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An overview of productivity, business competitiveness and viability

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The contents of this paper are the responsibility of the authors and the research has been conducted without the involvement of members of the Minimum Wage Panel of Fair Work Australia.

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List of abbreviations

ABS	Australian Bureau of Statistics
ABN	Australian Business Number
ANZSIC	Australian and New Zealand Standard Industrial Classification
ATO	Australian Taxation Office
AWIRS	Australian Workplace and Industrial Relations Survey
BERD	Business Expenditure and Research and Development
BLD	Business Longitudinal Database
BLS	Business Longitudinal Survey
CURF	Confidentialised Unit Record File
EEH	Employee Earnings and Hours
GDP	Gross Domestic Product
HRMP	Human Resource Management Practices
ICT	Information and Computerised Technologies
IRRA	*Industrial Relations Reform Act 1993*
JLMC	Joint Labor-Management Committees
NFP	Not-for-profit
OECD	Organisation for Economic Co-operation and Development
R&D	Research and Development
UK	United Kingdom
US	United States
WRA	*Workplace Relations Act 1996*

Executive summary

This report provides an overview of existing research on productivity, business competitiveness and viability in Australia and examines measures of these at a national, industry and firm level, with a particular emphasis on award-reliant industries and firms.[1]

Overview of the research literature

This section reviews the concepts of productivity, business competitiveness and viability and presents a literature review on the determinants of productivity, which also influence business competitiveness and viability.

Productivity is the ratio of output of goods and services per unit of input. For labour productivity, input is labour, while for multifactor productivity it is typically labour and capital. While both indicators measure efficiency to some extent, multifactor productivity is the better indicator of efficiency, as it measures how effectively labour and capital combine to generate output.

For the labour market, higher labour productivity means that there is more capacity to provide higher wages, as firms have higher output and more revenue per unit of labour, other things being equal. In general terms, productivity is a key driver of living standards at the aggregate level, as productivity growth generates more output and income without any increase in inputs, which in turn makes goods and services more affordable.

The concept of competitiveness is difficult to define. In the market sector, business competitiveness as discussed at the micro level refers to the ability of the firm to increase in size, market share and profitability. At the industry level, this is measured by aggregating across firms within an industry.

While competitiveness is likely to affect business viability, which refers to whether the business can continue to survive or remain viable, this is not the case for all firm types. For example, competitiveness and viability in the non-market sector does not necessarily reflect that a firm is productive and generating profits. A firm in this instance remains competitive and viable for other reasons.

The literature reviews the determinants of productivity and how they affect business competitiveness and viability. The determinants reviewed are physical capital accumulation, research and development, technologies, innovation, human capital accumulation, firm organisation, management practices and work arrangements. The review also highlights that causality across these variables is unclear and remains a key issue for further research.

In addition, the section demonstrates that minimum wage adjustments may affect productivity through these determinants. For example, they may have the effect of increasing research and development or raising human capital accumulation, factors that enhance a firm's competitiveness and increase its chances of survival.

However, past research reveals that the overall effect of minimum wages on productivity for Australia is ambiguous, and there are different implications depending upon whether increased training or the substitution of low-skilled labour with high-skilled labour is driving the results. While theory suggests that minimum wages have an adverse impact on profitability and business closure rates, the evidence appears to be inconclusive.

1 Award-reliant employees are employees that are paid at the exact rate specified in an award.

Trends in productivity, competitiveness and viability at an aggregate and industry level

Measures of productivity growth have shown that before and after the productivity surge of the 1990s, Australia experienced a period of slow growth. An analysis of the data by industry demonstrates that sectors responsible for the upturn were also accountable for the slowdown in productivity. The data also show that award-reliant industries have relatively low levels of labour productivity. This is not unexpected because industries with low levels of labour productivity are generally labour-intensive industries with low wages and skill levels, and reduced bargaining power.

Indicators of business competitiveness have mostly remained constant over time. Award-reliant industries exhibit higher levels of competition, as evidenced by relatively low levels of market concentration and small profit margins, as well as relatively high proportions of businesses that report a loss over the course of a financial year.

Bankruptcy rates appear to have moderated after peaking in the 1990s. Approximately two-thirds of the businesses operating within award-reliant industries in June 2007 survived to June 2009, which is slightly below the average across all industries.

Analysis of productivity, business competitiveness and viability at the firm level

In 2005–06 and 2006–07, businesses that paid only award rates were more likely to report stable or decreased productivity and profitability, relative to non-award businesses and businesses that used a combination of awards and non-award arrangements. While most businesses had three or more competitors over the same period, businesses that used a combination of award and non-award agreements experienced higher levels of competition. In addition, businesses covered by non-award agreements only, were more likely to have less than 10 per cent of the market share. Throughout this period, approximately four in five businesses that only paid award rates of pay survived, which is lower than the survival rates of non-award and combination businesses.

However, the subjective nature of some of the measures used adds more uncertainty to these findings and the direction of causality remains ambiguous, as these data reflect in part the characteristics of the award-reliant market sectors rather than differences between award-reliant firms within sectors.

1 Introduction

As part of the minimum wages objective specified in s.284(1) of the *Fair Work Act 2009* (FW Act), Fair Work Australia must establish and maintain a safety net of fair minimum wages, taking into account:

- the performance and competitiveness of the national economy, including productivity, business competitiveness and viability, inflation and employment growth; (s.284(1)(a)).

In varying modern award minimum wages Fair Work Australia must also take into account the modern award objective. As part of the modern awards objective (as given by s.134(1) of the FW Act), Fair Work Australia must ensure that modern awards, together with the National Employment Standards, provide a fair and relevant minimum safety net of terms and conditions, taking into account:

- the need to promote flexible modern work practices and the efficient and productive performance of work (s.284(1)(d));

- the likely impact of any exercise of modern award powers on business, including on productivity, employment costs and the regulatory burden (s.284(1)(f)); and

- the likely impact of any exercise of modern award powers on employment growth, inflation and the sustainability, performance and competitiveness of the national economy (s.284(1)(h)).

Other parts of the FW Act refer to aspects of productivity as well, such as the object of the FW Act, which refers to 'achieving productivity and fairness through an emphasis on enterprise-level collective bargaining…' (FW Act—s.3).

The purpose of this report is to provide an overview of the existing body of research on productivity, business competitiveness and viability in Australia and to examine its measures at an aggregate, industry and firm level, with a particular emphasis on award-reliant industries and firms. Award reliance reflects employees that are paid at the exact rate specified in an award.

The paper is structured as follows. Section 2 provides an overview of the relevant research literature relating to the concepts and determinants of productivity, business competitiveness and viability and their relationship with minimum wages. Section 3 presents various measures of productivity, business competitiveness and viability and their trends at an aggregate and industry level over the medium term. Using the ABS Business Longitudinal Database (BLD), Section 4 presents measures and determinants of productivity, business competitiveness and viability at a firm level and Section 5 concludes.

2 Overview of the research literature

This section reviews the literature relating to productivity and business competitiveness and viability. Section 2.1 will review the concepts and determinants of productivity, business competitiveness and viability and Section 2.2 reviews the literature relating productivity, competitiveness and business viability to minimum wage setting.

2.1 Overview of concepts and determinants of productivity, business competitiveness and viability

This section reviews the concepts of productivity, business competitiveness and viability and presents a literature review on the determinants of productivity. The section demonstrates how each concept is related, because the determinants of productivity also influence business competitiveness and viability. For example, while competition provides an incentive to implement factors that promote productivity, such as investment in research and development and capital accumulation, these factors also enhance competition.

The survey also highlights how causality across these variables remains unclear, for example: Does increased productivity lead to an accumulation of capital, research and development and efficient work practices, or vice versa? As Syverson (2010: 18) states, 'establishing causality definitely remains a key issue for research'.

Productivity is the output of goods and services per unit of input. Two main indicators used to measure productivity are labour productivity and multifactor productivity. Labour productivity is the amount of output per unit of labour (measured in terms of either number of workers or number of hours worked) and multifactor productivity measures the ratio of growth in output to growth in two or more factor inputs and represents that part of the change in output that cannot be explained by changes in the inputs. Measures of multifactor productivity are based on gross output and value added. The gross output-based multifactor productivity is measured by comparing gross output to three classes of inputs: labour, capital and intermediate inputs (materials, energy and business services used in the production process), while value added[2] based multifactor productivity measures the contributions of only capital and labour in production.

While both indicators, labour productivity and multifactor productivity, measure efficiency to some extent, multifactor productivity is the better indicator of efficiency, as it measures the output produced for a given quantity of labour, capital and in some instances intermediate inputs. For example, labour productivity may increase not as a result of any gains in workers' efficiency, but through an increase in the amount of capital that each unit of labour has to work with (known as 'capital deepening'). Hence, multifactor productivity may be a better measure of efficiency gains arising from, for example, labour market reforms, technological change and human capital accumulation. However, multifactor productivity measures can also be influenced in the short and medium terms by other factors not related to efficiency, such as the weather, and by changes in capacity utilisation relating to the business cycle.[3]

Although labour productivity is not an ideal indicator of worker efficiency, it is relatively easy to measure for most industries.[4] However, multifactor productivity is difficult to estimate, particularly as obtaining reliable measures of capital input at the industry level are problematic.

2 Value added is defined as gross output less intermediate inputs (materials, energy and business services used up in the production process).

3 ABS, Australian National Accounts: Concepts, Sources and Methods, 2000, Catalogue No. 5216.0, p. 362. Capacity utilisation refers to the extent to which a firm uses its available productive capacity. Weather can affect multifactor productivity as it can adjust levels of output without altering capital or labour.

4 Productivity is difficult to measure accurately for the non-market sector (i.e. Property and business services, Government administration and defence, Education, Health and community services and Personal and other services), therefore analysts typically focus on the market sector.

For the labour market, higher labour productivity means that there is more capacity to provide higher wages, as firms have higher output and more revenue per unit of labour, other things being equal. In general terms, however, productivity is a key driver of living standards at the aggregate level. This is because productivity growth generates more output and income without any increase in inputs, which in turn makes goods and services more affordable.

The concept of business competitiveness and viability differs between the market and non-market sector. In the market sector, which reflects the traded goods and services sector, business competitiveness as discussed at the micro level refers to the ability of the firm to increase in size, market share and profitability (Clark & Guy 1998: 364). In traditional economic theory, comparative costs of production determined business competitiveness, because to become more competitive implied to produce more cheaply. However, non-price factors, such as human resource endowments, research and development capabilities and managerial and organisational factors have increased in importance as underlying determinants of competitiveness and productivity (see Section 2.1.1).

Clark and Guy stated that 'these factors determine the ability of a firm to attain and maintain a profitable position in the face of changing technological, economic and social environments. Profitability and survival remain the ultimate indicators of competitiveness' (Clark & Guy 1998: 364). Hence business viability, which refers to whether the business can continue to survive or remain viable, is largely dependent upon the ability of the firm to remain competitive.

Competitiveness and viability in the non-market sector does not necessarily reflect that a firm is productive and generating profits. A firm in this instance remains competitive and viable for other factors. For example, the not-for-profit (NFP) sector comprises organisations that are established for a community purpose and add value to the community through how their activities are undertaken. Many of these activities would not be undertaken by the for-profit or government sector and this could be, among other things, as a result of lack of financial return (Productivity Commission 2010: xxix). These firms however compete for donations, government funding and corporate support, with organisations offering services and solutions to meet similar community needs (The Centre for Corporate Public Affairs 2008: 75). Furthermore, relative to businesses operating within the market sector, the NFP sector face greater constraints on improving productivity, as they have difficulty in accessing funds for making investments in technology and training, lack of support for evaluation and planning, prescriptive service contracting by government as well as resistance to change by some volunteers, members and clients (Productivity Commission 2010: 225).

Hence, while firms within the NFP sector could improve their efficiency and effectiveness, they are not required to do so to remain viable as 'competition is less of a motivating force for driving improvements in efficiency and effectiveness than it is in the commercial world' (Productivity Commission 2010: xxx). NFP organisations are required to perform at a level expected by their members and participants, and remain viable in doing so (Productivity Commission 2010: xxx).

Business competitiveness and to some extent, business viability, are also affected by the market structure of the industry. Economic theory identifies four theoretical market structures:

- monopoly—where one firm represents the industry
- oligopoly—where a few firms represent the industry, with significant barriers to entry

- perfect competition—where many firms represent the industry and sell the same products with no significant barriers to entry

- monopolistic competition—where many firms represent the industry, but sell similar yet differentiated products with no significant barriers to entry.

The most prevalent market structures are monopolistic competition and oligopolies, as perfect competition markets are more of a theoretical concept, and monopolies are rare. Monopolies are characterised by a lack of economic competition for the goods or service that they provide and a lack of viable substitute goods. Hence, a monopoly need not be productive to remain profitable and viable, as they attain greater market share than is expected under perfect competition.

However, at a broad industry level, market power is more commonly shared across monopolistic competition and oligopolies. An example of monopolistic competition may be the hospitality industry, where many businesses sell similar but differentiated products. The supermarket and grocery stores industry is an example of an oligopoly in Australia, as Woolworths and Coles account for the majority of the market.

Porter (2008: 80) examined industry structure and its influence on competition and profitability and argued that:

> Industry structure drives competition and profitability, not whether an industry produces a product or service, is emerging or mature, high tech or low tech, regulated or unregulated. While a myriad of factors can affect industry profitability in the short run – including the weather and the business cycle – industry structure, manifested in the competitive forces, sets industry profitability in the medium and long run.

Porter (2008: 79) found that five competitive forces shaped industry competition, which is not limited to competition for profits among established rivals. Porter commented that 'the extended rivalry that results from all five forces defines an industry's structure and shapes the nature of competitive interaction within an industry'. The competitive forces that influence industry competition includes:

- threat of new entrants—when industry profits are high, additional firms may enter the market to take advantage of high profit levels, which may drive down profits over time for all firms in the industry. When profits decrease, firms are likely to exit the market and restore market equilibrium. The threat of entry in an industry depends on entry barriers. If entry barriers are low, the threat of entry is high and industry profitability is moderated, as Porter (2008: 81) states that 'it is the threat of entry, not whether entry actually occurs, that holds down profitability'. Barriers to entry can arise from restrictive government policy, capital requirements, economies of scale, demand side benefits of scale, unequal access to distribution channels, customer switching costs and incumbency advantages independent of size[5]

5 Economies of scale—firms that produce at larger volumes enjoy lower costs per unit because they can spread fixed costs over more units or employ more efficient technology. Demand side benefits—buyers are likely to trust larger companies more for a 'crucial product'. In this instance, entry is limited by the willingness of customers to buy from a newcomer. The newcomer's price will have to be reduced until it gains a large base of customers. Unequal access to distribution channels—new entrants need to secure distribution of their product or service through either price breaks, promotions or market strategies. Porter (2008: 82) states that 'the more limited the wholesale or retail channels are and the more that existing competitors have tied them up, the tougher entry to an industry will be.' Customer switching costs—they represent fixed costs that buyers face when they change suppliers. For example, a buyer that changes its supplier may have to retrain employees to use the new product or alter product specifications. Hence, the greater the switching costs, the harder it will be for an entrant to gain customers. Incumbency advantages independent of size—regardless of size, incumbents may have cost or quality advantages not available to potential rivals. Advantages can stem from proprietary technologies, established brand identities or cumulative experience to learn how to produce more efficiently.

- threat of substitutes—when this is high, industry profitability suffers. Substitute products or services limits an industry's potential profitability by placing a ceiling on prices

- rivalry among existing competitors—this can include price discounting, new product introductions, advertising campaigns and service improvements. High levels of rivalry can limit the profitability of an industry based on the intensity with which companies compete and the basis on which they compete. Porter (2008: 85–86) notes that:

  > Rivalry is especially destructive to profitability if it gravitates solely to price because price competition transfers profits directly from an industry to its customers. Price cuts are usually easy for competitors to see and match, making successive rounds of retaliation likely...competition on dimensions other than price – on product features, support services, delivery time, or brand image, for instance – is less likely to erode profitability because it improves customer value and can support higher prices.

- the power of buyers—buyers can have industry participants compete against one another at the expense of industry profitability, as customers are able to force down prices and demand better quality or more service, which is likely to raise costs

- the power of suppliers—powerful suppliers can capture more of the value for themselves by charging higher prices, limiting quality or services or shifting costs to industry participants. For instance, a supplier group can be powerful if it is more concentrated than the industry it sells to. An example of this is Microsoft's near monopoly in operating systems and its interaction with PC assemblers (Porter 2008: 82).

Minniti (2009: 112) explained that there are two dimensions of product market competition. Inter-sector competition between products of different industries and intra-sector competition between goods produced within an industry and across firms. Minniti found that the more substitutable differentiated goods within (across) industries are, the more intense the intra-sector (inter-sector) competition is and the higher the productivity growth rate.

Our analysis of competitiveness and viability in Section 3 is predominantly at an industry level. As a result, the analysis captures the performance across firms within an industry and between industries. In contrast, using micro data obtained from the ABS Business Longitudinal Database, Section 4 presents an analysis of competitiveness and viability between firms. Unfortunately, small sample size numbers restrict a detailed analysis of competitiveness and viability of firms by industry and employment arrangements.

At the national level, the concept of competitiveness is difficult to define. Krugman (1994: 31) argued that it is 'elusive' and stated that:

> ...trying to define the competitiveness of a nation is much more problematic than defining that of a corporation...when we say that a corporation is uncompetitive, we mean that its market position is unsustainable—that unless it improves its performance, it will cease to exist. Countries, on the other hand, do not go out of business. They may be happy or unhappy with their economic performance, but they have no well-defined bottom line. As a result, the concept of national competitiveness is elusive.

Porter and Ketels (2003: 3) suggested that competitiveness should be measured by productivity, which reflects a nation's standard of living, and stated that:

> Competitiveness remains a concept that is not well understood, despite widespread acceptance of its importance. To understand competitiveness, the starting point must be the sources of a nation's prosperity. A nation's standard of living is determined by the productivity of its economy, which is measured by the value of goods and services produced per unit of the nation's human, capital and natural resources. Productivity depends both on the value of a nation's products and services; measured by the prices they can command in open markets, and the efficiency with which they can be produced. True competitiveness then, is measured by productivity. Productivity allows a nation to support high wages, a strong currency and attractive returns to capital and with them a high standard of living.

Porter and Ketels (2003: 19) argued that while sound macroeconomic policies and stable political, legal and social institutions create the potential for improving national prosperity, 'competitiveness ultimately depends on the firms and the way they compete. Hence, a sound macroeconomic, political, legal and social context is necessary for achieving competitiveness, but not sufficient'.

Hence, Porter (2004) stated that an economy cannot be competitive unless businesses are competitive, whether they are domestic firms or subsidiaries of foreign companies. However, he noted that the sophistication of companies is 'inextricably intertwined' with the performance of the national business environment (Porter 2004: 3), stating that:

> National prosperity is strongly affected by competitiveness, which is the productivity with which a nation uses its human, capital, and natural resources. Competitiveness is rooted in a nation's microeconomic fundamentals, manifested in the sophistication of its companies and the quality of its microeconomic business environment (Porter 2004: 19).

The Productivity Commission (1999) presented a framework of factors affecting productivity. This framework drew upon the *fundamental influences* and *underlying factors* that can influence the *immediate causes* of productivity growth.

Fundamental influences, as defined by the Productivity Commission, reflect changes in government policies that influence underlying factors, such as trade and competition, which ultimately affect the immediate causes of productivity and the viability of business. The immediate causes of productivity addressed in this paper are physical capital accumulation; research and development, technologies and innovation; human capital accumulation and firm organisation, management practices and work arrangements.

Government policy and institutions may affect the determinants of productivity and influence productivity growth. For instance, policies related to education and training and improvements in technologies and innovation are likely to influence productivity growth. Nonetheless, government policy decisions cannot by themselves raise the level of productivity growth and instead:

> ...sensible government intervention in markets, through investment in infrastructure and human capital or modifying regulatory frameworks, lifts productivity by enabling firms to allocate resources more efficiently (Commonwealth of Australia (2010: 111).

In its submission to the Parliament of the Commonwealth of Australia *Inquiry into raising the productivity growth rate in the Australian economy*, the Treasury noted the importance of public policy in encouraging productivity:

> Public policy settings also play a vital role in achieving productivity growth as they affect the environment in which firms operate. Policy is important for improving the efficiency of resource use in the economy as it can support well-functioning markets, remove distortions and enhance flexibility, responsiveness and dynamism at the level of the firm and the individual.
>
> Policy can also promote an operating environment in which workers and firms have the incentives and the capacity to continually adapt to take advantage of opportunities, which in turn improves productivity. Addressing market failures in the areas of infrastructure, innovation and human capital also provides an important avenue for productivity gains (Commonwealth of Australia (2010): 112).

Underlying factors, such as trade and competition, as well as demand and supply factors, as defined by the Productivity Commission, are considered to have an indirect effect on productivity through their influence on immediate causes. Immediate causes are developed at the firm level and thus considered to have a direct effect on productivity (refer to Section 2.1.1).

Fundamental influences, such as policy reform, have increased business competitiveness through domestic and international developments. Parham (2002a: 196) noted that, since the mid 1980s, policy reforms have promoted productivity by strengthening competition through increased incentives; opening the economy to trade, investment and technologies developed overseas; and providing greater flexibility[6] by less regulatory restrictions and more flexible labour markets, to adjust production processes and firm organisation and improve productivity.

For example, domestic developments, such as the introduction of enterprise arrangements 'has provided a framework to facilitate the redesign of work arrangements within enterprises and allocate labour to where it can be most productively used' (Productivity Commission 1999: xxxi). While international developments, such as the removal of Australia's barriers to trade in goods and services, have exposed domestic producers to greater competitive pressure (Productivity Commission 1999). In effect, 'increased competition provides incentives for businesses to improve productivity in order to maintain and improve their financial positions' (Productivity Commission 1999:xxxi).

Nickell (1996) agreed and argued that a competitive economy does not just generate an efficient allocation of resources, but also exerts downward pressure on costs, reduces slack, provides incentives for the efficient organisation of production and helps drive innovation (Nickell 1996:724-25).

Syverson (2010) stated that pressure from other competitors within an industry can affect levels of productivity through two key mechanisms. The first mechanism acts to force some firms to exit as more efficient producers enter the market, raising productivity and the expectation that new potential entrants must perform at a high standard. The second mechanism acts through increased efficiency within firms. Increased competition can induce firms to take more initiatives and adopt productivity-raising techniques through innovation or workforce re-organisation. External competitive pressures may also exist. Meagher and Wang (2009:1) noted that the performance of a firm is jointly determined by the external and internal environments, which work together to determine the profitability of the firm. External pressures may emanate from productivity spillover effects and trade or intra-trade competition. Productivity spillovers can reflect unintended 'knowledge transfers' as it is unlikely that the production techniques of a firm can be protected from unauthorised expropriation completely.

6 While the concept of flexibility is not examined in this paper, a brief discussion is presented later in the section.

As a result firms can learn from each other and, through experimentation, efficiency will increase not only in the innovating firm but across all firms (Ergas & Wright 1994:69). Crespi et al. (2007) combined micro data with survey data to measure information flows and explore the role of information flows and productivity growth. They found that firms gather information from competitors, suppliers, firms that belong to the same group, and universities. They concluded that much of the spillover flow of knowledge sourced from their competitors is free and that having a multinational presence aids such information flows. Syverson (2010) however noted that differences in productivity within industries suggest that spillovers may not confer the same competitive success as their rival partners.

Some studies have estimated the impact international research and development spillovers have had on productivity. Research and development is considered to have a significant effect on productivity growth. For example, an OECD (2003) study estimated growth regressions that included research and development intensity variables (expressed as a percentage of GDP and as expenditures on research and development as collected in national accounts). The results suggested that there was a significant effect of research and development activity on the growth process. The positive association between total research and development intensity and output growth was mainly driven by business-performed research and development and less likely through research and development supported by public research institutes (OECD 2003: 84–85). However, the study did note that certain public research and development may in the long run generate basic knowledge with public 'spillover' effects emanating from energy, health and university research (OECD 2003: 90).

Coe and Helpman (1995) estimated the magnitude of international research and development spillovers by analysing the annual growth of total factor productivity for 21 OECD countries, including Israel, from 1970 to 1990. They found that the stock of knowledge in one country, measured by cumulated historical research and development expenditures raises productivity in foreign countries with which they trade.

Rogers (2002) also looked at the effect international diversification had on research and development and knowledge flows. Using a sample of large Australian firms between 1994 and 1997, Rogers found that firms that have operations overseas (international diversification) in North America or Europe had higher research and development intensity, but caution that the causality is unclear. Hence, it is ambiguous whether high research and development intensity causes international diversification or whether international diversification improves knowledge flows and incentives.

Meagher and Wang (2009) argued that product market[7] competition is one of the most important factors in market structure (other factors include consumer sensitivity to firm operations and the distribution of consumer tastes). Ergas and Wright (1994) commented that stronger product-market competition forces less productive firms to exit the market. They stated that '[t]he most natural route through which this Darwinian process occurs is the reduction in price-cost margins brought by increased competition, since this will make it more difficult for inefficient firms to survive' (Ergas & Wright 1995: 69).

Syverson (2010) commented that product-market competition is enhancing productivity if there is a positive correlation between productivity and producer growth and survival. Citing an earlier paper, Syverson (2004b) studied the connection between competition and productivity in the ready-mixed concrete industry. Since the industry has a homogeneous product and high transport costs, differences in competitiveness should be related to the density of concrete producers in the market. The paper found that it is difficult for firms to be profitable in dense markets because consumers can easily source other competitors. The paper also found that markets with

7 The product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer by reason of the product's characteristics, their prices and their intended use.

dense construction activity[8] have higher average productivity. Focusing on the retail sector, Foster, Haltiwanger and Krizan (2006) found that aggregate productivity growth in the United States is almost exclusively through the exit of less efficient single-store firms and by replacement of more efficient national chain store affiliates, such as discount retailers Wal-Mart and Target.

International trade exposure, which is the ratio of gross trade (imports plus exports) to Gross Domestic Product (GDP), is used to measure trade intensity. Increased international integration can affect firm and industry performance through its impact on the intensity of competition. An increase in competition may yield improvements in both allocative efficiency and technical efficiency (which is the productivity with which resources are used) (Ergas & Wright 1994:67). An increase in international exposure may aid exporting firms or those firms investing in foreign markets, as they become more aware of foreign technology. It may also deliver gains from a greater range of intermediate inputs and capital goods, which will reduce costs and expand the number of goods available that will effectively lower the cost of innovation (Ergas & Wright 1994: 69).

Madden and Savage (1998) defined international competitiveness as the ability of a country to expand its market share in global markets. They employed the ratio of export to import prices to measure international competitiveness as Australian exports tend to be primary goods and sensitive to shifts in the terms of trade. They found that between 1950 and 1994 the composition and direction of trade in Australia had significantly changed, as trade policy had become less restrictive. Over this period of time, their study revealed that openness to trade and international competitiveness were significant sources of short-run labour productivity (Madden & Savage 1998: 370).

The Australian Manufacturing industry has a high degree of trade exposure and is one of the industries most exposed to competition from overseas firms. Wheatley (2009) found that firms in Manufacturing have the most difficulty competing in non-differentiated traded goods that rely on low-skilled, labour intensive processes. Wheatley noted that over the past 20 years, the most significant change in the composition of the Manufacturing industry has been the decline of the Textiles, clothing, footwear and leather manufacturing subdivision. The paper stated that the significant decline in this subdivision can be attributed to the increased exposure to international competition. Citing the Productivity Commission's report on the sector, the paper noted that competitors from developing countries, such as China, have productivity levels often matching those of Australia, but at significantly lower wage rates (Wheatley 2009:12).

In the Australian Motor vehicle wholesaling and retailing industry, competitive pressures emanate from international sources as well. The demand for imported vehicles is largely influenced by the exchange rate, while the removal of import quotas and the reduction in tariffs have influenced productivity. Johnston et al. (2000) found that as a result of these changes made to regulatory arrangements, imported vehicles increased their share of the new vehicle market, increasing the diversity of makes and models of vehicles available to consumers. Demand and supply side factors are also involved. Johnston et al. (2000) noted that much of the productivity growth in the 1990s is attributed to a significant increase in the demand for cars and the improvements in distribution. They also noted that macroeconomic factors, such as inflation and interest rates, are important for growth as they boost consumer confidence and increase sales.

Nonetheless Johnston et al. (2000) remarked that 'irrespective of whether competition derives from domestic firms or from imports, it provides an incentive to implement many of the factors (for example, new technologies and innovation) that promote productivity growth' (Johnston et al. 2000: 62).

8 Syverson uses construction density as an exogenous shifter of concrete-producer density because the construction sector purchases almost all of the ready-mixed industry's output, yet concrete accounts for only a small share of construction costs.

In effect, underlying factors, such as trade and competition, along with general supply and demand factors that are influenced by public policy can help promote the immediate causes of productivity, which are discussed in the following section.

2.1.1 Immediate causes

The framework adopted by the Productivity Commission as described above distinguishes between determinants that operate at different levels. Determinants that reflect immediate causes have 'close and tangible links to input/output relationships in production' (Productivity Commission 1999: 54). Immediate causes also tend to 'overlap'; for instance, the organisational structure of a firm may affect the development and application of technology (Productivity Commission 1999: 56). However, it is important to note that this report does not aim to present a debate or analysis of what caused the productivity surge of the mid-'90s and the decline thereafter. Economists disagree about what was the primary impetus for the surge. Some argue it was extensive microeconomic reforms introduced throughout the 1980s and 1990s, while others argue that there was no productivity surge. For further review see Dolman et al. (2005); Hancock et al. (2007); Parham (2005); Quiggin (2002); Dolman (2009); Productivity Commission (1999); Commonwealth of Australia (2010).

2.1.1.1 Physical capital accumulation

The rate of accumulation of physical capital is one of the main factors determining the level of real output per capita (OECD 2003: 59). Investment in physical capital has a direct impact on labour productivity, as an increase in capital enables workers to utilise more capital and raise productivity. This may have an indirect effect on multifactor productivity through the adoption of new technology and a redesign in organisational structure (Productivity Commission 1999: 176). Investment in economic infrastructure, which is largely provided by the public sector, can also promote productivity. Such initiatives can affect city planning and the efficiency of transport, water, energy and communication infrastructure (Commonwealth of Australia 2010: 120).

Madden and Savage (1998) studied sources of Australian labour productivity change from 1950 to 1994. Using time series data, they constructed a model that estimated the interaction between labour productivity, fixed capital, human capital, telecommunications, trade openness and international competitiveness. Their estimates revealed that policies designed to encourage investment, economic integration and international competitiveness would improve labour productivity in the short run, while in the long run, fixed-capital accumulation was considered to be the dominant source of productivity improvement. Madden and Savage (1998) noted that policies that promote investment in public infrastructure and investment in information technology and telecommunications increased national labour productivity by reducing transport and transaction costs and accelerating the diffusion of knowledge (Madden & Savage 1998: 369–370).

Citing a study conducted by Dowrick (2001), Parham (2003) noted that Australian public investment has been declining rather than increasing since the mid-1980s, which suggested that an increase in public infrastructure could not help explain Australia's productivity surge over the 1990s. However, Parham commented that technological advances and improvements in efficiency, in sectors such as communications and transport, have enabled services and better utilisation of infrastructure through spillover gains to other industries, such as agriculture and wholesaling (Parham 2003: 21).

Blomstrom et al. (1996) examined changes in capital formation and growth over successive five-year periods to determine the directions of influence and timing between capital formation ratios and rates of growth. Dividing the post-World War II period into five-year sub-periods, they found that per capita GDP growth in a period is more closely related to subsequent capital formation than to current or past capital formation. Their results

suggested that growth induces subsequent capital formation more than capital formation induces subsequent growth and thus they find no evidence that fixed investment is the key to economic growth. Instead, Blomstrom et al. claim that policies that encourage education, inflows of direct investment, lower population growth and the efficient use of investment are the 'chief foundations' for economic growth (Blomstrom et al. 1996:275–76).

De Long and Summers (1992) argued that policies that fail to promote equipment investment 'are likely to be disastrous', as they found a strong relationship between equipment investment and economic growth. For instance, policies that make it costly for firms to substitute capital for labour are likely to inhibit growth by discouraging equipment investment. De Long and Summers also found that a one percentage point increase in the equipment investment share of GDP is associated with an increase of approximately 0.10 to 0.15 percentage points per year in the total factor productivity growth rate[9] (De Long and Summers 1992: 192). They also cautioned that investment in equipment can yield large external benefits if 'learning-by-doing' helps create an experienced workforce competent to handle new technologies and standard operating procedures to produce efficiently (De Long and Summers 1992: 194).

Syverson (2010: 25) noted that 'the very act of operating can increase productivity'. In citing Benkard (2000), Syverson (2010) gives an example of learning and forgetting the dynamics of aircraft production, in which the 'learning rate' is how fast past production increases productivity and the 'forgetting rate' is how fast the knowledge stock built by learning depreciates. Benkard's study found that the first few units required more than one million person hours, although this was cut in half by the 30th plane and halved again by the 100th plane. He also found that almost 40 per cent of the knowledge stock depreciates each year, although this may not only reflect 'forgetting' as much as labour turnover. Shifting to work on a new variant of the plane created an imperfect substitutability of the knowledge stock between the original and new variants, which led to a temporary but substantial increase in labour requirements (Syverson 2010: 25).

In examining policy settings and growth, the OECD (2003) found that there is no clear agreement on the mechanisms linking policy settings to growth. Some studies have suggested that policy influence on savings and investment affects output growth only in the short to medium term, with the underlying rate of growth remaining unchanged. On the other hand, other studies have indicated that other forms of capital affect production, such as human capital (education), knowledge capital (research and development) and infrastructure. These forms of capital are likely to influence the process of innovation and by doing so form new production processes, creating a link between physical capital accumulation and long-term growth rates (OECD 2003: 58–59). Nonetheless, the OECD (2003: 60) argued that:

> Whatever the transition mechanism from capital accumulation to output and growth, the significant differences in the investment rate across OECD countries point to it as a possible source of differences in output per capita growth across countries and over time.

2.1.1.2 Research and development, technologies and innovation

Technological progress is a prime source of productivity growth. Research and Development reflects an accumulation of business knowledge and ideas that influence the development of technology (Parham 2003: 16). In effect, investment in research and development is a measure of business competitiveness and thus productivity. Banks (2000: 8) stated that '[b]usiness R&D is clearly important, but it is not an end in itself. Its contribution to national income and living standards ultimately depends on the extent to which it raises productivity.'

9 Total factor productivity growth rates were estimated for 31 economies derived from the high productivity sample for the period between 1960 and 1985. The high productivity sample included 61 non-oil exporting nations. By 1960, these nations had progressed far toward industrialisation.

Support for innovation and research and development can stem from publicly funded research and development in universities and government research agencies and through the research and development tax concession. The research and development tax concession is the largest single government innovation outlay, amounting to over $500 million annually (Cutler 2008: 101). The tax concession provides an increased deduction of 125 per cent to be claimed on the volume of research and development expenditure (Cutler 2008: 102). In examining the long-run trends in business research expenditure, research conducted by Cutler found that the trend analysis suggests that there is a strong correlation between the availability of the concession and the steady increase in Business Expenditure and Research and Development (BERD); however they caution that the causation remains unclear (Cutler 2008: 103).

In their submission to the Parliament of the Commonwealth of Australia *Inquiry into raising the productivity growth rate in the Australian economy*, the Manufacturing Alliance argued that public investment in innovation had been neglected and that this had contributed to the productivity slowdown. In addition, the 2008 review of the National Innovation System, *Venturous Australia,* led by Cutler, found that public investment in research had declined since 1995, with university funding for research falling further behind the full cost of conducting that research and government research agencies suffering from funding cutbacks (Cutler 2008: 13–14).

In their submission to the same inquiry, the Productivity Commission noted that government assistance can provide benefits in supporting research and development, particularly when results are shared across the sector, but along with the Treasury they cautioned that policy design was important and stated that:

> But, again, careful design and evaluation are needed to ensure that support measures actually give rise to additional R&D activity, such that the benefits to society exceed the costs. It seems unlikely that the extension of tax concessions will induce sufficient additional R&D to warrant the revenue forgone, and the costs of raising it elsewhere (Commonwealth of Australia 2010: 128).

Parham (2003) noted that Australia's measured research and development effort (ratio of business research and development to GDP) had increased since the mid-1980s while the industry mix of research and development effort had shifted in the 1990s toward service industries that had shown productivity acceleration. Parham found that while most of the research and development effort and the highest research and development intensity remained in manufacturing, there was little growth experienced in this sector in the 1990s, with much of the increase in research and development in services thought to be related to Information and Computerised Technologies (ICT). Banks (2002) and Dowrick (2002) noted that Australian BERD had fallen significantly as a result of the cut in concessional rate in Australia's tax concession for research and development. The Productivity Commission had estimated that BERD had declined by 16 per cent in real terms from 1995–96 to 1999–00. However, Banks also found that some of the best industry performers had not been among those sectors with high or rising research and development intensity, such as the wholesale trade industry.

Johnston et al. (2000) found that new technology had a significant impact on productivity in the wholesale sector. Technologies developed in the mid to late 1980s had transformed the sector by the end of the 1990s. For instance, new technologies improved the efficiency of transportation and new routing systems helped maximise efficiency in drops-offs and pick-ups (Johnston et al. 2000: 55). Johnston et al. also found that technological change, such as scanning and computerisation, also influenced retail productivity by reducing labour input and changing management systems. For instance, the scanner at the checkout is an obvious example of labour-saving technology. The study found in the 1980s technology had a significant impact by saving labour input and in the 1990s it changed the way management assessed performance. For example, the study found that in a particular supermarket chain, management focus had changed from broad productivity indicators, such as 'percentage of turnover' to more targeted indicators, such as 'throughput by item value relative to labour input',

which enabled management to focus more on the task level in order to assess labour productivity, which helped raise profitability and lower costs (Johnston et al. 2000: 81).

Parham (2002b) noted that ICTs can influence labour productivity in the following three ways:

- capital deepening—as firms invest in more ICTs, this results in a higher capital to labour ratio, which means that workers have more capital to utilise
- productivity gains from ICT usage—the use of ICTs improving efficiency is considered to be the most 'controversial source of ICT related productivity gain', as some commentators remain sceptical that it led to increasing returns to scale and spillover effects
- productivity gains from ICT production—the rapid nature of technological advances in ICTs means that producers of ICTs can produce better equipment with the same inputs. However, Parham (2002) noted that most of the productivity gains from ICTs are derived from their use in Australia, rather than the production of ICTs. This is evidenced by the fact that Australia's use of ICT equipment is relatively high compared with other OECD countries, while its production of ICTs is relatively small.

Parham (2002b) noted that in the first productivity cycle that spanned from 1988–89 and 1993–94, strong productivity growth emanated from the 'traditional' contributing sectors, which included Agriculture, Mining and Manufacturing. However, from 1993–94 onwards, a new set of service industries contributed to the 'productivity surge' of the 1990s, with wholesale trade the 'stand-out performer'. Parham commented that while there was no strong positive relationship between ICT use and multifactor productivity across all industries, there was a strong (above-average) positive relationship between increased ICT use and multifactor productivity acceleration in Finance and insurance and a weaker relationship in Wholesale trade. However, he cautioned that the relationship between ICT use and productivity growth are complex and that the Australian evidence supported the view that it is the changes in products and processes that generated gains in productivity:

> …importantly, reforms were acting as the underlying drivers and facilitators of productivity gains and ICT's were just one component of change. It was not so much that wholesaling became much more ICT intensive or that new 'breakthrough' technologies became available. It was more that the competitive incentives to be productive became stronger and that new flexibilities became open to businesses to use ICT's as part of a more general process of restructuring and transformation (Parham 2002b: 204).

Parham (2003) also noted that overseas developments in technology can have a positive effect on productivity growth in Australia. Since Australia imports rather than manufactures most of its ICT requirements, increases in demand for numbers and the power of the technology can have an effect on capital deepening and labour productivity growth. Simon and Wardrop (2002) used industry-level estimates of productivity capital stock and found that since the early 1990s Australian business investment in computer and related equipment had grown rapidly, with the use of computer technology in Australia being among the highest in the world. They found that Australia had experienced significant output growth related to computer use and had benefited through technological advances in the sector through lower prices passed on to users.

Syverson (2010: 26–67) stated that while innovations in product quality may not necessarily raise the quantity of output per unit input, they can increase the product price and hence affect the firm's revenue per unit input. Therefore 'if one thinks about productivity as units of quality delivered per input, product innovation can enhance productivity'. In exploring the productivity effects of product innovation, Syverson cited a study conducted by Bernard, Redding and Schott (forthcoming), which showed that productivity growth is correlated with the expansion of the variety of products a firm produces. However, Syverson noted that it was not clear

whether innovative activity drives productivity and product-variety growth or whether firms experiencing 'productivity shocks' expand their number of products in response to the shock.

2.1.1.3 Human capital accumulation

Knowledge is essential to economic progress as 'all economic activities depend on institutions that encourage the preservation, transmission and development of knowledge' (Dowrick 2002: 5). Knowledge can raise workers' output per hour worked and it can increase the rate of innovation through the development of technologies (Barnes & Kennard 2002: xiii). Forbes et al. (2010: xiii) noted that:

> Human capital is a key driver of workforce participation and labour productivity and, at the aggregate level, gross domestic product, consumption and community wellbeing. Measures to maintain and enhance the community's stock of human capital are likely to increase standards of living.

Dowrick (2002) discussed the economic attributes of disembodied and embodied human capital. Embodied human capital represents skills and abilities, while disembodied human capital reflects ideas that are 'non-rival' and 'cumulative'. Non-rival ideas imply that people can simultaneously use an idea to develop a wide range of applications and such ideas can be 'cumulative' in that they may develop and advance to further ideas and new inventions. As a result, Dowrick expects that educational attainment should have long-run growth effects, since a skilled workforce (which alone is likely to affect growth in the short run) is required to implement and adapt new ideas emanating from the research and development sector (and therefore affect the long run).

> A one-off increase in attainment will produce a one-off rise (albeit spread over time) in the level of GDP *per capita.* There is mounting evidence, however, that there are also substantial dynamic or *growth* effects, which are linked to a country's ability to implement new technologies. This evidence suggests that Australia would do well to increase its educational levels to match the OECD leaders – the USA and Scandinavia (Dowrick 2002: 29).

Barnes and Kennard (2002) found that the strongest growth in skill, measured in terms of educational attainment plus work experience, was evident towards the late 1980s and early 1990s. Between 1988–89 and 1993–94, growth in skill contributed 0.2 of a percentage point to the 0.7 per cent a year growth in multifactor productivity. However, throughout the productivity surge of the 1990s, growth in skill contributed only around 0.05 of a percentage point to the 1.7 per cent a year growth in multifactor productivity. Barnes and Kennard concluded therefore that factors other than skill mainly contributed to Australia's productivity surge from the mid-1990s. Nonetheless, they comment that education and skills remain important for long-run growth and claim that:

> ... even in the context of the productivity surge, Australia's relatively high level of education may have contributed to the relatively rapid rate of uptake of information and communications technologies in the 1990s, which in turn made some contribution to the productivity acceleration (Barnes & Kennard 2002: x).

In his review of the research on human capital and productivity, Parham (2003) highlighted that an issue in the literature was whether the level of human capital or the accumulation of additional human capital mattered. While a majority of papers focused on the accumulation of additional human capital and associate higher accumulation of human capital with improved productivity (such as Dowrick (2002)), Parham noted that Barnes and Kennard (2002) were careful not to rule out productivity effects associated with the level of education, as they drew upon evidence from OECD countries that had high rates of ICT take-up, with relatively high average levels of schooling.

Using the 1990 and 1995 Australian Workplace and Industrial Relations Survey (AWIRS), Laplagne and Bensted (1999) looked at the links between training and innovation and labour productivity in the workplace. They warn however that the data have some limitations, as measures of 'productivity use' are the subjective assessments of workplace managers, and should be interpreted with caution. Nonetheless, Laplagne and Bensted found that training and innovation are more likely to occur in workplaces experiencing strong labour productivity growth. However they do not appear to be significantly associated with higher levels of labour productivity, once other influences are taken into account. The paper also found that different types of innovation can have different effects on labour productivity. For example, they found that changing the work of non-managerial employees was immediately beneficial, but workplace restructure and a change of product/service had a delayed impact. Furthermore, they stated that while innovation alone could promote labour productivity growth, its returns are increased by the addition of training. In comparing technically efficient and inefficient workplaces, they found that training is an effective strategy for less efficient workplaces as they endeavour to 'catch up' with competitors, while innovation promotes labour productivity growth among both types of workplaces.

Bartel (1994) applied data on the personnel policies and economic characteristics of businesses in the Manufacturing sector to measure the impact of formal training programs on labour productivity. They found that businesses operating below their expected labour productivity levels in 1983 implemented new employee training programs after 1983, which significantly increased labour productivity growth between 1983 and 1986. Bartel stressed that the findings in the paper were important because it showed that a relationship exists between training and productivity.

Black and Lynch (1996) discussed limitations associated with Bartel's work. They found that most establishments used in the survey were part of multiple establishment firms and the data had referred to the firm as a whole and not to specific establishments. In addition, the response rate to the survey analysed in Bartel's work was very low (at 6 per cent) further affecting the analysis.

While Black and Lynch highlighted the importance of human capital, especially education and certain types of employer-provided training for establishments' productivity, they cautioned that 'first and foremost is the problem of endogeneity. The presence of unobserved establishment characteristics that are time-invariant is likely to bias our estimated coefficients' (Black & Lynch 1996: 266). Simultaneity of productivity and training was also discussed in Laplagne and Bensted (1999: 34), who stated that:

> The effect of training on labour productivity is difficult to estimate econometrically, due to the likely existence of feedback from productivity to training. Such feedback, if not formally modelled in a system of equations, can lead to simultaneity bias affecting the estimated relationship between training and labour productivity.

Black and Lynch (2001) examined the impact of workplace practices, information technologies and human capital investment on productivity. Using a nationally representative sample of businesses they estimated an augmented Cobb Douglas production function[10] covering the period between 1987 and 1993. They found that it is not whether an employer adopts a particular work practice, but rather how that work practice is implemented within the establishment that is associated with higher productivity. In addition, they found that unionised establishments that had adopted human resource practices that promoted joint decision making coupled with incentive-based compensation had higher productivity than their non-unionised counterparts, while unionised businesses that maintained more traditional labour management relations had lower productivity.

10 A production function measures the maximum possible output that you can get from a given amount of input. A Cobb Douglas production function takes the form $y = Al^a k^b$ where y is output, l is input labour and k is capital. Parameters a and b represent change in output as a result of changes in inputs labour and capital respectively. A>0 is a technical efficiency parameter. The efficiency paramater grows as less capital and labour are required for a given amount of output.

Furthermore, their results suggested that firm productivity is higher in businesses with more educated workers or greater computer usage by non-managerial employees.

Bertschek and Kaiser (2004) argued that although Black and Lynch (2001) found that workplace reorganisation affected labour productivity, they failed to recognise a potential reverse causality, since the main reason for firms to reorganise workplaces is to increase labour productivity.

Forbes et al. (2010) noted that human capital theory supports the view that people with higher levels of education and lower incidences of chronic illness should have higher labour productivity. While they found that higher levels of education are estimated to be associated with significantly higher wages, they also found that people who suffer from chronic illnesses are estimated to earn less than their healthy counterparts. However, Forbes et al. cautioned that while wages are likely to be a reasonable indicator of the effects of education on labour productivity, statistical issues could lead to results that may overstate the positive effects of education and good health on labour productivity. For example, there is potential for bias in their modelling, as only people who report a wage (the employed) are included in the data to estimate the effects of education and health on wages.

In its submission to the Parliament of the Commonwealth of Australia *Inquiry into raising the productivity growth rate in the Australian economy*, the Productivity Commission suggested that if Australia wants to make substantial increases in productivity it must do more to strengthen the human capital areas of health and education and stated that:

> the stimulus of intensified competition and the gains of flexible markets remain, but further productivity improvement is now in the more difficult terrain of improving human capital and innovation (Commonwealth of Australia 2010: 114).

In its submission, the Australian Chamber of Commerce and Industry noted that 'Australian industry needs a skilled, flexible and motivated workforce equipped with the skills and knowledge required to meet the needs of employers' (Commonwealth of Australia 2010: 116). While the Australian Institute of Mining and Metallurgy urged that 'despite the short term decline in commodity prices, expectations of skills needs to meet demand over the medium term continue to be high… With significant numbers of skilled workers and professionals due to retire, sustaining investment in meeting the future skills needs of the minerals sector remains a priority' (Commonwealth of Australia 2010: 117).

2.1.1.4 Firm organisation, management practices and work arrangements

Improvements to productivity can be gained from the organisational structure of the firm, which can be reflected in the production techniques managed, supply arrangements achieved and/or the team work developed (Productivity Commission 1999: 56). While management practices play an integral part in coordinating the application of labour, capital and intermediate inputs of production systems (Syverson 2010: 14) work arrangements are also likely to influence productivity. For example, Hancock et al. (2007:9) stated that:

> The idea that industrial relations affect productivity derives from a supposition that they influence the behaviour of owners, managers and workers. They may do so because they affect the ability of management to manage; because they affect the levels of antagonism and cooperation in the workplace; and because the terms on which labour is employed influence the investment and innovation decisions of business.

Adopting an econometric case study approach, Jones et al. (2006) examined 34 retail outlets of a Finnish firm in the non-food retailing sector, operating during 2002–05 and found that productivity can be raised when employees have opportunities to participate and to receive appropriate information and pertinent rewards.

Their findings also implied that there are benefits to innovative work practices even in instances where employees are required to do simple tasks and are relatively low-skilled.

In a study of Australian workplaces undertaken in 2001, Hull and Read (2003: 30) reported that 'the central focus for workplaces was the quality of the working relationships between the people who worked in them. All the other dimensions[11] were important, but somehow the issue of working relationships[12] linked all of them together'.

Phipps (1995) reviewed a study conducted by Macduffie who found strong evidence that innovative human-resource practices increased firm-level performance and national competitiveness. Macduffie analysed the relationship between human resource practices, manufacturing policies and productivity using data from plants in the United States, Japan, Europe, Australia, Korea, Taiwan, Mexico and Brazil. He found that, regardless of location, plants using team-based work systems, extensive training and performance-based compensation linked with flexible production operations, outperformed mass production plants in terms of quality and productivity. In effect, he found that innovative human resource practices affect performance and contribute the most to productivity when they are integrated with a flexible production system.

Koch and McGrath (1996) also found positive and significant effects on labour productivity for organisations that adopt sophisticated human resource planning, recruitment and selection strategies, particularly for capital-intensive organisations. They argued that their research suggests that an organisation's human resource management has a significant relationship to the productivity of its employees and state that:

> We argue that this set of findings supports the resource-based view of strategy, in which the competitiveness of firms is believed to be related, at least in part, to investments in firm-specific assets. Investments explored here include the planning for, recruitment, selection and development of firm-specific human capital assets (Koch & McGrath 1996: 352).

Bertschek and Kaiser (2004) analysed the relationship between investment in ICT and non-ICT investment, labour productivity and workplace reorganisation. In their empirical analysis of 411 German business-related service sector firms, they considered two different types of organisational change: enhancement group work and flattening of hierarchies. Their results showed that it is more profitable to invest in a range of complementary activities instead of focusing on just one activity. For example, their results showed that firms should not only invest in labour and capital, but they should accompany such investments with appropriate organisational change. Furthermore, they found that there was little difference between the labour productivity effects of hierarchy flattening and group-work enhancement, as both types of changes affected information flows and worker motivation and led to equally large gains in productivity.

Guthrie (2001) collected data on a multi-industry sample of New Zealand firms to examine the relationship between firms' use of high-involvement work practices and employee retention and productivity. In this context, high-involvement work practices[13] are designed to link innovative approaches to human resource practices to

11 Other dimensions included workplace leadership; having a say; clear values; being safe; the built environment; recruitment; pay and conditions; getting feedback; autonomy and uniqueness; a sense of ownership; getting feedback; a sense of ownership and identity; learning; passion; having fun and community connections.

12 Working relationships was defined as 'people relating to each other as friends, colleagues, and co-workers. Supporting each other, and helping to get the job done.

13 High-involvement work practices entail a system of management practices that enhance employee skills, information and motivation and result in a workforce that is a source of competitive advantage.

enhance organisational productivity and increase a firm's competitive advantage. The study found that employee turnover and employment practices interact to affect firm productivity and that employee retention is especially critical when investments in high-involvement work practices are relatively high. The paper also concluded that the use of high-involvement work practices may have implications for the effect of turnover on firm productivity. Turnover is adversely associated with productivity when the use of employment practices is high and it is positively associated with productivity when the use of these practices is low. The results suggest that greater use of these practices is associated with significant productivity losses when associated with employee turnover, as the use of such practices increases the value and importance of human capital and hence, the cost of employee turnover.

Using a unique panel data set containing Japanese firms, Kato and Morishima (1995) also looked at the effects of specific Human Resource Management Practices (HRMP). They found significant productivity-enhancing effects for all HRMPs and found that the productivity gains would change as the practices aged. For example, they found that the introduction of joint labor-management committees (JLMC) would increase productivity initially by 9 per cent annually. The productivity gains would then rise, peaking at 11 per cent 23 years after the introduction of the JLMC, and gradually diminish, calling for a new innovation in information sharing.

Hancock et al. (2007) reviewed the literature on the relationship between Australia's industrial relations practices and its productivity performance and highlight some key assertions, particularly with respect to the effect trade unions, industrial arrangements and employment relationships have on productivity.

The effect trade unions have on productivity remains contested. A number of researchers assert that trade unions can adversely affect productivity by enforcing restrictive labour practices and increasing labour costs through inefficient personnel hiring and firing practices (Green and Macdonald 1991; Magnani and Prentice 2006; Hancock et al. 2007). Conversely, a number of researchers assert trade unions can positively affect productivity by promoting better relations between management and workers through better communication, workplace restructure and the adoption of more efficient work practices (Hancock et al. 2007, citing Freeman 1976 and Freeman and Medoff 1984). The lack of quality Australian micro data, however, limits conclusive findings of the effect trade unions have on productivity (Webster and Loundes 2002; Farmakis-Gamboni and Prentice 2007).

Employment relationships are considered to have an effect on productivity. For example, Buchele and Christiansen (1999: 326) argued that:

> …all of the basic determinants of productivity growth—the pace of innovation in technology and the labor process, the rate of growth of capital per worker and the development of workers' skills (including general problem solving and integrative skills)—depends crucially on the cooperation and effective participation of workers. Due to their first hand experience and strategic position in the production process, workers are in a unique position to contribute to improvements in technology and work organization that raise labor productivity.

Rogers (1999b) found that workplaces with better employee management are more likely to induce changes in the workplace and workplaces with higher levels of training undergo more change. Furthermore, Laplagne and Bensted (1999) found that productivity gains will not be realised if innovative ideas are introduced without appropriate training, hence innovation is only of benefit to labour productivity growth if combined with training. The Productivity Commission (1999) also noted that management strategies can raise productivity if they facilitate organisational change and improve competitive advantage.

Changes made to industrial relations policy during the 1990s, the introduction of the *Industrial Relations Reform Act 1993* (IRRA) and *Workplace Relations Act 1996* (WRA) led to an increase in the types of formal employment arrangements available to the firm, transforming 'agreement making' in Australia. In addition to awards and

informal and contractual overaward arrangements, the IRRA introduced enterprise agreements. Terms and conditions of employment are negotiated between the employer, employees and/or trade union and can be used as a means of linking improvements to productivity with wage growth.

Improvements to productivity have been linked with labour market flexibility. There is no universally accepted definition of flexibility—it varies according to whether it is for the employer or the employee—hence the literature covering flexibility is diverse.[14] In an industrial relations context it is common to review a discussion of flexibility based on the functional mobility of labour, the core and periphery model and, in more recent literature, as a form of corporate strategy. Atkinson (1984) identifies four types of labour market flexibility; external numerical flexibility—internal numerical flexibility, functional flexibility, and financial or wage flexibility. As Burgess and MacDonald (1990: 16) described:

> Labour flexibility has become the catch-call for improving labour productivity specifically and industrial performance in general. The term is ambiguous and rarely defined. Attempt to categorise the many forms that labour flexibility can take have been numerous and range in complexity from a simple distinction between functional flexibility and numerical flexibility to schemes with up to five categories...like beauty or taste, labour flexibility can mean all things to all people.

Since the concept of flexibility is broad, a review of the literature is not in the scope of this paper and will not be explored as the volume of material is expansive. However, in considering academic discussion of flexibility, it is important to note the tensions between functional and financial flexibility, and differential, and potentially divergent, impacts, of these as employer strategies on productivity.

While it is difficult to quantify the effects of industrial relations on productivity, many commentators argue that industrial relations changes have, in part, contributed to productivity growth (Productivity Commission 1999, 2000; OECD). For instance Parham (2003) claims that changes in enterprise bargaining have improved the reallocation of labour and capital increasing the productive use of technology:

> Labour markets have become more flexible, particularly with greater focus on enterprise bargaining. [T]here is a range of evidence that flexibility in the labour markets has allowed work and organisational arrangements to be restructured and labour to be reallocated; and has facilitated the productive use of technology (Parham 2003: 22).

In its submission to the Parliament of the Commonwealth of Australia *Inquiry into raising the productivity growth rate in the Australian economy*, the Australian Chamber of Commerce and Industry submitted that 'with the domestic and international economy constantly changing, flexibility in workplace arrangements enables employers to react quickly to changing demands' (Commonwealth of Australia 2010: 133).

However, as cited in the report, Mr Gary Banks, Chairman of the Productivity Commission, noted '... legitimate concerns for workers' rights need to be balanced against the flexibility that firms need to implement the organisational changes and other innovations on which productivity growth ultimately depends' (Commonwealth of Australia 2010: 133).

14 George Stigler introduced the concept of flexibility to economic literature in his publication of 1939. He first defined this notion in relation to the costs incurred by a plant producing in excess or less than the level of optimum output, i.e., the minimum average cost point. Hereinafter, academics have explored this concept and added to it their own interpretation of flexibility.

Loundes et al. (2003) claim that enterprise bargaining can help remove inefficient work and management practices by trading off wage increases for changes in work practices. In this instance, productivity is enhanced only in the short run, after the removal of these inefficiencies. Enterprise bargaining, however, can affect the long-run rate of productivity growth if it encourages innovation, the adoption of new technologies and training:

> …enterprise bargaining may have a sustained impact on productivity by affecting the long-run rate of productivity growth. This might arise if enterprise bargaining is able to promote more cooperative relations in the workplace, thereby potentially encouraging innovation, facilitating greater acceptance of new technology and promoting the development of worker skills (Loundes et al 2003: 247–248).

While some analysis suggests that the rate of productivity growth declines as the extent of award reliance increases (DEWR 2003; Access Economics 2005), other commentators have analysed and quantified the productivity effects of enterprise bargaining and trade unions and found the evidence to be inconclusive (Rimmer 1998; Dawkins 1998; Tseng and Wooden 2001; Loundes et al 2003; Webster and Loundes 2002; Farmakis-Gamboni and Prentice 2007).

Tseng and Wooden (2001) found that firms that engage in enterprise bargaining arrangements are more productive than firms that do not participate in enterprise bargaining, but warn that the causal relationship is unclear. For instance, high productivity firms may be more likely to engage in enterprise bargaining than less productive firms. To establish a causal relationship, better micro data which tracks the output performance of firms over time are necessary (Wooden and Tseng 2001; Wooden 2002; Loundes et al 2003; Hancock et al 2007).

Since quality Australian micro data are unavailable, qualitative studies have attempted to fill the void by documenting workplace experiences (Demura 1995; Oster and Antioch 1995; Productivity Commission 1999, 2000; Loundes et al 2003).

The Productivity Commission (1999, 2000) explored Australia's productivity performance in a series of case studies in the Wholesale and Retail trade industries and found that enterprise bargaining had increased flexibility, as defined by the Productivity Commission, across firms. The report found that in the wholesaling of motor vehicles, for example, efficiency and productivity had improved by aptly matching shift arrangements to shipping and delivery times.

Also focusing at the enterprise level, Demura (1995) looked at productivity changes in BHP Steel between 1982 and 1995. He noted that the push to improve productivity commenced in the early 1980s as a result of the world recession, a decline in demand and an influx in imports of cheap steel in the Australian domestic market. With excess capacity in both plant and labour and a decline in market share, Demura noted that pressure from competitive forces motivated management to improve business performance and innovate. While these largely reflect external factors, Demura also commented that changes in industrial relations policy led to an improvement in labour productivity through a reduction in industrial and demarcation disputes following the restructure of awards.

While studies have been able to provide some insight into the effects of industrial relations changes on workplace productivity, their effects from other influences remain difficult to isolate (Dawkins 1998, Wooden 2002). Nonetheless, Wooden (2002: 2) argued that this does not suggest that a relationship between industrial relations reform and productivity fails to exist:

> …there are good reasons to be cautious about defending the bold claims often made about the impact that enterprise bargaining and industrial relations reform is having on productivity. In large part, however, this is a result of the

> difficulty disentangling the impact of industrial relations reforms from other possible influences on productivity. There is certainly no strong evidence that strongly refutes the existence of a connection between reform and improvement in productive performance.

2.2 Minimum wages, productivity, competitiveness and business viability

According to the model of competitive markets, each worker receives the value of his or her marginal product based on the assumption that market clearing wages can be achieved when demand equals supply. At this intersection firms and workers under the model of competitive markets are assumed to maximise profits and utility respectively. The model argues that if the supply of labour increases, there will be a natural reduction in the cost of labour until supply once again equals demand. A wage floor above the theoretical market clearing rate, however, will prevent the cost of labour from falling and firms may reduce their demand for labour, which results in unemployed workers.

In this instance, Stigler (1946) noted that a minimum wage may have one of two effects. It may lead to unemployment for those workers whose services are worth less than the minimum wage or it may increase the productivity of low-efficiency workers. He noted that labour productivity can be achieved in one of two ways—through increased work effort or from the introduction of different production techniques. Stigler argued that the introduction of new production techniques was 'the more common source of increased labour productivity' and stated that:

> First, techniques which were previously unprofitable are now rendered profitable by the increased cost of labor. Costs of production rise because of the minimum wage, but they rise by less than they would if other resources could not be substituted for labor. Employment will fall for two reasons: output falls; and a given output is secured with less labor. Commonly the new techniques require different (and hence superior) labor, so many inefficient workers are discharged. This process is only a spelling-out of the main competitive effect. Second, entrepreneurs may be shocked out of lethargy to adopt techniques which were previously profitable or to discover new techniques (Stigler 1946: 359).

Levin-Waldman (1997) noted that a wage floor can lead to greater efficiency because workers become more productive. He stated that while an increase in the minimum wage may result in a wage exceeding the marginal product of the worker, the employer would be encouraged to find ways to increase productivity either by getting workers to produce more or by substitution of technology for labour. At the higher wage, the worker is also assumed to have incentive to work harder.

The efficiency-wage model suggests that higher wages lead to greater efficiency because workers are more productive. The efficiency wage is the wage that maximises the ratio of the effort supplied by the workers to the wage. It involves the assumption that the level of effort supplied by an employee depends on the wage paid. The efficiency wage can be considered a 'wage floor' because a profit maximising firm would not choose to pay a wage below the efficiency wage (Harding and Harding 2004).

A higher minimum wage may have the effect of offering positive inducement to work and incentive for them to work harder and be more productive. Employers concerned with shirking will also pay less in monitoring costs because a higher wage is more likely to result in less shirking. In conducting a natural experiment provided by the introduction of the United Kingdom National Minimum Wage, Georgiadis (2008) investigated the relationship between wages and monitoring and tested for efficiency wages considerations in the United Kingdom residential care homes industry.

Georgiadis (2008) found empirical evidence that in care homes in which the United Kingdom National Minimum Wage had a larger impact on the wage bill, monitoring, as measured by different ratios of senior to

junior staff fell by more, compared to firms that were less affected by the United Kingdom National Minimum Wage. His estimates suggested that wage increases induced by the United Kingdom National Minimum Wage increase were on average more than offset by a fall in monitoring costs. Georgiadis interpreted this as indirect evidence of productivity-enhancing effects of higher wages. His study also found that employers did not increase work effort and that there was no significant profit effects as a result of the United Kingdom National Minimum Wage, which suggested that the United Kingdom National Minimum Wage had operated as an efficiency wage in the care homes sector.

While Georgiadis' study demonstrated that an increase in the United Kingdom National Minimum Wage had an indirect productivity-enhancing effect through reducing monitoring costs, the direct effect an increase in minimum wages has on productivity remains unclear. For example, as highlighted by an OECD study conducted by Bassanini and Venn (2007), minimum wages can have a negative effect on productivity by compressing wage relativities between skilled and unskilled employment, reducing incentives across firms to invest in training among the lower skilled. On the other hand, minimum wages can increase productivity in that they lead firms to hire high-skilled workers in preference to low-skilled workers. Bassanini and Venn estimated that an increase of 10 percentage points in the ratio of statutory minimum wage to median wages is associated with an increase of between 1.7 and 2.0 percentage points in the long-run level of average labour productivity and multifactor productivity. The study found that an increase in the minimum wage is associated with a small, but statistically significant increase in average productivity in low-wage industries compared with other industries. The size of the effect is similar for labour productivity and multifactor productivity. However, the study found that at least part of this effect is caused by a reduction in the demand for unskilled workers relative to skilled workers. Also, the effects are dependent on the level of unemployment benefits, as substantial unemployment benefits may discourage unskilled workers from seeking education and training.

Wimmer (2000) looked at differences in labour productivity across industries in the United States. He stated that the displacement of lower-skilled workers for higher-skilled workers is likely to be most prevalent in industries and occupations where the service provided is the labour input itself. For example, he noted that it would be difficult for these industries to move to a more capital-intensive approach and as a result these firms would hire more highly skilled labour to increase labour productivity and offset the effect of a minimum wage increase. If workers that are more productive are not available, the firm may either absorb the labour cost increase or pass the increase to consumers via higher prices. However, as noted by Kreuger (1991) the ability to increase productivity can be limited by the type of work performed. For example, the fast-food industry is considered to be highly routinised and capital intensive, hence hiring workers with increased skills may not improve productivity because the job does not require a lot of work effort.

Welch (1995) noted that labour intensity across restaurants differs. For example, Welch highlighted that in comparison to fast-food chains that specialise in fried chicken and hamburgers, Chinese and Mexican restaurants are low-wage labour intensive. An increase in the cost of low-wage labour may raise the relative cost of Chinese and Mexican food and the consumer may substitute between restaurant foods. Hence, while an increase in the minimum wage may not have a very large effect on the profitability of franchised fast-food restaurants, they may in restaurants that are more labour intensive. Wimmer (2000), however, commented that it is unclear how high minimum wages can be pushed before consumers switch from highly labour-intensive goods and services.

Fairris and Bujanda (2008) utilised an employer-employee matched dataset on city contract establishments to examine the extent of labour-labour substitution following the Los Angeles Living Wage Ordinance. They tested for substitution on observable and unobservable skills and worker demographic characteristics. Demographic and human capital characteristics allowed them to test for substitution along observable demographic and skill dimensions. In addition, data on the wages of workers before the Living Wage Ordinance was implemented

allowed them to measure the extent of substitution among unobservable skill and demographic characteristics. Unobservable characteristics may include strength, mental agility, diligent work habits, intensity of labour effort and physical attractiveness, which cannot be observed in the data but may be observable to participants in the hiring process.

Based on observable characteristics, their results found labour substitution toward male, Latino and black workers and workers with a greater propensity to possess prior formal training. Based on the unobservable characteristics by comparing the 'before' wages of stayers and joiners within the establishments, holding constant observable worker characteristics, their results found that there was evidence of significant substitution toward workers with more valuable unobservable skills and worker characteristics. For example, their results revealed that the before wages of joiners were statistically significantly different from, and roughly 20 per cent above, those of stayers, all else being constant. Fairris and Bujanda commented that:

> To the extent this substitution is based largely on unobservable features related to worker productivity, comparing these results to those for observables suggests that labor substitution on unobservables such as mental agility or work ethic is much more important in minimum wage contexts than is substitution on observable skills such as education or experience (Fairris and Bujanda: 489).

Reich et al (2005) evaluated the costs, benefits and related impacts of living wage policies implemented at San Francisco Airport and noted that the wage policies at the airport were binding for a very large proportion of workers in the airport labour market, unlike contractor-focused living wage ordinances, which benefited only a small number of workers. They observed a series of dynamic adjustments that reduced costs, improved worker morale and increased work effort. They also found limited evidence of labour-labour substitution but no evidence of a decline in employment. Hiring patterns of the firm slightly changed as more male workers were employed in some low-wage occupations and educational requirements were raised for screeners.

McLaughlin (2009) argued that, due to the ready availability of low-paid workers, employers have little incentive to increase productivity through investing in new technology, training, or the reorganisation of production. Thus, McLaughlin argues, by introducing or raising the minimum wage, these firms 'will be shocked into adopting the high productivity road to competitiveness'. Poire and Sable (1994) defined the low and high roads. The 'low-road' assumes a mass industrial production in which most functions can be performed by cheap and low-skilled workers. The 'high-road' reflects an information-based economy with a flexible and high-skilled labour force developed through education and training. Booth and Bryan (2006) and Arulampalam et al. (2004) found that an increase in the minimum wage raised the probability of low-skilled workers receiving training, with Arulampalam et al. (2004) finding that this probability increased by 8 to 11 percentage points when the minimum wage is increased by 1 per cent.

Enterprise level case studies have also evaluated the effects of minimum wages on indicators of productivity, business competitiveness and viability. Focusing on the effects of the introduction of the United Kingdom National Minimum Wage in 1999, Forth and O'Mahony (2003) found little evidence to suggest that the introduction of the United Kingdom National Minimum Wage provided a boost to labour productivity growth in low-paying sectors. This research found that the strategies implemented by employers in response to recent changes in wage rates differed across industries. For instance, 'training to increase productivity' was a common strategy implemented in response to a wage increase in the Health and community services sector, whereas in Retail and Accommodation, cafes and restaurants, a common strategy was to reduce staff numbers.

In their 2009 study, Forth et al. extend their analysis to determine the effect of the United Kingdom National Minimum Wage and its upratings on various measures of business performance, such as productivity, capital intensity, unit labour costs, profitability and firm closure. The analysis focused on sectors where employment of

minimum wage reliant workers is relatively high. Their results found that the United Kingdom National Minimum Wage and its upratings led to an increase in unit labour costs in firms with a relatively high exposure to the minimum wage, but there was less evidence of an impact on productivity, profitability and firm closure. The impact of the United Kingdom National Minimum Wage was not consistent across these indicators and was associated with negative productivity in some industries, positive profitability in selected industries and a mixture of results in terms of the probability of closure (which depended upon the size of the business). These results reflect the difficulties associated with isolating and understanding the impact of the United Kingdom National Minimum Wage.

Few studies look at the effects of the minimum wage on profits. This could possibly be as a result of a lack of available data on profits (Neumark and Wascher (2008: 225).

Draca et al. (2006) estimated the link between profits and the minimum wage in the United Kingdom using firm level data on profit margins. Implementing a difference-in-difference approach Draca et al. estimated the change in average profit margins for the three-year periods before and after the date the new United Kingdom National Minimum Wage was introduced. The treatment group included firms whose labour costs were more heavily affected by the United Kingdom National Minimum Wage and the control group included firms whose labour costs were less affected. Using two separate data sets, one which focused on the residential home care sector and the other using accounting data from a subsample of firms registered in the United Kingdom, they found that profit margins were reduced in low-wage firms compared to margins in higher wage firms following the introduction of the United Kingdom National Minimum Wage. However, their results did not find any evidence to suggest that the introduction of the United Kingdom National Minimum Wage resulted in a higher probability of closure for low-wage firms. Draca et al. suggest that wage gains accruing to low-wage workers as a result of the introduction of the United Kingdom National Minimum Wage were financed by squeezing profit margins, and that the ability of firms to absorb the increases through reducing profits may help to explain the absence of large increases in people being put out of work.

Wimmer (2000) however, noted that an increase in the minimum wage may have a negative effect on firm survival. For example, firms unable to alter their production processes in response to an increase, for they may be unable to substitute capital for labour because their operations are labour intensive, must either absorb the cost increases or pass them on to their customers, which is likely to decrease firm profitability.

Card and Krueger (1995) conducted a stock market event methodology which consisted of combining data on stock prices with news stories about minimum wages. They estimated the daily excess returns on stock prices for two subsamples of firms in the United States. The first subsample consisted of firms in industries that have a high proportion of minimum wage workers, such as firms in the restaurant, department store, grocery store, merchandise store, variety store, hotel and motel, linen supply and motion picture theatre industries. The second subsample consisted of firms (mostly restaurants) that cited the 1990 or 1991 minimum wage increase as a reason for increased labour costs in their company annual reports. Card and Krueger identified 20 events that related to the progress of the bill introduced in Congress which resulted in the increase in the 1990-1991 minimum wage increase. They interpreted each event as ‘positive’ or ‘negative’ with respect to minimum wage employers’ future profits, based on the assumption that a minimum wage increase would be perceived as having a negative effect on profits.

Card and Krueger noted that it is difficult to identify an event that unambiguously raises or lowers investors’ expectations about the future level of the minimum wage and, as a result, conclusions drawn are ‘tentative’, since their results provided mixed evidence that news about a minimum-wage rise was likely to make investors adjust their valuation of firms downward.

Card and Krueger (1995) also studied the effect of the minimum wage on restaurants that were open for business prior to an increase in the minimum wage, including any effect on restaurant closings. Their results provided no evidence that a higher minimum wage rate had a negative effect on either the net number of restaurants in operation or the rate of new openings, although many of the estimates were not statistically significant. Nevertheless, the evidence was based only on data drawn from one food chain and, while this has been subject to criticism, Card and Krueger (1995: 66) stated 'that it is probably safe to conclude that new openings in the fast-food industry are not strongly affected by wage changes induced by modest changes in the minimum wage'.

Waltman et al. (1998) examined whether higher minimum wage rates have been associated with actual increases in the rate of business failures in the United States. Business groups have argued that larger minimum wage increases should lead to more failures than smaller ones. Using published data on rates of business failures from Dunn and Bradstreet from the period between 1926 and 1983, they utilised failure rates from 1949, which was the year of adoption of the first post-war increase in the minimum wage. Their aim was to determine whether the failure rate during the years when the minimum wage rose was higher than the longer-term average and whether this was also the case for each of the years following immediately after a minimum wage rise (the 'lag' years). They also examined the effect of the magnitude of the increase in the minimum wage on the failure rate.

They found that comparing the years when there was an increase in the minimum wage with other years, the failure rate was 43.2 in the former and 50 in the latter. Concentrating on the lag years, the rate was 48.4 for the year following a minimum wage increase and 47.6 in the remaining years. Waltman et al. seemed to find no correlation between minimum wage increases and a rise in business failures either in the year the increase occurred or in the following year. In regressing the magnitude of the minimum wage increase on the failure rates for both the year of the increase and the lag year, they found that the larger the minimum wage increase, the lower the failure rate.

Wimmer also studied the effects of minimum wage adjustments on business viability, by looking at the relationship between the number of firms that fail in the retail trade industry and the real minimum wage. He found that there was a large upturn in the number of failures in 1996 and 1997, which coincided with an increase in the minimum wage. In addition, the number of new business starts had also fallen in 1997. Wimmer commented that:

> While these data are insufficient to draw any definitive conclusions, they do show that business starts and failures vary widely from year to year and suggest that they may be sensitive to changes in the level of the minimum wage and changes in coverage. This analysis suggests that firms that find it difficult to substitute away from low-skilled labour will be most adversely affected by a minimum wage increase (Wimmer 2000: 663–664).

In conducting research on minimum wage effects, Butler (2006) cited a Danish study, which found that one per cent of new jobs were in 'new firms' that did not exist a year earlier and had a larger number of low-paid workers. He also drew upon evidence which indicated that new businesses tend to be less productive than existing businesses and in some instances, a higher wage cost may prohibit entry of businesses that are likely to increase their productivity after becoming established in the marketplace. Butler commented that high investment costs and marketing inhibit productivity among new market entrants, and stated that 'there is no reason why less efficient companies cannot provide worthwhile jobs in an interim period prior to increases in productivity being achieved' (Butler 2006: 192).

In summary, this section illustrated that productivity is determined by many factors, such as physical and human capital accumulation, research and development as well as management practices and work arrangements. Minimum wage adjustments may affect productivity through these determinants. For example, they may have

the effect of increasing research and development or raising human capital accumulation, factors that enhance a firm's competitiveness and increase its chances of survival.

Nonetheless, a review of the literature suggests that the relationship between minimum wages and productivity for Australia is ambiguous because it is not clear whether increased training or the substitution of low-skilled labour for high-skilled labour is driving the results. Furthermore, while theory suggests that minimum wages adversely affect profitability and firm survival, the evidence appears to be inconclusive.

3 Trends in productivity, business competitiveness and viability at a national and industry level

This chapter reviews various measures of productivity, business competitiveness and viability and their trends at an aggregate and industry level, with a particular emphasis on award-reliant industries such as Retail trade and Accommodation, cafes and restaurants. Section 3.1 looks at the trends in productivity growth, at an aggregate and industry level and the link between productivity and industrial arrangements. Section 3.2 discusses the measures of business competitiveness and viability, focusing on indicators such as profitability, investment and industry size as well as bankruptcy and firm survival data.

3.1 Measurement of productivity

Productivity measures are subject to statistical limitations. Specifically, the ABS cautions that productivity measures are derived as a residual[15] and thus are subject to any errors in the output and input measures. These errors assume even more importance when measuring productivity growth as productivity growth is usually a small number.[16] Furthermore, productivity is particularly difficult to calculate in the service sector due to the inherent difficulties in calculating inputs and outputs. In their submission to the inquiry into raising the productivity growth rate in the Australian economy, Professors Cooper and Sheen note that outputs may not be physical products, and complex interrelationships in the production of goods and services mean that the contribution of individuals is increasingly an unobservable task.[17] The report also noted that excluding the six services sectors in official multifactor productivity estimates may prove more problematic in the future as this sector of the economy continues to grow.[18]

In light of these issues, the common approach to analysing productivity is to compare annual average rates of growth in the market sector between peaks in the productivity cycle (as identified by the ABS) rather than focusing on short-run (quarterly and annual) trends. According to the ABS:

> Year to year changes in measured productivity may reflect changes that are conceptually distinct from the notion of productivity. In particular, changes in the degree to which businesses are utilising their capital stock would ideally be recorded as changes in the capital services inputs. As there is insufficient information to implement such an adjustment, it is assumed for the purpose of measurement that this capital is utilised at a constant rate. This means that year to year changes in estimates may not be truly indicative of a change in productivity. By analysing average productivity statistics between growth cycle peaks, the effects of some of these influences can be minimised, allowing better analysis of the drivers of growth in different periods.[19]

3.2 Trends in productivity

In Australia, the 1980s was characterised by two productivity cycles—the first spanning from 1981–82 to 1984–85 and the second from 1984–85 to 1988–89. Labour productivity growth slowed significantly in the second cycle, decreasing from 2.3 per cent in the first cycle to 1.0 per cent in the second cycle. However, this

15 Where a residual is, in this instance, the remainder after dividing output by input.

16 ABS, *Australian National Accounts: Concepts, Sources and Methods*, 2000, Catalogue No. 5216.0, p. 375.

17 Professors Cooper and Sheen in Commonwealth of Australia (2010), *Inquiry into raising the productivity growth rate in the Australian economy*, House of Representatives, House Standing Committee on Economics, Canberra.

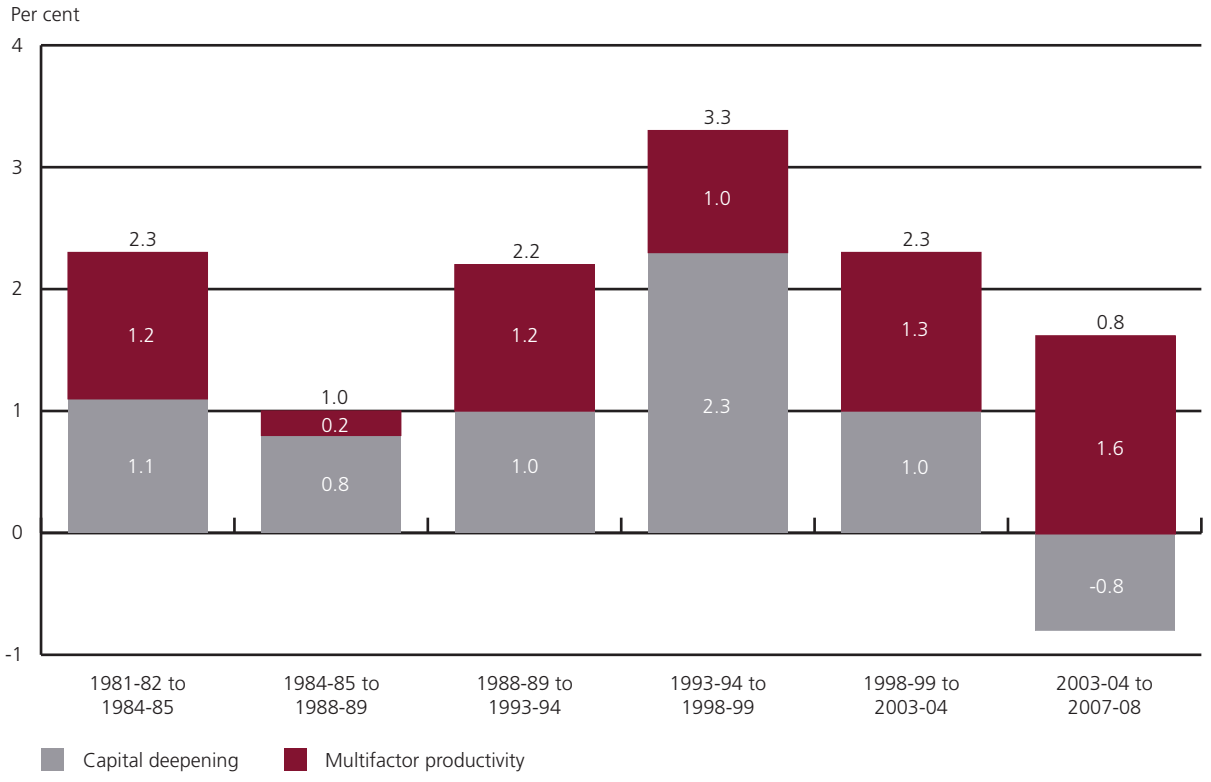
18 Commonwealth of Australia (2010), *Inquiry into raising the productivity growth rate in the Australian economy*, House of Representatives, House Standing Committee on Economics, Canberra.

19 ABS, *Australian System of National Accounts*, 2007-08, Catalogue No. 5204.0, p. 11.

was caused by a decline in the capital to labour ratio, as multifactor productivity[20] growth decreased by a smaller margin (Figure 3.1). The surge in productivity occurred in the cycle marked from 1993–94 to 1998–99, when labour productivity increased sharply by 3.3 per cent, driven by strong multifactor productivity growth (2.3 per cent) rather than capital deepening. Many commentators argue that micro and macro reforms contributed to the productivity surge of the 1990s (Productivity Commission 1999; Dolman et al. 2006; Parham 2003; Banks 2002; Dawkins and Rogers 1998; Davis and Rahman 2006). Studies have suggested that 'trade liberalisation, use of ICTs, research and development, labour market reform, increased competition, and human capital accumulation contributed to the productivity surge' (Parham 2003: 11).

Productivity growth has since declined, with labour productivity growth falling to 2.3 per cent for the period between 1998–99 and 2003–04, and 0.8 per cent in the current cycle. The decrease was due to a decline in multifactor productivity, which dropped to 1 per cent in the period from 1998–99 to 2003–04 and –0.8 per cent in the current cycle. The decline in multifactor productivity in the current cycle is mostly attributed to falls in Agriculture, forestry and fishing, Mining and Manufacturing (Topp et al. 2008: 2).

Figure 3.1: Annualised labour productivity growth in the market sector over productivity cycles



Note: Figures prior to 1998–99 use the ANZSIC 1993 definition of the market sector. Under the ANZSIC 1993 classifications, the market sector includes all industries except Property and business services, Government administration and defence, Education, Health and community services and Personal and other services. Under the ANZSIC 2006 classifications, the market sector includes all industries except Public administration and safety, Education and training and Health care and social assistance. These industries are excluded because their outputs are not marketed and/or because their outputs are derived either wholly or primarily by using either deflated input cost data or hours worked as indicators of output.

Source: ABS, *Australian System of National Accounts*, 2007–08 Catalogue No. 5204.0; ABS, *Australian System of National Accounts*, 2009–10, Catalogue No. 5204.0.

20 In our analysis, the input for multifactor productivity is labour and capital combined.

Most market sector industries experienced a strong increase in labour and multifactor productivity growth during the 1990s productivity surge. Productivity growth in Wholesale trade, Communication services and Transport and storage outperformed other industries during this period (Tables 1 and 2).

Johnston et al. (2000) and Gretton et al. (2002) argued that in most of these sectors, productivity and business competitiveness were enhanced by increased price competition and improved technology. For example, the wholesale sub-industry (wholesaling of motor vehicles) experienced increased price competition emanating from tariff reductions in the early 1990s, while Information and Communication Technologies (ICT) related innovations introduced new methods of production and operation to workplaces in the service industries. Johnston et al. (2000: 123) claimed that:

> The improvements in the productivity performance in the wholesaling of motor vehicles appears to strongly reflect increased output. It has also been driven by changes in technology and, to a lesser extent, in workplace arrangements. In the retailing of motor vehicles, output growth has been important and productivity performance has been underpinned by ongoing rationalisation and the introduction of increased competition resulting from changes in the regulatory arrangements surrounding the import of motor vehicles.

By the end of the 1990s, investment in technologies was greatest in the Finance and insurance sector, followed by Manufacturing and Wholesale and Retail trade. Gretton et al. (2002) found strong associations between productivity growth and IT use in Finance and insurance and Wholesale trade, but not in Manufacturing. They argued that, despite its uptake of IT, the Manufacturing sector did not show positive growth because of the lags between the adoption and implementation of new technologies. Gretton et al. (2002) also commented that the investment in ICT related innovations was not a post-1995 phenomenon and claimed that the strong uptake of ICTs began in some sectors before the 1990s.

However, following the 1990s, productivity growth, particularly multifactor productivity, slowed substantially for most industries, especially among those that performed strongly during the 1990s. For example, while Wholesale trade experienced the largest increase in multifactor productivity in the 1993–94 to 1998–99 cycle the growth rate declined significantly afterwards, falling from 5.8 to 1.8 per cent in the 1998–99 to 2003–04 cycle, and 0.3 per cent in the current cycle (Table 2).

Dolman et al. (2006) argued that the reduced rates of productivity growth presented a return to historically normal rates. They found that the sectors responsible for the upturn were also accountable for the slowdown in productivity and argued that over the medium term there were some industries affected by supply shocks, such as the benefits of past microeconomic reforms. The reforms therefore were considered to have only temporarily raised the level of productivity growth during the transition to a new and higher productivity level.

However, Dolman et al. (2006) represent one view in an expansive volume of literature subject to much contention. For a review of studies that examined the surge in productivity and the resulting slowdown, please see Banks 2002; Commonwealth of Australia 2010; Cutler 2008; Dawkins and Rogers 2006; Dolman et al. 2006, 2009; Forsyth 2000; Hancock et al. 2007; Parham 2002b, 2003, 2005; Productivity Commission 1999.

Industries with high proportions of award-reliance, such as Retail trade and Accommodation, cafes and restaurants also experienced strong increases in labour and multifactor productivity growth during the 1990s, before slowing in the 2000s. Increases in labour productivity in Retail trade were mainly attributable to increases in multifactor factor productivity rather than capital deepening, except for the most recent cycle. This is similar for Accommodation, cafes and restaurants; however, multifactor productivity declined by 0.2 per cent while labour productivity increased by 0.3 per cent between 2003–04 and 2007–08 (Tables 3.1 and 3.2). This is somewhat expected, particularly throughout the productivity surge of the 1990s, as an increase in multifactor

productivity may reflect technological advancements, increased human capital accumulation and labour market reforms—all determinants of productivity considered to have great effect during this period.

Table 3.1: Annualised labour productivity growth by industry, 1988–89 to 2007–08

	1988–89 to 1993–94	1993–94 to 1998–99	1998–99 to 2003–04	2003–04 to 2007–08
Agriculture, forestry and fishing	4.9	3.7	5.3	–0.5
Mining	5.2	5.3	–0.3	–5.8
Manufacturing	1.7	2.3	3.2	0.6
Electricity, gas and water supply	6.6	7.1	–2.6	–4.4
Construction	0.2	2.6	0.6	1.1
Wholesale trade	–1.4	6.9	3.3	2.7
Retail trade	1.9	2.5	2.0	1.8
Accommodation, cafes and restaurants	–1.3	2.3	1.1	0.3
Transport and storage	2.1	2.2	3.4	1.9
Communication services	9.9	7.4	3.0	5.2
Finance and insurance	5.1	4.1	2.4	2.5
Cultural and recreational services	–0.4	–0.6	2.6	0.3
Market sector	**2.2**	**3.3**	**2.2**	**1.1**

Source: ABS, *Australian System of National Accounts*, 2007–08, Catalogue No. 5204.0.

Table 3.2: Annualised multifactor productivity growth by industry, 1988–89 to 2007–08

	1988–89 to 1993–94	1993–94 to 1998–99	1998–99 to 2003–04	2003–04 to 2007–08
Agriculture, forestry and fishing	3.9	3.7	3.4	–1.4
Mining	2.4	0.5	–0.7	–4.8
Manufacturing	0.3	0.9	1.8	–0.8
Electricity, gas and water supply	3.7	2.0	–2.3	–4.2
Construction	–0.4	2.7	1.0	1.0
Wholesale trade	–2.3	5.8	1.8	0.3
Retail trade	1.2	1.9	1.3	0.6
Accommodation, cafes and restaurants	–1.6	2.1	0.7	–0.2
Transport and storage	1.4	2.2	2.4	0.8
Communication services	5.9	4.7	0.1	3.0
Finance and insurance	3.0	3.0	0.7	2.2
Cultural and recreation services	–0.9	–1.4	1.4	0.2
Market sector	**1.0**	**2.3**	**1.1**	**–0.3**

Source: ABS, *Experimental Estimates of Industry Multifactor Productivity*, 2007–08, Catalogue No. 5260.0.55.002.

3.2.1 Labour productivity and industrial arrangements

Industries with a relatively high reliance on award rates of pay, such as Accommodation, cafes and restaurants and Retail trade have relatively low levels of labour productivity (Table 3.3). This is not unexpected because industries with low levels of labour productivity are generally labour-intensive industries with low wages and skill levels, and reduced bargaining power. In contrast, industries that have high wages and high labour productivity levels relative to other industries (e.g. Electricity, gas and water supplies) tend to be associated with higher proportions of collective agreements.

Table 3.3: Labour productivity comparisons by industry (market sector)

	Ratio of labour productivity in industry to labour productivity across all industries			Award reliance (% of employees in industry)	Collective agreement coverage (% of employees in industry)
	1993–94	1998–99	2007–08	2008	2008
Agriculture, forestry and fishing	0.6	0.6	0.6	-	-
Mining	7.1	8.0	4.9	1.0	31.9
Manufacturing	1.0	1.0	1.0	10.8	29.5
Electricity, gas and water supply	2.9	3.6	2.4	np	81.6
Construction	0.9	0.9	0.8	8.4	24.2
Wholesale trade	0.7	0.8	1.1	11.0	11.6
Retail trade	0.5	0.5	0.5	29.3	33.3
Accommodation, cafes and restaurants	0.5	0.5	0.5	53.8	13.5
Transport and storage	1.0	0.9	1.0	11.8	39.9
Communication services	1.1	1.3	1.5	1.8	53.5
Finance and insurance	1.9	2.0	2.1	2.5	38.9
Cultural and recreational services	0.9	0.7	0.7	15.0	37.5

Note: A ratio of less than 1 shows that labour productivity is lower in this industry than across all industries. The EEH Survey does not collect data on the Agriculture, forestry and fishing industry. Award coverage for Electricity, gas and water supply is not published due to high standard errors—but would most likely constitute a very small number, as coverage in 2006 was 0.9 per cent.

Labour productivity levels are calculated by dividing industry output data from the Australian System of National Accounts by total hours worked from the Labour Force Survey.

Source: FWA calculations using ABS, *Australian System of National Accounts*, 2007–08, Catalogue No. 5204.0 and ABS, Labour Force, November 2008, Catalogue No. 5204.0; ABS, *Employee Earnings and Hours*, customised data, August 2008, Catalogue No. 6306.0.

3.3 Competitiveness and viability

A range of measures are required to consider business competitiveness and viability at the aggregate and industry level. It is important to note that the data presented in this section highlight the level of competition within an industry and in some instances the competitiveness of the businesses within an industry. An analysis of business competitiveness is best defined at the firm level, which is discussed in Section 4. Data that measure

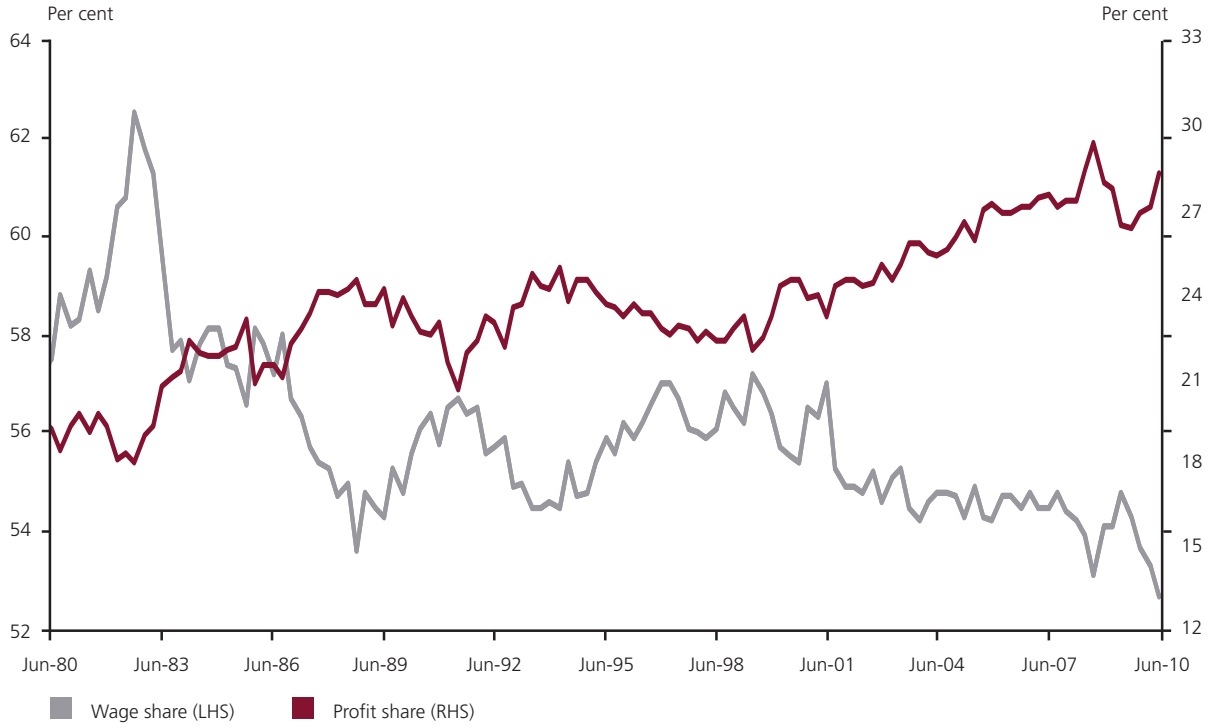
business viability are scarce. The sources used in this analysis include bankruptcy data provided by the Insolvency and Trustee Service Australia and business survival data obtained from the ABS.

3.3.1 Measures of business competitiveness

3.3.1.1 Profitability

Profitability is a key measure of business competitiveness. Profit share of total factor income increased significantly during the 1980s while the share paid out as wages decreased (Figure 3.2). During the 1990s, profit and wage shares remained relatively stable. Since then, the profit share has steadily increased, while the wage share has declined.

Figure 3.2: Wage and profit shares of total factor income



Note: Profit, in this instance, is gross operating surplus, which is the excess of gross output over the sum of intermediate consumption, compensation of employees, and taxes less subsidies on production and imports. It is calculated before deduction of consumption of fixed capital, dividends, interest, royalties and land rent, and direct taxes payable, but after deducting the inventory valuation adjustment.

Source: ABS, *Australian National Accounts: National Income, Expenditure and Product*, June 2010, Catalogue No. 5206.0.

Higher profit growth by an industry illustrates that competitiveness among firms within that industry has increased. Notable developments by industry show that:

- profit growth for many industries was relatively high between June 1999 and June 2008

- profit growth slowed for many industries between June 2008 and September 2010, mainly due to the global financial crisis
    - however, profit growth in Mining continued to increase between June 2008 and September 2010, which reflects a terms of trade effect due to higher commodity prices
- in Retail trade, profit growth remained relatively steady between September 1994 and June 2008, but has since declined in the following two years to September 2010 due to the global financial crisis
- in Accommodation and food services, profit growth was relatively high between June 1999 and June 2008, before turning negative in the following two years to September 2010 (Table 3.4).

Table 3.4: Annualised company gross operating profit growth

	September 1994 to June 1999	June 1999 to June 2004	June 2004 to June 2008	June 2008 to September 2010
Mining	7.3	15.6	32.8	12.6
Manufacturing	-0.9	11.4	6.7	-6.9
Electricity, gas, water and waste services	68.6	16.3	9.8	4.2
Construction	12.9	29.1	13.4	0.0
Wholesale trade	-1.1	22.8	9.5	-5.4
Retail trade	10.0	12.4	10.7	3.9
Accommodation and food services	5.3	12.1	11.3	-0.9
Transport, postal and warehousing	20.2	19.0	4.2	13.3
Information media and telecommunications	8.3	14.0	25.9	-0.7
Financial and insurance services	-6.2	32.3	13.4	-48.0
Rental, hiring and real estate services	1.0	49.2	3.0	0.8
Professional, scientific and technical services	-37.5	99.4	4.2	60.7
Administrative and support services	-8.1	36.6	-1.5	12.4
Arts and recreation services	-22.7	162.5	0.6	16.9
Other services	32.9	16.3	8.7	6.2
All industries	**4.5**	**18.8**	**14.4**	**3.8**

Note: Company gross operating profits are calculated before tax and also exclude interest incomes and expenses, depreciation and amortisation, and other items that do not involve the production of goods and services such as net foreign exchange gain/loss, gains/losses arising from the sale of non-current assets, and net unrealised gains/losses from revaluation of assets.

Source: ABS, *Business Indicators*, September 2010, Catalogue No. 5676.0.

3.3.1.2 Profit margins

Profit margins are operating profits before tax as a percentage of income received, and can be used to compare profitability levels by industry. It may indicate the level of competition within that industry and may also demonstrate the level of capital intensity within an industry, since capital intensive industries are likely to show higher profit margins.

Profit margins for most sectors remain relatively constant over time. Industries that are heavily reliant on award rates of pay, such as Retail trade and Accommodation, cafes and restaurants (or Accommodation and food services based on the 2006 ANZSIC Industry classification) have relatively small profit margins (Table 3.5 and 3.6), which may reflect high rivalry among existing competitors within the industry. High rivalry limits the profitability of an industry. The degree to which rivalry drives down an industry's profit potential depends on the intensity with which firms compete and on the basis on which they compete (Porter 2008: 85).

Table 3.5: Profit margins, 2006–07 to 2008–09

	2006-07	2007-08	2008-09
Agriculture, forestry and fishing	10.4	11.3	8.7
Mining	36.1	38.0	37.1
Manufacturing	8.2	8.6	6.5
Electricity, gas, water and waste services	16.4	13.8	15.0
Construction	12.6	11.7	10.6
Wholesale trade	4.6	4.9	5.0
Retail trade	4.3	4.0	3.9
Accommodation and food services	9.6	6.9	7.6
Transport, postal and warehousing	13.0	11.8	9.2
Information media and telecommunications	14.8	15.7	9.1
Rental, hiring and real estate services	49.4	44.0	16.3
Professional, scientific and technical services	19.3	21.8	24.6
Administrative and support services	13.6	10.2	7.5
Public administration and safety (private)	11.8	8.8	10.7
Education and training (private)	18.9	24.5	9.8
Health care and social assistance (private)	22.4	18.9	21.5
Arts and recreation services	15.1	15.5	15.5
Other services	16.0	15.5	14.5
Total selected industries	**12.8**	**12.5**	**11.2**

Note: These data use the 2006 ANZSIC industry classifications. Note that 1993 and 2006 ANZSIC industry classifications are not directly comparable.

Source: ABS, *Australian Industry*, 2008–09, Catalogue No. 8155.0.

Table 3.6: Profit margins, 2002–03 to 2005–06

	2002–03	2003–04	2004–05	2005–06
Agriculture, forestry and fishing	9.7	9.1	8.6	5.4
Mining	21.9	25.6	29.5	34.9
Manufacturing	6.4	7.7	8.4	7.8
Electricity, gas and water supply	15.7	14.6	14.5	16.4
Construction	9.3	10.1	9.9	9.9
Wholesale trade	3.4	4.5	4.4	4.3
Retail trade	3.7	3.9	3.9	4.1
Accommodation, cafes and restaurants	5.0	6.0	5.9	5.5
Transport and storage	7.0	4.4	7.3	7.4
Communication services	13.5	17.3	16.1	11.6
Property and business services	16.2	20.3	17.9	23.2
Education (private)	16.6	15.5	15.9	15.3
Health and community services (private)	16.2	17.7	19.4	18.6
Cultural and recreational services	7.5	12.9	12.1	12.9
Personal and other services	13.1	15.2	16.7	15.0
Total selected industries	**8.7**	**9.6**	**9.8**	**10.8**

Note: These data use the 1993 ANZSIC industry classifications. Note that 1993 and 2006 ANZSIC industry classifications are not directly comparable.

Source: ABS, *Australian Industry*, 2005–06, Catalogue No. 8155.0.

3.3.1.3 Percentage of businesses that made a loss in the financial year

The proportion of businesses that made a loss in the financial year may highlight intra-industry competition. Industries that contain a high proportion of businesses that made a loss may reflect intense competition within that industry. Around a quarter to a third of businesses in award-reliant industries, such as Accommodation, cafes and restaurants and Retail trade, reported a loss between 2002–03 and 2008–09, which is slightly higher compared with other industries (Table 3.7 and 3.8). While these percentages remained relatively constant, they increased for most industries during the global financial crisis in 2008–09. Note, however, that these measures show only the proportion of businesses that made a loss over the financial year, and do not necessarily reflect the proportion that made a loss over a longer-term horizon.

Table 3.7: Percentage of businesses that made a loss over the financial year, 2006–07 to 2008–09

	2006–07	2007–08	2008–09
Agriculture, forestry and fishing	42.5	40.3	41.1
Mining	41.4	41.5	46.9
Manufacturing	22.8	23.1	24.8
Electricity, gas, water and waste services	23.5	20.6	20.1
Construction	21.3	17.9	22.7
Wholesale trade	31.5	26.7	28.4
Retail trade	20.7	25.4	25.4
Accommodation and food services	23.2	32.0	33.9
Transport, postal and warehousing	18.3	14.2	14.9
Information media and telecommunications	30.5	27.6	32.5
Rental, hiring and real estate services	21.1	23.5	23.0
Professional, scientific and technical services	20.7	20.5	23.5
Administrative and support services	18.1	16.6	17.0
Public administration and safety (private)	24.4	31.6	21.9
Education and training (private)	21.5	18.5	31.4
Health care and social assistance (private)	14.4	19.9	14.5
Arts and recreation services	29.9	27.6	28.4
Other services	18.3	24.8	23.6
Total selected industries	**23.5**	**23.6**	**25.0**

Note: These data use the 2006 ANZSIC industry classifications. While a business may make a loss over the financial year, this does not mean that it is bankrupt. Note that 1993 and 2006 ANZSIC industry classifications are not directly comparable.

Source: ABS, *Australian Industry,* 2008–09, Catalogue No. 8155.0.

Table 3.8: Percentage of businesses that made a loss over the financial year, 2002–03 to 2005–06

	2002–03	2003–04	2004–05	2005–06
Agriculture, forestry and fishing	44.6	43.6	44.9	48.4
Mining	37.7	27.5	34.9	33.1
Manufacturing	25.6	28.4	26.2	27.1
Electricity, gas and water supply	22.5	23.9	23.1	26.0
Construction	15.2	14.9	16.5	16.8
Wholesale trade	32.1	31.8	34.0	34.8
Retail trade	28.7	29.3	30.5	30.7
Accommodation, cafes and restaurants	37.2	36.3	36.7	37.3
Transport and storage	19.5	18.7	19.5	20.1
Communication services	18.2	20.1	20.3	23.3
Property and business services	28.5	28.2	29.0	28.5
Education (private)	20.8	22.4	21.1	25.0
Health and community services (private)	18.4	20.6	20.4	18.3
Cultural and recreational services	30.6	29.4	30.7	29.0
Personal and other services	25.1	24.3	23.6	25.6
Total selected industries	**27.0**	**26.9**	**27.6**	**28.0**

Note: These data use the 1993 ANZSIC industry classifications. While a business may make a loss over the financial year, this does not mean that it is bankrupt. Note that 1993 and 2006 ANZSIC industry classifications are not directly comparable. Source: ABS, *Australian Industry*, 2005–06, Catalogue No. 8155.0.

3.3.1.4 Industry concentration

Industry concentration can measure competition within an industry. If an industry has a significant concentration of income in large businesses, it is likely that a small number of businesses within that industry have market power (ACIL Tasman 2008). In the Accommodation, cafes and restaurants and Retail trade sectors, small and medium-sized businesses account for the majority of income (Table 3.9). Competitors within these industries are therefore likely to be numerous or equal in size and power. This form of rivalry is likely to erode profits if the firms compete on price, as price competition transfers profits directly from an industry to its customers. Competition on dimensions other than price is less likely to erode profitability because it will improve customer value and this is likely to support higher prices (Porter 2008: 85).

Table 3.9: Proportion of income by business size, 2005–06

	Small		Medium		Large		Non-employing	
	No. of businesses	%	No. of businesses	%	No. of businesses	%	No. of businesses	%
Agriculture, forestry and fishing	68,702	51.2	1,140	13.7	32	5.3	179,343	29.8
Mining	2,582	20.3	303	18.2	102	60.0	5,904	1.6
Manufacturing	54,557	13.8	7,103	22.9	638	60.1	71,138	3.3
Electricity, gas and water supply	682	9.0	167	15.3	56	73.8	1,939	1.9
Construction	115,611	41.5	2,709	21.0	127	18.4	288,741	19.1
Wholesale trade	44,412	25.9	2,782	30.1	256	38.4	49,727	5.6
Retail trade	120,175	32.8	5,220	22.9	263	35.8	126,942	8.4
Accommodation, cafes and restaurants	36,547	35.3	3,866	36.4	145	19.6	24,639	8.7
Transport and storage	36,031	24.5	1,525	20.5	160	43.7	94,629	11.3
Communication services	8,482	6.5	169	8.0	21	76.3	21,448	9.3
Property and business services	167,863	31.3	5,268	17.2	561	23.0	544,727	28.6
Education	8,659	11.8	2,299	49.2	161	29.8	27,345	9.2
Health and community services	51,531	34.2	3,230	16.1	371	31.8	75,137	18.0
Cultural and recreational services	19,367	22.0	766	26.7	96	40.0	70,463	11.3
Personal and other services	41,689	36.7	1,181	22.7	70	19.8	92,150	20.8
Total selected industries	**776,890**	**26.3**	**37,728**	**22.6**	**3,059**	**39.7**	**1,674,272**	**11.4**

Source: ABS, *Australian Industry*, 2005–06, Catalogue No. 8155.0.

3.3.1.5 Industry output

Total industry output is measured using gross value added and reflects the size of an industry.

As at June 2010, Retail trade and Accommodation and food services combined to contribute only 7.7 per cent of the total gross value added of all industries, a contribution that has not changed significantly since the 1980s (Table 3.10).

Table 3.10: Gross value added as a proportion of all industries

	June 1984	June 1994	June 2010
Agriculture, forestry and fishing	3.9	3.2	2.9
Mining	6.2	8.2	8.1
Manufacturing	18.2	14.2	10.0
Electricity, gas, water and waste services	3.7	3.6	2.8
Construction	7.9	6.7	8.5
Wholesale trade	6.1	5.0	5.2
Retail trade	5.4	4.7	5.3
Accommodation and food services	2.9	2.7	2.4
Transport, postal and warehousing	5.6	5.4	5.8
Information media and telecommunications	1.6	2.7	3.4
Financial and insurance services	7.2	10.6	11.7
Rental, hiring and real estate services	3.3	3.9	3.6
Professional, scientific and technical services	4.0	4.8	7.2
Administrative and support services	1.7	2.1	2.7
Public administration and safety	7.0	6.9	5.8
Education and training	6.3	6.0	4.7
Health care and social assistance	5.5	5.9	6.8
Arts and recreation services	0.9	0.9	1.0
Other services	2.6	2.4	2.0
All industries	**100.0**	**100.0**	**100.0**

Note: The dates represent the beginning of the productivity cycles in the 1980s and the 1990s. Gross value added is a measure of GDP at the industry level. It is the value of output at basic prices minus the value of intermediate consumption at purchasers' prices. Basic prices are defined as the amount receivable by the producer from the purchaser for a unit of good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale.

Source: ABS, *Australian National Accounts: National Income, Expenditure and Product*, June 2010, Catalogue No. 5206.0.

The size of an industry can influence business competitiveness, affecting the costs of production through external economies of scale. Specifically, industry expansion may lead to the development of supporting services that benefit the industry, such as the improvement of transport links servicing production facilities. Advantages from external economies of scale that can benefit new competitors include spillover effects from increased research and development, which can contribute to innovation at the workplace and raise the level of firm productivity. Award-reliant industries may therefore not benefit from external economies of scale as much as larger industries.

Industry size itself may also be an indicator of business competitiveness. While industry size may signal increased competitiveness among firms within an industry, it may also be indicative of its international competitiveness. For example, the small size of Australia's textiles industry is indicative of the difficulty it has in competing with low-wage firms in developing countries such as China (Wheatley 2009). However, the size of an industry may not always reflect its ability to compete internationally, for example, the Accommodation and food services is an industry that does not compete in the export market.[21]

21 Nevertheless, industries that tend to be award reliant are less likely to compete in the export market.

Growth in output can reflect the competitive performance of businesses within an industry. Between 1982 and 2010 the strongest growth was experienced in Information media and telecommunications, Professional, scientific and technical services, Financial and insurance services, Administrative and support services, Mining and Health care and social assistance (Table 3.11). In contrast, Manufacturing recorded the lowest growth, while the award-reliant industries experienced average rates of growth. Most industries experienced their highest growth between 1994 and 2004, particularly award-reliant sectors such as Accommodation and food services and Retail trade.

Table 3.11: Annualised growth in gross value added, June 1982 to June 2010

	June 1982 to June 1994	June 1994 to June 2004	June 2004 to June 2010	June 1982 to June 2010
Agriculture, forestry and fishing	1.7	3.7	1.2	2.3
Mining	5.9	2.8	4.3	4.4
Manufacturing	1.3	1.9	0.1	1.3
Electricity, gas, water and waste services	3.2	1.6	2.5	2.5
Construction	1.9	5.0	5.0	3.7
Wholesale trade	1.7	4.6	2.4	2.9
Retail trade	2.3	4.6	3.3	3.4
Accommodation and food services	2.9	4.2	0.2	2.8
Transport, postal and warehousing	3.1	4.5	3.1	3.6
Information media and telecommunications	8.1	6.0	3.0	6.2
Financial and insurance services	6.9	3.9	4.4	5.3
Rental, hiring and real estate services	5.0	4.0	1.1	3.8
Professional, scientific and technical services	5.0	7.6	3.7	5.7
Administrative and support services	5.3	7.1	2.3	5.3
Public administration and safety	3.3	2.3	2.3	2.7
Education and training	3.0	2.0	1.8	2.4
Health care and social assistance	4.1	4.3	4.4	4.3
Arts and recreation services	3.4	3.9	3.0	3.5
Other services	2.6	3.7	-0.1	2.4
Gross value added	**3.1**	**3.8**	**2.8**	**3.3**

Note: The dates represent the beginning of the productivity cycles in the 1980s, 1990s and 2000s. Gross value added is a measure of GDP at the industry level. It is the value of output at basic prices minus the value of intermediate consumption at purchasers' prices. Basic prices are defined as the amount receivable by the producer from the purchaser for a unit of good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale.

Source: ABS, *Australian National Accounts: National Income, Expenditure and Product*, June 2010, Catalogue No. 5206.0.

3.3.1.6 Investment

Economic growth, productivity and employment are driven by investment. Investment in physical capital leads to increased productivity and firm competitiveness and may raise the level of firm competition. Private business investment may also be reflective of future demand. Conditions in the business sector can be gauged by assessing the level of investment relative to GDP.

Investment is currently at high levels, with both business and government investment rising sharply over the past decade (Figure 3.3). Private business investment has steadily increased since the mid-1980s, with the exception of slow activity in the early 1990s due to the recession. Government investment exhibited a progressive decline from the mid-1980s to the late-1990s, but has increased over the past decade.

Figure 3.3: Private business and government investment

Source: ABS, Australian National Accounts: National Income, Expenditure and Product, June 2010, Catalogue No. 5206.0.

Across industries, Mining and Rental, hiring and real estate services had substantially higher levels of private investment (as a percentage of total output) compared with other industries as at June 2010. The data also show that these industries experienced significant increases in investment over the past 16 years (Table 3.12). The Mining industry exhibits the greatest profit margin, which implies that part of the profits are being reinvested.

Table 3.12: Private new capital expenditure as a proportion of industry gross value added

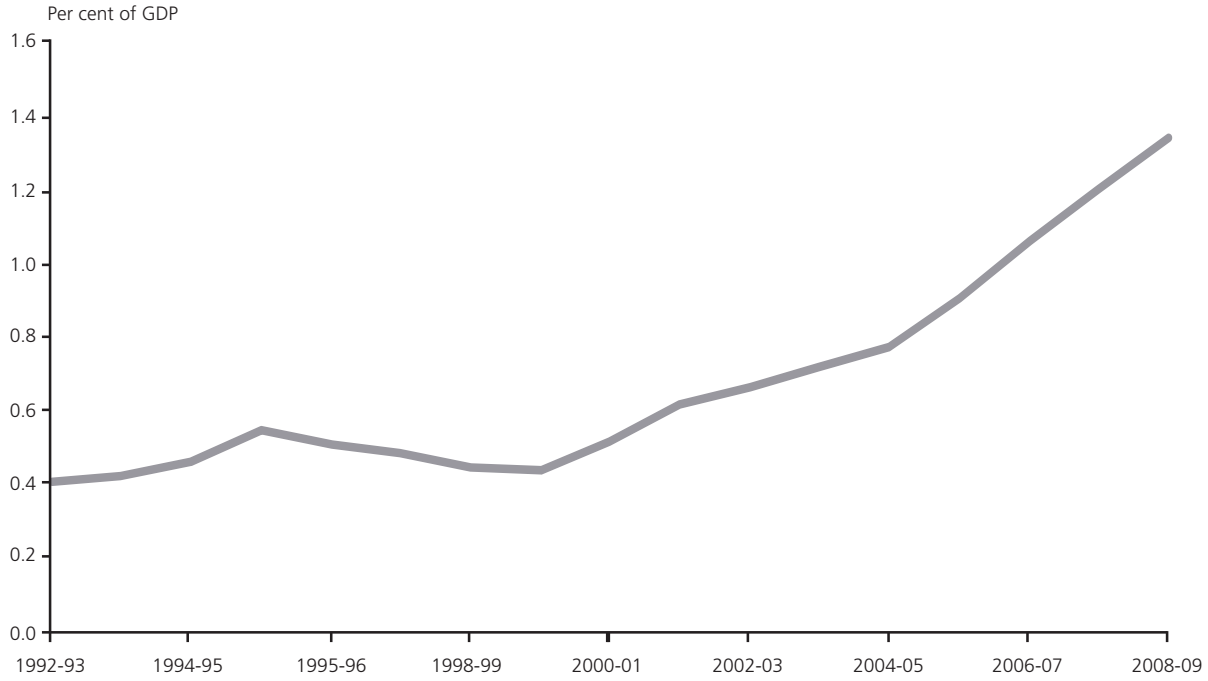
	June 1987	June 1994	June 2010
Mining	11.8	10.9	44.0
Manufacturing	7.9	9.7	11.7
Electricity, gas, water and waste services	0.4	0.4	16.3
Construction	3.0	5.8	6.7
Wholesale trade	7.2	8.0	4.9
Retail trade	6.8	6.0	6.2
Transport, postal and warehousing	7.1	6.2	15.1
Information media and telecommunications	5.1	8.6	12.5
Financial and insurance services	4.2	4.1	2.0
Rental, hiring and real estate services	18.6	10.3	30.2
Professional, scientific and technical services	3.7	7.5	4.4

Note: Not all industries are included in the table due to data restrictions.. There are slight differences between private new capital expenditure and private business investment in the national accounts survey, as different data sources have been used, and components included. The national accounts data are derived from data in the Private New Capital Expenditure and Expected Expenditure survey and other sources such as the ABS Economic Activity Survey, Business Activity Survey, and Engineering Construction Survey, as well as data drawn from the ATO. Furthermore, private business investment also includes the value of work done on speculative construction projects as the work is put into place, while the full value of speculative projects is included for private new capital expenditure.

Source: ABS, *Private New Capital Expenditure and Expected Expenditure*, June 2010, Catalogue No. 5625.0; ABS, *Australian National Accounts: National Income, Expenditure and Product*, June 2010, Catalogue No. 5206.0

Investment in research and development can also lead to improvements in productivity and increase firm competition. Expenditure on research and development as a share of total GDP increased significantly over the past two decades, with growth particularly accelerating from the early 2000s (Figure 3.4). However, Australia's investment in research and development as a proportion of total GDP remained below the average OECD ratio of 1.63 per cent in 2008–09.

Figure 3.4: Expenditure on research and development



Source: ABS, *Research and Experimental Development, Businesses, Australia*, 2008–09, Catalogue No. 8104.0.

The main industries investing in research and development are Manufacturing, Mining and Property and business services. Growth in expenditure on research and development grew significantly in Mining between 1992–93 and 2006–07. In contrast, it decreased sharply for Manufacturing over the same period partly due to the decline in size of the industry, which nevertheless remained the largest contributor to research and development. For award-reliant industries, Retail trade, Accommodation, cafes restaurants and Health and community services accounted for less than 2 per cent of total expenditure on research and development in 2006–07. Property and business services was the third largest contributor to research and development in 2006–07 (Table 3.13).

Table 3.13: Proportion of total expenditure on research and development by industry

	1992–93	2006–07
Agriculture, forestry and fishing	n/a	0.9
Mining	6.2	22.1
Manufacturing	59.2	32.1
Electricity, gas and water supply	2.3	0.9
Construction	0.5	3.7
Wholesale trade	7.6	6.9
Retail trade	0.3	1.1
Accommodation, cafes and restaurants	0.0	0.0
Transport and storage	0.6	0.9
Communication services	0.0	5.3
Finance and insurance	4.3	8.8
Property and business services	15.7	16.3
Education	n/a	n/a
Health and community services	0.1	0.3
Cultural and recreational services	0.2	0.2
Personal and other services	0.1	0.4
Total	**100.0**	**100.0**

Note: Values not available are not published by the ABS, but included in the total.

Source: ABS, *Research and Experimental Development, Businesses, Australia*, 2008–09, Catalogue No. 8104.0.

3.3.1.7 Qualitative measures

Due to the lack of quantitative measures of business competitiveness in Australia relative to other countries, qualitative measures can be used as a proxy. The World Economic Forum surveyed over 13,000 business leaders from 133 economies across the world to score its country based on various measures of business competitiveness. Unfortunately, the analysis provides data only at an aggregate level and no inferences can be made across industries. Overall, however, Australia ranked very highly on these measures, particularly with regard to the extent of market dominance, effectiveness of anti-monopoly policy and the ease and time required to start a business (Table 3.14).

Table 3.14: Qualitative measures of competition in Australia relative to other countries

	2010
Intensity of local competition	17th/133
Extent of market dominance	12th/133
Effectiveness of anti-monopoly policy	7th/133
Prevalence of trade barriers	22nd/133
Prevalence of foreign ownership	24th/133
No. of procedures required to start a business	3rd/133
Time required to start a business	2nd/133

Note: Competitiveness is hindered by distortionary trade barriers and restrictive rules against foreign ownership.

Source: World Economic Forum, *The Global Competitiveness Report*, 2009–10.

3.3.1.8 Export propensity and import penetration

Other measures of international business competitiveness include export propensity and import penetration, which also gauge an industry's trade exposure. Export propensity measures the proportion of domestically produced goods that are exported and import penetration measures the proportion of goods sold domestically that are imported. However, data for both of these measures is not readily available.

Differences in wage costs and productivity between Australia and competing countries may affect trade-exposed sectors. For example, Manufacturing declined significantly from the 1980s, one of the reasons being the inability to compete with expanding low-wage economies.

3.3.2 Measures of business viability

While measures of business competitiveness can determine a business's long-term viability, measures such as bankruptcy and survival rates provide a snapshot of the number of firms viable at any given point in time.

3.3.2.1 Bankruptcy rates

One way of measuring business viability is by observing the trends in business-related bankruptcies. However, simply analysing the trends in the level of bankruptcies over time may be misleading. In the long run, the number of businesses is expected to increase as the economy grows and hence, the number of bankruptcies can reasonably be expected to rise. Therefore, a preferable measure is one that relates bankruptcy levels to the number of businesses.

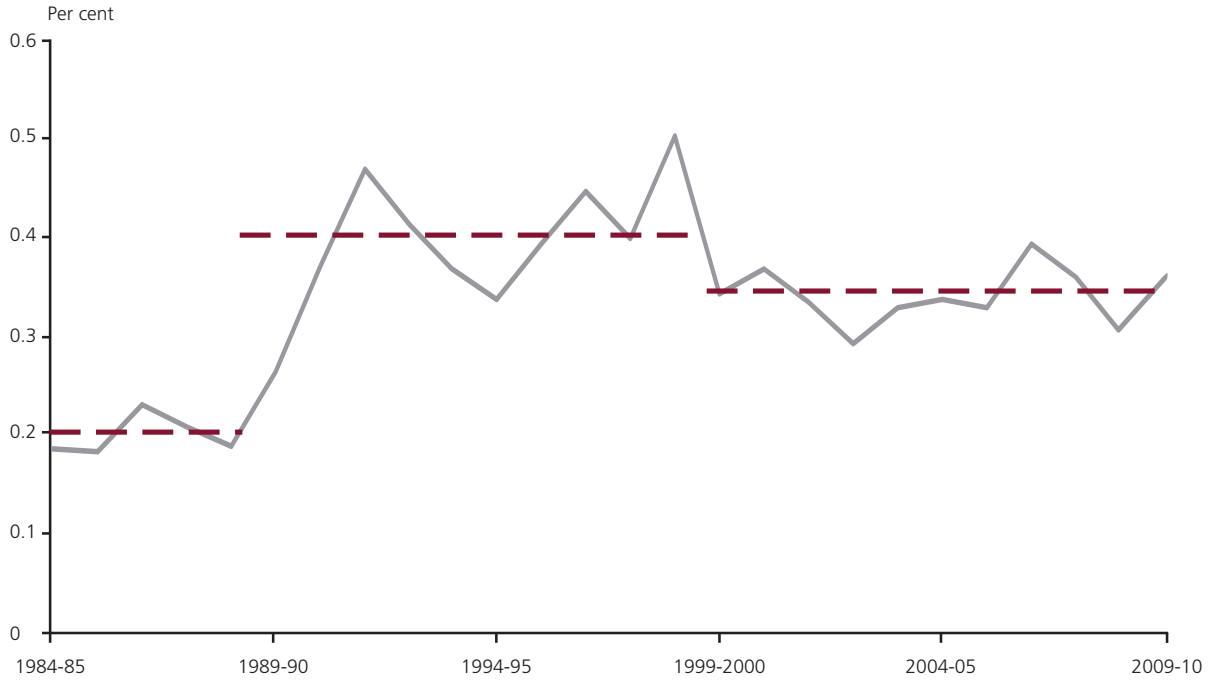
By adopting the bankruptcy rate[22] used in Bickerdyke et al. (2000), the data show that bankruptcy rates were relatively low during the late 1980s at around 0.2 per cent (Figure 3.5). In contrast, bankruptcy rates doubled in the 1990s to around 0.4 per cent. Following this, bankruptcy rates declined slightly to an average of around 0.35 per cent from 1998–99 to 2009–10.

Nonetheless, the number of bankruptcies is small compared with the number of businesses that exit the economy each year (see commentary of business entry, exit and survival rates in section 3.3.2.2 for further discussion), which amounted to around 15 per cent of businesses in 2008–09.[23]

22 Bankruptcy rate is the ratio of business-related bankruptcy to the number of self-employed and employers in the economy.

23 ABS, Counts of Australian Businesses, Including Entries and Exits, June 2007 to June 2009, Catalogue No. 8165.0.

Figure 3.5: Bankruptcy rates



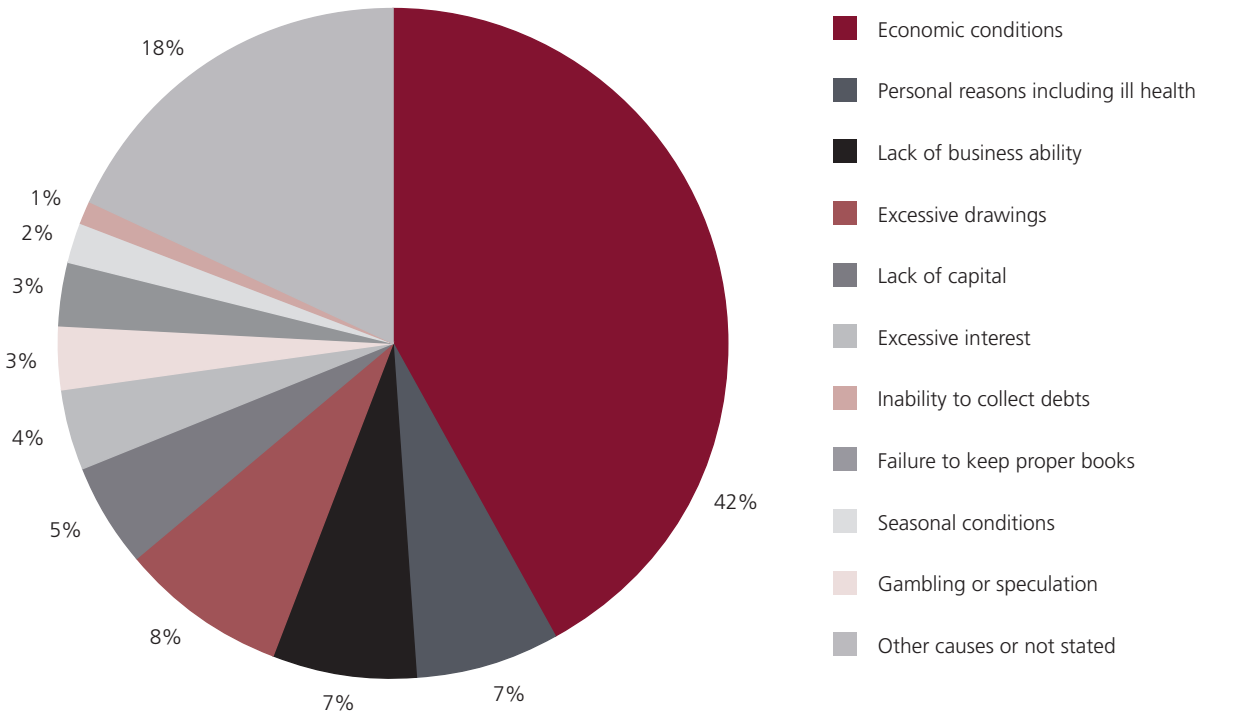
Note: The bankruptcy rate is the number of business-related bankruptcies divided by the number of self-employed and employers in the economy. The red dotted lines represent medium-term averages of the bankruptcy rate.

Source: Insolvency and Trustee Service Australia, June 2010.

Citing data derived from the Inspector-General in Bankruptcy, Bickerdyke et al. (2000) noted that the three major causes of business-related bankruptcies between the 1970s and the 1990s were economic conditions, lack of capital and lack of business ability. Minimum wages are captured under economic conditions, as it includes factors that affect increases in costs, as well as other factors such as competition, credit restrictions and fall in prices. These causes fluctuated in importance over time, with lack of business ability being the most commonly stated reason for business bankruptcy during the 1970s and 1980s, and economic conditions being the most commonly cited reason throughout the 1990s.

However, economic conditions have remained the most commonly cited reason for business bankruptcy over the last decade. Recent data collected for 2009–10, show that 'economic conditions' accounted for 42 per cent of business-related bankruptcies (Figure 3.6).

Figure 3.6: Causes of business-related bankruptcies, 2009–10



Source: Inspector-General in Bankruptcy, *Annual Report by the Inspector-General in Bankruptcy on the operation of the Bankruptcy Act 2009-2010*, September 2010.

3.3.2.2 Business entry, exit and survival rates

Entry and exit rates[24] gauge the ease at which businesses enter and exit an industry. As such, entry and exit rates are often closely related, as industries with low (high) rates of business entries tend to also have low (high) rates of business exits. That said, exit rates tend to be higher than entry rates for most industries. In 2008–09, the business entry rate was 14.4 per cent, while the business exit rate was 15.4 per cent.

It is important to note that business exits are not necessarily business failures. Bickerdyke et al. (2000) found two broad avenues by which businesses can exit. The first avenue is through changes in ownership (temporary exits), which accounts for 20 per cent of business exits. The remaining 80 per cent of exits come from cessations (permanent exits), which represent 'real' deaths and occur when businesses cease operations. The majority of these cessations are from solvent businesses exiting for non-financial and 'lifestyle' reasons, such as retirement.

However, Bickerdyke et al. (2000) also noted that some cessations are caused by business failure. They found that most business failures are 'solvent failures'—that is businesses that have ceased operations to avoid making further losses, but without owing debts. Insolvent failures, where businesses have ceased operations because of bankruptcy or liquidation[25], represent only around one in five business failures. The paper found that in 1999–2000 the economy-wide business failure rate was estimated to be around 3.6 failures per 1000 enterprises

24 Entry rates are business entries in the financial year as a proportion of total businesses operating at the start of the financial year, while exit rates are total business exits in the financial year as a proportion of total businesses operating at the start of the financial year.

25 Liquidation data are used to measure insolvent business failure in incorporated businesses, while business-related bankruptcies are used for unincorporated businesses.

(0.36 per cent).[26] Nonetheless, they found that the effects on employment of business solvencies were relatively modest, with job losses resulting from bankruptcies and liquidations in 1999–2000 estimated to have accounted for less than 1 per cent of total job losses in that year.

Looking at entry and exit rates by industry over 2008–09, the data reveal that estimates for Retail trade sit relatively close to the average for all industries (Table 3.15). The Accommodation and food services sector has relatively high entry and exit rates (although it accounts for only a small proportion of businesses). In contrast, the Agriculture, forestry and fishing and Rental, hiring and real estate services sectors record low entry and exit rates.

Table 3.15: Entry and exit rates by industry, year to June 2009

	Proportion	Entry rate	Exit rate
Agriculture, forestry and fishing	10.1	8.9	10.7
Mining	0.4	14.5	13.4
Manufacturing	4.6	10.5	13.4
Electricity, gas, water and waste services	0.3	15.0	15.0
Construction	17.1	14.5	16.4
Wholesale trade	3.8	12.2	14.8
Retail trade	6.9	13.4	15.8
Accommodation and food services	3.8	16.8	18.1
Transport, postal and warehousing	6.6	15.7	16.3
Information media and telecommunications	0.9	16.8	17.5
Financial and insurance services	7.4	16.4	15.8
Rental, hiring and real estate services	10.8	10.7	12.4
Professional, scientific and technical services	11.6	14.4	15.3
Administrative and support services	3.8	18.9	19.5
Public administration and safety	0.4	19.4	21.3
Education and training	1.2	16.4	16.6
Health care and social assistance	4.6	11.9	10.9
Arts and recreation services	1.4	14.8	17.5
Other services	4.3	13.5	15.8
All industries	**100.0**	**14.4**	**15.4**

Source: ABS, *Counts of Australian Businesses, Including Entries and Exits,* June 2007 to June 2009, Catalogue No. 8165.0.

Reviewing entry and exit rates by firm employment size, the data reveal that micro businesses (employing 1 to 4 employees) and non-employing businesses incur the highest rate of entries and exits, while firms of medium size (employing 20 to 199 employees) experience the smallest rates of entry and exit (Table 3.16). Firms of medium size employed the highest proportion of award-reliant employees (40.9 per cent), followed by micro and small firms grouped collectively (37.5 per cent) and large firms (21.6 per cent).[27]

26 This was approximately one-third of the rate in 1991–92 when the comparable figure was 10.4 failures per 1000 enterprises (1.04 per cent).

27 ABS, *Employee Earnings and Hours, Expanded CURF, Australia*, May 2006, Catalogue No. 6306.0.55.001.

Table 3.16: Entry and exit rates by employment size range, year to June 2007

	Proportion	Entry rate	Exit rate
Non-employing	59.7	16.6	19.5
Total employing	40.3	11.2	9.4
Micro	24.8	14.4	10.7
Small	11.2	6.7	7.5
Medium	4.0	4.0	7.1
Large	0.3	8.4	7.6
All businesses	**100.0**	**14.4**	**15.4**

Note: Micro businesses employ 1 to 4 employees, small businesses employ 5 to 19 employees, medium businesses employ 20 to 199 employees and large businesses employ more than 200 employees.

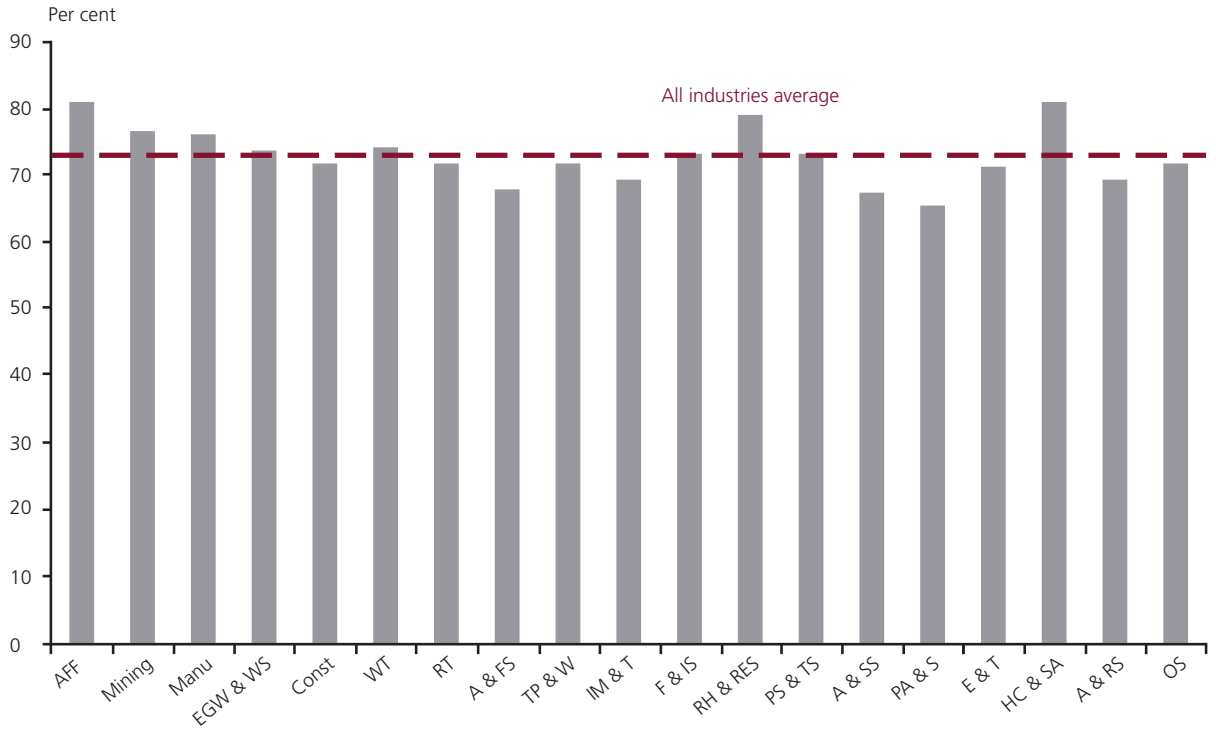
Source: ABS, *Counts of Australian Businesses, Including Entries and Exits,* June 2007 to June 2009, Catalogue No. 8165.0.

Survival rates[28] of businesses can also be calculated by industry and employment size. Between June 2007 and June 2009, the survival rates of award-reliant industries, such as Accommodation, cafes and restaurants and Retail trade were slightly below the average across all industries (Figure 3.7). Around two-thirds of the businesses that were operating in the Accommodation and food services (67.9 per cent) and Retail trade (71.9 per cent) sector in June 2007 had survived to June 2009.

Survival rates were highest in Health care and social assistance (81.2 per cent) and Agriculture, forestry and fishing (80.9 per cent) and lowest in Public administration and safety (65.3 per cent) and Administrative and support services (67.4 per cent). These patterns are somewhat different to those for the percentage of businesses in each industry that recorded a loss over each financial year, indicating that within an industry, the survival of businesses over the medium-term may be unrelated to the percentage of businesses that made a loss over the financial year (see Table 3.7).

28 A surviving business is defined in this case as a business which was actively trading in June 2007 and continues to be trading in June 2009.

Figure 3.7: Survival rates by industry, June 2007 to June 2009

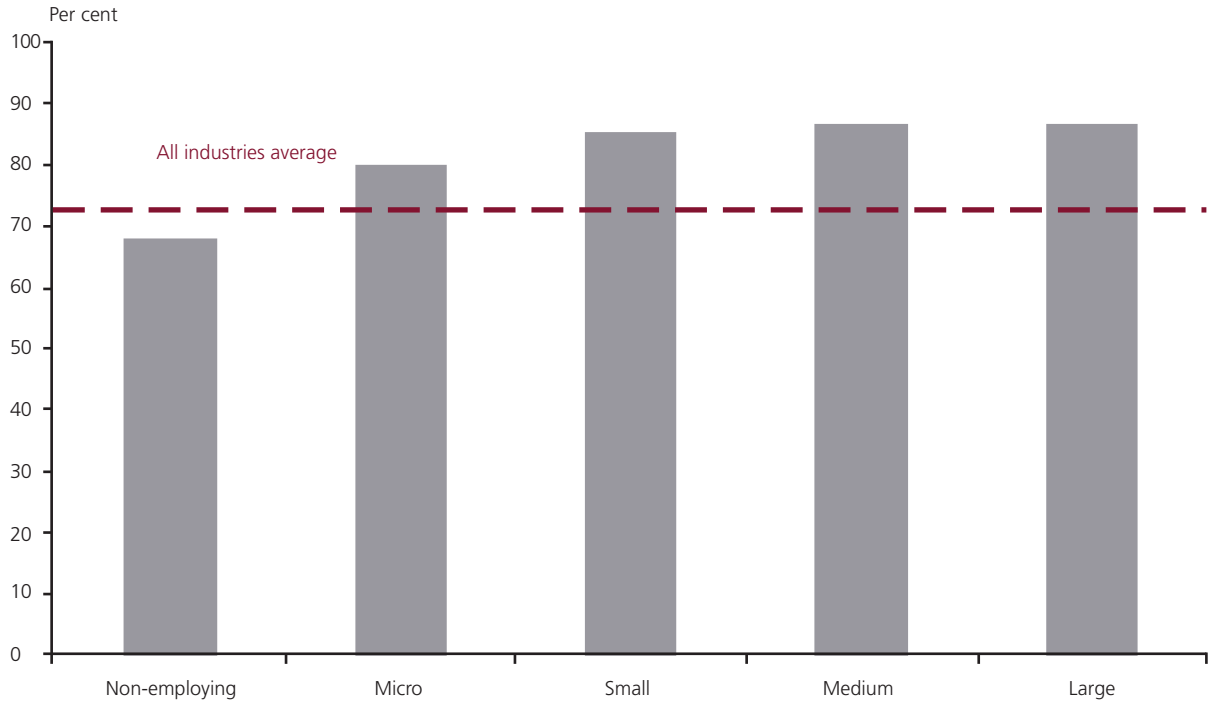


Note: AFF is Agriculture, forestry and fishing, Manu is Manufacturing, EGW&WS is Electricity, gas, water and waste services, Const is Construction, WT is Wholesale trade, RT is Retail trade, A&FS is Accommodation and food services, TP&W is Transport, postal and warehousing, IM&T is Information media and telecommunications, F&IS is Finance and insurance services, RH&RES is Rental, hiring and real estate services, PS&TS is Professional, scientific and technical services, A&SS is Administrative and support services, PA&S is Public administration and safety, E&T is Education and training, HC&SA is Health care and social assistance, A&RS is Arts and recreation services and OS is Other services.

Source: ABS, Counts of Australian Businesses, Including Entries and Exits, June 2007 to June 2009, Catalogue No. 8165.0.

By employment size, a far smaller proportion of non-employing businesses operating in June 2007 survived to June 2009, compared with other firm types (Figure 3.8).

Figure 3.8: Survival rates by employment size range, June 2007 to June 2009



Source: ABS, *Counts of Australian Businesses, Including Entries and Exits*, June 2007 to June 2009, Catalogue No. 8165.0.

In summary, measures of productivity growth have shown that before and after the productivity surge of the 1990s, Australia experienced a period of slow growth. Dolman et al. (2006) stated that sectors responsible for the upturn were also accountable for the slowdown in productivity and this is evidenced in the data. The data also show that award-reliant industries exhibit relatively low levels of productivity.

Various indicators of business competitiveness have remained fairly stable over time at an aggregate and industry level. Focusing on award-reliant industries, the data show these industries face higher levels of competition, as evidenced by smaller profit margins, lower levels of market concentration and higher proportions of businesses that made a loss over the financial year. Furthermore, approximately two-thirds of the businesses operating within award-reliant industries in June 2007 survived to June 2009, which is slightly below the average across all industries.

4 Analysis of productivity, business competitiveness and viability at the firm level

The ABS Business Longitudinal Database (BLD) is used to analyse differences in productivity, business competitiveness and viability across businesses that utilise different employment arrangements.

Based on the survey instrument, respondents were asked to identify how many employees were covered by the following employment arrangements:

- awards (paid at the award rate)
- overawards (paid above the award rate), individual agreement or individual contracts, including Australian Workplace Agreements, informal individual agreements and individual employment contracts
- collective/enterprise agreements, including enterprise, workplace, industry, site or project collective agreements that set pay, enterprise bargaining agreements or certified agreements and unregistered or verbal collective agreements
- working proprietors, partners or directors
- other.

Although the survey instrument collects data on the number of workers covered across employment arrangements, the data are presented as three binary variables.

The question presented in the BLD 'data item list' is 'Which of the following pay-setting arrangements were used by this business during the last day period ending in June (tick all that apply). The responses are assigned as:

- Award: Yes/No
- Individual agreement: Yes/No
- Other: Yes/No.

Based on these variables, the 'employment arrangements' variable applied in the data analysis (Section 4) is generated to contain three alternatives and grouped as:

- awards—only award rates of pay (264 businesses or 12.9 per cent of employing firms for Panel 2 in 2005–06)
- non-awards—individual contracts, enterprise bargaining agreements, individuals hired as working proprietors, partners or salaried directors and other agreements (1166 businesses or 56.8 per cent of employing firms for Panel 2 in 2005–06)
- combination of award and non-award arrangements—a firm may use award rates of pay and non-award(s) collectively (623 businesses or 30.3 per cent of employing firms for Panel 2 in 2005–06).[29]

29 Figures on the proportions of firms that use award, non-award or a combination of both are extracted from panel 2, which is designed to be representative of the Australian business population in 2005–06.

The BLD contains a number of explanatory variables that can help characterise the performance and competitiveness of firms across these types of employment arrangements. The BLD is the only Australian dataset that allows for such analysis.

The BLD is a longitudinal dataset that contains business characteristics and financial data. In its current iteration, it contains two independent samples (known as panels) drawn from the Australian business population, with panel 1 containing three reference periods of data (2004–05, 2005–06 and 2006–07) and panel 2 containing two reference periods of data (2005–06 and 2006–07).[30] During its period of introduction, panel 1 had 2159 employing businesses representing 705,675 businesses, while panel 2 had 2297 employing businesses representing 709,468 businesses. While overall non-response rates are low (ranging from 2 to 5 per cent of the sample), the sample size is slightly reduced for this analysis as approximately 80 and 90 per cent of businesses responded to the employment arrangements question in panel 1 and 2, respectively. Each panel is selected independently and designed to represent the Australian business population at the time of its introduction, as it is stratified by industry division and business size. However, the BLD is not stratified by geography. The paper examines various measures across both panels to ensure consistency. Furthermore, the ABS has advised that statistics should not be derived from pooling the two panels together, as the pooled sample is not representative of the business population.

The business population in Australia is not static due to new business entries, business deaths and businesses that undergo structural change.

Business deaths are represented by ABNs that cease to operate during the life of the panel. Once a business death occurs, the business remains in the sample and is appropriately flagged, with any data for that business prior to the death being included in the BLD. Businesses that undergo structural change (eg. mergers, takeovers, business splits, or a combination of these) are treated in the BLD as follows:

- if the structural change does not change the original ABN, then the business will remain in the sample and the change will not be flagged
- if the structural change does change the original ABN, then the business is treated as a death.

There are a number of businesses not included in the survey, with the main exceptions being large businesses (with 200 or more employees) and businesses in the following industries:

- Electricity, gas and water supply
- Finance and insurance
- Government administration and defence
- Education
- Health and community services
- Other services.[31]

30 As most variables of interest are only available from 2005–06 onwards, figures from 2004–05 are not presented for panel 1.

31 For a detailed discussion on the scope and coverage of the survey, please refer to the Business Longitudinal Database, Expanded CURF Technical Manual pp. 3–4.

The survey excludes some industries mainly because they are dominated by government enterprises or classified as non-profit institutions serving households. Nevertheless, many of these industries are not analysed in the previous section as their measurement of productivity is problematic (refer to Section 2 for a discussion on competitiveness and viability in these non-market sectors).

The BLD follows the Business Longitudinal Survey (BLS) which spanned from 1994 to 1999. Both data sets contain characteristics and financial data to help analyse changes in the performance over time of a cohort of small and medium businesses.

The BLS and BLD contain variables that assess business performance. For example, respondents are asked to:

- compare their performance relative to other businesses, with respect to price, quality and cost
- state major changes that have occurred in the businesses, in regards to training initiatives, the range of products and/or services introduced or if they have expanded operations to a number of different locations
- name business practices that have been introduced, such as Total Quality Management, Just-in-time Management, Process engineering or other types of formal business plans
- identify any new services or improved products and/or procedures that have been introduced to the business.

In contrast to the BLD, the BLS provided a greater amount of financial data and employment data. For instance, unlike the BLD, the BLS provided numbers of employed at an aggregate and disaggregate level, taking into account staff newly employed during the year and staff that ceased to be employed. Labour quantity is normally measured in terms of the number of employees. As adjustments should be made for the extent of part-time work, an ideal measure is 'effective full-time labour'. This variable cannot be generated using the BLD, as numbers of people employed full time and part time are not available. The BLD instead presents a categorical variable which assigns the number of people working full time and part time into two categories, where 1 represents 0 to 4 persons and 2 represents 5 or more persons.

In addition, the BLS provided a broader range of financial items as firms surveyed were asked to record their actual profit or loss before tax, value of current and non-current assets, capital expenditure and disposals, including expenditure on research and development. The BLD does not present a breakdown of assets and liabilities, nor does it include a value of rent, leasing and hiring expenses to provide an appropriate measure of capital[32]. The construction of value added is also imperfect since data on inventory levels are not surveyed in the BLD. Rogers (1998) asserted that output should be defined as the real output produced in a set time period. Rogers stated that the sales or revenue figure normally reported in accounts would not coincide with this if inventory levels have risen or fallen over the period, arguing that adjustments for the level of inventories should be made.

Since variables such as effective full-time labour, capital and value added cannot be generated using the BLD, sound quantitative measures of productivity cannot be constructed. Instead the BLD has introduced qualitative measures aimed to evaluate productivity and business competitiveness across firms. As a result, respondents in the BLD Survey were asked:

32 The log of capital is the total book value of non-current assets plus imputed leasing capital which includes the value of rent, leasing and hiring expenses.

- how many competitors their business has faced during the year? Have they faced no effective competition, one or two competitors or three or more competitors

- how would they describe the nature and size of their competitors. If the business is 'similar in nature' it means that the goods or services provided or the activities undertaken are similar. If the business is 'different in nature' it means that the goods or services provided or the activity undertaken include similar goods, services or activities as part of a much wider range or a much smaller range. For example, if two retailers are both selling clothing only, then they are similar in nature. However, if one sells clothing only while the other is a department store, then they are different in nature

- to consider the market in which it operates and estimate what share they think the business had during the year. This could range from less than 10 per cent, greater than or equal to 10 per cent and less than or equal to 50 per cent and greater than 50 per cent

- to compare whether productivity, profitability and the range of products or services offered had decreased, stayed the same or increased since last year.

Most indicators on the productivity and business competitiveness of firms are subjective measures and should be considered only as proxies for variables of interest. A major shortcoming of subjective measures is that firms may interpret and measure the given indicator in different ways. Crockett et al. (1992), however, found an advantage in using such measures, stating that it avoided the problem of establishing strictly comparable measures between businesses.

4.1 Characteristics of businesses by employment arrangements

This section looks at the industry structure and employment characteristics of firms that adopt different methods of setting pay. Across industries, the data show that the majority of businesses that paid only award rates operated within the Retail trade, Agriculture, forestry and fishing and Construction sectors. This structure was similar for firms that employed a combination of award and non-award arrangements, although it represented a smaller proportion of businesses in Agriculture, forestry and fishing, and a higher proportion of businesses in Retail trade, Construction and Manufacturing. For businesses that utilised non-award employment arrangements, most firms operated within the Property and business services, Construction and Retail trade sectors (Table 4.1).

Overall, it is interesting to note that the industry structure across all employment arrangements appears to be somewhat similar. For example, across all types of employment arrangements, many businesses operated within the Retail trade and Construction sectors.[33]

33 Since the industry structure is somewhat similar across all employment arrangement groupings, this suggests that our analysis in the next section is not driven by differences in industry structure.

Table 4.1: Industry structure by employment arrangement 2005–06, panel 2

	Award only	Combination	Non-award
Agriculture, forestry and fishing	17.8	4.9	9.4
Mining	0.3	0.2	0.4
Manufacturing	4.5	9.5	7.7
Construction	16.9	19.6	16.5
Wholesale trade	3.2	7.2	7.1
Retail trade	22.5	25.9	13.4
Accommodation, cafes and restaurants	9.7	8.7	2.9
Transport and storage	3.4	4.7	5.7
Communication services	0.7	1.5	1.1
Property and business services	12.2	9.1	30.9
Cultural and recreational services	2.7	2.4	2.5
Personal services	6.2	6.5	2.4
Total	**100.0**	**100.0**	**100.0**

Note: The BLD excludes the following main industries: Electricity, gas and water supply, Finance and insurance, Government administration and defence, Education, Health and community services and Other services. The data are drawn from Panel 2, as it is representative of the business population in 2005–06.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Looking at firm size, around 95 per cent of businesses across all employment arrangements were micro and small businesses (employing 1-4 employees and 5-19 employees, respectively). However, businesses covered by non-award employment arrangements had a higher proportion of micro businesses (Table 4.2).

Table 4.2: Business size by employment arrangement 2005–06, panel 2

	Award only	Combination	Non-award
1 to less than 5	77.9	65.5	82.2
5 to less than 20	18.6	28.6	14.9
20 to less than 200	3.5	5.9	2.9
	100.0	100.0	100.0

Note: The BLD excludes businesses that employ 200 or more employees.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

While the majority of businesses across all types of employment arrangements did not hire temporary or seasonal workers[34], businesses that paid only award rates had a higher proportion of businesses that hired temporary or seasonal workers, compared with their counterparts (Table 4.3).

34 Temporary or seasonal jobs are those that existed for less than six months of the year to deal with peaks in workload. This excludes jobs held by casuals on an ongoing basis throughout the year.

Table 4.3: Temporary or seasonal workers 2005–06, panel 2

	Award only	Combination	Non-award
No	71.5	81.6	83.6
Yes	28.5	18.4	16.4
	100.0	100.0	100.0

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

The following tables provide a snapshot of employment characteristics across firms using different employment arrangements. Unfortunately, employment characteristics are not a strong feature of the BLD, as all employment variables are categorical and limit detailed analysis. Furthermore, it is not clear from these categorical variables whether these firms do indeed hire selected employees of interest.

Looking at hiring casual workers[35] however, the data implied that businesses that paid only award rates and a combination of award and non-award employment arrangements, had a higher proportion of businesses that hired five or more casual workers compared with their counterparts (Table 4.4).

Table 4.4: Hiring casuals 2005–06, panel 2

	Award only	Combination	Non-award
0 - 4	84.6	80.9	95.5
5 or more	15.4	19.1	4.5
	100.0	100.0	100.0

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

With respect to full-time employees, the data showed businesses that utilised a combination of award and non-award employment arrangements were more likely to employ five or more full-time employees (Table 4.5).

Table 4.5: Hiring full-time employees 2005–06, panel 2

	Award only	Combination	Non-award
0 - 4	84.1	67.9	87.6
5 or more	15.9	32.1	12.4
	100.0	100.0	100.0

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

In summary, the descriptive statistics revealed that across all firm types the most businesses were micro and small firms and most did not employ temporary or seasonal workers and were more likely to employ a small number of casual and full-time workers. In addition, these firms were likely to operate within the Retail trade and Construction sectors.

However, compared to their counterparts some small variations existed between firms of different types of employment arrangements, for example:

- firms that utilised only awards rates of pay were more likely to employ seasonal or temporary workers

35 Casual workers are defined in the BLD as employees that usually receive a higher rate of pay to compensate for lack of permanency and leave entitlements.

- firms that utilised only awards rates of pay and a combination of award and non-award employment agreements were more likely to employ five or more casual workers
- firms covered by a combination of employment arrangements were more likely to employ five or more full-time employees.

4.2 Indicators of productivity, business competitiveness and viability

Indicators of productivity, business competitiveness and viability are examined at a firm level between 2005–06 and 2006–07. During this period, economic growth was strong, averaging at 3.5 per cent per annum, the unemployment rate was low and inflation for the most part remained within the Reserve Bank of Australia target band of 2 and 3 per cent.

Unfortunately, small sample size numbers restrict a detailed multivariate analysis of productivity, competitiveness and viability of firms by industry, business size and employment arrangements. As a result, spurious correlations may have some effect on the analysis. However, as demonstrated in Section 4.1, the characteristics of businesses by different employment arrangements appear to be similar, with comparable industry structures and business sizes. Hence, any influence stemming from the nature of the industry or business size on firm productivity, profitability and viability should be minimal, since their effect across all employment arrangement categories would be similar. Note also that the ABS has advised that statistics should not be derived from pooling the two panels and hence various measures are examined across both panels to ensure consistency.[36]

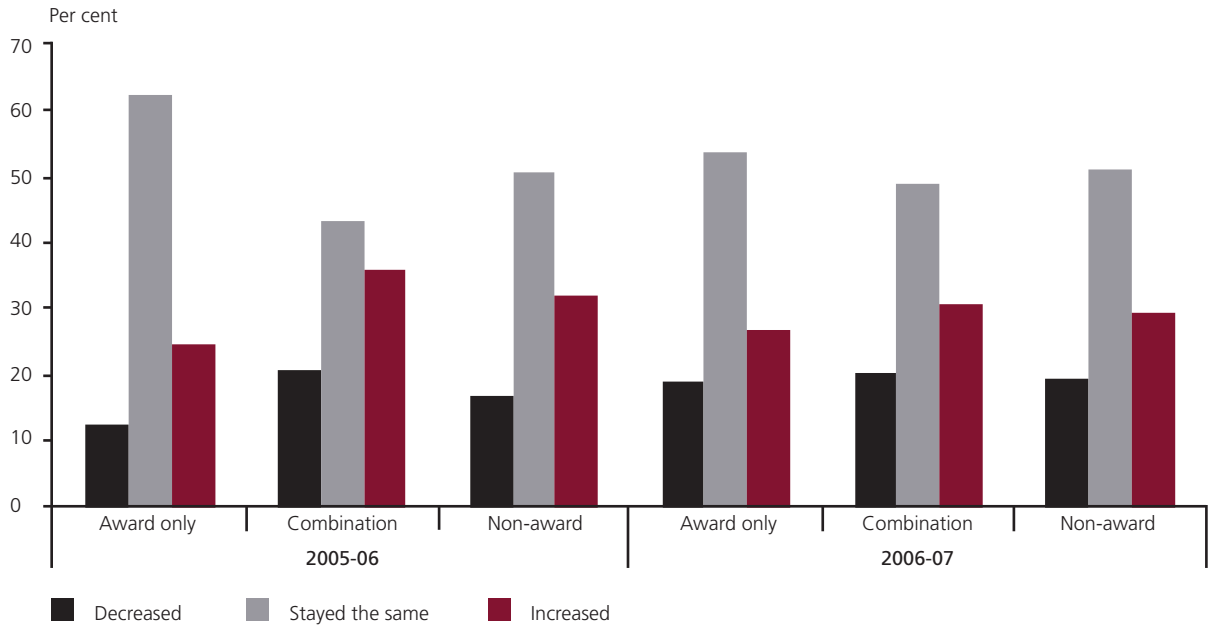
4.2.1 Productivity and profitability

To measure productivity and profitability, survey respondents were asked to assess their performance compared with the previous year. In effect, the variables measure whether productivity and profitability decreased, stayed the same, or increased. As a result, these measures are available only for businesses that have been operating for more than a year, which excludes business entrants.

The descriptive statistics revealed that most businesses reported no changes in productivity for 2005–06 and 2006–07. Businesses that paid only award rates were more likely to report decreased or stable productivity for these years compared with businesses that utilised non-awards or a combination of both (Figure 4.1 and 4.2).

36 Refer to page 65 for further detail on the composition of panel 1 and 2.

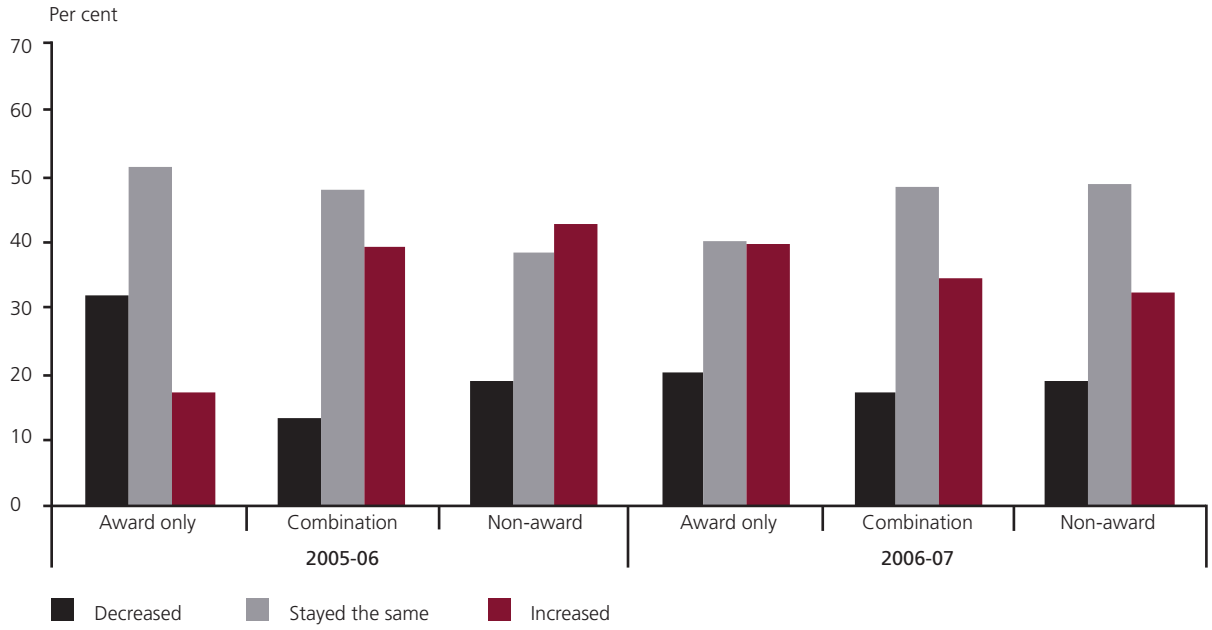
Figure 4.1: Changes in productivity, panel 1



Note: Not applicable and missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.2: Changes in productivity, panel 2

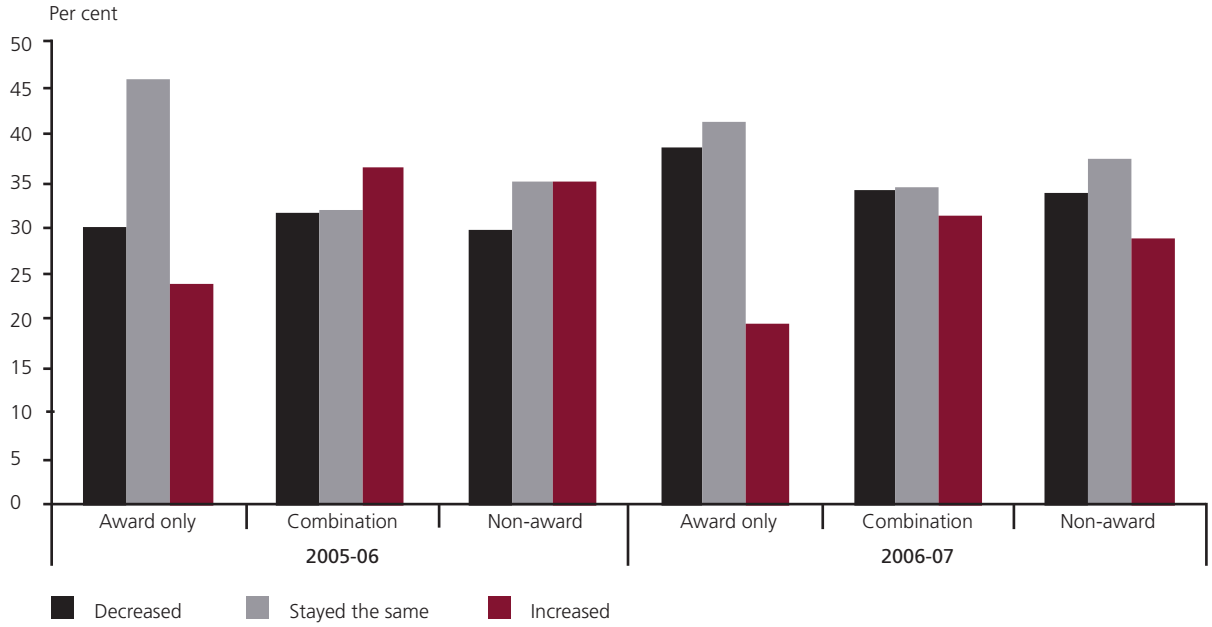


Note: Not applicable and missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Businesses that paid only award rates also incurred a higher proportion of businesses reporting decreased or stable profitability for most instances in 2005–06 and 2006–07 compared with businesses that utilised non-awards or a combination of both (Figure 4.3 and 4.4).

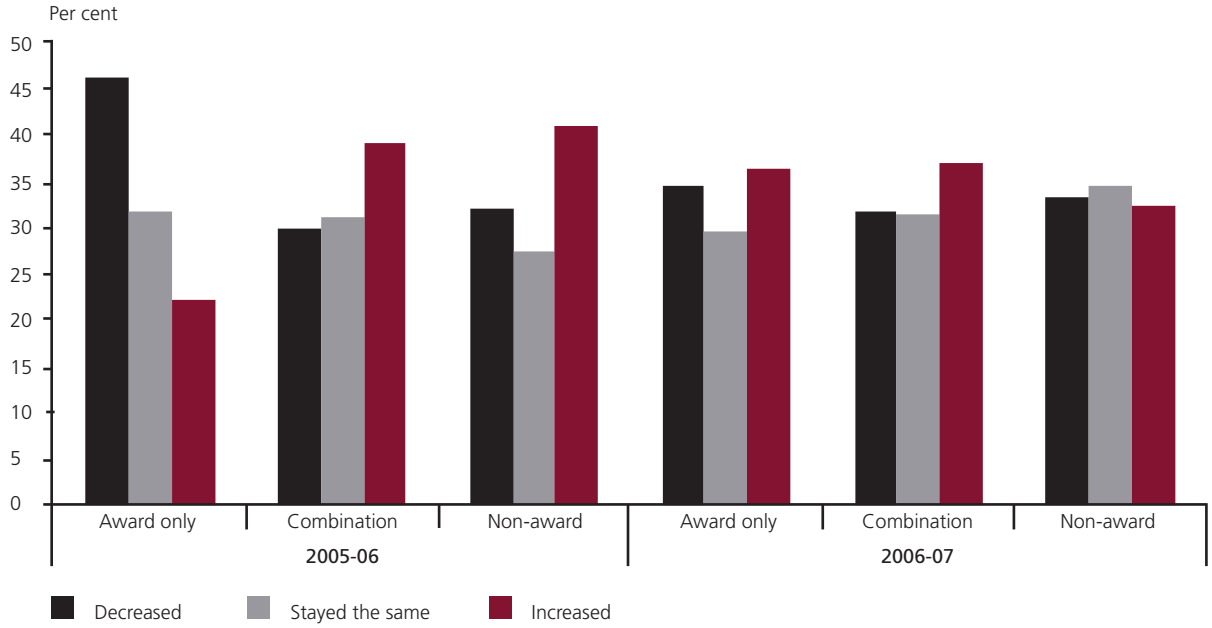
Figure 4.3: Changes in profitability, panel 1



Note: Not applicable and missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.4: Changes in profitability, panel 2

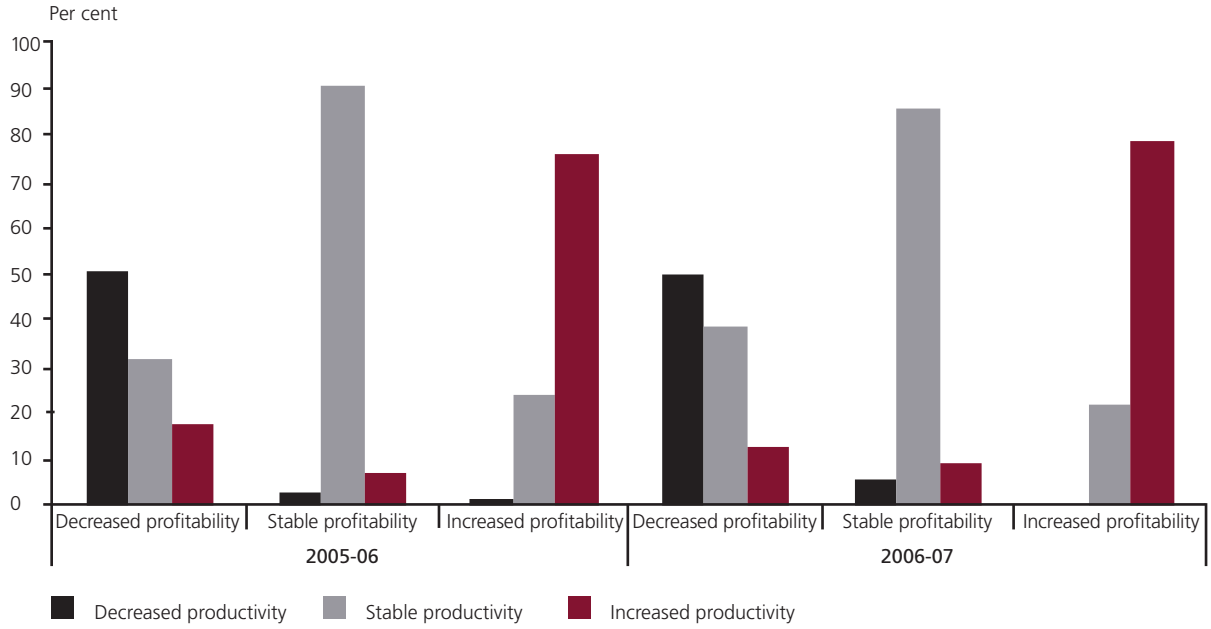


Note: Not applicable and missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Changes in productivity and profitability were positively correlated. The strength of this relationship was particularly noticeable for firms reporting stable and increased profitability (Figure 4.5 and 4.6).

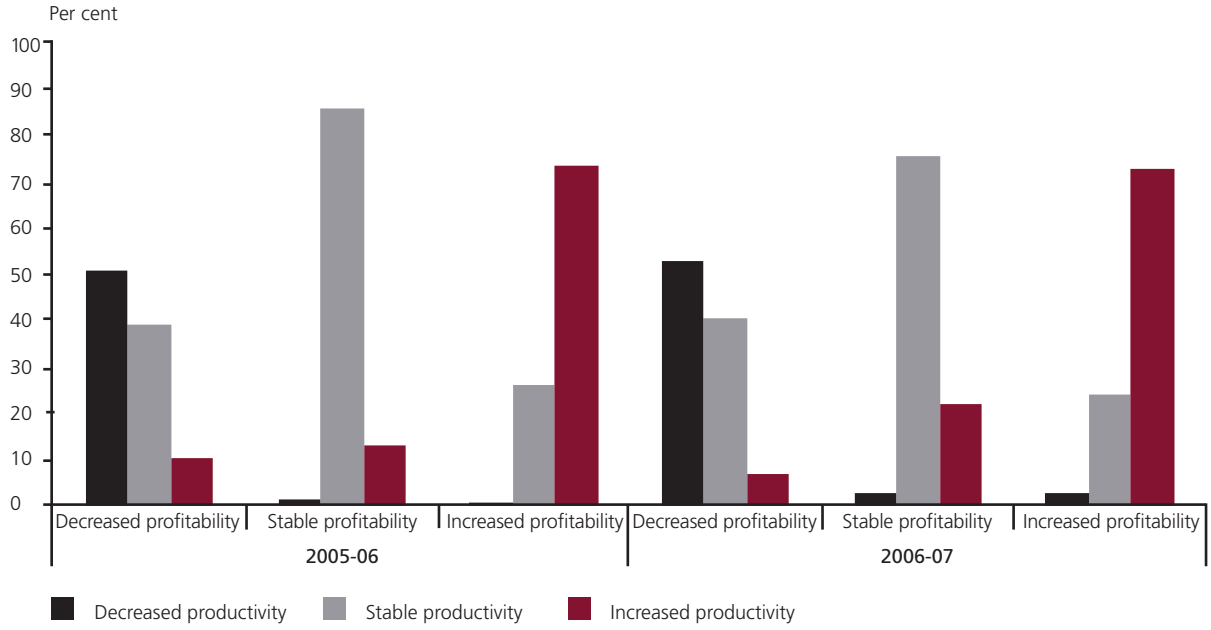
Figure 4.5: Relationship between changes in productivity and profitability, panel 1



Note: Not applicable and missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005-06 and 2006-07, Catalogue No. 8168.0.55.001.

Figure 4.6: Relationship between changes in productivity and profitability, panel 2



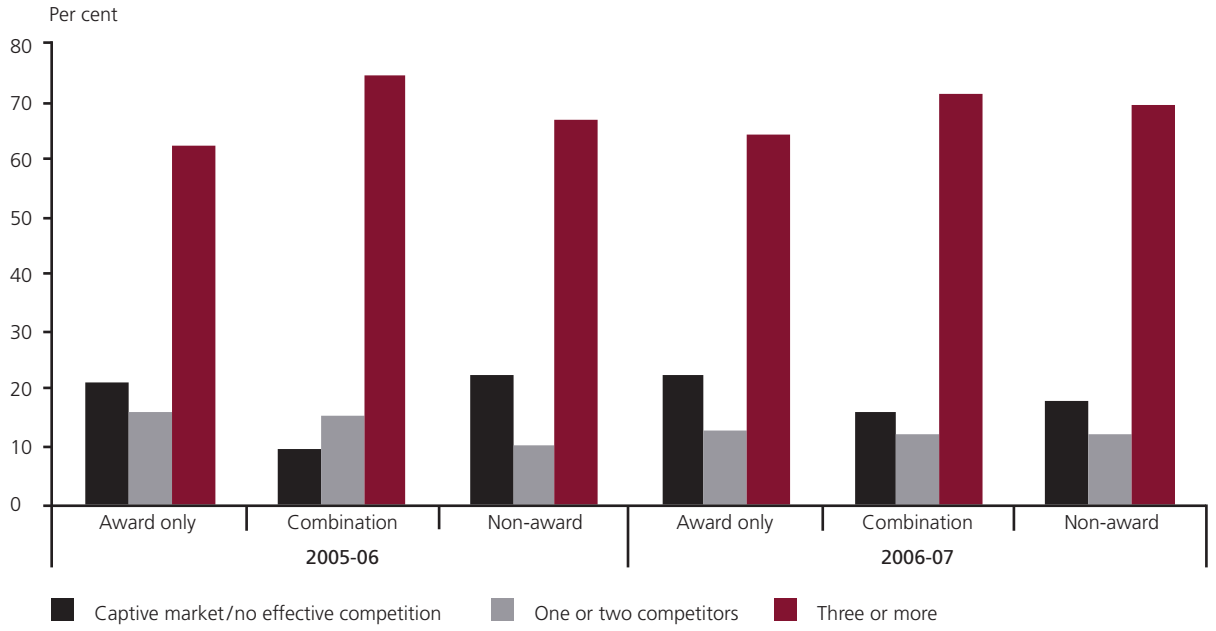
Note: Not applicable and missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005-06 and 2006-07, Catalogue No. 8168.0.55.001.

4.2.2 Competition

The BLD contains a number of other indicators that measure competition. One measure is market structure, which explores the number of competitors encountered by firms. For instance, the data demonstrate whether a business has faced no effective competition (monopoly), one or two competitors (oligopoly), or three or more competitors (monopolistic competition). The data found a majority of businesses had three or more competitors for 2005–06 and 2006–07, indicating the prevalence of monopolistic competition. Over this period, businesses that used a combination of both types of pay setting arrangements were slightly more likely to have three or more competitors compared with their counterparts (Figure 4.7 and 4.8).

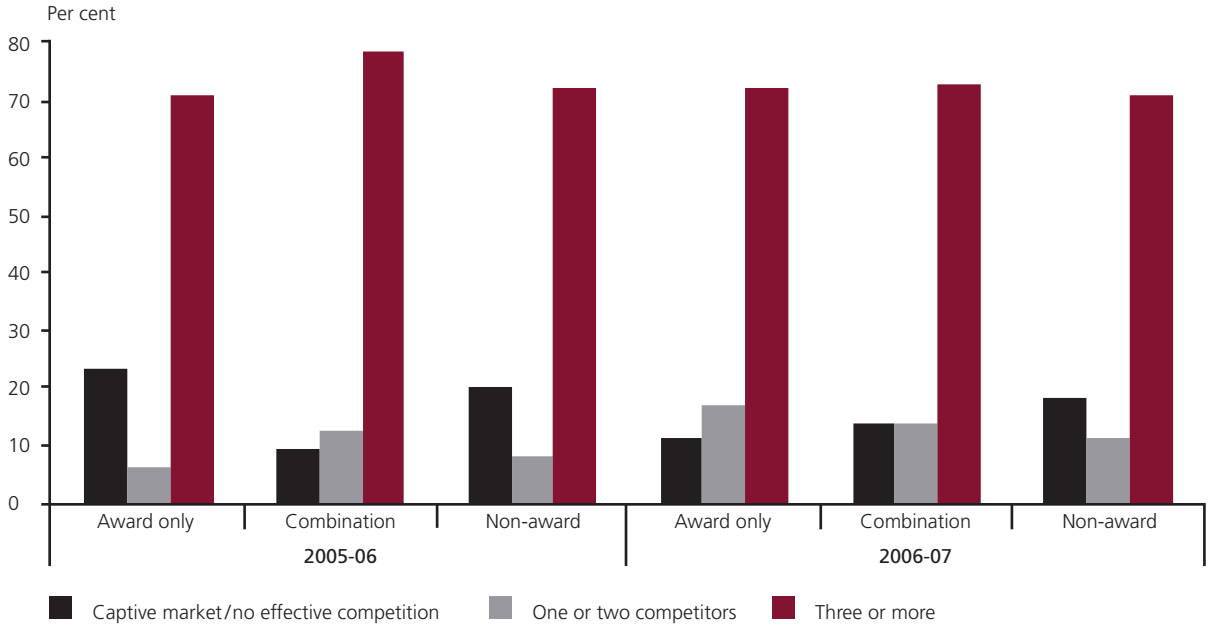
Figure 4.7: Number of competitors, panel 1



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.8: Number of competitors, panel 2



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

The BLD also contained another measure of competitiveness, which examines the nature and size of a firm's competitors. The nature of competitors is determined by its similarities or differences in goods or services provided or the activity undertaken. For example, if two retailers are both selling clothing only, then they are similar in nature. However, if one business sells clothing only while the other is a department store that sells other goods in addition to clothing, then they are different in nature.

Across all types of industrial arrangements, competitive pressures most commonly emanated from businesses that were similar in nature and of the same size or larger. However, there considerable proportion of larger competitors were of a different nature (Table 4.6 and 4.7).

Table 4.6: Nature and size of competitors, panel

	2005–06			2006–07		
	Award only	**Combination**	**Non award**	**Award only**	**Combination**	**Non award**
Similar in nature—smaller	20.6	16.8	22.2	19.5	28.9	19.7
Similar in nature—about the same size	51.4	53.6	48.4	52.4	57.9	56.7
Similar in nature—larger	49.3	49.9	57.9	46.8	53.8	60.6
Similar in nature—None	0.0	2.9	2.8	1.6	0.4	1.3
Different in nature—smaller	5.1	4.0	7.0	9.8	6.3	6.9
Different in nature—about the same size	22.1	16.7	11.5	8.3	7.7	16.2
Different in nature—larger	42.3	28.1	37.3	16.9	26.3	39.4
Different in nature—none	13.1	14.9	11.7	8.0	17.1	16.2

Note: Missing responses are omitted. These figures do not sum up to 100 and should be interpreted as follows: 20.6 per cent of award-only businesses had smaller competitors that were similar in nature, while 79.4 per cent of award-only businesses did not.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Table 4.7: Nature and size of competitors, panel 2

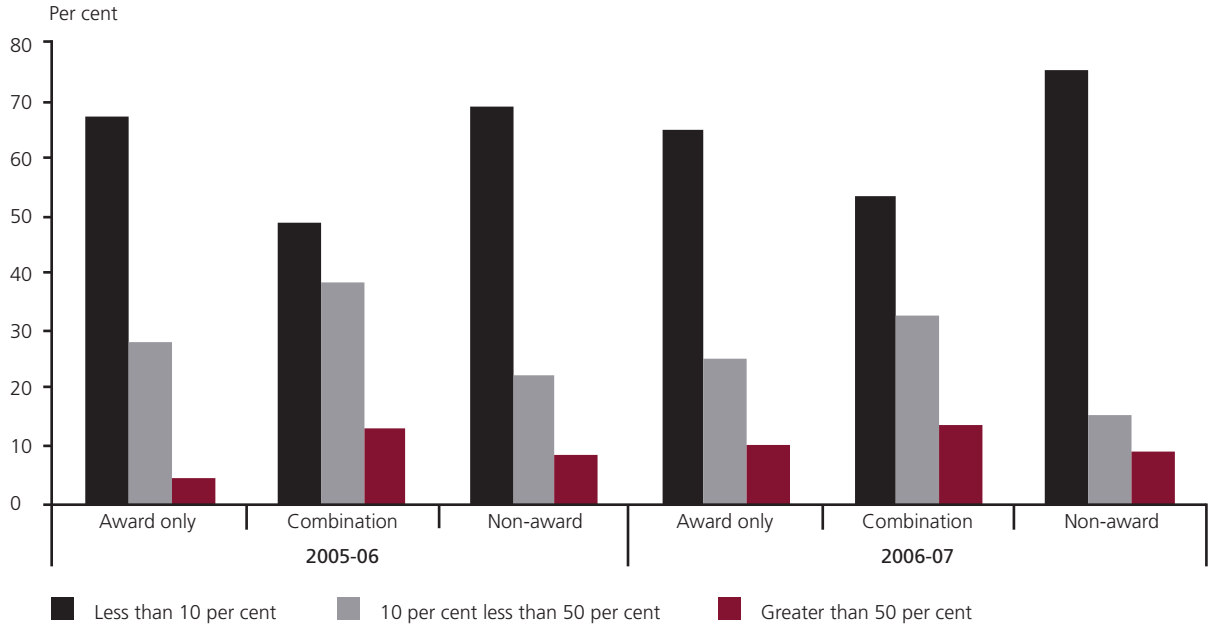
	2005–06			2006–07		
	Award only	**Combination**	**Non award**	**Award only**	**Combination**	**Non award**
Similar in nature—smaller	13.9	23.2	19.0	21.3	26.7	17.4
Similar in nature — about the same size	59.4	58.0	59.4	50.3	76.6	58.4
Similar in nature—larger	44.7	52.1	55.5	51.1	45.4	54.2
Similar in nature—None	0.0	0.3	0.8	1.3	0.0	1.0
Different in nature—smaller	4.2	10.6	3.2	7.3	7.3	6.3
Different in nature — about the same size	11.8	14.7	13.4	14.8	20.2	13.2
Different in nature—larger	20.6	34.5	36.7	32.6	28.2	41.0
Different in nature—none	12.8	12.9	15.4	12.4	10.7	17.0

Note: Missing responses are omitted. These figures do not sum up to 100 and should be interpreted as follows: 13.9 per cent of award-only businesses had smaller competitors that were similar in nature, while 86.1 per cent of award-only businesses did not.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005-06 and 2006-07, Catalogue No. 8168.0.55.001.

A business's share of the market was also gauged in the BLD, with responses ranging from less than 10 per cent, 10 per cent to 50 per cent or greater than 50 per cent. Across all types of employment arrangement categories, most businesses were likely to constitute less than 10 per cent of the market share between 2005–06 and 2006–07. This was most prevalent among firms covered by non-award agreements (Figure 4.9 and 4.10).

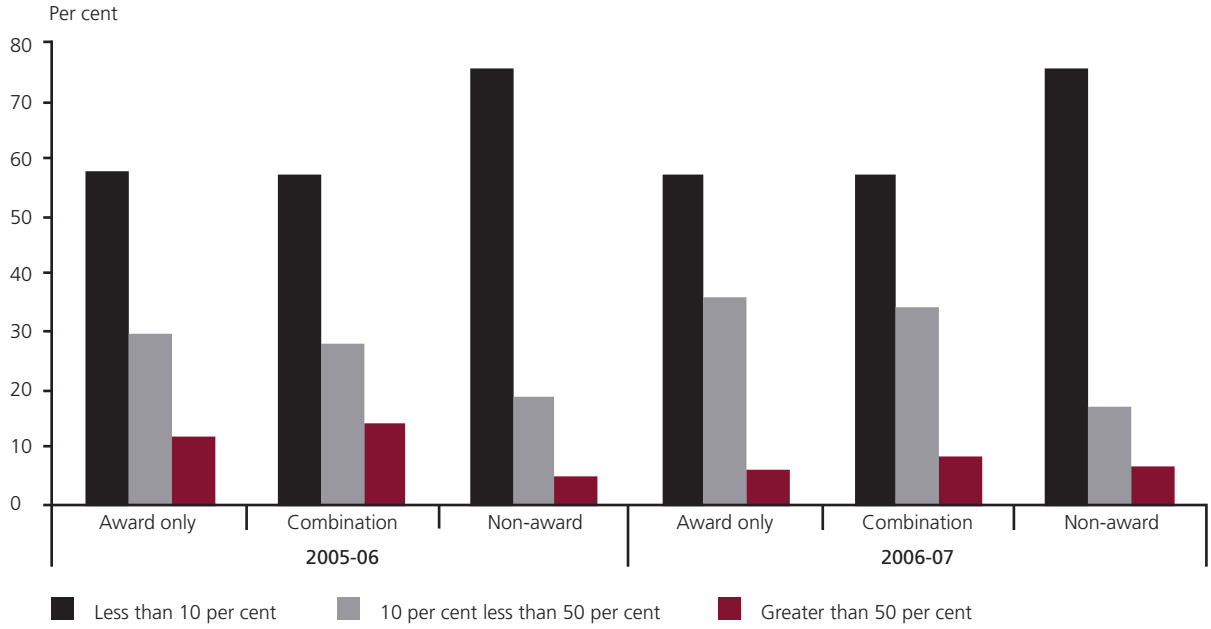
Figure 4.9: Market share, panel 1



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.10: Market share, panel 2



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

4.2.3 Business viability

Using the longitudinal dimension of the BLD, business survival rates can be constructed by identifying a business by its type of employment arrangement in June 2005 and tracking its status in June 2007. It is important to remember that business deaths[37] are not necessarily business failures as they may exit for other reasons. For instance, an owner may decide to sell its operations or restructure the business via merger/takeover opportunities.[38] As mentioned previously, Bickerdyke et al. (2000) found that 20 per cent of business deaths were due to changes in ownership, while the remaining 80 per cent were from cessations, which mainly comprise solvent businesses ceasing operations for non-financial, 'lifestyle' reasons rather than business failure. Nonetheless, the efficiency of the sector is potentially enhanced when efficient entrants replace less efficient exiting businesses, raising productivity and increasing efficiency within firms through innovation or workforce re-organisation.

The data show that around four-fifths of businesses that paid only award rates survived between June 2005 and June 2007, which was lower than the survival rates for non-award businesses and businesses that used a combination of both types of agreements. Businesses that used non-award agreements and a combination of both had similar survival rates over the two years (Table 4.8).[39]

Table 4.8: Survival rates between June 2005 and June 2007, panel 1

	Award only	Combination	Non-award
Survived	80.9	84.6	83.1
Death	18.5	10.8	12.4
Dormant	0.6	4.7	4.5
	100.0	100.0	100.0

Note: A death is when a business's ABN ceases to operate during the life of the panel. A dormant unit is a business with a 'live' ABN but no longer operate in the market. A small number of outstanding businesses and businesses that became out of scope of the survey are excluded.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

4.3 Determinants of productivity, business competitiveness and viability

In addition to measures of productivity, business competitiveness and viability, the BLD also contains some measures of their determinants, namely innovation and management practices.[40] The relationship between these determinants and productivity has been explored in the literature review (section 2.1).

37 A death is when a business's ABN ceases to operate during the life of the panel.

38 Business failures cannot be quantified using the BLD.

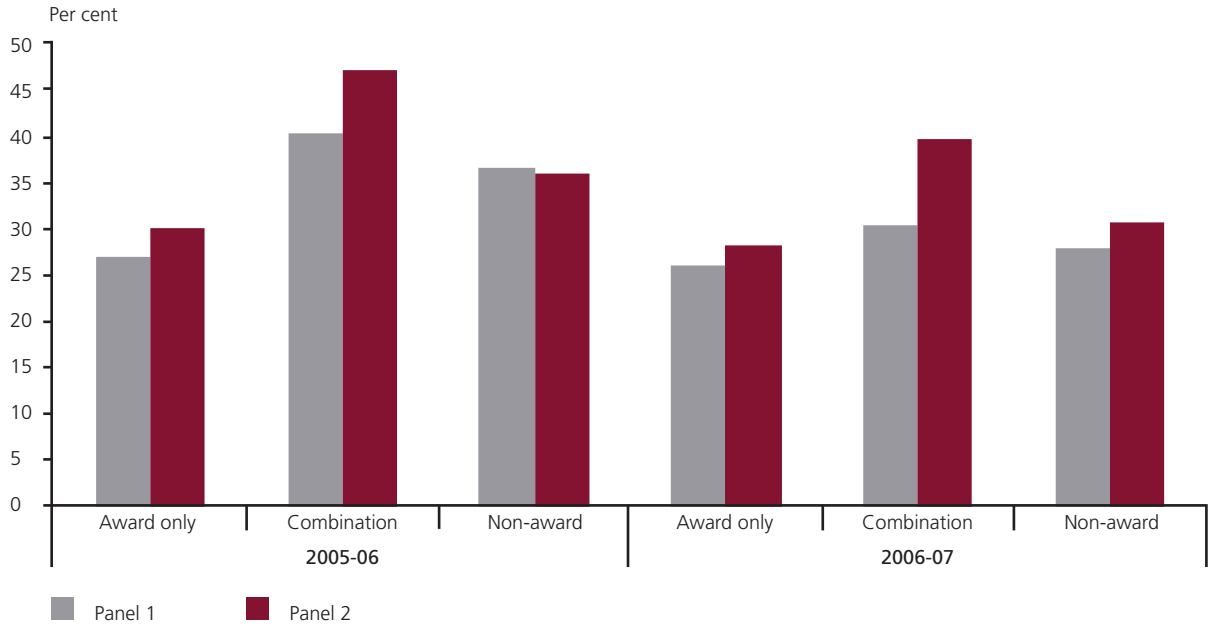
39 Due to the survey design, it is not possible to construct survival rates between 2005 and 2007 for panel 2.

40 These are the only two determinants that can be examined within the BLD.

4.3.1 Innovation

Innovation, as defined by the ABS, refers to whether a business has introduced any new or significantly improved goods or services, operational processes, organisational/managerial processes or marketing methods. While a majority of businesses did not innovate, businesses that utilised a combination of employment arrangements experienced greater innovation than their counterparts (Figure 4.11).

Figure 4.11: Proportion of innovating businesses



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Across firms that did innovate, profit, competition and production were considered to be the main drivers for innovation. Profit, in particular, was the most prevalent reason for innovation among all businesses. In contrast to firms that utilised other types of employment arrangements, firms that paid only award rates were more likely to innovate in response to government regulations or standards, to improve safety and working conditions or to help reduce environmental impacts (Table 4.9).

Table 4.9: Reasons for innovation

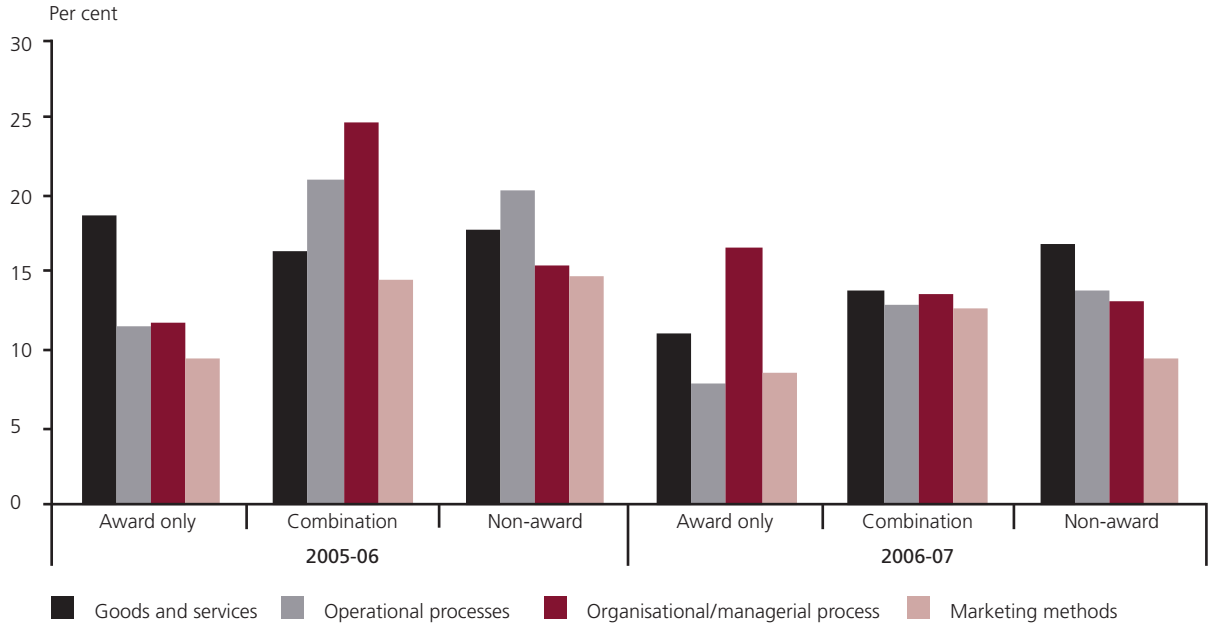
	Award only		Combination		Non-award	
	Panel 1	Panel 2	Panel 1	Panel 2	Panel 1	Panel 2
Profit-related reasons	70.6	69.7	66.5	83.6	77.2	82.7
Competition, demand, market-related reasons—be at the cutting edge of the industry	29.5	43.7	43.1	34.2	29.7	37.2
Competition, demand, market-related reasons — increase responsiveness to customer needs	46.7	45.8	56.1	53.8	52.4	46.9
Competition, demand, market-related reasons — ensure products are competitively priced	34.0	36.4	20.1	26.9	33.1	28.2
Competition, demand, market-related reasons — increase or maintain market share	33.0	50.1	52.8	53.6	29.8	42.4
Competition, demand, market-related reasons — establish new markets	36.0	41.1	42.3	43.7	32.4	34.0
Production and delivery reasons—increase efficiency of supplying/delivery goods or services	20.8	34.4	26.4	35.9	35.2	33.8
Production and delivery reasons—improve quality of goods and services	53.1	42.3	44.0	42.2	32.3	29.6
Production and delivery reasons—improve IT capabilities or better utilise IT capacity	49.3	21.1	29.3	27.6	27.5	18.7
Production and delivery reasons—increase capacity of production or service provision	13.0	29.3	27.5	26.6	15.5	14.2
Reduce environmental impacts	39.9	35.1	6.6	11.3	10.9	9.7
Improve safety or working conditions	37.0	43.3	18.7	28.6	16.6	12.8
In response to government regulations or standards	22.8	33.5	5.7	10.5	6.2	11.9
Other reasons	2.3	2.8	8.4	7.9	10.9	13.9
No main reasons	4.9	7.0	2.8	3.2	4.2	0.7

Note: Missing responses are omitted. These figures do not sum up to 100 and should be interpreted as follows: 70.6 per cent of award-only innovating businesses in panel 1 innovated due to profit related reasons, while 29.4 per cent innovated for other reasons unrelated to profit.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

The data also revealed that innovating businesses across all methods of setting pay were most likely to introduce new goods or services or re-design operational processes than develop new marketing methods (Figure 4.12 and 4.13).

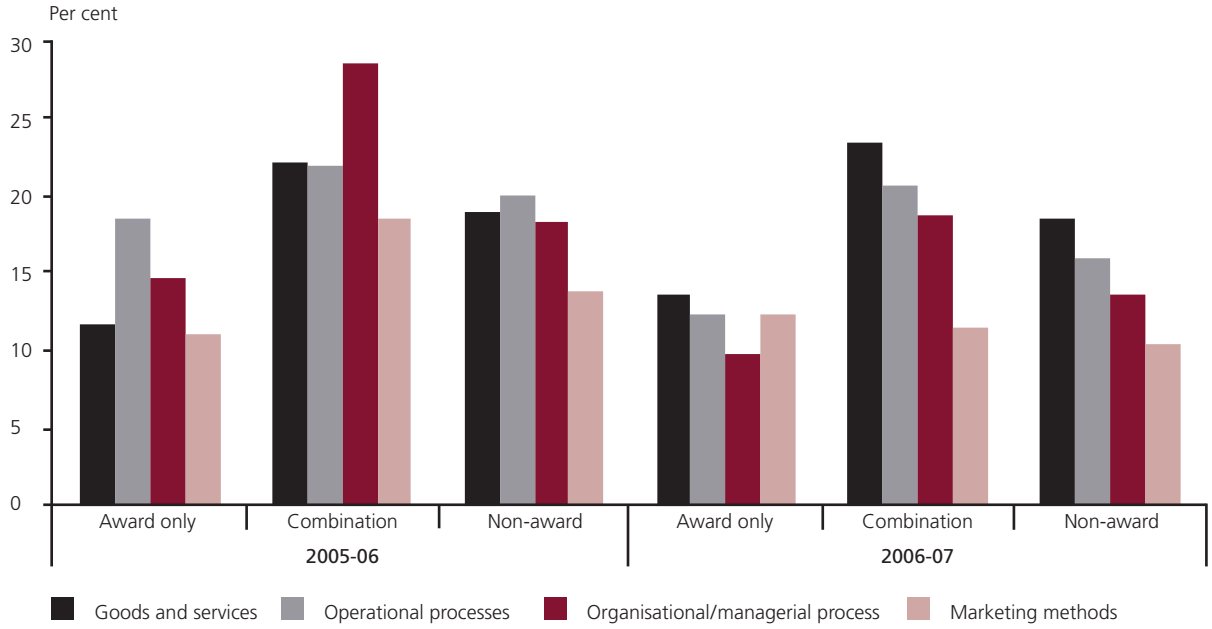
Figure 4.12: How businesses innovated, panel 1



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005-06 and 2006-07, Catalogue No. 8168.0.55.001.

Figure 4.13: How businesses innovated, panel 2



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005-06 and 2006-07, Catalogue No. 8168.0.55.001.

As a result, expenditure on the acquisition of machinery, equipment or technology was greater than expenditure on marketing activities undertaken, although a significant proportion of innovating businesses did not invest in innovation, particularly among businesses that paid only award rates (Table 4.10).

Table 4.10: Expenditure on innovation

	Award only		Combination		Non-award	
	Panel 1	Panel 2	Panel 1	Panel 2	Panel 1	Panel 2
Acquisition of machinery, equipment or technology	56.9	38.0	53.7	47.2	51.9	42.4
Training specific	27.9	36.4	20.0	35.0	13.5	35.5
Marketing activities undertaken	43.3	29.8	26.7	23.6	29.8	29.9
Research and experimental development	20.6	13.8	12.5	9.3	15.2	17.4
Design, planning or testing to develop or introduce new goods, etc	30.1	16.5	7.0	13.1	25.3	15.0
Acquisition of licenses, rights, patents or other intellectual property	17.9	9.4	16.3	4.0	7.9	8.7
Other activities—new goods or services	22.5	7.5	15.6	15.2	14.9	10.1
Other activities—new operational processes	23.7	10.1	18.8	5.6	12.3	11.0
Other activities—new organisational/managerial processes	24.5	11.6	20.5	5.9	7.4	8.9
Other activities—new marketing methods	18.4	23.8	23.5	10.3	12.7	20.4
Other activities—no expenditure	35.5	28.8	15.7	29.1	28.3	21.0

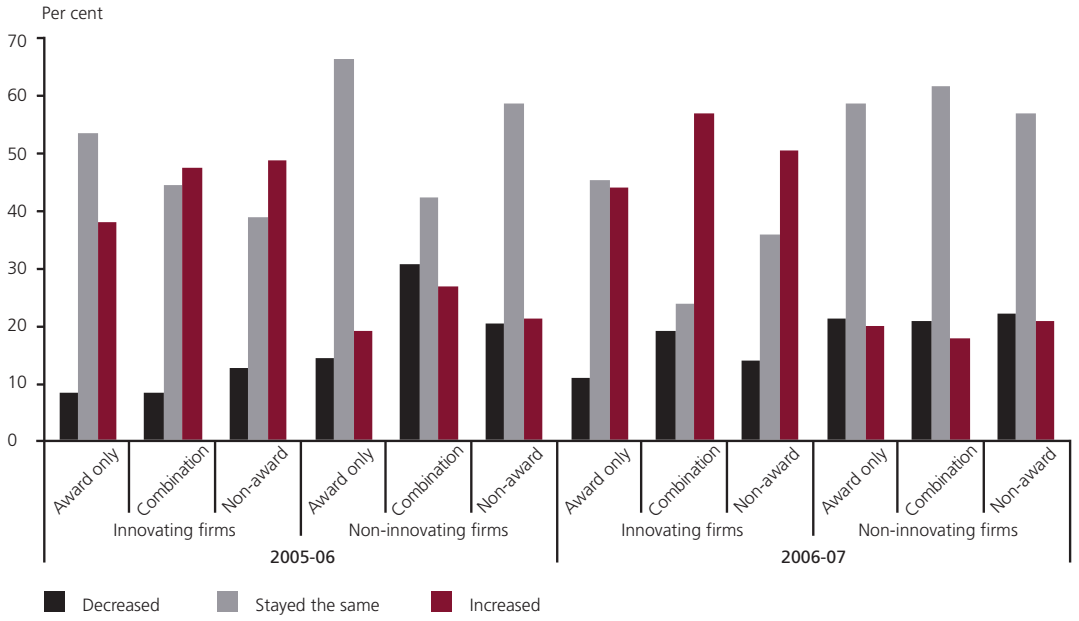
Note: Missing responses are omitted. These figures do not sum up to 100 and should be interpreted as follows: 56.9 per cent of award-only innovating businesses in panel 1 acquired machinery, equipment or technology to innovate, while 43.1 per cent did not.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

4.3.1.1 Productivity and innovation

A comparison of firms that innovated with those that did not revealed that, regardless of the employment arrangement chosen, firms committed to innovative activities were more likely to experience increased productivity relative to their counterparts (Figure 4.14 and 4.15).

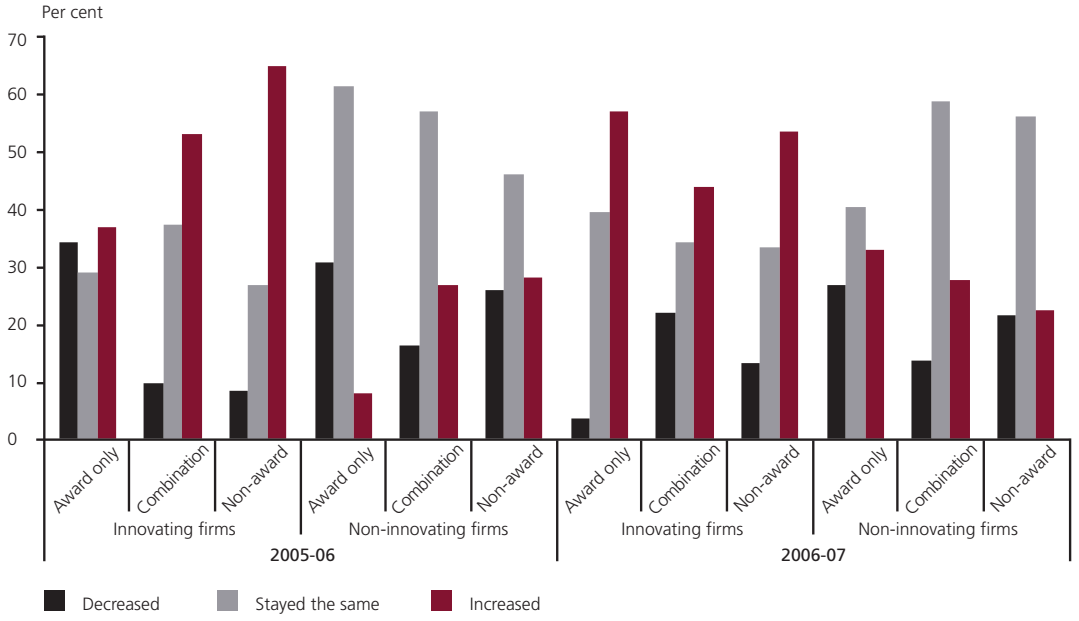
Figure 4.14: Changes in productivity for innovating and non-innovating firms, panel 1



Note: Not applicable and missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.15: Changes in productivity for innovating and non-innovating firms, panel 2

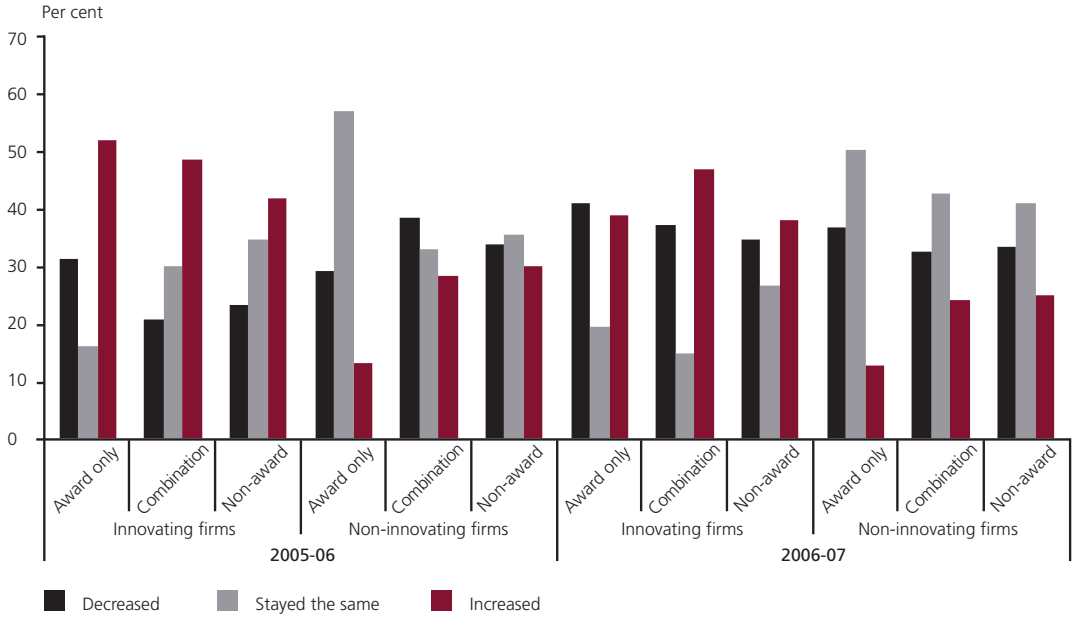


Note: Not applicable and missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Across all firms with different types of employment arrangements, businesses that innovated also experienced higher instances of increased profitability compared with businesses that chose not to innovate (Figure 4.16 and 4.17).

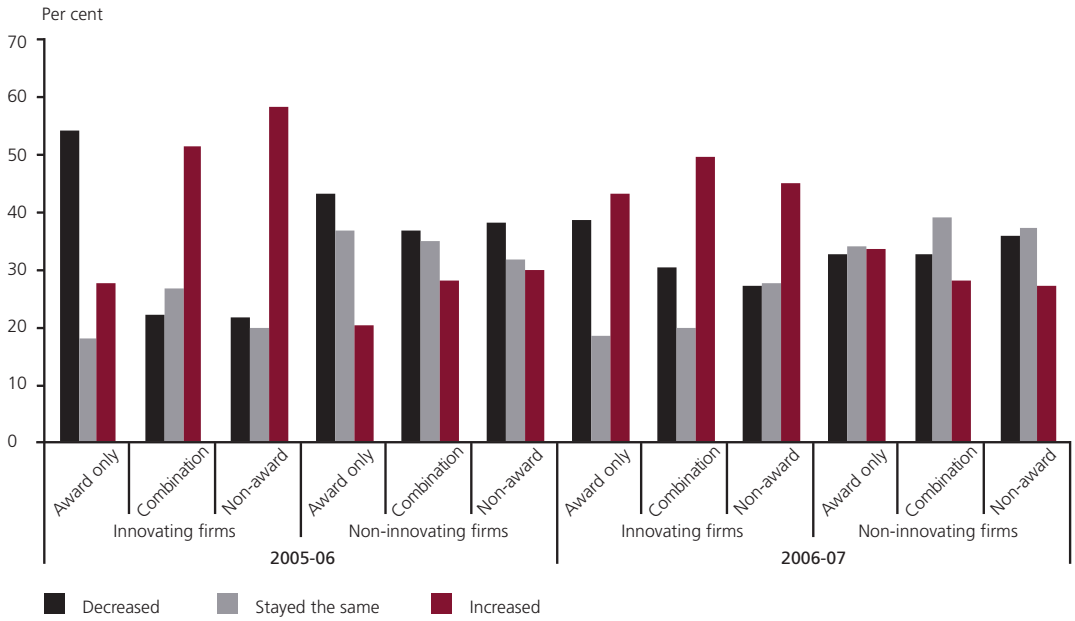
Figure 4.16: Changes in profitability for innovating and non-innovating firms, panel 1



Note: Not applicable and missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.17: Changes in profitability for innovating and non-innovating firms, panel 2



Note: Not applicable and missing responses are omitted.

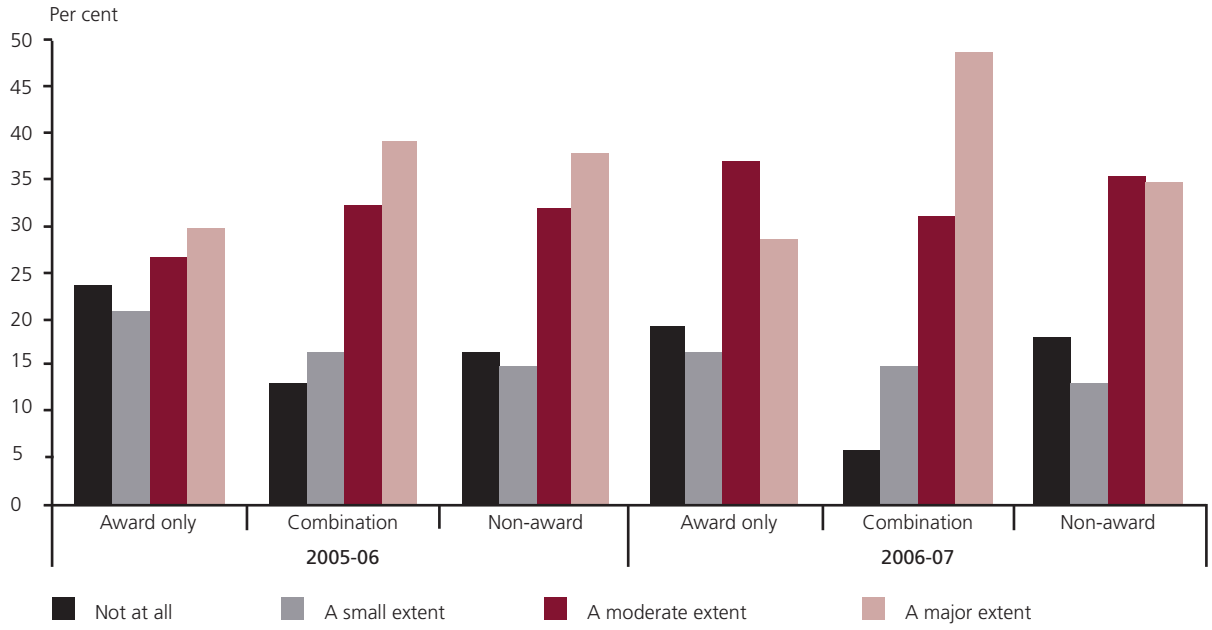
Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

4.3.2 Management practices

As described in the literature review, management practices can also influence productivity, business competitiveness and viability. The performance of management in coordinating labour and capital to be competitive and productive is important to business viability. The BLD examines measures that businesses focus on to increase their productive and competitive capabilities, such as financial and organisational planning. The data show that most businesses focused on all measures to varying extents.

Financial measures relate to profits, sales growth and return on investments. For both time periods most firm types focused on financial measures to 'a major extent' when assessing overall business performance. However, relative to their counterparts, businesses that paid only award rates were more likely to place less emphasis on financial measures and focus on them 'not at all' or to 'a small extent' (Figure 4.18 and 4.19).

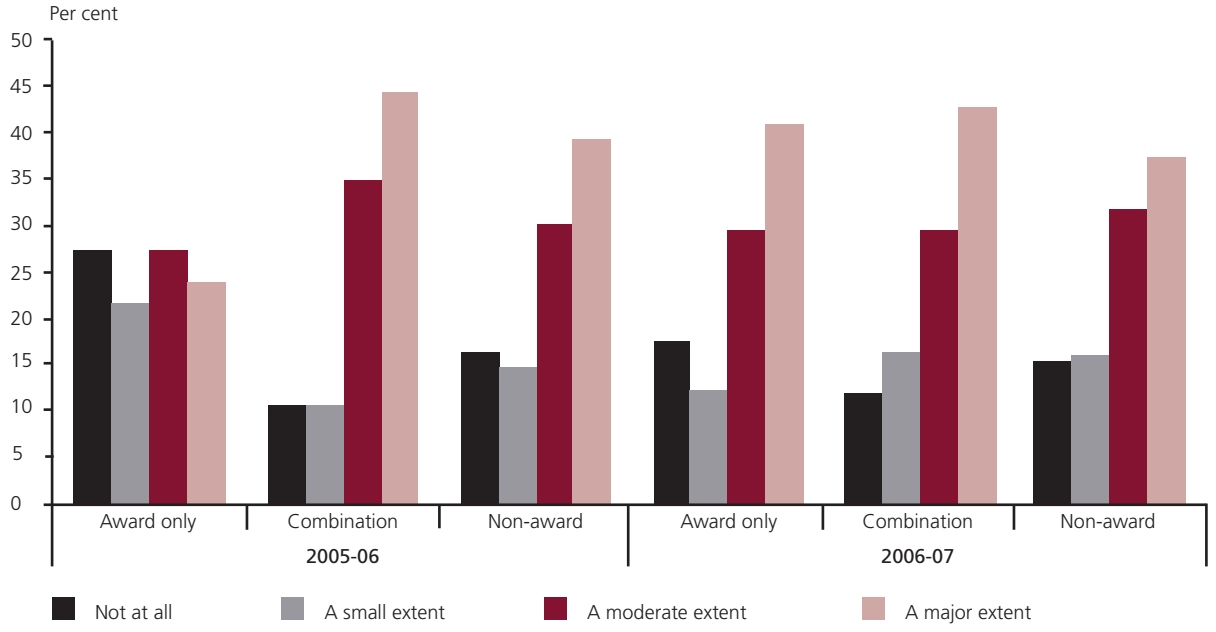
Figure 4.18: Business focus on financial measures when assessing overall business performance, panel 1



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.19: Business focus on financial measures when assessing overall business performance, panel 2

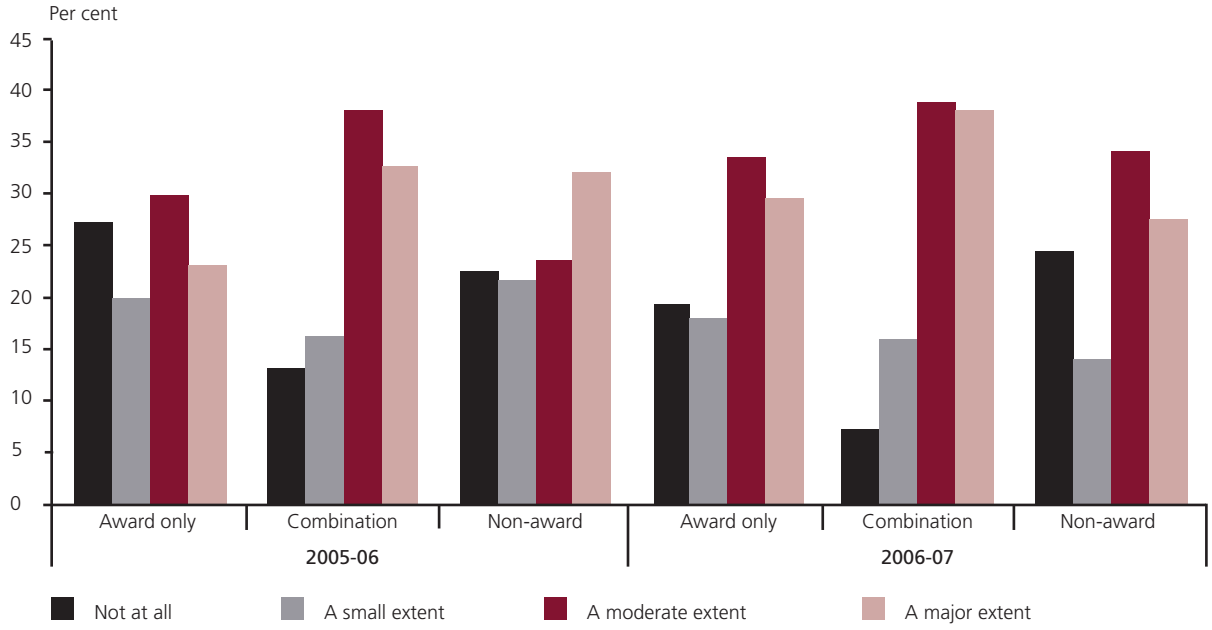


Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Cost measures relate to budgeting, cost per unit of output and inventory costs. In most instances all firm types focused on cost measures to 'a moderate extent' throughout the two periods. However firms that combined awards with non-award agreements were more likely to focus on cost measures to 'a moderate or major extent', compared with firms covered by other types of employment arrangements (Figure 4.20 and 4.21).

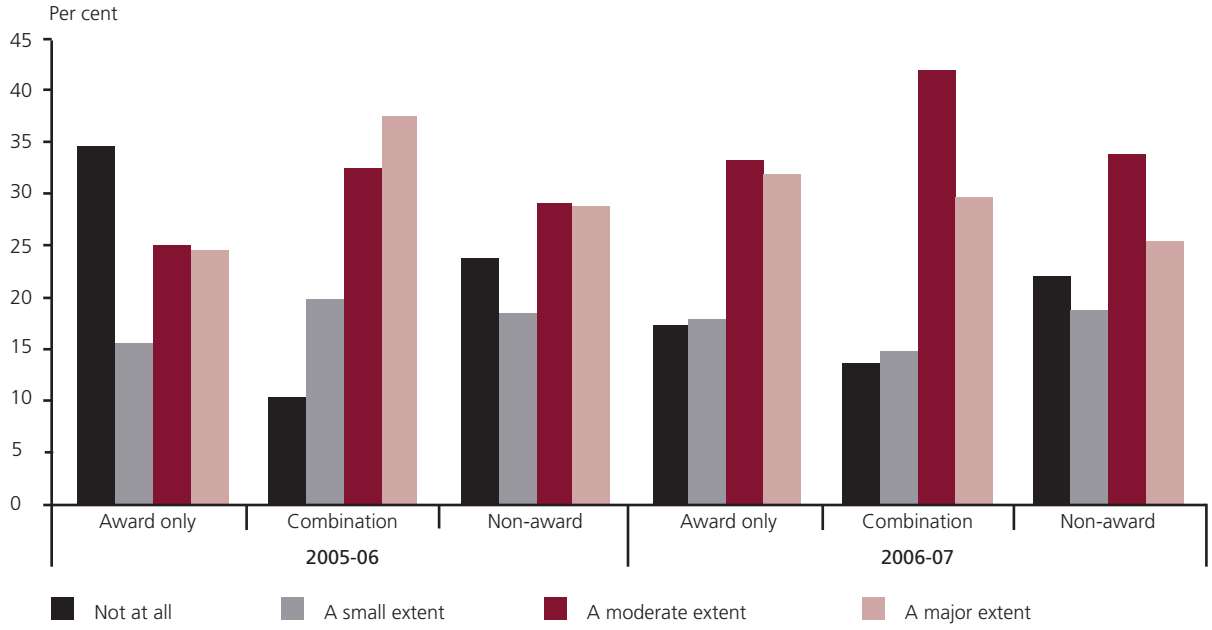
Figure 4.20: Business focus on cost measures when assessing overall business performance, panel 1



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.21: Business focus on cost measures when assessing overall business performance, panel 2

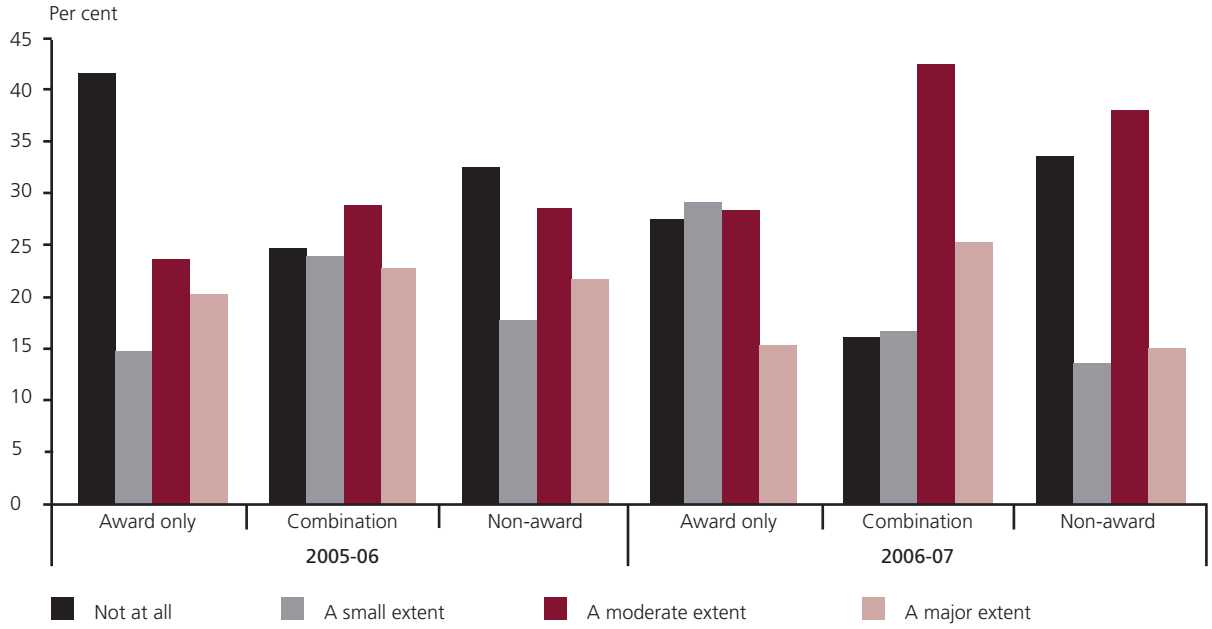


Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Operational measures relate to asset utilisation and on-time delivery. In 2005–06 businesses that used a combination of award and non-award agreements were more likely to focus on the performance of operational measures to 'a moderate extent'. However, the focus on such measures increased over the period, as a greater proportion of firms that utilised a combination of pay-setting arrangements were more likely to focus on the measures to 'a moderate extent'. A large majority of firms that only paid award rates did 'not at all' focus on operational measures in 2005–06, however, a greater proportion of these firms in the following period began focusing on such measures to 'a small or moderate extent' (Figure 4.22 and 4.23).

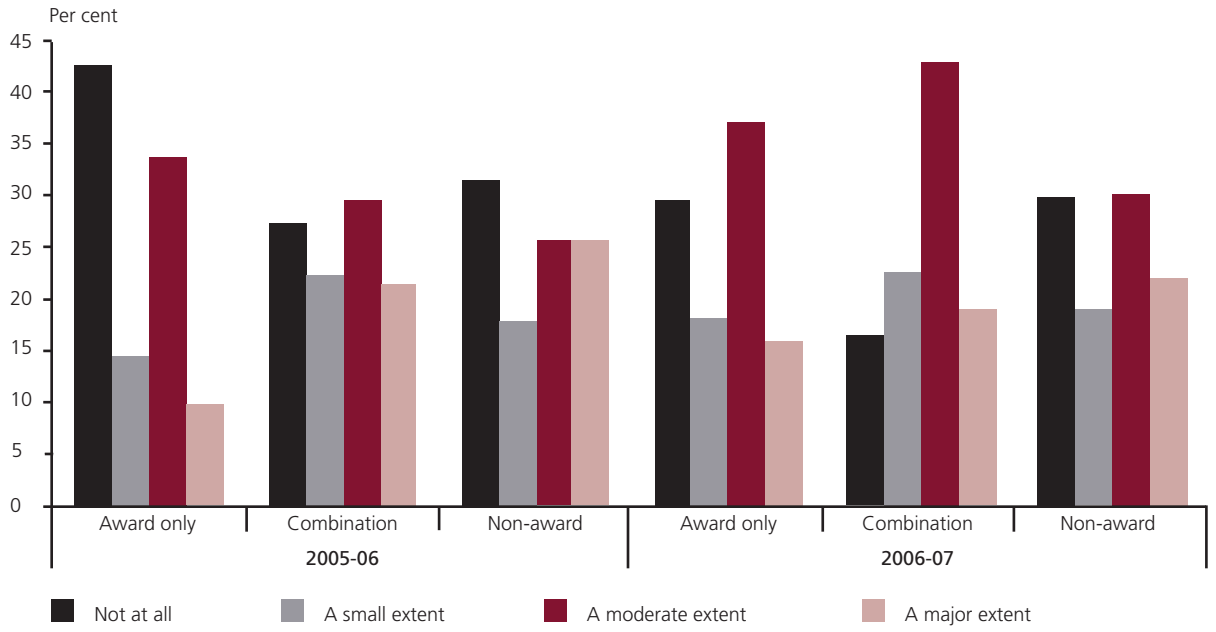
Figure 4.22: Business focus on operational measures when assessing overall business performance, panel 1



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.23: Business focus on operational measures when assessing overall business performance, panel 2

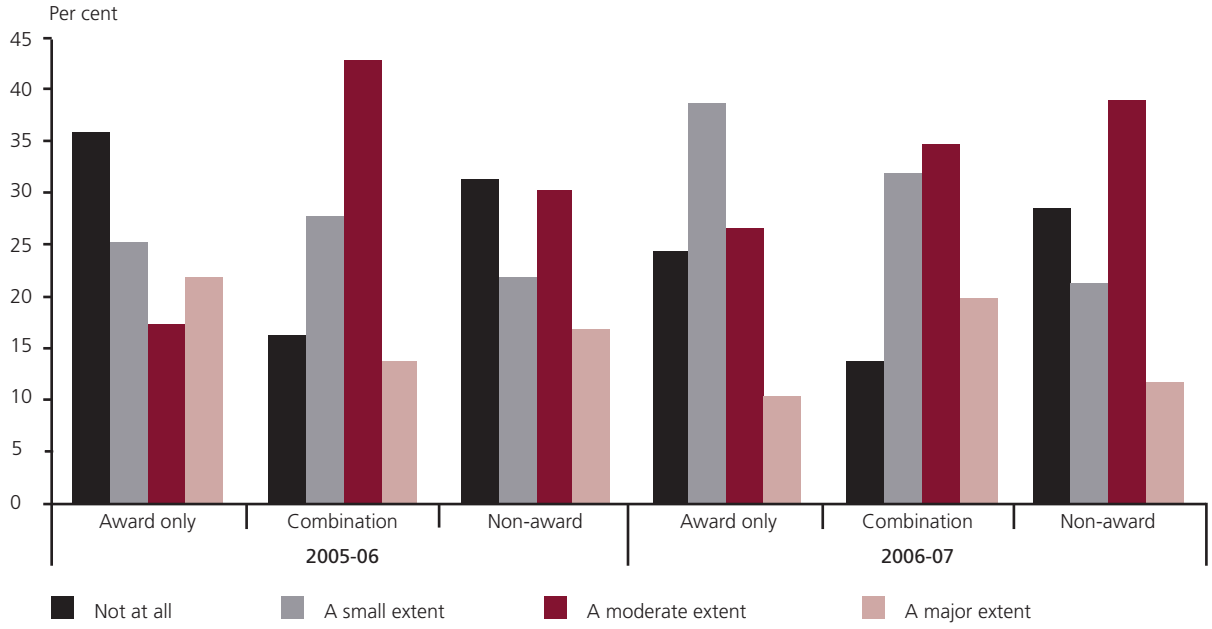


Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Human resources relate to job satisfaction and skill development. Over the two periods, firms that used a combination of employment arrangements were more likely to focus on human resource management when assessing overall business performance, relative to their counterparts. Firms covered by non-award arrangements were either 'not at all' or only moderately interested in pursuing human resource management to enhance business performance, while firms that paid only award rates were more likely to focus on these measures to a 'small or moderate' extent in 2006–07 compared with 2005–06 (Figure 4.24 and 4.25).

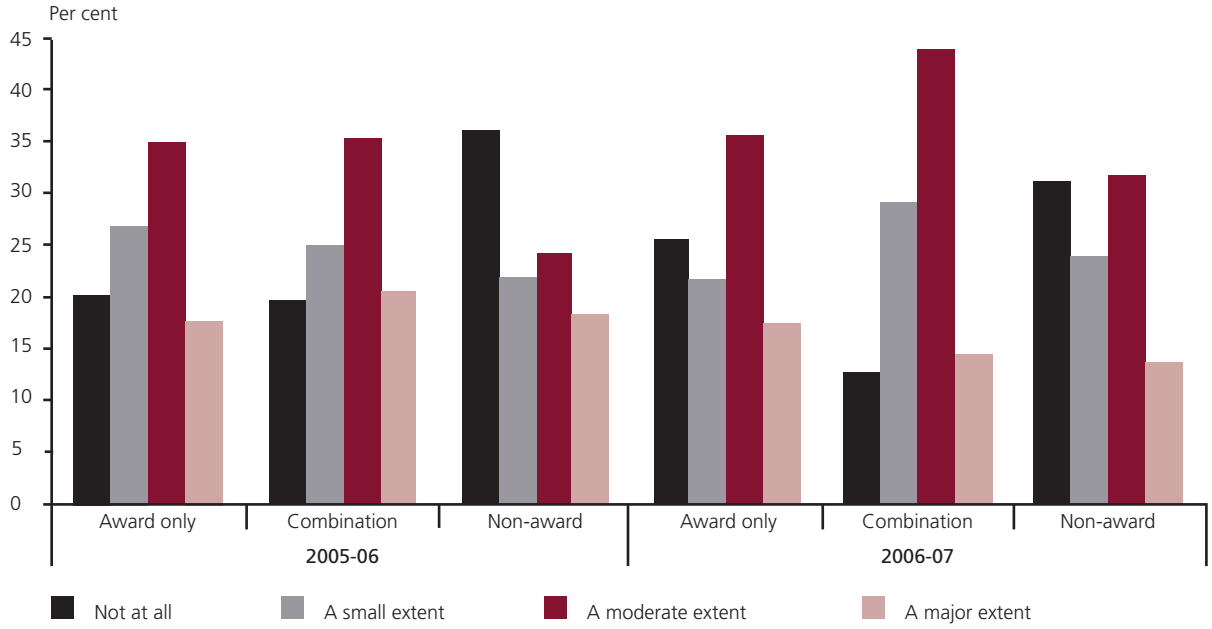
Figure 4.24: Business focus on human resources when assessing overall business performance, panel 1



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.25: Business focus on human resources when assessing overall business performance, panel 2

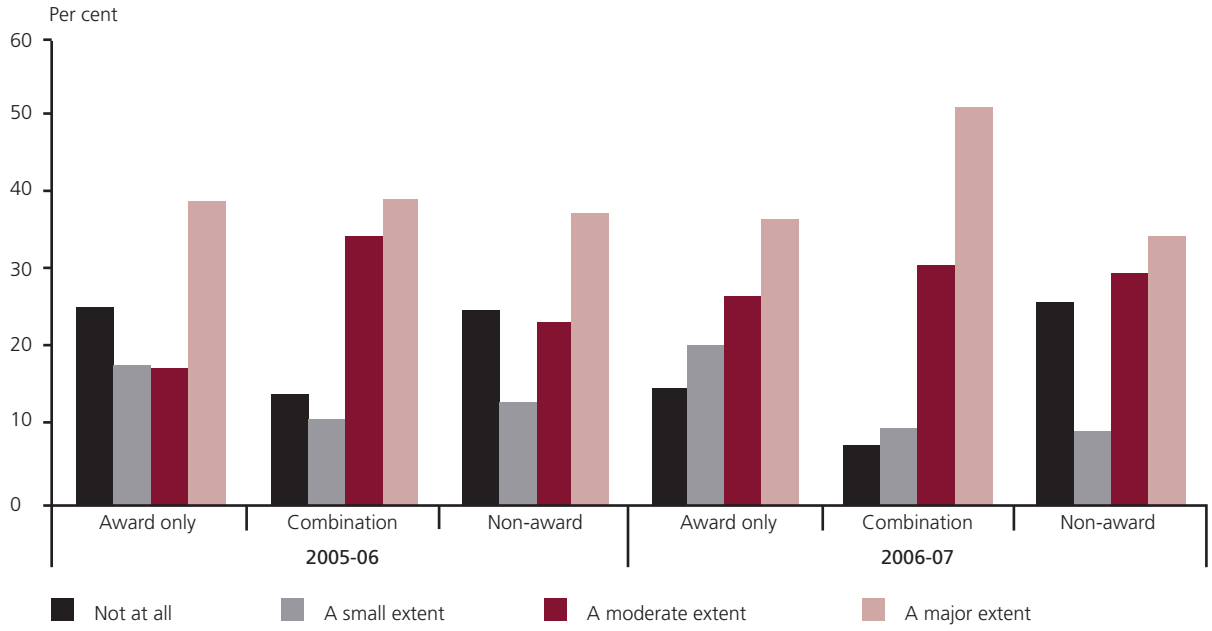


Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Quality measures relate to customer satisfaction and defect rates. While all firm types were more likely to focus on quality measures to 'a major extent', firms that used a combination of awards and non-award agreements had a greater focus on such measures, particularly in 2006–07 (Figure 4.26 and 4.27).

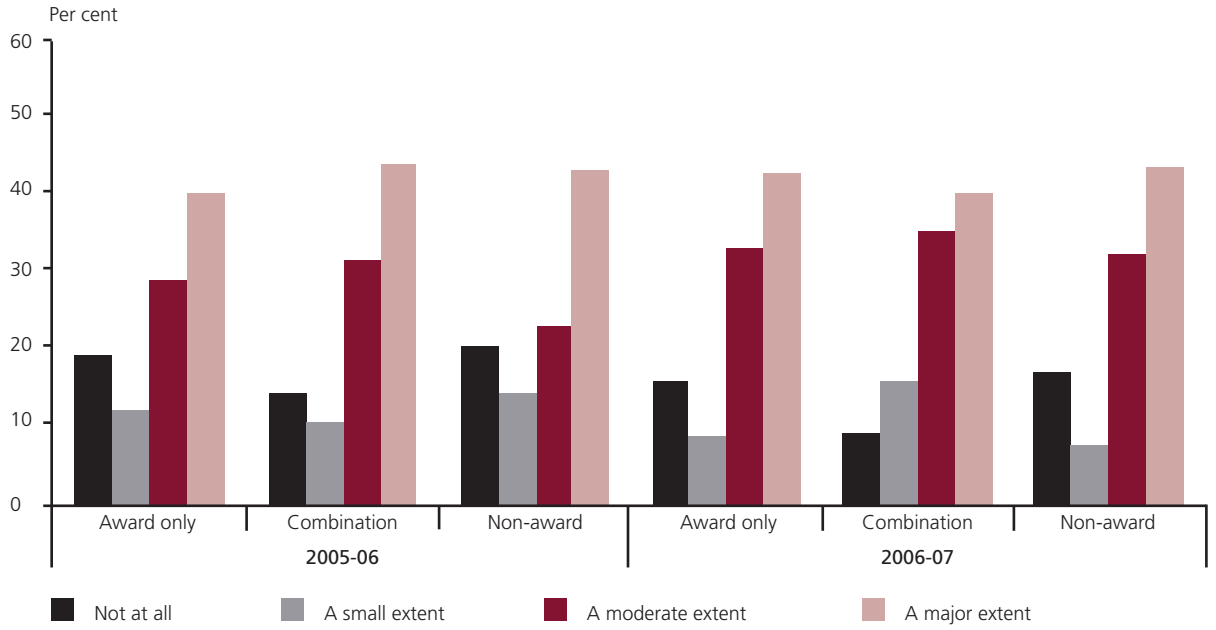
Figure 4.26: Business focus on quality measures when assessing overall business performance, panel 1



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

Figure 4.27: Business focus on quality measures when assessing overall business performance, panel 2



Note: Missing responses are omitted.

Source: ABS, *Business Longitudinal Database, Expanded CURF*, 2005–06 and 2006–07, Catalogue No. 8168.0.55.001.

In summary, the data revealed that, relative to firms that utilised non-award arrangements and firms that used a combination of award and non-award arrangements, firms that paid only award rates were less likely to experience increased productivity and profitability, which was also evidenced in the industry data presented in Section 3. Furthermore, the results revealed that firms that paid only award rates exhibited lower survival rates relative to their counterparts. However, the subjective nature of some of the measures used adds more uncertainty to these findings and the direction of causality remains ambiguous, as these data highlight only associations between firms that paid award rates and their productivity, business competitiveness and viability.

5 Conclusion

This report examined trends in productivity, competitiveness and viability at an aggregate, industry and firm level in Australia. A literature review of the determinants of productivity, business competitiveness and viability suggested each concept is interrelated because the determinants of productivity also influenced the competitive performance of the firm and hence its viability. The determinants reviewed were physical capital accumulation, research and development, technologies, innovation, human capital accumulation, firm organisation, management practices and work arrangements.

The review highlighted how causality across these variables is unclear and remains a key issue for further research, but suggested that minimum wage adjustments may affect productivity through these determinants. For example, they may have the effect of increasing research and development or raising human capital accumulation, factors that enhance a firm's competitiveness and increase its chances of survival.

However, the literature review indicated that the overall effect of minimum wages on productivity for Australia is ambiguous, and there are different implications depending upon whether increased training or the replacement of low-skilled labour with high-skilled labour is driving the results. Furthermore, while minimum wages are theorised to have an adverse impact on profitability and business closure rates, the evidence appears to be inconclusive.

Measures of productivity growth have shown that before and after the productivity surge of the 1990s, Australia was characterised by a period of slow growth. An analysis of the data by industry demonstrated that sectors responsible for the upturn were also accountable for the slowdown in productivity. The data also showed that award-reliant industries have relatively low levels of labour productivity. This is not unexpected because industries with low levels of labour productivity are generally labour-intensive industries with low wages and skill levels, and reduced bargaining power.

Various indicators of business competitiveness have remained fairly stable over time at an aggregate and industry level. Award-reliant industries exhibited higher levels of competition, as evidenced by relatively low levels of market concentration and small profit margins, as well as relatively high proportions of businesses that reported a loss over the course of a financial year.

Bankruptcy rates appear to have moderated after peaking in the 1990s. Around two-thirds of the businesses operating within award-reliant industries in June 2007 survived to June 2009, which was slightly below the average across all industries.

Relative to firms that utilised non-award arrangements and firms that used a combination of award and non-award arrangements, firms that paid only award rates were less likely to experience increased productivity and profitability, which was also evidenced in the industry level data presented in Section 3. Furthermore, the results revealed that firms that paid only award rates exhibited lower survival rates relative to their counterparts. However, the subjective nature of some of the measures used adds more uncertainty to these findings and the direction of causality remains ambiguous, as these data only highlight associations between firms that pay award rates and their productivity, business competitiveness and viability.

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