the ABS to protect the confidentiality of individual companies. However, aggregation was kept to a minimum. This gave the 672 products that appear in MM600+ .This is the maximum achievable level of product detail.

The high level of product detail in MM600+ has many advantages. In commissioning MM600+ as a further development of Econtech’s earlier CGE model, MM303, the ACCC requested the high level of product detail so that model estimates could serve as a more useful point of comparison in the ACCC's price monitoring work.

The high level of product detail also means that many policy changes can be analysed without the need for further disaggregation. For example, petrol and diesel are distinguished from other petroleum products, making it easier to accurately model the changes in fuel taxation under the New Tax System, as these tax changes are different for petrol, diesel and other fuels.

It also means that the gains from some micro-economic reforms can be more fully captured. For example, a finer level of disaggregation better reveals the diversity in rates of customs duty, leading to more reliable estimates of the gains from tariff reforms that produce benefits by reducing this diversity.

Tax Detail

The treatment of taxation is particularly detailed in MM600+. The model distinguishes 24 different indirect taxes on industry production and products, as listed below. These can each be varied either universally, or as they apply to each industry or product or end purchaser. In addition, MM600+ provides for a GST, under which each product/industry can be classified as taxable, input-taxed or GST-free.

Production Taxes	Product Taxes
Land Tax	GST
LGA Rates	Sales tax
Liquor & Gambling Taxes	Stamp Duty
Payroll Tax	Gambling Taxes; Former State Licence Fees
Taxes on Insurance	Primary Production Taxes
Motor Vehicle Taxes	Regulatory Service Fees
Stamp Duties	Excise Taxes
Taxes on use of goods etc	Motor Vehicle Taxes
Fringe Benefits Taxes	Financial Institution Duties
Departure Tax	Customs Duty on Exports
Other Indirect Taxes nec	Other Commodity Taxes
Total Subsidies	Commodity subsidies
	Customs Duty on Imports

This high level of indirect tax detail is only possible because MM600+ uses the unpublished input-output tables. While these unpublished tables distinguish 24 categories of indirect taxes, the published tables distinguish only three categories.

In modelling the changeover to the New Tax System, it was important to accurately represent the application to industries and products of sales tax, GST and fuel taxes.

The ABS input-output tables have significant shortcomings in their application of sales tax to products. For example, they do not allow for the “aids to manufacture” exemption on sales tax on inputs into the agriculture, mining, manufacturing and utilities industries. They also overstate sales tax collections on motor vehicles.

Also, obviously the input-output tables do not incorporate the just-introduced GST.

To address these sales tax and GST areas, Econtech commissioned a review by KPMG of the wholesale sales tax and GST treatments of each of the 672 products appearing in the model. We also built in the “aids to manufacture” exemption form sales tax. These tax assumptions were in turn reviewed by the ACCC in conjunction with the ATO.

The remaining significant complication in accurately modeling the changeover to the New Tax System is the complex nature of the changes to fuel taxation. MM600+ takes into account that changes in diesel fuel tax are different in each on the following areas:

- qualifying road use;
- non-qualifying road use;
- rail and marine transport;
- agriculture and fishing use;
- mining use; and
- other non-transport use.

MM600+ also takes into account that *ANTS* does not include any cuts to taxation of fuel used in air transport, including both aviation turbine fuel and aviation gasoline.

Economic Choices and Elasticities

MM600+ models how changes in relative prices affect economic choices, leading to changes in the industry pattern of production and employment. The main price-sensitive choices in the model involve:

- business choice between labour and capital;
- business choice between different types of capital;
- business choice between different forms of energy;
- business choice between road and rail freight transport;
- business choice of its size;
- choice between import and local sources of supply;
- business choice between local and export destinations for sales;
- consumer choice between broad commodity groups;
- consumer choice within broad commodity groups; and
- demand for Australian exports.

In modelling economic choices, values need to be assigned to the elasticities that govern the sensitivity of each choice to changes in relative prices. The following explains each of the economic choices listed above in more detail and also gives the associated values for the elasticities. The only elasticities not presented below are trade elasticities.

Substitution between labour and capital

The elasticity of substitution between labour and capital in production in each of the 108 industries is set to 0.75 in MM600+, consistent with Econtech's econometric research for MM2.

Substitution between different types of capital inputs

MM600+ provides for substitution between different types of business capital e.g. motor vehicles, computers, buildings etc. Business holdings of motor vehicles and computers are price sensitive, making it important to allow for substitution between different forms of business capital.

In MM600+ the elasticity of substitution between different forms of business capital is set at 0.5. In modelling this substitution, the user cost of each form of capital is calculated by applying a required rate of return plus a depreciation rate to the price of new investment, where both the depreciation rate and the price of new investment vary from one form of capital to the next.

Substitution between different forms of energy

MM600+ allows for substitution by business between different forms of primary energy, including black coal, brown coal, LPG and natural gas. Allowing for these substitution possibilities is vital when assessing the economic effects of energy development projects, or in examining greenhouse gas emission issues.

For most industries, the elasticity of substitution between forms of primary energy is set to 4.5. The exception is the electricity industry, where the elasticity has been set to 6, to reflect the high sensitivity of the choice of type of electricity generation to the relative cost of different forms of energy.

Substitution between road and rail freight transport

MM600+ allows for substitution by industry between road and rail freight transport. It does this by drawing on earlier work by the Industry Commission, incorporated in the ORANI-HILMER model, on the elasticity of substitution between road and rail freight transport. For most products this elasticity is set to 2, but lower values are used for some products. Substitution between freight transport modes is modelled both for transport from business to business (or importer to business) and from business to export wharves.

Business choice of its size

In MM600+, the representative business in each industry selects its size to minimise unit costs. The small business exemption from payroll tax distorts this choice so that in each industry the selected size is less than the technically efficient size.

In modelling the technically efficient size, it is assumed that for the representative business in each industry the need for primary factors (i.e. capital and labour), F, depends on its level of output, Q, according to the following equation.

$$F = Q + a.(QC–Q) + a.Q.\ln(Q/QC)$$

For technical efficiency, Q=QC. The sensitivity of efficiency to variations in Q away from QC is given by the parameter a. Fuss and Gupta, analysed 91 Canadian manufacturing industries and found that there was an average loss of efficiency of about 4 per cent from operating at one-half of the technically efficient scale. Using that result, in MM600+ the parameter a has been set to equal 0.13 in each industry.

In most states, payroll tax is calculated by applying the payroll tax rate to the business wage bill net of a tax-free threshold. This threshold provides a larger reduction in unit cost for smaller businesses than for larger businesses, distorting the choice of business size.

The technically efficient business size, QC, was then set separately for each industry so that the model correctly predicts industry payroll tax collections. This involves using the corollary of the fact that industries dominated by small businesses do not pay much payroll tax because of the tax-free threshold.

The model has been used to examine the distorting effect of the small business exemption from payroll tax on business size in an Econtech report of 23 June 1998 for the Australian Chamber of Commerce & Industry on “Payroll Tax: Is it as Good as a VAT or as bad as sales tax?”.

Substitution between imports and local supply

As in the Monash Model, allowance is made for substitution between imported and local sources of supply for each importable commodity for each of three categories of end use. The categories of end use are: recurrent inputs; business investment; and other components of final demand. The values of the Armington elasticities governing this substitution were originally based on those used in the Monash Model in 1997, but some have been modified in the light of experience with MM600+.

Substitution of local producers between supplying the export and home markets

In modelling export supply, MM600+ distinguishes between the production of a commodity for the home market and production for the export market. For each commodity, an elasticity of transformation links production for the two markets.

To the extent that a commodity’s transformation elasticity is set to less than infinity (the value implicit in the ORANI model), an allowance if made for some friction in switching supply between the two markets. This friction may arise because some exported commodities are tailor made for export, or are more narrowly defined than the corresponding home commodity e.g. Australian consumers may eat all types of apples while we may only export Fuji apples to Japan — this affects the ability to switch supply between the two markets.

Based on model simulation experiments, the exports elasticity of transformation has been set to 0.5 for water transport and black coal, 1.5 for other minerals, and 2.5 for all other exports.

Substitution between broad consumption groups

Substitution between broad consumption groups is modelled in a linear expenditure system of consumer demand. The parameters of this system were estimated by Econtech using quarterly national accounts data extending from 1974-75 to 1996-97 and are set out in Table A.2. Implied price and income elasticities are also presented in Table A.2.

As expected, consumer demand for the following groups is income inelastic: food; cigarettes & tobacco; gas, electricity & fuel; fares; and operation of motor vehicles. Equally, consumer demand for the following groups is income elastic: financial services; other services; and personal travel imports (i.e. overseas holidays);

Table A.2
Consumption Group Parameters and Elasticities
Estimation Period: 1974.3-1997.2

		β	γ	Budget share	Income elast.	Price elas.	ν
A	Food	0.078	1320	14.5%	0.54	-0.34	-1.0
B	Cigarettes and tobacco	0.011	164	1.9%	0.57	-0.39	-0.5
C	Alcoholic drinks	0.040	187	4.1%	0.97	-0.65	-1.0
D	Clothing, fabrics and footwear	0.041	342	5.2%	0.78	-0.52	-0.5
E	Household appliances	0.031	93	2.9%	1.10	-0.73	-0.5
F	Other household durables	0.032	233	3.8%	0.83	-0.55	-0.5
G	Health	0.084	268	7.8%	1.08	-0.68	-0.5
H	Dwelling rent	0.208	531	18.4%	1.13	-0.62	-0.5
I	Gas, electricity and fuel	0.012	205	2.2%	0.52	-0.36	-1.0
J	Fares	0.010	160	1.8%	0.54	-0.37	-1.0
K	Purchase of motor vehicles	0.042	119	3.8%	1.11	-0.73	-0.5
L	Operation of motor vehicles	0.045	440	6.2%	0.72	-0.48	-0.1
M	Postal and telephone services	0.019	72	1.8%	1.03	-0.70	-0.5
N	Entertainment and recreation	0.038	314	4.9%	0.79	-0.52	-0.75
O	Financial services	0.054	1	3.9%	1.40	-0.92	-0.5
P	Other goods	0.093	67	7.1%	1.31	-0.82	-0.5
Q	Other services	0.130	-161	8.2%	1.59	-0.96	-0.5
R	Personal Travel Imports	0.032	-103	1.6%	2.03	-1.36	-0.5

Substitution within broad consumption groups

MM600+ also allows for substitution within broad consumption groups. Alcoholic drinks serves as an example. Clements et al. conclude that “the price elasticity of alcohol as a whole is about -1/2” (p.77). However, because of substitution between different forms of alcohol, price elasticities for individual alcoholic beverages are larger at –0.8, –0.7 and –1.9 for beer, wine and spirits respectively (p. 78). Thus it is important to allow not only for substitution between broad consumption groups, but also for substitution within consumption groups.

To allow for substitution within consumption groups, the consumer demand system in MM600+ is derived from a generalisation of the indirect utility function associated with the linear expenditure system. In this two-level generalisation, an intra-group substitution parameter, ν, appears which can take different values for different groups, as shown in the last column of Table A.2. This parameter is set to –0.5 for most groups (zero equates to no intra-group substitution, as in the Monash model). This value implies that the price elasticity for an individual consumption commodity is up to 1.5 times the size of the price elasticity for the consumption group in which it belongs.

Under this approach, consumer demand for consumption of commodity k in group i is given by the following equation.

$X_{ik} = \alpha_{ik}.\gamma_i + \phi_{ik}.(\beta_i/P_{ik}).(C - \Sigma P_j.\gamma_j).(Q_i/P_{ik})^{-\nu i}$

where:

$P_i = \Sigma \alpha_{il}.P_{il}$ for all i

$Q_i = [\Sigma \phi i_l.P_{il}^{\nu i}]^{1/\nu i}$ for all i

$\Sigma \alpha_{il} = 1$ for all i

$\Sigma \phi_{il} = 1$ for all i

$\Sigma \beta_i = 1$

Export demand

Export demand elasticities in MM600+ range from -4 for wool, where Australia has market power, and tourism, where product differentiation is important, to -12 for a broad range of exports. The pattern of elasticities for minerals and minerals processing were developed in 1998 in consultation with Malcolm Gray, a commodities consultant engaged by the Minerals Council of Australia.

Long-term Closure

MM600+ has two different closures frames — a short-term closure and a long-term closure — so that it can provide results from an economic shock for two different time frames. The long-term closure is described in this section while the short-term closure is described in the next section.

The long-term closure models a long-run equilibrium. For most economic shocks, the long run is likely to be attained in five to ten years.

In the long-run, economic agents optimise, all markets are in equilibrium, and assets and liabilities follow sustainable paths. Some of the key assumptions involved are:

- *profit maximisation*: the representative business in each industry chooses inputs and outputs to maximise profit subject to prices and a production function exhibiting constant returns to scale. This involves choosing inputs of capital and labour and outputs for the local and export markets;

- *labour market equilibrium*: in the long-run the labour market is assumed to attain equilibrium, so that an economic shock has no lasting effect on total employment. This assumption is implemented by fixing the level of total employment;

- *external balance*: in the long-run net liabilities to the foreign sector must follow a sustainable path. This assumption is implemented by setting the trade balance equal to the cost of servicing payments on foreign-owned capital — the real exchange rate needed to achieve this outcome is determined by the model;

- *budget balance*: in the long-run the budget balance must be sustainable. Specifically, in MM600+ the government budget is assumed to be in balance. It is necessary to designate a swing fiscal policy instrument to achieve that outcome. Generally, the rate of tax on labour income is used as the swing fiscal policy instrument; and

- *private saving*: in the long-run the level of private sector saving and associated asset accumulation must be sustainable. Further, one potential problem with long-run models is that saving (i.e. sacrificing present consumption for future consumption) can appear artificially attractive, because the model results show the gain in future consumption but not the sacrifice of present consumption. To address both of these issues, saving is held constant in MM600+ by fixing the quantity of capital that is owned locally.

MM600+ pays particular attention to the correct measurement of changes in national economic welfare. It uses the compensating variation and equivalent variation from welfare economics. These are alternative measures of the gain in real consumer spending.

More specifically, under a linear expenditure system model of consumer demand, these measures of welfare change virtually equate with changes in real supernumerary (or non-essential) consumption. Real supernumerary consumption is calculated by subtracting nominal "essential" consumption from nominal total consumption to obtain nominal supernumerary consumption, before deflating using the ideal price index for supernumerary consumption.

In MM600+ effects on vertical equity can also be measured. This is done by calculating movements in real supernumerary consumption for consumers at different income levels. In the results, the benefits of an economic reform are tilted towards low-income earners if the ideal price index for essential consumption falls by more than the ideal price index for supernumerary consumption.

Short-term Closure

The long-term closure factors in full adjustment of industry capital stocks to economic shocks, which is a protracted process that may take five to ten years.

Because of this lengthy capital stock adjustment process, short-term closures have been developed for economic models. These short-term closures hold industry capital stocks fixed.

In the case of MM600+, the short-term closure is different because it was developed under a contract to the ACCC to mimic the price exploitation guidelines issued by the ACCC in March 2000. Under these guidelines, businesses:

> "should not increase the net dollar margins on their goods and services as a result of the New Tax System changes alone".

While this rule applies to June 2002, the short-term closure is only designed for the introduction year of the New Tax System, 2000/01.

Under this short-term closure, the long-term closure is modified by holding fixed the price of capital services in each industry. This means that changes in the cost of non-capital inputs flow through fully into prices, but changes in the cost of capital inputs have no effect on prices.

This is a reasonable representation of the ACCC guidelines as they apply in 2000/01.

Under the guidelines, savings in the cost of capital inputs only need to be passed on into prices as existing capital is replaced. This would not occur to a significant extent in 2000/01, so it is reasonable to model the guidelines by holding fixed the cost of capital inputs.

Equally, the ACCC guidelines require that savings in the cost of non-capital inputs are passed on fully into prices, and this is also captured in the short-term closure.

The short-term closure is only designed to mimic the ACCC guidelines, not other short-term applications, where a more conventional short-term closure based on fixed capital stocks would need to be used.

A conventional short-term closure is similar in that changes in the cost of capital inputs would have no effect on prices. However, it differs in that only part of changes in the cost of non-capital inputs would flow through into prices, with the proportion varying from one product to the next depending on supply and demand elasticities in each market.

Applications

MM303/MM600+ has been used in modelling the changeover to the New Tax System as well as many other applications.

The changeover to the New Tax System has been modelled for:

- companies
- industry associations
- governments; and
- the ACCC.

Companies

MM303/MM600+ is the most widely used model for estimating the effects of the New Tax System on company costs. MM600+ services have been supplied to companies by Econtech itself as well as through Ernst & Young, KPMG and Firmstone & Feil. These taxation services have been used by major companies in each of the following industries.

- mining
- pharmaceuticals
- other manufacturing
- media
- water
- retailing
- hotels

- road transport
- rail transport
- communications
- banking
- insurance
- professional services

Industry Associations

Econtech has used MM303/MM600+ to analyse the effects of the New Tax System for the following industry associations.

- Australian Automobile Association
- Australian Chamber of Commerce & Industry
- Australian Bankers Association
- Australian Hotels Association
- Australian Pharmaceutical Manufacturers Association
- Distilled Spirits Industry Council of Australia
- Housing Industry Association
- Master Builders Australia
- Minerals Council of Australia
- Plastics and Chemicals Industry Association
- Printing Industry Association of Australia
- Water Services Association of Australia

Governments

Econtech developed the Econtech ANTS Savings Calculator, which has been used by the following governments for estimating the effects of the New Tax System on the costs of their agencies.

- Commonwealth Government
- New South Wales Government
- Victorian Government
- Queensland Government
- WA Government
- SA Government
- Tasmanian Government
- ACT Government
- NT Government

ACCC

- Under contract to the ACCC, Econtech further developed its MM303 model to produce MM600+.

- The ACCC has used the results from MM600+, together with industry information, in its Shopping Guide covering the likely effects of ANTS on about 200 consumer prices.

- The ACCC Small Business Cost Savings Estimator - a tool to help small business comply with the ACCC price exploitation guidelines - was developed for the ACCC by Econtech.

Other Applications

MM303/MM600+ was also used in the following industry policy consultancies.

- a study for Chevron of its proposed natural gas pipeline from PNG to Gladstone
- a study for a major corporation of a proposed shale oil project
- a study for an oil company of a possible business decision with major implications for the oil industry
- a study for the Australian Greenhouse Office on National Average Fuel Consumption
- a study for two oil companies of a proposed merger of their oil refining operations.