

# HOW BIG BUSINESS PERFORMS

PRIVATE PERFORMANCE AND  
PUBLIC POLICY



Foreword by Phillip K. Ruthven

Edited by

PETER DAWKINS, MICHAEL HARRIS and  
STEPHEN KING

# **How Big Business Performs**

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PRIVATE PERFORMANCE AND  
PUBLIC POLICY

ANALYSING THE PROFITS OF AUSTRALIA'S  
LARGEST ENTERPRISES DRAWING ON THE  
UNIQUE DATA OF IBIS BUSINESS INFORMATION

Edited by  
PETER DAWKINS, MICHAEL HARRIS and  
STEPHEN KING

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in association with  
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# Foreword

*Phillip K. Ruthven*

Big businesses, employing over 200 persons or with assets over \$200 million, number less than 3,000 of Australia's over 1.1 million enterprises or just 0.2%. Yet they account for some 62% of the nation's expected revenue of \$1.6 trillion in 1999. This is big business. Further, these enterprises employ around 3.4 million (40%) of the nation's workforce and account for nearly half of Australia's gross domestic product (GDP) of close to \$590 billion in the 1999 calendar year.

Big business is deserving of close analysis in terms of performance and public policy. This book is a landmark study, with high praise due to the Melbourne Institute of Applied Economic and Social Research for its initiative and the book's many contributors. My own firm is delighted to be associated with its production in terms of providing reference data.

Perspective is always useful in an age of increasing specialisation, new and old vested interests, yet in a world that is becoming borderless. While small and medium enterprises are lauded as vital to an economy — which they are in terms of employment (60%) and entrepreneurship — their share of the nation's revenue is less than many would have us believe: small enterprises (<20 employees), 26%; medium enterprises (20-199 employees), 12%.

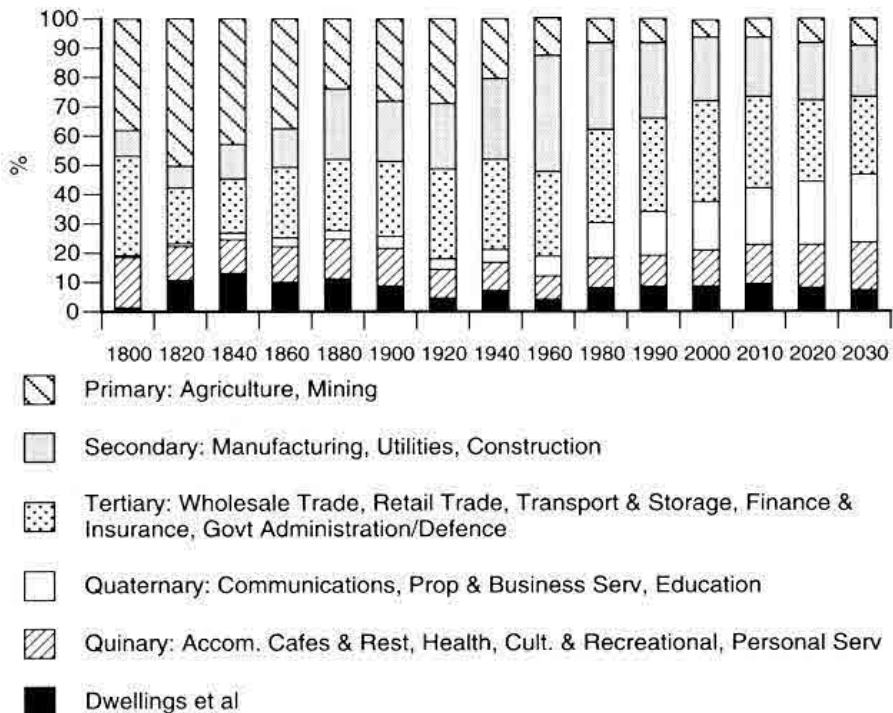
And, surprisingly, big business is no longer synonymous with government which now accounts for just 19% of the nation's revenue of which government business enterprises are under 8% and general government around 11% — both being reduced through continuing privatisation and outsourcing.

Overall, these data and trends tell us that private sector big business is a force to be acknowledged, and a sector to understand better in terms of performance. Even more important is how good performance is achieved; and this book tackles this question with precision and insight.

Mindful of the retreat of government from the production side of the economy, albeit retreating more slowly from the expenditure or consumption side of the economy, Part 3 of this book addresses public policy: governments are not about to abrogate their overarching responsibilities to electorates.

The concept of big businesses is not new of course. In feudal times, regents and the aristocracy at large controlled big endeavours. However, in the Industrial Age, entrepreneurship and meritocracy began to displace plutocracy; and the freemarket marshalling of large amounts of capital gave birth to corporations.

With the advent of yet another new age in the mid 1960s — the post-industrial or infotonics age (of service industries and IT&T) — coupled with the emerging borderless world of trade, information, finance and investment<sup>1</sup> we are seeing radical changes to corporations. These changes include internationalisation, outsourcing, flatter structures, franchising, leasing (rather than ownership) of hard assets and much more. Many of these changes are addressed in this book also.



Source: IBIS November 1998.

Figure 0.1 Industries in Australia Economy (Share of GDP by Broad Sector)

The economic arena in which all enterprises now operate is unrecognisable from that of a century ago. Competition is more fierce and global. Businesses are becoming more conscious of the wider environments in which they operate, taking more of an outside-in approach to planning and strategy compared with the more insular inside-out approach of defence and tactics in the Agrarian and Industrial Ages. As profound is the changing industry mix in modern economies, shown in Figure 0.1 representing Australia's economy from 1800 to 2030 (forecast).

It shows the simple evolution of industries, aggregated into seventeen industry divisions and, in turn, aggregated into five sectors: primary; secondary; tertiary; quaternary (information based); and quinary (personal and household services based).

It is the quaternary and quinary sectors that are in ascendancy — diluting the relative importance of primary and secondary sectors — and creating growth in opportunities for investment, exports and jobs. Indeed, over half of Australia's 8.7 million jobs at the end of 1998 have been created from new service industries since 1965; and these new industries and emerging modern corporations will create over 80% of all new jobs over the next several decades.

Interestingly, the tertiary sector has remained a somewhat constant share of GDP and employment over the past two centuries. This suggests that this cluster of industries — commerce, transport and public administration/defence — is a core infrastructure of any economy at any time.

Over 100 years ago, in the mid 1890s, the biggest 100 enterprises (of which only fourteen remain in 1999!) were predominantly in the tertiary sector; in 1997 this was still the case, but less so. Table 0.1 (below) makes for an interesting comparison. At least the quaternary and quinary sectors now have more than token (if any) players compared with 1894.

**Table 0.1 Largest 100 Enterprises (on Net Assets Basis)**

<i>Industry Sector</i>	<i>1894</i>	<i>1997</i>
Primary	11	6
Secondary	14	33
Tertiary	74	51
Quaternary	1	5
Quinary	0	5
Total	100	100



**Table 0.2 Top 30 Listed Companies by Weighted Return on Equity (%)**

	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>Average</i>
US	10.4	20.5	20.5	23.3	22.3	19.4
UK	10.7	14.4	16.6	18.0	17.4	15.4
Australia	8.3	11.1	12.4	11.4	9.7	10.6

This book, however, concentrates on performance. The authors suggest focus and innovation are two of the vital characteristics if not precursors to sustained high performance. This is timely given Australia's tardiness in the big business group to match results coming out of the US and the UK. Taking just the 30 largest enterprises (on a market capitalisation basis) in the US, UK and Australia over a five year period, the findings are sobering as Table 0.2 (above) reveals.

So what are the US and UK corporations doing differently? My own firm puts focus at the top of the list of reasons; and we could be persuaded to lift 'pursuing intellectual property' (innovation) higher up as the findings of this book does.

1. They are focusing on single industries rather than diversification (conglomeration).
2. They are outsourcing non-core activities and functions.
3. They are jettisoning hard assets from their balance sheets (land, buildings and equipment plus stock and debtors) via securitisation, operating leases, 'just-in-time' inventory systems and factoring.
4. They are pursuing intellectual property, that unique cocktail of systems and skills, with high R&D.
5. They are aggressively globalising their new age service industries, and utilities.
6. They are leading first and managing second.
7. They are alliancing, networking and franchising.

Among the 100 most successful large Australian enterprises (in return on equity terms) over the five-year period 1993 to 1997, 86% were highly focused (predominantly in one only of the 465 classes of industry in the economy) and enjoyed an average return on shareholders'

funds (after tax) of 34.4% over this five-year period. The 100 most diversified big businesses languished with an average return of just 8.6% over the same five-year period!

As suggested earlier, the arena for big business is changing dramatically with terrifying attrition rates as we prepare to enter the 21st Century. Just fourteen of the 100 largest corporations of 1894 are still with us in 1999, the rest being absorbed by predators (or gone broke). In recent decades, one-third of the Top 100 enterprises drop out each decade. Of the 1980 Top 100 list, just 33-34% of the players will remain as parent corporations by the year 2000.

These facts make the reading of this well-researched book compulsory, if not a condition of survival.

## Endnote

1. Note the development of the Multilateral Agreement on Investment and the formation of the World Trade Organisation.

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The Melbourne Institute has now obtained another ARC SPIRT grant, in collaboration with the Australian Taxation Office, the Office of Small Business in the Commonwealth Department of Workplace Relations, and the Productivity Commission, as well as IBIS and the Victorian Department of State Development. This project will further develop our research on big business and extend the research agenda to analysing the performance of small business. Some of the early work in this project has been drawn into this book. Thanks are therefore extended to the new strategic partners as well as IBIS and the Victorian Department of State Development.

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*Peter Dawkins, Michael Harris and Stephen King*

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# Part 1: Introduction

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# 1 Big Business, Private Performance and Public Policy: An Introduction

*Peter Dawkins, Michael Harris and Stephen King*

## 1. Introduction

This book is about Big Business in Australia — how it performs, how it can be improved and how it affects government policy. The studies presented in this book are based on the IBIS Enterprise database, which contains information for medium to large firms in Australia from 1979 to the present. The database currently provides historic information for approximately 6,000 firms including information from their profit and loss statements and balance sheets. This information is augmented for some of the studies from a variety of sources. Together, the studies presented in this book give an unprecedented overview of big business in Australia and provide important insights for both business people and policy makers.

But why should we care? What is so important about big business, particularly in Australia? Many of the key companies whose practice and performance are analysed in this volume are so familiar that we might tend to forget how important they are to our lives and our standard of living. From the moment we rise in the morning, we are likely to be consuming the products of big business. The bread we eat, the clothes we wear, the cars we drive and even the houses we live in are made from the products of big business. Even when we believe that we are consuming 'boutique' products from small, specialised suppliers, the inputs used by these suppliers regularly come from large firms. Many of us work for big business. Often they are our direct employers. In other cases, the firms we work for depend on big business for their survival. Australia's largest businesses are household names such as

BHP, Coles Myer, News Corporation, Telstra, and Woolworths. If you are living in Australia it is almost certain that you have used the goods or services produced by at least one of these five firms in the last 24 hours. Many of us will have used products from all five of these large firms. If not, then we have probably used the products of their competitors, most of who are also among the top 1,000 large Australian firms.

Big business is important because it provides the key products that we use every day. The performance of these firms is critical to our welfare. The failure of a corner milkbar or a small local restaurant might mean hardship and loss to one or two families. A reduction in the performance of a key large firm can lead to hardship and loss for entire communities. It is critical to national welfare to understand how these large firms perform, how this performance can be improved and what types of policies governments need to follow to both enhance big business performance and align the goals and objectives of business with the welfare of Australia.

In this first section of the book, we set the scene. This first chapter provides a brief overview of the Australian economy and considers the role of big business in this economy. The next two chapters then introduce the IBIS database and address the key question of how to measure firm performance. The second section of the book considers the private performance of big business. What are the key factors that lead to better business performance? The studies presented in this section deal with both the 'macro' factors, such as economy wide performance and industry level concentration, as well as 'micro' factors such as individual management practices. The third section of the book looks at government policy. What policies does the government use to align the interests of big business and general Australian welfare? Are these policies adequate or do they lead to ambiguous outcomes?

## 2. A Snapshot of the Australian Economy

The Australian economy, at an aggregate level, looks similar to most other OECD economies, particularly those with relatively large rural and mining sectors like Canada and New Zealand. Manufacturing accounts for approximately 15% of Australia's gross domestic product (GDP) and the service sector for almost 70% of output (Bureau of Industry Economics 1996). Based on a 1990 comparison, Australia has a slightly smaller services sector (as a fraction of total GDP) than France and the United States, but a slightly larger services sector than the rest of the G7 and New Zealand. In contrast, the output share for manufacturing is substantially lower in Australia than in some other G7 countries, in part reflecting the relatively high contribution of the rural and

mining sectors to Australian GDP (Bureau of Industry Economics 1995). These aggregate sectoral comparisons between countries are relatively unchanged over the last 25 years although the shares have altered considerably. All of the G7, Australia and New Zealand have experienced a fall in the share of GDP from manufacturing since 1970 while the sectoral share of services has risen. For example, in 1970, manufacturing accounted for 24.3% of Australia's GDP.

If we focus on the four productive sectors, manufacturing, services, mining and rural, then services account for approximately 74% of total output and 80% of employment but only about 20% of import and export trade. In contrast, manufacturing has an approximately 17% share of output, export and import trade shares of about 50% and 75% respectively, but only 14% of employment. Mining, which accounts for only about 5% of output and 1% of jobs makes up almost 20% of exports, while the rural sector, with only 4% of output and 5% of employment, comprises almost 10% of exports. These figures suggest that the services sector is the driving force behind Australian employment and output, while manufacturing, mining and the rural sectors provide most of Australia's exports.

Of course, these aggregate figures hide more than they reveal. There are well-known measurement problems in calculating the output of the services sector. The contracting out of services, such as accounting and legal services, maintenance and cleaning, will tend to artificially raise the reported size of the service sector. Also, while the direct contribution of the services sector to exports is relatively small, services provide significant inputs to other sectors. In 1989-90, it has been estimated that on average \$100 worth of manufactured outputs required \$52.90 worth of inputs from other Australian sectors, including \$16.70 from services, and also required \$10.50 worth of imported goods.

The figures hide both the importance of individual parts of each sector and the variation within each sector. The largest parts of manufacturing are machinery and equipment (about 25% of total manufacturing by output), food, beverages and tobacco (21%) and metal products (17%). But while one of these sectors can be thriving and growing, other parts of manufacturing can be declining. For example, in 1995, the output of machinery and equipment and of metal products rose by 2.1% and 4.8% respectively, while the output of food, beverages and tobacco fell by 1%. These three manufacturing groups also dominate manufacturing employment. Dao, Ross and Campbell (1995) report that from 1966-67 to 1991-92, the annual average rate of output growth in Australia was 3.5%, with mining (6.3%) transport, storage and communications (5.4%), electricity, gas and water (5.2%) community services (5.1%) and finance (3.9%) all performing above the average.



While services dominate the relatively fast growing sectors, another part of the service sector, construction, grew at a below average rate and consequently, its share of GDP fell.

The degree of structural change within each sector is also hidden by the aggregate figures. The Bureau of Industry Economics (1995) used an index of structural change in manufacturing to conclude that 'structural change *within* Australian manufacturing occurred relatively slowly between 1970 and 1990. The Australian rate of structural change . . . was around 15 per cent below the unweighted average of the G7' (p. 80, *italics in original*). This said, Australia's degree of manufacturing structural change does not differ greatly compared with most G7 countries. Rather, Germany and Italy have had significantly higher structural change in manufacturing than other G7 countries using the Bureau of Industry Economics index.

Finally, the aggregate figures tell us little about the importance and structure of different parts of the manufacturing, services, mining and rural sectors. Of particular interest here, which of these sectors have large firms and who are these large companies?

### 3. Big Business

The Australian Bureau of Statistics Business Operations and Industry Performance 1994-95 (ABS No. 8140.0), provides insight into the relative importance of large and small firms. 'In 1994-95 there were 1,094,064 businesses operating in Australia, employing 7,522,000 persons and producing \$361,000 million worth of goods and services' (p. 1). However, only a small number of these businesses can be classified as 'large'. 'There were over 2,600 operating businesses which employed 200 or more persons or had assets in excess of \$200 million as at June 1995' (p. 3). This small number hides the importance of these large firms. In June 1995 these large firms employed 2,170,000 persons — more than one quarter of all employment — held almost three-quarters of the net worth of all employing and trading businesses and accounted for nearly 50% of industry gross product. 'Very large businesses, i.e. those businesses employing 500 or more persons, produced 40% of the industry gross product of non-farm businesses in 1994-95' (p. 12).

Industry sectors dominated by a small number of firms include mining, electricity, gas and water, retail trade, communications, transport and storage and finance and insurance. In 1993-94, for each of these sectors, the four largest firms had an aggregate output share in excess of 20%. This sectoral balance is reflected in the 'ranking' of firms from the IBIS database. For example, if we look at 1996, in terms of total

revenue, the ten largest firms were BHP, Coles Myer, Telstra, the National Australia Bank (NAB), Woolworths, News Corporation, Australian Mutual Provident Society (AMP), the Australia and New Zealand Banking Group (ANZ), Westpac Bank and the Commonwealth Bank. Of the ten firms, one is in mining, two are retailing companies, one is a telecommunications company, one is an insurance company and four are banks. The remaining firm (News Corporation) is best known for its media interests.

Many of these large companies are also highly profitable. Again, focusing on 1996, the top ten most profitable companies in absolute terms (net profit before tax) included Telstra, NAB, AMP, BHP, ANZ, the Commonwealth Bank and the Westpac Bank. Of the three firms with a top-ten turnover that were not in the top ten on the basis of absolute profit, News Corporation was the eleventh most profitable, while Coles Myer and Woolworths were 27th and 31st respectively.

The top group of large companies is reasonably stable. While the fortunes of individual companies can wax and wane, both the growth and demise of large companies needs to be measured in decades rather than years. For example, if we look at total revenue, BHP was not only the largest firm in 1996 but was the largest firm throughout the 1990s. Even in 1986, BHP was the third largest Australian company in terms of total revenue. Of the top ten revenue earning companies in 1996, all were in the top fourteen revenue earners in 1991 and all remained in the top twelve revenue earners in 1998. Similarly Telstra, NAB, BHP, the Commonwealth Bank, ANZ and the Westpac Bank were all in the top twenty most profitable companies (in terms of net profit before tax) both in 1991 and 1986. This said, profits can be volatile and good performance one year does not guarantee success in the next year. News Corporation, the eleventh ranked firm in absolute profit in 1996 and the 27th ranked in 1986 had a bad year in 1991 and was well down the profitability league table.

The big revenue earning companies tend to be big employers. In 1996, Coles Myer was the largest employer with approximately 135,000 staff. The next largest employers, in order, were Woolworths, Telstra, BHP, NAB, Pacific Dunlop, ANZ, the Commonwealth Bank, TNT and the Westpac Bank. Together, these ten firms accounted for more than 600,000 Australian jobs. The top twenty employers, altogether, accounted for almost 900,000 jobs while the top thirty employers had more than one million jobs. Again, the group of largest employers tends to be stable over time, with nine of the top ten employers in 1996 also being in the top ten employers in 1991 and eight being in the top ten employers in 1986.

While the same firms dominate Australian big business in terms of total revenue, net profit before tax and employment, this does not mean that they are the best performing firms according to other measures. For example, if we consider return on equity, which can be viewed as the relevant measure of performance from a shareholder's perspective, none of the top ten revenue earners for 1996 was in the top ten firms on the basis of return on equity. AMP was highest ranked of the top ten earners but was only 281st in terms of return on equity. Woolworths was next, ranked at 310th, while Telstra was 393rd. This comparison shows the general lesson that 'performance' must be considered carefully. A firm might perform well according to some performance measures but poorly according to others. When considering the performance of big business in Australia, we always need to keep in mind the relevant perspective — performance according to what criteria? Firm performance as seen by a shareholder can be very different to performance viewed from the perspective of an employee or the government.

Large firms are not simply restricted to one or a few sectors. For example, even if we consider only Australian businesses with net profit after tax at least \$150 million in 1998, then these firms are present in

- Building materials manufacturing (Pioneer International)
- Food manufacturing (Foster's Brewing and CC Amatil)
- Machinery and equipment manufacturing (Ford Australia)
- Metals products manufacturing (Alcoa and Comalco)
- Petroleum, chemicals and coal manufacturing (Esso Australia Resources, Orica and Shell Australia)
- Wood and paper manufacturing (Fletcher Challenge)
- Wholesale trade (Kiwifruit NZ, Wesfarmers, NZ Apple and Pear Board)
- Retail trade (Coles Myer, Woolworths and Australian Consolidated Investments)
- Transport and storage (Qantas and Queensland Rail)
- Mining (Rio Tinto, Woodside Petroleum and Santos)

- Electricity, gas and water (SEC Vic, Pacific Power, Electricity Corporation of NZ, Water Corporation of WA, Queensland Transitional Power, Energy Australia, AGL, Melbourne Water and Sydney Water)
- Property and business services (Lend Lease, Brambles, Westfield Trust and General PT)
- Cultural and recreational services (News Corporation, NSW Lotteries, Publishing and Broadcasting, and Golden Casket)
- Communications services (Telstra, Telecom NZ and Australia Post)
- Finance and investment (eleven firms including all four major banks, the Reserve Bank of Australia, and some regional banks)

Health, education, government, construction, personal services, accommodation, agriculture, printing and publishing and textiles and clothing are sectors that did not have at least one firm with net profit after tax of more than \$150m in 1998. However, three of these sectors had large firms that made profits of more than \$100 million — John Fairfax (printing and publishing), the City of Brisbane (government) and Leighton Holdings (construction). Overall, there are few sectors of the Australian economy that are not dominated by the presence of one or a few large, highly profitable firms.

The breadth of productive activities covered by large firms and the difference in their performance raises some important questions. Why have some firms grown to be large and to dominate their sectors of the economy? What key factors aid firm growth? Why is there such a disparity between size and profitability in terms of, say, return on equity? What economic conditions outside the firm's control aid performance and what factors can be influenced by firm management to boost performance? Is being large and successful simply the result of being in the 'right place at the right time' or is business success based on more than this? These are the type of questions that are addressed in the second section of this book on private performance.

## 4. Big Business and Public Policy

The success of big business is intimately connected with the welfare of all Australians. But this does not mean that the interests of big business and the average Australian are always aligned. Significant parts of public policy require governments to judge the implications of big business

behaviour on Australian welfare and then to decide whether to either aid or outlaw that behaviour. For example, when BHP announced the closure of its Newcastle steel works, which would lead to the loss of thousands of jobs, politicians of all political persuasions responded with dismay. Governments pledged millions of dollars to aid Newcastle and some commentators went so far as to claim that BHP should not be allowed to close the steel works. In brief, a business decision by one of Australia's large firms led to political upheaval and changes to public policy.

The intimate connection between government and big business can be easily seen by examining the ownership of business. Of the top twenty Australian companies in terms of net revenue in 1998, three either are owned by the government or were owned by the government until the early 1990s. These are Telstra, the Commonwealth Bank, and Tabcorp. A fourth, the NZ Dairy Board, is a private company but is established under an Act of the New Zealand parliament. Similarly four of the largest employing firms in 1998 are, or until recently had been, government owned — Telstra, the Commonwealth Bank, Australia Post and Qantas. Government ownership (either current or recent) dominates the large firms in some key sectors of the Australian economy such as transport and storage (Qantas, and Queensland Rail), utilities (state electricity and water companies), education (state owned universities), communications (Telstra and Australia Post) and finance (the Reserve Bank and the Commonwealth Bank). Privatisation is clearly a key policy that affects the relationship between government and particular large firms. In some industry sectors, such as utilities, privatisation is likely to be the most important government policy to affect big business in the next decade.

While privatisation and selective responses to decisions made by individual firms such as BHP dramatically highlight the relationship between government and big business, they do not really reflect the type of policies that we are concerned with in this book. The aim of this book is to analyse big business success and failure. To do this we need to consider policies that are aimed at big business generally rather than ad hoc government decisions that relate to specific firms. We can break these general policies into two groups — those that restrain the activities of big business and those that aim to help big business.

Big business often has considerable market power. Individual firms might be tempted to use this power to raise profits even when this is harmful to general welfare. Because of this, the government has merger laws to prevent large firms from joining together to dominate a market, and competitive behaviour laws that prevent firms from abusing market power. These laws are aimed at big business.

For example, as of early 1999, the federal government has a 'four pillars' banking policy that prevents any of the four largest Australian banks from merging with each other. The government also has trade practices laws that limit mergers between large firms if this is likely to lead to a substantial reduction in competition. Some of the mergers, take-overs and joint ventures that are under way as this chapter is being written involve AMP and GIO, Incitec and Orica, HIH Insurance and FAI, Shell Australia and Mobil Oil, and Citipower. All of these firms are among the top five hundred, in terms of net revenue, in Australia for 1998. It is certain that the federal government's main competition watchdog, the Australian Competition and Consumer Commission (ACCC) will be paying close attention to much of this activity.

The ACCC has the job of monitoring potentially anti-competitive behaviour by large firms. Again, as this chapter is being written, there are court cases involving disputes about big business behaviour that involve some of Australia's largest firms such as Woolworths (Safeway) and Boral. The ACCC and other state based regulators also have specific powers that affect the behaviour of large firms such as Telstra and AGL in key industries such as communications and utilities.

The studies in the third part of this book critically evaluate the effects of some of these government policies. Is there really a need for government concern about big business? Are policies, such as merger laws, better able to align the interests of big business and general Australian welfare or do they stop legitimate and potentially desirable big business deals from going ahead?

Government policies can also be aimed at helping big business. This is particularly the case with government policies on innovation, research and development. In the third part of this book we critically evaluate some of these 'helping hand' policies.

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# 2 Measuring the Performance of Australian Businesses

*Ian Gow and Stuart Kells*

## 1. Introduction

Before we can begin to analyse the performance of big business in Australia, we need to answer a fundamental question. How do we measure performance? Unfortunately, there is no simple answer to this question.

Different people in society will have vastly different views about firm performance. A politician, concerned about unemployment levels, may judge performance by the ability of a firm to grow and create new jobs. A consumer may be more interested in the ability of a firm to produce innovative, low-cost products that it sells at a highly competitive price. A union leader may judge firm performance by working conditions and the wages that are paid to the employees. Shareholders in the firm will want to receive a high return on their investment, while individuals who are holding company debt may judge performance by the ability of a firm to repay that debt at minimum risk of default.

Clearly measures of the public and private performance of firms — the two issues investigated in this book — will differ. A firm may perform well from a private perspective by yielding a high return to its shareholders or workers, while performing badly from a social perspective by charging excessively high prices or polluting the environment.

In this chapter we focus on measures of private performance. We consider a variety of different measures that could be used to evaluate firm performance and show how these measures differ. While all of these performance measures fall under the broad rubric of 'profit', as we show below, there are many ways to evaluate the profit performance of a firm.

Two important caveats need to be kept in mind when considering even private performance measures. First, the relevant measure that should be used to judge firm performance will depend on the underlying

activity that is being investigated. For example, when judging merger activity, it is useful to judge performance by a 'forward looking' measure. Share-price-based measures often fulfil this requirement as they include the 'best guess' of the share market about future firm dividends. In contrast, when judging historic effects of the business cycle on firm performance, a historic measure of profitability may be more likely to provide accurate information.

Secondly, while the IBIS database used in the empirical studies in this book provides excellent firm level information, it is not perfect. Sometimes the most desirable measure of firm performance will not be available from either the IBIS database or other sets of data. In such cases, we will need to use a second best measure of performance.

## 2. Profit

Most people would not be surprised to learn that profit is a key variable in economic analysis. Most people *would*, however, be surprised to hear that the way economists think about profits is rather different to the way in which other people think about profits. Economists go so far as to refer to something that is called *economic profit*, as distinct from the *accounting profit* that is reported in company accounts.

Just as economic profit is an alien concept to many people, most economists are unfamiliar with the accounting practices and definitions that underlie accounting profits. Also, the relationship between accounting profit and economic profit has not received a great deal of research attention. In this chapter, the nature of economic and accounting profit are outlined in a non-technical way. The economic limitations of accounting profit are explained, and the relationships between accounting and economic profit are discussed.

### 2.1 The Meaning of Profit

In the standard, idealised situation of economic textbooks, 'perfectly competitive' firms earn zero profits, and their owners are indifferent between continued trading and closure. How can this be? In principle, how can firms earn zero profits and survive; and in practice, why do many firms appear to earn quite large profits?

The first question hinges on the distinction between accounting profits and economic profits. Accountants measure the explicit (cash) costs of doing business, and attempt to impute some indirect costs such as the depreciation of capital equipment. Economists, by contrast, include *all* the costs of staying in business, including the owner's time and effort, and alternative investment opportunities. For example, if the real market



rate of return is 4%, and a firm is making a 4% return on its capital, then it is making positive accounting profits but zero economic profits. Why? Because the firm is doing no better than the market cost of capital: the owner could close up shop, invest the assets of the business in bonds, and do just as well. Moreover, in the perfect competition parable, if the firm earned returns persistently above 4%, other firms would enter the industry, emulate its behaviour, and compete away its profits.

In the far-from-ideal real world, firms not only make positive accounting profits; many firms also make positive, and sometimes quite substantial, economic profits. Millions of investors buy equity in firms, hoping to share in these profits. These profits also exhibit persistence, which raises the question as to why new firms do not enter and compete away these profits.

A first step in reconciling these two conflicting pictures is to acknowledge the widespread existence of monopoly power, arising from institutional barriers to competition ('barriers to entry') as well as product-level 'distortions' such as product differentiation and advertising. To the extent that such distortions exist, the perfect competition, zero profits picture is inappropriate for examining the experience of real firms. Empirical studies of firm performance must therefore spend time constructing and applying appropriate measures of profitability. These measures must tackle the problems inherent in accounting data, as well as the difficulty of measuring important variables.

While many different approaches to measuring profitability have been used, they have all had certain basic concerns and common characteristics. Profit measures attempt to extract economically meaningful information from the data published in firms' accounts or obtained via firm surveys. They will often aim to look 'behind' certain variables to get to the 'true' or 'underlying' performance of firms. Many researchers coming from several different business disciplines — industrial economics, public economics, finance, accounting, tax — have worked to develop economically meaningful measures of profitability. In this chapter we catalogue some of these measures, and develop a technology that will be applied to measure the profitability performance of firms on the IBIS database of Australian firms, and companion databases.

For a discussion of Australian studies of firm profitability, and a survey of international profitability studies, refer to Gow and Kells (1998).

### 3. Accounting Information

The standard set of Australian company accounts consist primarily of three statements. The **profit and loss statement** contains information

on the firm's 'incomings and outgoings' for a given time period (see Table 2.1 below). The **balance sheet** contains information on the underlying wealth, or asset base, of the firm; that is, what it owns and what it owes (see Table 2.2 below). Like the profit and loss statement, the **cash-flow statement** also focuses on incomings and outgoings, but only those that involve actual transactions rather than mere book entries such as depreciation, revaluations and provisions — all of which impact on the profit and loss statement. The cash-flow statement shows the company's actual cash position rather than its accounting profits.<sup>1</sup>

### 3.1 The Profit and Loss Statement

Table 2.1 (below) sets out a basic profit and loss (P&L) statement for an Australian company. The P&L statement includes information on

**Table 2.1 The Profit and Loss Statement**

Sales Revenue	*
Other Revenue	*
Total Revenue	*
[Expenses]	
Earnings before Depreciation, Interest and Tax (EBDIT)	*
Depreciation	*
Earnings before interest and Tax (EBIT)	*
Interest Revenue	*
Interest Expense	*
Net Interest Expense	*
Profit before (Income) Tax (PBT)	*
(Income) Tax	*
Profit after Tax (PAT)	*
Outside Equity Interests in Profit	*
Profit after Tax Attributable to Shareholders	*
(Abnormal Items)	*
(Extraordinary Items)	*

**Table 2.2 The Balance Sheet (or Statement of Assets and Liabilities)**

<b>Assets</b>	<i>Current Assets</i>	
	Cash	*
	Receivables/Trade Debtors	*
	Inventories	*
	Other	*
	Total Current Assets	*
	<i>Non-Current Assets</i>	
	Receivables/Trade Debtors	
	'Investments'	
	Property, Plant and Equipment	
<b>Liabilities</b>	Intangibles	*
	Other	
	Total Non-Current Assets	*
	Total Assets	*
	(Tangible Assets)	*
	<i>Current Liabilities</i>	
	Trade Creditors	*
	Borrowings	
	Provisions	
	Other	
<b>Shareholders' Funds</b>	Total Current Liabilities	*
	<i>Non-Current Liabilities</i>	
	Trade Creditors	*
	Borrowings	
	Provisions	
	Total Non-Current Liabilities	*
	Total Liabilities	*
	Share Capital	
	Reserves	
	Retained Profits	
	Shareholders' Equity Attributable to Shareholders	
	Outside Equity Interests in Controlled Entities	
	Total Shareholders' Equity	*

*Note:* Current and non-current trade creditors are aggregated on the IBIS Enterprise Database.

revenue, expenses and profits. It is concerned with 'flow' variables. In the table, an asterisk indicates that this information appears on the IBIS Enterprise database.

### 3.2 The Balance Sheet

The balance sheet describes the size and composition of a company's assets and liabilities and, hence, unlike the P&L statement, it is concerned with 'stock' variables. Table 2.2 (above) provides an example of a balance sheet. Asterisks are again used to indicate variables that are available from the IBIS Enterprise database.

Total shareholders' equity is definitionally equivalent to net assets (i.e. total assets less total liabilities). 'Tangible assets' is reported in parentheses because, while it appears on the IBIS Enterprise database, it is not a single balance sheet item, but the aggregation of all the (current and non-current) asset items minus the intangible assets line. Intangible assets include patents, brand names, mastheads and goodwill (loosely, the difference between the book value of an acquired business — equal to the market value at the time of purchase — and the book value of the assets of the business).

## 4. Measuring Firms' Profitability Performance

A glance at the P&L statement shows that we can choose to measure profitability as an amount or *level*, in dollar terms. However, this raises the question of which profit line to use; earnings before depreciation, interest and tax (EBDIT), earnings before interest and tax (EBIT), profit before tax (PBT) or profit after tax (PAT).<sup>2</sup> Of these, EBIT (and EBDIT) relates to the entire economic entity, in that it is the return to all holders of claims to the company's profits, except wage and salary earners (recall that EBDIT is calculated by adding depreciation to EBIT).<sup>3</sup>

PBT is subsequent to the satisfaction of the claims of debt holders. PAT is subsequent to the claims of debt holders and to the claims of the income taxing government; in other words, PAT is the return to equity holders (both in the parent company and subsidiaries). Profit after tax after outside equity interests is the return to equity holders in the parent company only. This line gives the amount that may be paid in dividends.<sup>4</sup> The various profit measures may be summarised as shown in Table 2.3 (below).

Given that profit information is available over time, as well as across companies, each of these levels of profits may be summed (with or without discounting) or averaged to derive a 'long-term' or 'dynamic' measure of performance.

**Table 2.3 Various Alternative Accounting Measures of Profit**

<i>Profit Measure</i>	<i>Relevant Holders of Claims</i>
Earnings before Interest and Tax (EBIT)	Shareholders, Debt Holders, Government
Profit before Tax (PBT)	Shareholders, Government
Profit after Tax (PAT) before Outside Equity Interests	Shareholders (of Parent Company and of Partly-Owned Consolidated Subsidiaries)
Profit after Tax after Outside Equity Interests	Shareholders (of Parent Company Only)

### 4.1 Profit: Levels versus Ratios

The obvious problem with using levels of profits to measure performance is that such measures are biased by firm size. A large firm may have positive accounting profits even if it is extremely inefficient and badly run, and it can even have higher profits than might a smaller, more efficient firm. A solution is to express profits as a proportion of some 'size' variable, such as total assets, net assets or revenue; that is, in the form of a *profitability ratio*.

Profit ratios depending on profit after tax (PAT) measure how well the resources of the company have been used to satisfy the claims of shareholders. These ratios include the profit margin and the return on shareholders' funds. The profit margin is defined as PAT divided by sales revenue. PAT, and therefore the profit margin, are affected by changes in tax rates, and are sensitive to changes in interest rates and gearing. Return on equity is defined as PAT over shareholders' funds. This ratio measures the 'earning power' of the shareholders' investment. In Chapter 8, Danny Samson argues the case for using the ratio of PAT to employment when analysing managerial performance.

Ratios that look beyond the interests of shareholders include the earnings before interest and tax (EBIT) margin and EBIT over total assets. The EBIT margin is calculated as earnings before interest and tax divided by sales revenue: this ratio shows *the amount per dollar of sales that is retained by the company*, to be distributed to debt holders as interest, to the government as income tax and to shareholders as net profits. A reduction in costs given sales, or an increase in sales given costs, will increase a firm's EBIT margin. Unlike the profit margin, the EBIT margin is not directly affected by an increase in interest costs or company taxation. EBIT over total assets shows the ability of the company to use its assets to generate earnings. An increase in EBIT over

total assets represents an increase in the 'productivity' of the firm's assets.

It is often useful to 'add back' the depreciation expense to earnings before interest and tax to arrive at a definition of earnings which is less dependent on accounting fictions. Similarly, it is often sensible to add back abnormal and extraordinary expenses to profit after tax so as to derive an 'underlying' after tax profit measure.

## 4.2 How P&L Items Relate to the Balance Sheet

Recall that the P&L relates to flows while the balance sheet is concerned with stocks. By looking at Tables 2.1 and 2.2, we see that certain items on the P&L naturally correspond with items on the balance sheet.<sup>5</sup> These relationships are relevant for the calculation of profitability ratios. It is not very meaningful, for example, to compare profit after tax with total assets, as the former variable relates just to equity holders in the company, while the latter is financed by both equity holders and debt holders. Accordingly, in creating ratios one would normally pair profit after tax with net assets (shareholders' funds), and earnings before interest and tax with, say, total assets. Table 2.4 (below) suggests some meaningful relationships between balance sheet variables and profit and loss variables.

Finally, we might consider calculating ratios using accounting variables and information from other sources, such as market valuations. A common statistic is the ratio of a listed company's market capitalisation (that is, the market value of its ordinary equity shares, calculated as the number of such shares on issue multiplied by the share price) to

**Table 2.4 Corresponding Variables from the Profit and Loss and Balance Sheet**

<i>P&amp;L Variable</i>	<i>Balance Sheet Variable</i>	<i>Reason</i>
EBIT, EBDIT, Revenue	Total Assets	Relates to Whole Company, Including Outside Equity Interests, Debt Holders etc.
PAT, before Outside Equity Interests	Gross Shareholders' Funds	Relates to All Equity Holders, Including Equity Holders in Subsidiaries
PAT, after Outside Equity Interests	Shareholders' Funds Attributable to Members of the Parent Company	Relates Only to Equity Holders in the Parent Company

its net assets, with the resulting figure reflecting the market's valuation of the firm's net assets. We might wish to compare a measure of profits, say EBIT or EBDIT, with the gross value of the firm, calculated as the firm's market capitalisation plus the (book) value of its debt plus the value of any other securities such as preference shares, warrants and convertible notes.

To summarise, Table 2.5 presents some profitability ratios that we might calculate. Some of the measures are readily calculable from the IBIS Enterprise database, while others will require supplementing the database. For example, market capitalisation is not available from the database but is available from the Australian Stock Exchange (ASX). Accurate figures for debt and for hybrid securities are not available from the database, but are reported in public company accounts.

Another solution to the problem of size bias is to calculate the change in profits over time. Again, thought must be given to which profit line is chosen. PAT would be affected by changes in tax rates, while both PBT and PAT would be sensitive to changes in interest rates and gearing.

**Table 2.5 Profitability Ratios**

<i>Ratio</i>	<i>Requisite Variables</i>	<i>Availability</i>
Return on Equity (ROE) (PAT over Shareholders' Funds)	PAT, Shareholders' Funds	IBIS Database
Return on Assets (ROA) (EBIT over Total Assets)	EBIT, Total Assets	IBIS Database
EBIT Margin (EBIT over Revenue)	EBIT, Revenue	IBIS Database
Gross Market Value over Total Assets (Market Cap. of Equity and Hybrids plus Book Debts over Total Assets)	Market Capitalisation of Equity, Market Capitalisation of Preference Shares etc., Book Debts, Total Assets	Market Capitalisation of Ordinary Shares and Hybrids from ASX (Number of Shares and Prefs. on Issue from Annual Reports); Book Debts from Annual Reports or Equivalent Source; Total Assets from IBIS Database.
Market Value of Equity over Shareholders' Funds	Market Capitalisation of Ord. Shares, Shareholders' Funds	Market Cap. from ASX; Share Funds from IBIS Database

## 5. Economic and Accounting Profits

We noted above that accounting measures of profit differ conceptually from economic notions of profit. The chapters in this book will be concerned with analyses of economic profits, but the accounting data they are based on are designed to measure accounting profit. The purpose of this section is to outline the relationship between economic and accounting profits.

While economic profit is theoretically a unitary notion, the diversity of purposes to which it is put means that, in practice, different notions will be used depending on the issues under investigation.

One notion of economic profit (the 'cash-flow' definition<sup>6</sup>) focuses on actual cash-flows as they occur. This can be contrasted with accounting profit, which is arrived at by capitalising certain expenditures on the balance sheet and then amortising or depreciating these capitalised expenditures through the profit and loss statement. An example would be the purchase of plant and equipment. The cash-flow definition of economic profit would record the whole amount as an expense in the current period, whereas accounting profits are derived by capitalising the item and depreciating it over the asset's useful life.

Intangible items such as goodwill, patents and trademarks are also often capitalised on the balance sheet. As these accounting entries affect both profit and the assets of the business, particular care must be taken in calculating the denominators of various profitability ratios.

Bosworth and Kells (1998) have noted that the current accounting profits of a company and, by implication, measures such as the accounting rate of return, are driven by a range of earlier investments. This is in contrast to the ideal economic profit measure, which would attempt to relate future marginal income flows to the particular investments that generated them.

A second meaning of 'economic profit' is *rates of return in excess of the opportunity cost of funds employed in projects of equal risk*. This notion reflects the distinction between normal and supernormal profits. A company can earn positive accounting profits without earning economic profit if it fails to achieve a return on capital appropriate to its risk class.

An economic profit measure reflecting the opportunity cost of funds is calculated by Copeland, Koller and Murrin (1990), who subtract a capital charge (arrived at by multiplying the opportunity cost of capital by the capital employed) from reported profit. This notion of economic profit is essentially equal to what is commonly called economic value added (EVA), a measure of corporate performance that has gained some currency in the corporate arena in recent years.



Krouse (1990) treats economic profit as accounting profit less the opportunity cost of a firm's investments. He shows that the (economic) profits to sales ratio is equal to the following expression:  $(pa - r^*k)/R$ , where  $pa$  is accounting profit,  $r^*$  is an appropriate risk-adjusted rate of return,  $k$  is the opportunity cost of the firm's net investments and  $R$  is the firm's sales revenue. This expression demonstrates that the ratio of accounting profits to sales is 'deficient' as a proxy for economic profit to sales to the extent that it ignores the value of  $r^*(k/R)$ .<sup>7</sup>

In many circumstances, it is relatively easy to transform accounting measures of profit into economic measures of profit. Likewise, it is often possible to use accounting profit as a proxy for economic profit.

Copeland and Weston (1992) show that for an all-equity firm with no taxes, accounting profit can be transformed into the cash-flow measure of economic profit by subtracting from accounting profit the gross value of investment undertaken during the year less the depreciation accumulated during the year.

Copeland, Koller and Murrin detail the calculation of economic profit both in terms of free cash-flow and accounting profit. Rennie (1997) applies this technology to estimate the economic profits of 100 large Australian companies.

Even if direct transformation of economic profit is not possible, Bain (1952) has shown that the ratio of accounting profit to shareholders' funds is highly correlated with the ratio of excess profits to sales, his ideal theoretical measure of economic profitability. The study presented in Chapter 6 exploits this relationship between economic profit and the ratio of accounting profit to shareholders' funds in order to measure the effect of diversification on economic profitability.

A number of research studies have exploited the relationship that exists between (accounting) profitability and a commonly used measure of market power. The Lerner index of monopoly power, the ratio of a firm's price-cost margin to the price faced, has been shown, for constant marginal cost, to proxy the firm's accounting profit to sales ratio.<sup>8</sup> Numerous researchers have used this relationship between profit to sales and market power (supernormal economic profits) to examine the relationship between industry concentration and firm profitability. Chapter 12 utilises this relationship to examine market power in the Australian petroleum industry.

## 6. Making Profit Measures Operational

The aim of this section is to discuss how the above performance measures might be implemented using the IBIS Enterprise database and companion databases.

## **6.1 Some Shortcomings of the IBIS Database**

The IBIS Enterprise database contains variables which correspond to most of the variables on the profit and loss statement as well as the balance sheet. Table 2.1 shows which of the standard P & L items appear on the IBIS Enterprise database. A crude costs item can be derived from the database by taking the difference between revenue and, say, earnings before depreciation, interest and tax. Such a measure includes not only raw materials and intermediate inputs, but also the wages bill. By implication, standard Australian accounts, and hence the database, are not very helpful in breaking out expenses or costs into their various components such as material inputs and the wages bill. As a consequence, unlike firm accounts published in a number of other countries, it is not possible to derive a measure of value added which can be used in the construction of factor productivity or unit cost measures. The comparative strength of the database is in its profit measures.

Table 2.2 shows which balance sheet items are available from the IBIS Enterprise database. There is no neat measure of debt on the IBIS database. It is possible to arrive at a measure of debt plus provisions and other liabilities by subtracting trade creditors from total liabilities. Such a measure, however, is not wholly satisfactory, as the provisions item is potentially a significant and possibly volatile balance sheet category.

Another shortcoming is the absence of a measure of physical capital such as the property, plant and equipment line in Table 2.2. Other authors have noted the potential importance of investment in various forms of physical capital, especially plant and machinery, as a mechanism for the adoption of new technologies produced outside the firm. Given the significance of this variable, it is important to attempt to find some proxy measure. A 'back door' way to arrive at something like this would be to take the tangible assets line (which includes non-physical assets such as cash and short-term securities) and subtract from it current assets. The resulting figure relates to 'non-current tangible assets', which includes not only physical capital, but also 'investments' (shareholdings in other companies etc.) and non-current trade debtors. The last of these is clearly not something we would want in a measure of physical assets, although it is likely to be small relative to the value of physical assets, and neither is it desirable to have investments in such a measure.

Bosworth and Kells (1998) introduce arguments for adding discretionary expenditures like advertising, training and research and development (R & D) to reported profits in order to get a measure of economic profit that acknowledges how the costs of firms' rent-seeking

behaviour are funded from current monopoly profits. Data problems, however, loom large here. The only discretionary investments available from the IBIS database are R&D expenditures and investment in tangible assets. While these can be added to accounting profit<sup>9</sup>, there is still a measurement problem concerning the absence of similar information about expenditures on licences and know-how, human resource development and market promotion of new products. The R&D variable itself is subject to serious measurement problems. The accounting treatment of R&D expenditures differs both across countries and over time as accounting standards and guidelines change. Research and development reporting requirements also differ, with many firms not reporting these expenditures at all. Also, the introduction of tax concessions, as in the case of Australia, may have affected both the accounting interpretation of what can be classified as being R&D, as well as the real level of such activity. Finally, even if a clean measure of R&D were available, relatively few firms report market promotional expenditures, and even fewer disclose outlays on training.

## **6.2 Other Performance Ratios**

In addition to profitability ratios, there exist a plethora of other accounting ratios such as debt service ratios, gearing ratios and stocks (inventory) ratios. Some of these could be readily calculated using the IBIS database, while others would require supplementation of the database from outside sources. Apart from accounting ratios, there are many market valuation ratios which may be looked at. These include dividends per share, earnings per share, dividend yield and earnings yield. These are not calculable using the IBIS database, but in principle are available from the ASX and other sources.

## **6.3 Other Measures of Performance: Productivity and Unit Cost**

As we noted above, it is not possible to construct a value added measure from the IBIS database (nor from ordinary Australian company accounts); neither is it possible to disentangle the relative sizes of the labour input from that of raw materials and intermediate inputs. Also, there is no direct measure of physical assets. Thus, as Bosworth and Kells (1998) note, the IBIS data do not lend themselves to the construction of the various partial productivity (or unit cost) measures. The only indicators that can be derived are sales per employee and sales per unit of tangible assets, where the latter is proxied by tangible assets of over one year to maturity. While these measures are not without interest and can be found from time to time in the literature, they

have severe limitations and should be interpreted with some caution. For example, an increase in (real) sales per employee or (real) sales per unit of 'capital' may be the result of changes in the degree of 'buying-in' raw materials and intermediate inputs.

## 7. Conclusion

In this chapter we have outlined various measures of profit that can be used to evaluate firm performance. These measures are far from perfect. However, careful analysis of these performance measures is the best way to formally analyse the determinants of business success. The following chapters do just this.

## Endnotes

1. For the most part, the profit measures discussed in this chapter do not draw on the cashflow statement and so we will not need to pay it much attention.
2. Note that profit after tax (PAT) is sometimes called net profit after tax (NPAT).
3. Wage and salary earners receive their claims above the profit lines in the accounts; that is, from expenses. If the wage bill were available, we could calculate a measure of value added, that is the sum of all the income generated by the company, by adding the wage bill to EBDIT. While other sources of wage data are available, such as from the ABS, this data is not available at the firm level.
4. In Australia, companies cannot pay out dividends to shareholders except from the profit after tax line; the remaining profits not paid out as dividends appear in the balance sheet as retained profits.
5. For example, positive values on the net profit after tax attributable to shareholders line are (if not paid as dividends) additions to the retained profits line on the balance sheet.
6. Copeland and Weston (1992), p. 24.
7. Krouse (1990), p. 423.
8. Krouse (1990), p. 421.
9. Mueller (1967), Grabowski (1968) and Grabowski and Mueller (1978).

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# 3 What's Happened to Big Business Profits in Australia?

*Simon Feeny and Mark Rogers*

## 1. Introduction

In this chapter we begin to formally analyse the performance of Australian firms. Using three of the profit measures discussed in Chapter 2, we highlight trends in the performance of large Australian business between 1985 and 1996. We consider how performance has varied between companies and over time. Which industries are the strongest performers and which have been the weakest? How have different business sectors — government and non-government, foreign owned and Australian owned, manufacturing and non-manufacturing — performed? How does performance alter over the business cycle and how do Australian companies perform compared with other OECD countries? We also ask whether the same companies are persistently profitable. Were the best performing firms in the mid-1980s also the top performers in the mid-1990s?

Our aim in this chapter is not to provide an in-depth analysis to explain each trend. This job will be carried out in the second section of this book.

## 2. Profitability Measures

We use three measures of profitability in this chapter — the return on assets, the return on equity and the EBDIT margin.<sup>1</sup> Our approach to each of these performance measures follows the discussion in Chapter 2. For convenience, Table 3.1 summarises the three performance measures.

Since profits are earned during the course of an entire year, while equity and assets are stocks at a given point in time, the ratios for the return on equity and the return on assets calculate the denominator as

**Table 3.1 Profitability Ratios Used in this Chapter**

<i>Ratio</i>	<i>Definition</i>
Return on Equity (ROE)	Net Profit after Tax/Average Shareholders Funds
Return on Assets (ROA)	EBDIT/Average Total Assets
EBDIT Margin (EBDITM)	EBDIT/Total Revenue

the average of the beginning and end year value.<sup>2</sup> This is consistent with a number of other studies such as Lewis and Pendrill (1981) and Stekler (1963).

Each of the three profit measures captures a different aspect of firm performance. Return on assets is a measure of profit generated by the total assets employed by the company, regardless of how the assets have been financed. Return on equity measures the rate of return generated by management on the shareholders' investment in the business. The EBDIT margin indicates the amount of profit generated from a dollar of revenue and is often a proxy used for the price-cost margin (PCM).

There are a number of overseas studies that provide 'stylised facts' about these three profit measures.

1. Correlation between different accounting based measures of rates of return are high (Schmalensee 1989, p. 961).
2. Correlation between the EBDIT margin and rates of return are more varied. Measures of the correlation between PCM and the return on assets range from 0.27 (Amato and Wilder 1995) through 0.3 and 0.4 (Liebowitz 1982) to 0.8 (Collins and Preston 1969).
3. The EBDIT margin is less volatile over the business cycle than rates of return (Baldwin 1995, p. 331).
4. In general, differences in firm level profits do not persist indefinitely (Mueller 1990; Schmalensee 1989, p. 971; Scherer and Ross 1990, pp. 442-3).
5. Large firms are more likely than small ones to adopt accounting practices (like accelerated depreciation) that lower current profits and increase rates of return (Schmalensee 1989, p. 965).<sup>3</sup>

We will compare these 'facts' to Australian business as we move through the chapter.

### 3. The Data

Two 'balanced panels' are constructed using the IBIS database.<sup>4</sup> The longer panel covers the period from 1985 to 1996, while the shorter panel covers the period 1990 to 1996. Not all firms provide complete information and a firm is only included if the financial information needed to calculate all the profitability ratios for that firm is available for every year of the panel. This allows us to make a comparison between the profitability ratios for each panel. The long panel consists of 191 firms and the short panel consists of 671.

Table 3.2 provides information on the average size of firm in both the long and short panels. Firms in the long panel are, on average, significantly larger than firms in the short panel in terms of revenue, profit, assets and employment.

Table 3.3 gives an industry breakdown for the firms in the panels. Manufacturing accounts for the most number of firms. In the long

**Table 3.2 Comparison of the Long and Short Panel  
(Means and Medians for 1996)**

<i>Variable (000s \$)</i>		<i>Long Panel</i>	<i>Short Panel</i>
Revenue	Mean	1,659,911	734,526
	Median	579,631	221,565
EBDIT	Mean	173,302	74,232
	Median	42,205	14,667
Assets	Mean	4,885,088	1,890,776
	Median	632,770	205,120
Employment	Mean	6,393	3,011
	Median	1,481	591

**Table 3.3 Industry Breakdown of Panels**

<i>ANZSIC Category</i>	<i>% in Long Panel</i>	<i>% in Short Panel</i>
Mining	10.5	7.2
Manufacturing	42.4	34.1
Wholesale Trade	11.5	19.2
Finance and Insurance	15.7	15.1
Property and Business Services	5.2	5.5
Other	14.7	16.9
Total	100.0	100.0



panel, 42% of firms are in manufacturing as compared to 34% in the short panel. Another difference between the panels is the percentage of wholesale firms, with almost one-fifth of firms in the short panel in wholesale trade.

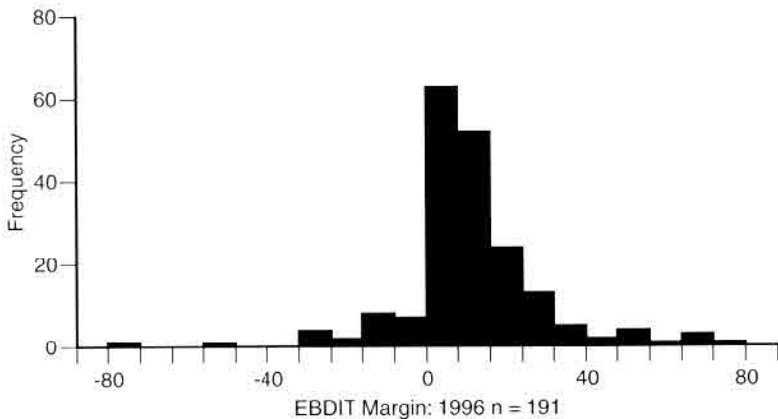
The extensive coverage of the IBIS database is highlighted in Table 3.4. The firms in the short panel account for over a third of Australia's total profit before tax and for over half of the country's total assets.

An important issue that must be confronted before analysing the data further is the presence of 'outliers' (i.e. extreme values) in each of the profitability ratios. For example, Figures 3.1, 3.2 and 3.3 show his-tograms of each of the profitability measures in 1996 for the long panel. All of the distributions show that the majority of the observations are in the 0 to 20% range. However, each of the distributions shows a large variation in firm performance. The most extreme example is Figure 3.3 for the return on equity with values of positive and negative 230%.<sup>5</sup> We

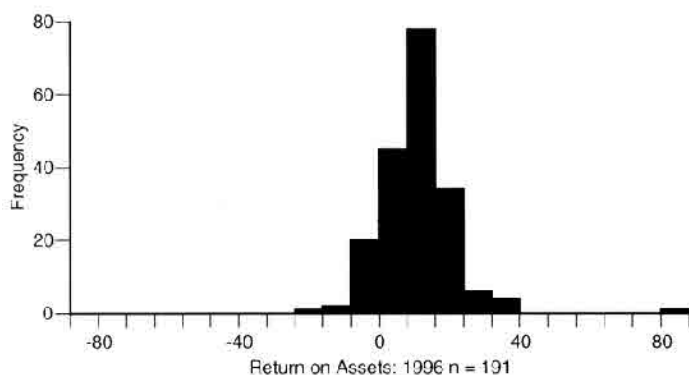
**Table 3.4 Comparison of Short Panel with the Whole of Australia (1996)**

	<i>IBIS (Short Panel)</i> (Millions)	<i>Australia</i> (Millions)
Employment	1.72	8.34
Profit before Tax	\$39,889	\$90,429
Total Assets	\$1,268,711	\$2,042,463

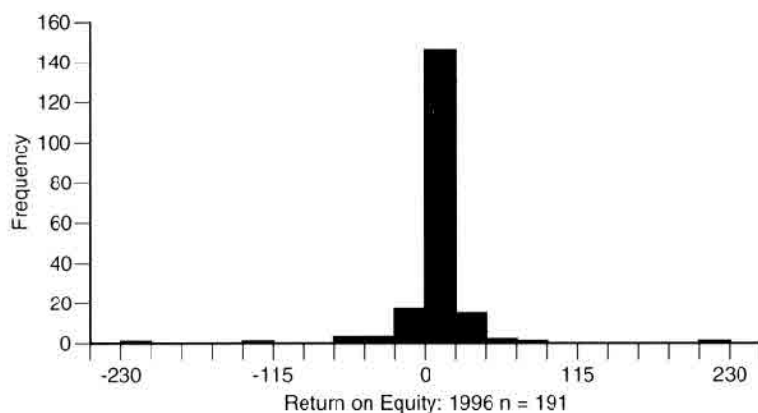
*Source:* ABS (Employment for Australia is an average for the year 1996). ABS 8140.0 (Australian data for 1995-96).



**Figure 3.1 1996 EBDIT Margin (Long Panel)**



**Figure 3.2 1996 Return on Assets Ratio (Long Panel)**



**Figure 3.3 1996 Return on Equity Ratio (Long Panel)**

focus on the median and 'trimmed mean' in this chapter to prevent outliers from biasing our discussion.<sup>6</sup>

## 4. An Overview of Performance

Table 3.5 provides some summary statistics for the profitability ratios from the long panel. Looking at the trimmed mean and median columns, we see that the three ratios follow a similar path through time. The results indicate that the profitability of firms peaked in 1988 and

1994/95 and fell to its lowest level in 1991. The standard deviations of these ratios show that the variability in the return on assets is almost always less than that of either the return on equity or the EBDIT margin. The standard deviations of the return on equity are normally higher than on the EBDIT margin, but in some years the reverse is true. The standard deviations suggest that, at the aggregate level at least, profitability across firms varies substantially.

**Table 3.5 Summary Statistics of Profitability Measures (Long Panel)**

Year	Trimmed Mean (%)			Median (%)			S.D. (%)		
	ROA	ROE	EBDITM	ROA	ROE	EBDITM	ROA	ROE	EBDITM
1985	11.4	11.8	10.6	10.9	11.8	9.8	8.6	10.1	15.3
1986	11.8	11.4	11.4	12.0	11.6	10.0	11.3	23.1	17.4
1987	12.2	11.7	12.4	12.3	11.9	10.2	14.6	26.0	18.2
1988	12.8	13.2	12.8	12.7	12.8	10.4	14.3	13.5	19.5
1989	12.5	13.0	12.6	12.9	12.8	9.6	10.9	16.7	25.9
1990	11.4	9.5	11.8	11.9	10.2	9.5	12.1	23.6	32.7
1991	9.3	5.9	9.3	10.0	8.3	8.6	13.1	34.0	25.4
1992	9.9	6.4	9.6	10.6	7.8	8.6	12.4	30.0	21.2
1993	10.4	8.9	10.5	11.1	9.6	9.0	9.4	20.3	17.0
1994	11.2	12.1	11.0	11.7	11.5	9.8	9.8	21.3	17.2
1995	11.3	12.1	11.4	11.3	11.2	10.0	9.5	38.4	15.7
1996	10.4	10.3	10.6	11.5	9.8	9.1	10.1	29.8	18.1

Notes: the trimmed mean is the mean of the sample when firms below the 5th percentile and above the 95th percentile are omitted.

**Table 3.6 Summary Statistics of Profitability Measures (Short Panel)**

Year	Trimmed Mean (%)			Median (%)			S.D. (%)		
	ROA	ROE	EBDITM	ROA	ROE	EBDITM	ROA	ROE	EBDITM
1990	9.6	7.8	8.9	9.6	8.3	7.3	90.2	94.6	44.9
1991	8.2	4.9	7.0	8.6	6.6	6.5	15.3	84.4	21.3
1992	8.8	5.9	7.5	8.7	7.3	6.4	13.4	44.9	18.9
1993	10.0	9.3	8.9	10.1	9.6	7.7	15.7	114.5	19.5
1994	10.9	13.0	9.7	10.8	11.9	8.4	28.3	145.8	26.3
1995	10.6	12.3	9.7	10.8	11.4	8.5	14.6	33.8	16.0
1996	9.9	10.5	9.5	10.1	10.4	7.9	11.0	46.5	16.2

Table 3.6 (above) shows a similar set of statistics for the short panel. The short panel has significantly more firms — 671 compared to 191 in the long panel. Comparing the common years between Table 3.5 and Table 3.6, we see that the trimmed mean and median for the return on assets and the EBDIT margin are always lower in the short panel. In contrast, the trimmed mean for the return on equity is higher in the short panel from 1993, and the median return on equity is higher from 1994 (although the magnitude of the differences are small).

These differences reflect the different firm characteristics between the long and the short panel. For example, the standard deviations for the short panel are generally higher than the equivalent years in the long panel. As the short panel has more small firms this suggests that smaller firms have greater variation in profitability within a single year. Note that the standard deviation for return on equity is markedly higher than the other two measures, which may be due to a small number of extreme values in the ratio.

Tables 3.7 and 3.8 show the correlation coefficients between the three profitability ratios for each of the panels. Two sets of correlation coefficients are shown in each table. The first set is for the full sample and the second set is for a restricted sample (where all observations above 100% and below -100% are omitted).<sup>7</sup> The long panel results indicate a relatively high correlation between the return on assets and the return on equity (0.61), which is consistent with the 'stylised facts'. The correlation between the return on assets and the EBDIT margin is

**Table 3.7 Correlations between Profitability Measures (Long Panel)**

	<i>Full Sample</i>			<i>Restricted Sample</i>		
	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>
ROA	1			1		
ROE	0.6093	1		0.5439	1	
EBDITM	0.5282	0.3247	1	0.5711	0.2852	1

**Table 3.8 Correlations between Profitability Measures (Short Panel)**

	<i>Full Sample</i>			<i>Restricted Sample</i>		
	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>
ROA	1			1		
ROE	0.104	1		0.6014	1	
EBDITM	0.6968	0.1067	1	0.5816	0.2895	1

lower (0.53), with the lowest correlation being between the return on equity and the EBDIT margin (0.32). Thus for the long panel, the correlations of the EBDIT margin with the rates of return measures are similar to those found by Amato and Wilder (1995) and Liebowitz (1982) for the US. Restricting the sample to exclude extreme values (the right hand block of Table 3.7 above) we see that the correlation co-efficients are similar in magnitude and sign.

Table 3.8 (above) shows the equivalent correlation coefficients for the short panel. The correlation coefficient between the EBDIT margin and the return on assets is higher than in the long panel (0.70), but the two correlations involving the return on equity are substantially lower (around 0.1). After inspecting the data, it appears that the low correlations for the return on equity are due to a number of extreme values in the short panel. The correlations from the restricted sample confirm this, with their magnitudes being strikingly close to those in Table 3.7. These results suggest that the correlation between profitability measures is highest between the EBDIT margin and the return on assets, lower for the return on assets and the return on equity, and is lowest for the return on equity and the EBDIT margin. These results are similar to Collins and Preston (1969) but are not consistent with Liebowitz (1982) who finds much lower correlations.

## 5. Industry, Ownership and Firm Size

What if we look at performance measures by industry and for sub-groups of firms? An industry is taken at the one digit ANZSIC level. The sub-groups we consider are: government versus non-government, foreign versus Australian owned, manufacturing versus non-manufacturing, stock market listed versus non-listed, and large and small. These groups are certainly not the only categorisations of interest, but they provide an initial starting point for investigating enterprise performance.

Table 3.9 (below) relates the top and bottom 25% of firm performers to their industries. The ratios shown are the percentage of firms in the top (bottom) 25% in each ANZSIC category divided by the percentage of firms in each ANZSIC category for the entire sample. If profitability did not vary across ANZSIC categories then all ratios should equal 1. Communications shows strong relative performance of firms in the top 25%, with a ratio exceeding 1 for all measures of profitability. Health and community services on the other hand, has a large relative proportion of firms falling in the bottom 25% of performers, followed by wholesale trade, accommodation, cafes and restaurants. Finance and insurance is also significantly over-represented in terms of

the EBDIT margin and the return on assets for the bottom 25% of firms. Table 3.9 conveys two messages. First, there are important industry differences in profitability. Second, each of the profitability measures can tell a different story about performance.

We now look at the performance differences between sub-groups of firms. The mean values for each enterprise are taken over time for each sub-group (e.g. for the long panel we find the mean value for the return on assets, the return on equity and the EBDIT margin over the eleven years). The various sub-groups for the long panel are shown in Table 3.10 (below) and, for the short panel, in Table 3.11 (below).

**Table 3.9 Top and Bottom Performers by Industry (Short Panel)**

<i>ANZSIC Category</i>	Ratio of Top 25% of Performers to All Performers			Ratio of the Bottom 25% of Performers to All Performers		
	<i>EBDITM</i>	<i>ROE</i>	<i>ROA</i>	<i>EBDITM</i>	<i>ROE</i>	<i>ROA</i>
Agriculture, Forestry and Fishing	0.8	0.8	0.6	0.5	1.7	0.6
Mining	3.0	1.0	1.9	0.4	1.1	0.4
Manufacturing	1.0	1.1	1.4	0.4	0.9	0.3
Electricity, Gas and Water Supply	3.6	0.2	0.6	0.0	1.2	0.2
Construction	0.0	0.6	0.7	1.1	1.3	0.7
Wholesale Trade	0.2	1.1	0.6	1.4	1.2	1.1
Retail Trade	0.4	1.2	1.4	0.7	1.0	0.4
Accommodation, Cafes and Restaurants	2.3	0.0	0.0	1.1	1.2	1.1
Transport and Storage	1.9	0.5	1.1	0.3	0.9	0.4
Communication Services	1.5	1.7	2.1	0.0	0.7	0.0
Finance and Insurance	0.5	0.9	0.1	2.9	0.9	3.3
Property and Business Services	1.7	1.1	1.1	0.5	0.9	0.7
Government Administration and Defence	2.5	0.6	0.4	0.2	2.2	1.1
Education	1.1	0.0	0.0	0.7	3.1	2.0
Health and Community Services	0.8	1.0	0.8	2.1	2.6	2.1
Cultural and Recreational Services	2.0	1.1	1.1	0.5	0.7	0.4
Personal and Other Services	1.0	0.3	1.0	0.8	1.6	1.0

*Notes:* ratio shown is the percentage of firms from industry in Top 25 (Bottom 25) of all performers divided by the percentage of firms from industry in entire sample. Figures are averaged (1990-96).

Both panels show that government owned firms are more profitable than non-government owned firms in terms of the trimmed means. However, the medians of the return on assets and return on equity ratios indicate results to the contrary. For the long panel, the standard deviations indicate that the variation in government owned firms for the return on equity and the return on assets are much higher than for non-government firms, reflecting a wider dispersion in the performance of government firms.

**Table 3.10 Summary Statistics by Sub-Group (Long Panel)**

<i>Company Type</i>	<i>Trimmed Mean (%)</i>			<i>Median (%)</i>			<i>S.D. (%)</i>		
	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>
Government	11.7	17.6	24.9	8.3	9.2	26.5	26.4	64.6	23.8
Non-Government	11.7	10.0	11.6	11.6	10.9	9.6	11.5	25.3	20.9
Foreign Owned	12.4	12.0	10.2	12.4	11.8	8.9	12.1	25.5	23.3
Australian Owned	10.6	10.1	11.6	11.2	10.3	10.2	11.1	25.2	19.4
Manufacturing	14.8	11.8	11.9	14.3	11.4	10.9	7.5	14.6	9.4
Non-Manufacturing	8.5	9.9	10.5	9.0	10.2	7.4	13.4	30.9	26.3
Listed	11.6	10.4	12.1	11.9	10.5	10.3	9.3	24.2	22.0
Non-Listed	10.7	11.3	9.9	10.7	11.2	8.3	13.8	26.4	19.5
> 1000 Employees	11.6	10.7	10.5	11.9	11.2	10.0	10.0	23.4	19.0
< 1000 Employees	11.8	10.9	12.6	10.5	9.9	8.3	14.2	28.7	24.3

**Table 3.11 Summary Statistics by Sub-Group (Short Panel)**

<i>Company Type</i>	<i>Trimmed Mean (%)</i>			<i>Median (%)</i>			<i>S.D. (%)</i>		
	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>	<i>ROA</i>	<i>ROE</i>	<i>EBDITM</i>
Government	11.6	13.5	18.9	6.6	6.1	13.8	26.0	49.0	30.7
Non-Government	10.8	9.1	9.2	9.9	9.3	7.5	37.7	89.5	25.1
Foreign Owned	9.3	9.0	6.5	9.1	9.3	5.9	12.4	124.7	16.6
Australian Owned	10.1	9.1	11.2	10.5	9.3	9.6	51.1	33.7	30.8
Manufacturing	13.4	10.8	10.3	13.0	10.6	9.6	58.2	39.0	26.2
Non-Manufacturing	7.8	8.2	8.0	7.4	8.6	5.5	19.7	107.0	24.5
Listed	11.6	9.2	11.8	11.9	9.9	10.5	20.7	32.0	23.2
Non-Listed	8.7	9.3	7.1	8.3	8.7	5.9	44.2	108.9	26.0
> 1000 Employees	10.5	7.9	9.6	11.0	9.0	8.9	51.9	87.8	29.0
< 1000 Employees	11.1	10.3	8.0	8.7	9.7	6.1	15.3	91.0	20.8

The long panel shows that foreign owned firms are more profitable than Australian owned firms, if measured using the return on assets or the return on equity. In contrast, the short panel shows that Australian firms are always at least as profitable as foreign owned firms, regardless of the profitability measure employed.

Both panels indicate that manufacturing firms are more profitable than non-manufacturing firms for every profitability ratio calculated. Also, in the long panel, the standard deviation of the manufacturing firms is substantially less than non-manufacturing firms. However, this does not hold for the short panel.

Listed firms are found to be more profitable than non-listed firms for the return on assets and the EBDIT margin ratios. When the return on equity ratio is used, non-listed firms are found to be more profitable in the long panel, however, in the short panel the listed firms have a higher median return on equity.

The results from both panels do not provide any evidence to indicate a difference in the profitability of small and large firms. This is in-consistent with the stylised fact which states that large firms are more likely than small firms to adopt accounting practices that lower current profits and increase the rate of return.

In summary there are considerable differences between the long and short panel, and also between the performance measures for sub-groups of firms. This means that it is not possible to make simple broad statements about differences in firm performance. It also means that there is substantial scope for investigating the determinants of profitability at a 'micro' level.

## 6. Firm Performance and the Business Cycle

Figure 3.4 (below) plots the three profitability measures (for the long panel) against the annual percentage change in GDP (income based) over the period 1985 to 1996. We would expect that there would be some correlation between the profitability measures and GDP since one of the components of GDP is company profit. Figure 3.4 shows that all three profitability ratios move, to some extent, with the business cycle. One exception appears to be the GDP downturn from 1985 to 1987 when the three profitability measures rose slightly. The 1990/91 recession is clearly reflected by the downturn of the three profitability measures, with the return on equity showing the strongest downturn.

Figure 3.5 (below) shows the time path of the standard deviation of the three different profitability measures. The standard deviations of the return on assets and the EBDIT margin do not appear to be related



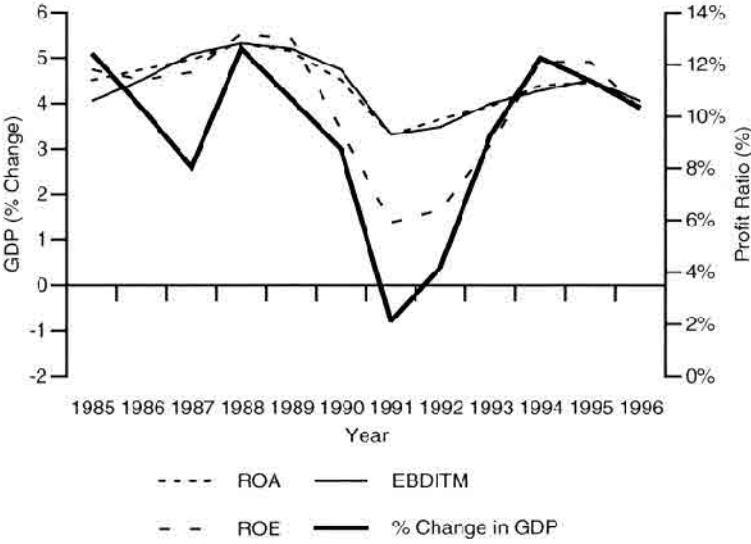


Figure 3.4 Profitability Measures and Annual Percentage Change in GDP (Long Panel)

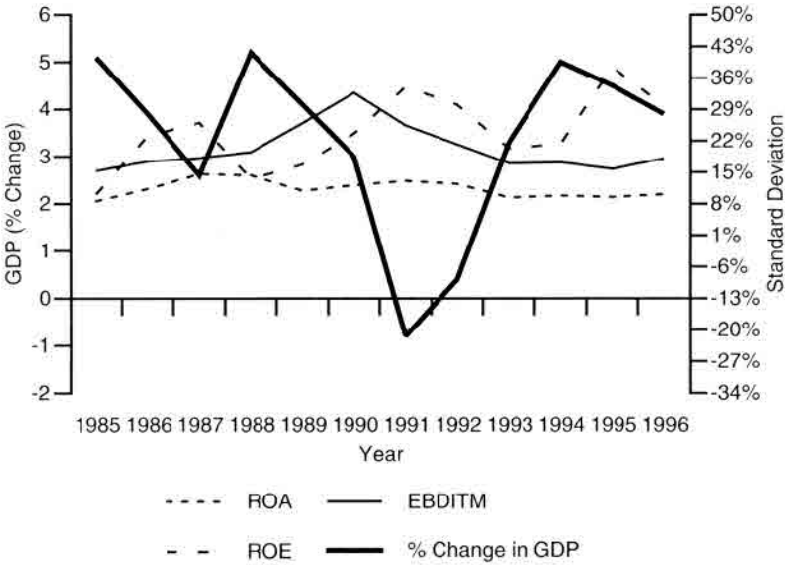


Figure 3.5 The Standard Deviation of Profitability Measures over Time (Long Panel)

to the business cycle. In contrast, the standard deviation for the return on equity exhibits a counter-cyclical relationship.

## 7. Persistence in Firm Profitability

Does firm profitability persist over time? Since the essence of competition is the pursuit of profitable opportunities, a firm with high levels of profitability should — in a simple world — attract competitors, and profits should be bid down to a long run competitive level. But the existence of barriers to entry and other limits on competition may prevent this from happening. In this way, the persistence of a firm's profitability gives us an insight into the competitive nature of the market where that firm operates.

Table 3.12 (below) analyses the persistence of firm profitability by 'tracking' the most profitable firms over time. The table contains a separate section for each of the profitability measures. Starting with the top section, which considers the return on equity, the four rows represent

**Table 3.12 Tracking Cohort of Most Profitable Firms Across Time (Long Panel)**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
ROE											
Top Quartile	1	0.71	0.46	0.42	0.44	0.38	0.38	0.33	0.38	0.33	0.29
2nd Quartile	0	0.21	0.25	0.21	0.21	0.21	0.21	0.25	0.27	0.21	0.27
3rd Quartile	0	0.08	0.17	0.17	0.19	0.12	0.15	0.15	0.15	0.21	0.19
Bottom Quartile	0	0	0.12	0.21	0.17	0.29	0.23	0.23	0.17	0.21	0.23
ROA											
Top Quartile	1	0.75	0.62	0.58	0.56	0.52	0.5	0.48	0.52	0.5	0.52
2nd Quartile	0	0.21	0.25	0.23	0.25	0.25	0.29	0.31	0.23	0.31	0.23
3rd Quartile	0	0.04	0.1	0.08	0.15	0.17	0.15	0.17	0.23	0.15	0.17
Bottom Quartile	0	0	0.02	0.1	0.04	0.06	0.06	0.04	0.02	0.04	0.08
EBDIT Margin											
Top Quartile	1	0.81	0.79	0.77	0.75	0.69	0.75	0.73	0.71	0.69	0.65
2nd Quartile	0	0.15	0.15	0.12	0.17	0.21	0.12	0.15	0.15	0.19	0.17
3rd Quartile	0	0.04	0.04	0.04	0.06	0	0.04	0.04	0.06	0.04	0.1
Bottom Quartile	0	0	0.02	0.06	0.02	0.1	0.08	0.08	0.08	0.08	0.08

quartiles of firm performance. The top quartile represents the firms that were in the top 25% when ranked by the return on equity. The initial column has a 1 in this row, which shows that in 1986 (the year we start tracking the cohort) all the firms were, by definition, in the top quartile. The second column (1987) shows how the top firms in 1986 performed in 1987 — 71% of them were still in the top quartile, 21% were in the second quartile, 7% had fallen to the third quartile and none had fallen to the lowest quartile. After two years, the top 25% of firms has dispersed so that less than 50% of firms who were initially in the top 25% remain. By 1991, nearly 30% of them had fallen into the bottom 25% of the firms in the panel. Looking at the final column, we can see that by 1996, the top performers in 1986 had become fairly evenly spread across the quartiles. Therefore, for the return on equity at least, there is little evidence of persistence after ten years.

The next two sections of Table 3.12 show similar statistics for the return on assets and the EBDIT margin. These profitability measures exhibit a different pattern of persistence. Looking over the entire ten years we can see that the return on assets exhibits stronger persistence than the return on equity, and that the EBDIT margin illustrates stronger

**Table 3.13 Tracking Cohort of Most Profitable Firms Across Time (Short Panel)**

	1991	1992	1993	1994	1995	1996
ROE						
Top Quartile	1	0.62	0.5	0.43	0.35	0.38
2nd Quartile	0	0.23	0.27	0.25	0.31	0.33
3rd Quartile	0	0.09	0.14	0.19	0.19	0.14
Bottom Quartile	0	0.05	0.09	0.12	0.15	0.14
ROA						
Top Quartile	1	0.74	0.65	0.6	0.54	0.58
2nd Quartile	0	0.2	0.26	0.29	0.31	0.3
3rd Quartile	0	0.05	0.06	0.1	0.11	0.11
Bottom Quartile	0	0.02	0.03	0.02	0.04	0.02
EBDIT Margin						
Top Quartile	1	0.82	0.77	0.74	0.72	0.68
2nd Quartile	0	0.11	0.19	0.21	0.22	0.24
3rd Quartile	0	0.04	0.02	0.03	0.02	0.05
Bottom Quartile	0	0.04	0.02	0.02	0.04	0.02

persistence than return on assets. For the EBDIT margin, of firms in the top 25% in 1986, 68% of them were still there in 1996.

Table 3.13 (above) produces a similar set of statistics for the six years available in the short panel. Again, we see a similar pattern of results to those for the long panel, with the return on equity being less persistent than the return on assets, which in turn shows less persistence than the EBDIT margin. These results illustrate that firm profitability exhibits some persistence but that that persistence varies according to the measure of profitability used.

## 8. Comparison with Other Countries

Finally, it is interesting to compare the performance of Australian business with firms in other OECD countries. Table 3.14 (below) shows the rate of return on capital — which is similar to the return on assets performance measure — for the business sector of five OECD countries. The most startling aspect of the figures is the relatively high performance of US companies. The table shows an overall increase in the

**Table 3.14 International Comparisons of the Rate of Return on Capital**

	<i>Rate of Return on Capital in the Business Sector: International Comparisons</i>				
	<i>Australia</i>	<i>Germany</i>	<i>US</i>	<i>UK</i>	<i>Japan</i>
1985	11.01	11.99	21.92	10.17	13.55
1986	10.58	12.49	22.08	9.69	14.02
1987	11.47	12.28	22.11	10.15	13.82
1988	12.58	12.79	22.58	10.15	14.63
1989	13.23	13.07	24.06	9.67	14.94
1990	12.45	13.7	23.8	9.08	14.92
1991	11.91	12.94	23.22	8.87	14.66
1992	12.26	12.77	24.44	10	14
1993	12.48	12.47	25.25	11.37	13.57
1994	13.06	13.33	26.16	12.25	13.08
1995	13.47	13.83	26.61	12.1	12.66
1996	13.92	14.37	27.68	12.61	13.38

*Source:* OECD Economic Outlook. The capital stock estimates which are used to compute the rates of return cover only assets included in non-residential gross fixed capital formation and hence exclude dwellings, inventories, monetary working capital, land and natural resources. The historical capital stock data are obtained from national sources whenever possible.

Australian rate of return from 11% in 1985 to almost 14% in 1996. This rate of return is higher than that of the UK and of Japan, the latter having experienced a declining rate of return since 1989. The Australian rate of return is marginally below that of Germany, but is significantly below the high and rising rate of return for the US, which approaches 28% in 1996.

## 9. Conclusion

In this chapter we have looked at performance trends for big business in Australia from the mid-1980s through to the mid-1990s. While our results are generally consistent with the 'stylised facts' that have been identified in overseas studies, we have shown that there are no simple explanations for differences in profitability that fall out of the data. We can identify important trends — that performance has improved over time, that the manufacturing sector has generally outperformed non-manufacturing firms, that performance generally tracks the business cycle and so on — but these trends raise more questions than they answer. Why is there so much variance in performance? What distinguishes top performers from the 'also-rans'? Why are some top performers able to maintain their market dominance over time while other large firms fall by the way? These are clearly the key issues for private performance that need to be considered and in the next section of this book, we turn our attention to these questions.

## Endnotes

1. There are, of course, a number of well-known problems with using accounting data to calculate economic profit. See the discussion of performance measures in Chapter 2. Further discussion is found in Benston (1985), Edwards et al. (1987), Fisher and McGowan (1983), Krouse (1990) and Schmalensee (1989).
2. For the initial year the denominator is taken as the end value. This may create some additional 'noise' in the ratios, hence, in some of the statistics presented below the initial year of the panel is excluded.
3. This stylised fact relates to the concept of 'political risk', which refers to the potential loss from government interference with the profitable conduct of large firms. It may be in the interest of large firms to adopt accounting practices that actually lower the true level of profits. For certain reasons, profit maximisation may not always be the objective of the firm.
4. A 'balanced panel' here is a dataset for a number of consecutive years for those enterprises for which data is available for each year in question.
5. Note that when calculating return on equity in our analysis in this chapter, we exclude negative observations for averaged shareholders' funds. A negative shareholders' funds implies that net liabilities exceed net assets and therefore

any profit generated by the firm would be paid to debtors before any return is paid to shareholders. In addition, if net profit after tax and shareholders' equity are both negative, a positive rate of return would be calculated which is clearly misleading.

6. The median only looks at the 'middle' observation, while the trimmed mean is the average value after the top and bottom 5% of values are discarded.
7. This is an arbitrary way to restrict the sample, but it does allow an indication of the importance of outliers.

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## Part 2: Big Business: Private Performance



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# 4 The Private Performance of Big Business: An Overview

*Peter Dawkins, Michael Harris and Stephen King*

## 1. Introduction

In Part 1 of the book, we discussed the measurement of the performance of business and the merits of alternative measures of profitability (Chapter 2). In Chapter 3 we provided some descriptive statistics about the performance of big business in Australia, over time and between industries, including some comparisons between public and private sector performance, and comparisons between foreign owned and Australian owned enterprises. In Part 2 of the book we go on to present the findings of our analysis of the causes of variations in profitability of big business in Australia, based upon our research using the IBIS database on large Australian enterprises.

Here, we attempt to provide an overview of the main findings. Subsequent chapters will provide more details and an outline of the way in which the findings were obtained. To provide an overview of the findings, it is useful to distinguish between the following four categories of influences on firm profitability:

- The macroeconomic environment
- The market environment
- Business strategy
- Management principles

Each is discussed in turn.

## 2. The Macroeconomic Environment

We start by investigating the effect of general economic conditions on the performance of individual firms. It is often assumed that firm profitability is pro-cyclical: that is, firm profits decline in a recession and rise in a boom. While that may be true for total profits in the whole economy our research suggests that the story is not so simple when you look at the results for individual enterprises.

In Chapter 5, Ted McDonald shows that, for manufacturing firms, the effect of the business cycle on firm profitability depends upon how concentrated the industry is. In more concentrated industries within manufacturing, i.e. industries occupied by fewer firms, profitability (defined as dollar profits relative to sales revenue) is found to be pro-cyclical. In industries with very low levels of concentration, the opposite is found. That is, firm profitability rises in a recession.

Put another way, it is found that dollar profits rise proportionately faster than sales in concentrated industries and slower than sales in more competitive industries. A possible explanation for this result is that in competitive industries, boom times result in new entrants into the market, adding to sales but competing away profits. By contrast, in highly concentrated industries, the market power of firms enables them to exploit the boom conditions by increasing prices and profits.

Since profitability is defined here as a ratio or proportion — the amount of each dollar of sales that goes to the firm as profit — it should not be concluded from the above result that firms in a competitive market do well in recessions and less well in booms. Most firms will find that life gets tougher in a recession, *but* the proportion of sales revenue that goes to profit will rise as sales fall in a competitive industry.

## 3. The Market Environment

As well as overall macroeconomic conditions, firms will face circumstances specific to their industry. In particular, the market structure, the firm's relative size and the degree of competition it faces from other firms will all be influences on its performance.

In Chapter 5, Ted McDonald reports the finding that when an industry has relatively few firms in it, these firms will tend to be more profitable. Economic theory suggests that firms in concentrated industries are likely to extract greater profits than firms in a highly competitive industry. So this is not a surprising finding and is consistent with results from previous studies in Australia, which have used data at the industry level rather than firm level data we use in our study.

We might also expect that whatever the market structure, if a firm increases its market share, it will increase its market power and thus its profitability. McDonald's results, however suggest that this only applies where the industry is relatively concentrated. In less concentrated industries no such effect is found.

It was also found that import competition affects profit margins. The greater is the proportion of the domestic market supplied by foreign firms, the lower are domestic firms' profit margins. Imports typically represent a form of competition that is not price-responsive to the actions of domestic firms. A large firm that dominates a local industry with little import penetration will be able to exercise a considerable degree of influence over the market price and hence its own profits. If the same firm faces heavy competition from imports, however, it will typically have little or no ability to influence the price of those imports through its own actions and thereby increase its profits.

## 4. Business Strategy

A good way of thinking about business strategy is in terms of finding ways to be ahead of your competitors in the market place that can be converted into profitability. One source of such an advantage is market dominance. We have seen how market dominance aids profitability in our discussion of the market environment above. There can be various causes of market dominance, which have been described by the British economist John Kay (1993), in his book on the *Foundations of Corporate Success*, as 'strategic assets'. These are of three main types. First there is natural monopoly which means that the market cannot readily accommodate more than one firm. Second, in some markets, incumbent firms may have cost advantages that prevent new entrants from coming in. Third, there may be market restrictions in the form of licenses and regulation.

If an enterprise does not possess strategic assets that provide for and protect market dominance, then it needs to be more creative in being ahead of its competitors in the market place. Kay described this as the development and exploitation of 'distinctive capabilities'. He argued that

distinctive capabilities enable companies to produce at lower cost than their competitors or to enhance the value of their products in ways that put them ahead of their rivals. Distinctive capabilities are the product of the organisation itself — its architecture, its reputation, or its success in innovation.

(Kay 1993, p. 113)

The findings of our research are very supportive of this way of thinking about business success. The most profitable enterprises in our analysis tend to be those who are very distinctive in the products they produce and very innovative in the development of such products. By contrast diversified conglomerates who do not have a distinctive reputation for well defined products, and who tend not to be so innovative, tend to be laggards in the profitability stakes.

### **The Importance of Focus**

The authors of Chapter 6 are concerned with testing the hypothesis that firms that concentrate on their core business or 'distinctive capabilities', sometimes referred to as 'sticking to your knitting', out-perform firms that have a greater spread of products or services. Does focus lead to higher profitability than diversification? This hypothesis is based upon a view of business strategy that has been strongly espoused by Phil Ruthven of IBIS, the business information organisation responsible for the database that we have analysed. In a paper by Ruthven (1994), evidence from those firms that appear in the top 100 performing companies ranked by their return on shareholders' funds, tended to suggest that focused firms were more prominent in the top performers than diversified firms.

In our study, the method used allowed us to use the information for 942 firms over the period 1989 to 1994 and to control for firm size and for the level of the firm's gearing, and for the firms' other firm specific characteristics. We also found that more diversified firms were less profitable than more focused firms.

This finding is consistent with a growing international literature on the subject. It appears that focus is good business strategy. That is not to say that focus is all that is needed. It is no good to focus on a bad product! But higher quality products, and better marketing of these products, seems more likely if the firm is able to be strongly focused on its distinctive capability.

### **The Importance of Innovation**

In Chapter 7, Derek Bosworth and Mark Rogers focus on the importance of innovation, with a special emphasis on the effect of research and development and of accumulated 'intangible assets' or 'intellectual property'. Research on this topic is hampered by the fact that intangible assets are probably not measured very well in many companies, and there are also many firms that do not report their R&D expenditure. Nevertheless, the results of the analysis in a reduced sample, suggested

that the market value of a firm is closely linked to the intangible assets of the firm and the current investment in R&D. Further, in explaining the level of R&D in firms, as well as 'technological opportunity', the degree of focus of the firm was also a significant factor. In other words firms whose activities were based in similar industries showed higher R&D intensity.

Thus a consistent picture emerges. Focus and innovation are interrelated and both tend to improve firm profitability.

## 5. Management Principles

So far we have focused on the kind of variables that economists have typically been able to analyse because much of the data required appears in annual reports of companies. However studies seeking to explain variations in firm profitability in terms of the macroeconomic environment, the market environment, the amount of R&D and innovation, and the degree of focus or diversification, can only explain some of the variation of firm profitability.

What else might affect the performance of firms? Many external or intangible factors may be at work, which are hard to measure and analyse. One such factor is luck: firms or entrepreneurs may simply be in the right place at the right time to take advantage of an emerging market or new innovation. To the extent that luck is important we will never be able to fully explain the profitability of firms.

Another important determinant is good management. It is obvious, almost by definition, that good management is a key consideration. The problem for analysts lies in defining and measuring exactly what constitutes 'good management'.

To some extent good management might be captured by our measure of focus, innovation and intangible assets. Higher levels of focus, and more innovation and intangible assets, are likely to be associated with good management. Can we be more specific than this?

In Chapter 8, Danny Samson, one of Australia's leading management researchers, who has made a study of the effect of management principles on firm performance, combined data that he has collected on the extent to which Australian firms exhibit management principles that he has identified as important, from in-depth studies of firms around the world and from a theoretical perspective, with data from the firms on the IBIS database that corresponded with his firms.

The statistical analysis of these data provides support for his hypotheses.

In particular Samson stresses fourteen management principles that contribute to firm performance, which are:

- *Alignment* (good alignment of employee behaviour with stated company values and direction at all levels in the organisation)
- *Distributed Leadership* (individuals and work teams are assigned and accept responsibility for operational decision making and performance improvement)
- *Integration of Effort* (organisation is focused on value creation and process management, not functional need and hierarchies)
- *Out Front* (the business strives to lead the pack in all industry standards and practices)
- *Up Front* (all employees demonstrate integrity and openness in all areas of their work and dealings with others)
- *Resourcing the Medium Term* (business can effectively balance short term operations with medium term development)
- *Time Based* (time is developed as a critical organisational value and the business practices the principles of time based competition)
- *Bias for Action* (all employees demonstrate willingness to embrace and accept change and the organisation excels in implementing new ideas)
- *Learning Focus* (all employees demonstrate willingness to develop skills and knowledge and are involved in a learning/development program)
- *Enabling Disciplines* (organisation invests in policies, procedures and standards and applies a strong systems perspective in everything it does)
- *Measurement/Reporting & Publication* (business measures and reports to all employees, the financial and non-financial performance information needed to drive improvement)
- *Customer Value* (all employees understand the set of order winners and actively strive to enhance customer value creation)
- *Capabilities Creation* (business and organisational capabilities are designed and prioritised and drive critical development investment decisions)
- *Micro to Macro* (all employees know how their particular activities and individual efforts contribute to the big picture of business success)

It is very noticeable that the two features of successful business strategy that we identified above, focus and innovation, come through strongly in these management principles, particularly in '*Capabilities Creation*', '*Resourcing the Medium Term*' and '*Bias for Action*'. They are also reflected in the principles named '*Learning Focus*' and '*Out Front*'. These five management principles between them imply a strong and distinctive focus with an emphasis on innovation and best practice in ensuring that these are truly distinctive capabilities.

A third theme that comes through very strongly from these management principles is the importance of the employees. They need to take responsibility for operational decision making, their behaviour needs to be aligned with company values, they need to demonstrate integrity and openness, and be willing to develop their skills. Further they need to be well informed about corporate performance and to know how their activities fit into the big picture.

The fourth theme that probably needs to be emphasised is that of customer focus. This perhaps almost goes without saying. It is no good being focused or innovative or having excellent employees who are well aligned, motivated and involved in decision making, if there is no customer focus. Indeed the concept of distinctive capabilities, or core business needs to be defined in relation to the market place. It is no good having a distinctive capability or a very innovative product if it does not satisfy customer demands.

## 6. Conclusions

In the chapters in this section of the book we provide evidence on the effect of a large number of variables on the performance. These range from aspects of the macroeconomic environment, aspects of the market environment (such as the firms own market power), to aspects of business strategy, to management principles and practices. While there are found to be important influences at all these levels, two factors that come through very strongly amongst those variables that the firm can influence, are the importance of focus and innovation.

Short of possessing outright monopoly power in the market place, firms need to obtain competitive advantage through developing and capitalising upon distinctive capabilities. Enterprises that appear best able to do this have a strong focus on a particular product or service, or at most a narrow range of products or services. They also display ongoing product and/or process innovation to continually maintain that competitive advantage.



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# 5 Profitability in Australian Manufacturing

*James Ted McDonald*

## 1. Introduction

Chapter 3 highlighted the trends in the performance of Australian business from the early 1980s to the middle of the 1990s. What explains these trends? What determines firm profitability?

In this chapter we will use the IBIS database and other data sources to begin to systematically examine the critical factors that influence firm profitability. In particular, this chapter focuses on the broad determinants of profitability that are 'external' to the firm.

### 1.1 What Determines Profitability?

A vast range of factors will influence firm profitability. Some of these factors are 'internal' to the firm, such as managerial skills, the training and motivation of the workforce, the level of innovation in production techniques, product design and marketing, and perhaps the use of exclusive technology or the development of a product market niche. Other factors are 'external' to the firm, reflecting industry structure and conduct and national economic performance. It is often easier to define, measure and analyse the external factors than the internal factors and they provide a natural starting point to study firm performance. The external factors are also critical to firm success. As a crude analogy, we can think of the internal factors as reflecting how the executives and managers in charge of a firm 'play the game'. The external factors, by contrast, look across industries — they tell you what type of game groups of firms are actually playing!

To see the importance of external factors, consider the following questions:

- Does firm performance improve with market share, and if so, when?
- Does a firm that favours capital over labour in its production process possess a profit advantage?
- Are profits higher for firms in more concentrated industries (industries with relatively few firms)?
- Does greater competition from imports in an industry lead to pressure on the profits of domestic producers?
- What is the impact on firm profits of a greater degree of union representation?
- What is the effect of the business cycle on firm profitability?

In this chapter we answer these questions. Some of the answers — while in general consistent with previous Australian and international studies — are far from obvious and provide important lessons about Australian business.

Clearly there is overlap between the internal and external factors that affect firm performance. For example, market share may increase due to limited market size or the capital-intensive nature of technology. Market share may also rise due to the skill of management at reducing production costs or raising output quality, to the detriment of competitors. Our focus on external effects in this chapter is not meant to suggest that internal factors are unimportant. Rather they are the subjects of extensive analysis in later chapters. Also it is clear that internal factors will influence the empirical results presented below. We do not directly proxy for internal factors in the analysis presented in this chapter. However, any specific qualities or characteristics possessed by individual firms may show up statistically as generic 'firm-specific effects'.<sup>1</sup>

Comparable studies using firm-level data have been undertaken overseas. But until now, Australian investigations have been limited in a number of ways. For example, they have been confined to industry-level data so that they have not captured the effects of potentially important firm-level variables. The IBIS database allows us to undertake a more sophisticated analysis of Australian firms.

## **1.2 Some Results from Previous Studies**

Consistent with the overseas literature, some previous Australian studies have found that profit margins are higher in more concentrated

industries. This is roughly what we would expect from economic theory. The international literature also finds that profit margins are reduced as exposure to international competition increases. No clear link between international competition and profitability, however, has been established in previous Australian studies. Overseas studies have also found that greater market share increases profit margins, and union density decreases them, but these issues have not previously been investigated for Australia.<sup>2</sup>

The relationship between firm profitability and movements in the business cycle is less well established, even overseas. Some evidence suggests that profit margins move with the business cycle for UK and US firms. In other words, profit margins rise in booms and fall in recessions. This issue has not been investigated in Australia, primarily because data on profitability are required over a relatively long time period in order for the business cycle effects on margins to be identified.

The results presented below are generally consistent with previous international research. Concentration and profitability tend to go together for Australian manufacturing firms. Both increased international competition and increased union coverage tend to reduce domestic profitability. However, our results also highlight critical factors that affect firm performance and have not been extensively discussed in overseas studies. For example, we show that the effect of the business cycle on firm profits critically depends on the degree of industry concentration. We also show that the relationship between market share and profitability is not straightforward. Dominating the market can improve profitability — but it also depends on other market features.

## 2. Analysing Profitability

A conceptual framework is needed to analyse the determinants of firm profitability. Much of the previous empirical work on the determinants of profitability in Australia and overseas has been based on versions of an *oligopoly* model outlined in Cowling and Waterson (1976). Oligopoly is the term used to describe a market structure with relatively few firms where each firm can affect the market price through its strategic decisions. There are three reasons to use an oligopoly framework to analyse firm profitability. First, it is realistic for big business. The industries we are studying will not simply involve small firms with little ability to respond to the market environment. In other words, the industries we are analysing are imperfectly competitive, not perfectly competitive. Second, as discussed in Chapter 3, since firms operating in the 'textbook benchmark' of a *perfectly competitive market* can only make

average rates of return, or *zero economic profits*, there is no way a perfectly competitive framework can help in the examination of systematically different profit rates across firms. Finally, oligopoly models are flexible. We can analyse a range of different factors that influence profits using an oligopoly framework.

In the Cowling and Waterson model, firm profitability is measured by the price-cost margin (or PCM) which is the difference between output price per unit and the marginal cost of producing an additional unit of output. Key points to note about this framework and the analysis which follows include:

- i. Price and cost, and thus the PCM, in an oligopoly setting are at least in part determined by a firm's choice of quantity of output. But the *degree* of influence that a firm has on price depends on two key factors — industry concentration (the number of firms in the industry), and the elasticity of demand (the proportional relationship between price changes, and changes in how much is demanded by consumers).
- ii. A profitability ratio is used as a proxy for the PCM. Profitability ratios were discussed in Chapter 3. Two ratios are used for the analysis here, both yielding similar results.
- iii. The results consider how profits alter when a single external factor is changed by itself. This is *not* to say that factors are thought to change in isolation. Rather it is an attempt to identify the general direction of change in performance caused by each separate factor. The fact that some variables are likely to be interdependent and interact with one another causes difficulties in the estimation procedures, which are described later in the chapter, and in more detail in McDonald (1997).

### 3. Results

The analysis of profitability in this chapter has been confined to the manufacturing industry. This makes it easier to assemble all the relevant data and allows direct comparison with other Australian and international studies of manufacturing profitability.<sup>3</sup>

#### 3.1 Industry Level Factors

First, consider some key industry level variables. The analysis shows that **industry concentration is positively associated with profit**

**margins.** That is, when an industry has relatively few firms in it, these firms will tend to be more profitable. This result accords with both economic theory and with the results of previous Australian studies that used industry-level data (Round 1978; Ratnayake 1990).

**Import intensity is found to have a negative effect on margins.** The greater the proportion of the domestic market supplied by foreign firms, the lower are domestic firms' profit margins. This is also not surprising, but it should be noted that imports represent more than just another source of increased competition. Imports typically represent a form of competition that is not price-responsive to the actions of domestic firms. In simple terms, a large firm that dominates a local industry with little import penetration will be able to exercise a considerable degree of influence over the market price and hence its own profits. If the same firm faces heavy competition from imports, however, it will typically have little or no ability to influence the price of those imports. The firm's market power and discretion over prices might be more severely limited by import competition than increased domestic competition.

What is the effect of changes in wages? Real wage growth — change in nominal wages adjusted for inflation — in manufacturing was analysed against profits. The negative relationship between real wage inflation and profit margins reported in Table 5.1 indicates that **real wage growth has a significant and negative impact on margins**, and suggests that increased labour costs are not immediately passed on to consumers through higher prices.<sup>4</sup>

Union density measures the union coverage of the relevant industry. Our results show that **higher union density leads to lower profitability**. Why this is so is open to speculation. The simplest story may be that unions are proving effective at redistributing economic profits from firms to workers in the form of better wages and conditions. However, there are other possibilities. It may be that union density is higher in outmoded workplaces with inefficient work practices and poor management; or that the industries with traditionally high union representation are declining for reasons beyond union or management control, and being replaced by new booming 'high-tech' industries with comparatively low union density.

### **3.2 Firm Level Factors**

Does higher capital intensity lead to higher profits, where capital intensity refers to the share of capital as compared to labour in the firm's output? It can be argued that higher capital intensity can act as an effective barrier to entry. New firms in capital intensive industries will

find it difficult to enter and compete away the profits of incumbent firms, so that incumbent firm profits will be protected in capital intensive industries.

However, the results show no compelling support for this argument. While simple analysis suggests that capital intensity is positively associated with margins, this result appears to be due to simultaneity bias rather than a causal effect.<sup>5</sup>

Does profitability increase with a firm's market share? The results here are surprising. Greater market share appears to impact *negatively* on profit margins, although the coefficient estimate is poorly determined and highly insignificant.<sup>6</sup> Further, there is reason to suspect that market share may interact with other key variables in affecting profits. The statistical investigation of interaction effects found that the impact of market share on margins depends on the degree of concentration in the industries in which the firms operate. Given the coefficient estimates, higher market share results in greater margins in relatively highly concentrated industries. When concentration is relatively low, however, market share is associated with lower profit margins. Thus, **only when firms have relatively few major competitors will increased market share lead to higher profit margins.**

What does this mean? A plausible argument is that increasing market *share* does not translate immediately into an increase in market *power*. A growing firm in a highly competitive market might find that competitive pressures from many other firms prevent it from exploiting any increase in its relative size. On the other hand, a large firm in a market that is shared between a small number of competitors is more likely to find that growth in its market share can be translated into an increase in its ability to manipulate prices to increase profits.

Another firm-specific variable that we can examine is lagged margins. **Is there a connection between this year's profit margin and last year's? The results show that the answer is 'yes'.** There are various possible explanations for this link. Consistent with our study of external factors, firms may gain or lose due to external shocks to profits. Over time, the effect of these external shocks will dissipate and firm profits will return to their normal level. Under this partial adjustment explanation, the coefficient of 0.56 (Column 1.2, Table 5.1) tells us that 44% of the total adjustment in margins from a shock will occur in the first year after the shock.<sup>7</sup>

Alternatively, high profitability today might result in high profitability tomorrow if more profitable firms are tangibly different from other firms. In other words, there might be an internal difference

between profitable and unprofitable firms rather than an industry-wide external profit effect. As we have noted, internal effects are examined in later chapters.

### 3.3 Aggregate Variables

What is the impact of general economic conditions on margins? In particular, are margins cyclical, rising and falling with the boom-bust business cycle? While it is natural to expect overall profits to be sensitive to the cycle, the analysis shows that profit *margins* in fact display no obvious cyclical pattern.

However, when we investigate the interaction of industry concentration with the business cycle we obtain a markedly different conclusion. There is a significant but non-linear relationship between concentration, the business cycle and profit margins, as seen in Column 1.3. The cyclicity of margins depends on the degree of industry concentration. In concentrated industries, margins are procyclical while in less concentrated industries, margins are counter-cyclical. For example, when concentration is 0.10, an increase in the unemployment rate from 7% to 11% increases margins by 1.4 percentage points. When concentration is 0.28, margins are acyclical, while when concentration is 0.60, a similar 4% increase in the unemployment rate reduces margins by 2.3 percentage points.<sup>8</sup>

What might be driving this result? The ratio of dollar profits to sales is being used to proxy for the PCM in our study. The result says that **in boom times, profits rise proportionately faster than sales in concentrated industries, and slower than sales in more competitive industries**. This is plausible since in competitive industries, boom times result in new entrants into the market, adding to sales but competing away profits.

### 3.4 How Robust Are These Results?

Econometric results can be highly sensitive to the data used, the variables chosen, and the model specification employed. As outlined in the next section, and in more detail in McDonald (1997), various estimations were undertaken. Two forms of profit ratio were used as dependent variables, a 'balanced sample' of firms was used to counter possible bias in the full sample of manufacturing firms on the database, and various econometric methods were employed to deal with simultaneity bias and firm-specific effects. The general results outlined above hold throughout, suggesting that we can be confident about their robustness.



## 4. The Data and the Method Used to Investigate Profitability

### 4.1 The Data

As noted in earlier chapters, an important characteristic of the IBIS database is that the number of firms on which data have been collected has increased steadily over the sample period. For firms in manufacturing, financial data on 297 firms are available in 1983, increasing to 566 firms in 1986, 801 firms in 1990, and 981 firms in 1993. The nature of the IBIS data collection has meant that the sample across later years increasingly reflects smaller firms (in terms of total revenue and number of employees). Thus, there is a systematic element to the sample selection across years; in practice, this means that if what affects profitability is noticeably distinct for larger firms compared to smaller ones, then the results generated by the available data will be misleading. In McDonald (1997), this is investigated by constructing a smaller balanced panel consisting of all firms for which financial data are available for *each year* of the period 1984-93, a total of 2480 observations on 248 firms. The results turn out to be sufficiently similar to those reported below that we conclude that they are robust.

### 4.2 How the Key Variables Are Constructed

The true price-cost margin for any firm is unobservable in the IBIS database, but each PCM can be estimated by computing the ratio of profits to sales. In the work reported here, profits net of depreciation and interest payments are used as the dependent variable since this measure is characterised by relatively few missing values in the IBIS database. (Another PCM measure similar to an EBDIT margin is employed in McDonald (1997) as an alternative, and is found to generate similar results.)

There are three main types of explanatory variables relevant to the current analysis: those variables specific to the *firm* (on market share and capital intensity); *industry-level* variables on union density, import intensity, wage inflation and market concentration; and *aggregate* variables that reflect macroeconomic conditions. Neither firm-level variable is directly observable from the data, so proxy measures must be constructed. A proxy for firm-level capital stock is obtained by computing each firm's tangible assets minus current assets, and then capital intensity is calculated as the ratio of the imputed capital stock to the firm's sales.<sup>9</sup> In order to compute market share, it is first necessary to assign to each firm in the database a two-digit manufacturing ASIC<sup>10</sup> code, based on the manufacturing segment with the greatest

contribution to the company's revenue. Market share is then computed as the ratio of each firm's sales to the two-digit industry sales corresponding to the firm's assigned ASIC code.

Industry level data on imports, unionisation, and concentration are also linked to each observation based on the assigned ASIC codes. Import intensity is computed as the ratio of industry imports to the sum of industry imports plus home sales, while industry concentration is the average four-firm industry concentration ratio over the sample period. Two union density variables are also included. First, inter-industry differences in union structure are captured by two-digit industry union density averaged over the sample period. Second, general trends in union structure are captured by data on aggregate union density. Another potentially important determinant of profit margins is the degree of wage inflation, which is based on percentage changes in weekly real earnings data at the two-digit industry level. Finally, aggregate economic conditions — the state of the 'boom and bust' cycle — over the sample period are proxied for by the aggregate unemployment rate.

### **4.3 Empirical Methods**

The primary advantage of the IBIS database is that data on individual firms are available over time, giving rise to a dataset that allows panel data econometric techniques to be used. However, the application of these panel data techniques is problematic in the current context because of the nature of some of the variables included as determinants of profitability. Specifically, simultaneity bias can occur when the explanatory variables include lagged values of the dependent variable (that is, lagged profit) and/or variables that are determined jointly with the dependent variable, profit. McDonald (1997) discusses how this leads to the need for instrumental variables techniques to be used and how the basic model must be expressed as 'first-differences' to eliminate any possible firm-specific effects before instrumental variables can be used.<sup>11</sup>

However, the use of first-differences in the estimation equation brings technical problems of its own. In particular, variables that change little over time (such as industry concentration) are effectively removed from the estimation by the process of taking first-differences; also measurement errors present in some of the series, in particular the computed measure of firm-specific capital stock, will be amplified.

For these reasons, the results presented previously are based on estimation of the profit margins model in both levels and first-differenced form.<sup>12</sup>

## 5. Conclusions

There are many reasons to be interested in the determinants of firm profitability. Profitable firms survive in the short term, and in the longer term they innovate, employ and train labour, pay dividends to shareholders, and in so doing drive the national economy. In this chapter we have considered a variety of external factors that affect firm performance. In particular, we have tested for firm, industry and economy-level factors that drive or inhibit profitability. The results on the determinants of firm profitability presented in this chapter are generally consistent with previous Australian industry-level results and overseas studies, and the main results of the paper are generally robust across a range of alternative specifications. Firm profitability falls with greater union density and with import penetration in the market, but rises with industry concentration. There is a strong degree of persistence in firm profit margins over time. Real wage inflation is negatively related to profit margins, which suggests that firms do not immediately pass on increases in real wages by raising current prices. As found in studies using US and UK data, firm profit margins are sensitive to macroeconomic conditions. The profit margins of firms in concentrated industries are procyclical while the profit margins of firms in relatively unconcentrated industries are counter-cyclical.

What broad lessons can be drawn from this chapter? The results indicate that both industry and macroeconomic variables significantly affect the profitability of individual firms. Firm performance is not simply a reflection of internal management. It also depends on the broader market and economic environment. The lesson for managers is clear — there is little point being a great player if you are in the wrong game. Public policies directed at domestic market structure, international trade barriers, and the labour market will all have direct linkages to firms' profitability and are likely to have implications for firms' subsequent employment, investment and other operational decisions. The results also indicate that not all firms are affected similarly by general economic cycles. Performance over the economic cycle can reflect external industry structure as well as internal managerial competence.

## Appendix

Table 5.1 presents regression results for a number of alternative specifications estimated in levels. Each column of the table gives results from a separate specification. Column 1.1 of Table 5.1 estimates the model using ordinary least squares (OLS) estimation, which implicitly requires that none of the regressors are jointly determined with profit

Table 5.1 Regression Results for the Price-Cost Margin

Regressor	1.5 IV				
	1.1 OLS	1.2 IV	1.3 IV	1.4 IV	Balanced Panel
Market Share	-.0003 (-.019)	-.0045 (-.448)	-.0045 (-.448)	-.0556 (-2.36)	-.0116 (-1.24)
Imports/Sales	-.0145 (-3.71)	-.0144 (-3.55)	-.0147 (-3.63)	-.0153 (-3.48)	-.0145 (-3.35)
Concentration	.0381 (2.87)	.0371 (2.57)	.1966 (3.41)	.1914 (3.33)	.1693 (2.40)
Union Density (Inter-Industry)	-.0491 (-2.27)	-.0485 (-2.33)	-.0494 (-2.37)	-.0526 (-2.22)	-.0238 (-1.18)
Union Density (Aggregate Trend)	.0680 (1.33)	.0698 (1.45)	.0366 (.773)	.0266 (.564)	.0553 (.992)
Capital/Sales	.0043 (2.98)	.0064 (1.21)	.0066 (1.26)	.0020 (.133)	.0140 (2.03)
PCM(-1)	.5627 (47.8)	.5600 (16.2)	.5589 (16.2)	.5646 (14.5)	.5849 (9.53)
Wage Inflation	-.4664 (-7.07)	-.4664 (-6.81)	-.4802 (-7.02)	-.4800 (-6.89)	-.3286 (-4.30)
U.E. Rate	.1082 (1.14)	.1021 (1.04)	.5205 (2.84)	.5225 (2.88)	.4745 (2.11)
U.E.* Concentration			-1.845 (-2.86)	-1.827 (-2.77)	-1.538 (-1.97)
Market Share* Concentration				.1774 (2.56)	
Sample Size	4802	4802	4802	4802	2480
Number of Firms	899	899	899	899	248
Adj-R <sup>2</sup>	.365	.365	.366	.366	.428

Notes: 1. Instrumented variables include Market Share, Capital/Sales and interactions with other variables. Instruments used were current and lagged values of industry-level regressors, values of endogenous variables and the dependent variable lagged one period, industry employment, industry import/export ratio, and industry capital/sales ratio.

2. Heteroskedastic-consistent t-statistics in parentheses.

3. The estimation sample was reduced to 4802 observations after the omission of observations in which PCM, PCM(-1), Cap/Sales or Cap/Sales(-1) could not be determined due to missing values, plus observations of firms for which only a single year of data was available.

4. The validity of the instruments depends on the disturbance term being free of autocorrelation. The null hypothesis of no first or second order autocorrelation could not be rejected by a Box-Ljung Q-test ( $Q = 2.05$  compared with a critical value of  $\chi^2(2.05) = 5.99$ ) for the specification in 1.5.

5. Dummy variables indicating whether the firm is predominantly foreign owned and whether the firm is listed on the ASX are included but their coefficients are insignificant in all cases and so are not reported.

6. Each of the time-varying variables is stationary in levels, based on Dickey-Fuller and augmented Dickey-Fuller tests. In every case, the null hypothesis of stationarity in first-differences is rejected at the 1% level of significance.

margins. Columns 1.2-1.5 allow for the potential endogeneity of market share and capital intensity by using instrumental variables techniques rather than OLS. Column 1.5 is based on the balanced panel of firms in the IBIS database for each year of the sample period, while the other columns are based on the full sample.

## Endnotes

1. Some of these firm-specific effects (firm structure, R&D, merger activity) are examined in later chapters, both for their effects on firm profitability and their impact on the economy more broadly.
2. McDonald (1997) describes these previous studies in more detail.
3. The appendix formally presents the results discussed in this section.
4. However, if nominal manufacturing wage growth is used instead, the results indicate a significant positive relationship between nominal wage inflation and profit margins. It is likely that this is really just a reflection of two things: first, that wage inflation and price inflation are closely related, and second, that price inflation will boost margins.
5. Capital intensity increases margins according to ordinary least squares regression, but as argued in a later section of this chapter, instrumental variables methods should be used. When they are, the capital intensity result disappears.
6. See Table 5.1. Using weighted market share does not change this result, nor does restricting the sample to include only firms with at least 75% of total revenue in the assigned two-digit industry classification.
7. The figure reported in Machin and Van Reenen (1993) indicates a somewhat higher speed of adjustment for UK firms.
8. While the business cycle is initially proxied for by unemployment, similar results are obtained when the business cycle is represented by deviations from trend in real manufacturing production.
9. See the discussion of this issue in Chapter 3.
10. Australian Standard Industrial Classification.
11. See also Keane and Runkle (1992) for further discussion of econometric issues.
12. Since firm-specific effects may be present in the levels specification, additional firm-specific variables are included in the levels estimation to capture these effects. These include dummy variables indicating whether the firm is publicly listed, whether it is at least 50% foreign owned, and whether the firm is primarily a producer-goods or consumer-goods manufacturer.

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# 6 Business Focus and Profitability

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## 1. Introduction

Recent history has seen a number of Australian companies moving into — and sometimes back out of — 'non-core' economic activities. While there are potential public policy ramifications when a company expands beyond its existing industrial 'boundaries' into new areas, the focus of this chapter is on the issues of concern to owners and managers: how diversification of a firm affects that firm's performance.

A key issue in the business strategy literature is the extent to which firms should specialise in particular product areas, or, to put it another way, 'stick to their knitting'. In Australia, for example, Ruthven (1994) (using the IBIS Enterprise database, which forms the basis of this chapter) reports that one of the main determinants of business success is 'focus', and that one of the worst strategies a firm could pursue is to evolve into a large conglomerate. Ruthven presents supporting evidence based upon those firms that appear in the 100 highest performing Australian companies, ranked by their return on shareholders' funds. This view that focus is necessary for business success has recently gained support in the international empirical literature.

The aim of this chapter is to examine empirically the relationship between diversification and firm performance. The chapter uses a sample panel of large Australian firms drawn from the IBIS Enterprise database, covering the period 1989 to 1994. While a simplified analysis provides some evidence that focus pays off, a full econometric analysis shows more rigorously that focused firms have superior profit performance.

## 2. Is Diversification a Good Idea?

To assess the possible benefit of diversification, analysts must move beyond the simplistic perception that 'bigger is better'. Previous chapters have provided evidence that bigger firms may not be more profitable, and the question under consideration here is whether firms that diversify into new lines of business can increase their profitability as well as their turnover.

### 2.1 Why Diversification Might Be a Good Idea

A well-known motivation for diversification involves the realisation of managerial economies of scale. The argument is that good managers are good managers: they are not confined by particular business lines or production technologies, and if the firm's growth is constrained (due to the size of its market or antitrust controls, for example), then the use of the talents of the firm's managers is similarly restricted. Growing 'sideways' enables fuller use of all the abilities of its managers, with the same managers overseeing diverse operations. A related argument is that diversified companies are able to realise economies of scope ('synergies') in production and marketing between the firm's various activities.

Another group of arguments for diversification relates to the exploitation of financial synergies. Imagine two firms with volatile and at least partially independent cash-flows: they can, by merging, reduce the probability of either firm defaulting and so increase the value of both firms (though as we note below, this argument has been shown to be seriously flawed). Tax considerations provide another possible value-increasing strategy whereby merging firms increase gearing by increasing borrowing and using the proceeds to retire equity:

The debt-to-equity ratio of the merged firm can be increased to offset the decrease in the volatility of the merged firm's rate of return. The increased amount of debt implies that the total value of the firm is increased through the merger due to the tax deductibility of interest payments.

(Copeland and Weston 1992, p. 694)

In addition to this ability to exploit latent debt capacity, larger firms might have better access to capital markets, and this may reduce the risk to lenders to diversified firms (Levy and Sarnat 1970, p. 801).

Another argument concerns the relative efficiency of internal (to the firm) and external (from the financial sector) capital markets. Insofar as internal capital markets allow a more efficient allocation of funds



across competing uses (arising from better access to information and the possibility of better control of the outcomes of investments) than external capital markets, then diversification is attractive in as much as it enables greater use of internal funds.

A recent view put forward is that firms diversify in order to build up a portfolio of product areas that matches their competitors' (Scott 1993). The main rationale for this strategy is that it enables companies to reduce the risk and uncertainty in situations of ongoing competition. The work undertaken by Scott (1993) has demonstrated that if two conglomerates are found to both operate one particular line of business, then there is a strong likelihood that the companies will have other lines of business in common. A similar result was shown for their research and development activities. According to Scott, this is part of a strategy of conglomerates to restrict competition both in a static and a dynamic sense.

Diversification may occur for fairly straightforward strategic reasons: managers, having formed a negative view about the expected future profitability of their main business and that business's industry (for example because the firm's market power is being eroded by increasing competition, or certain products are in irreversible decline), might gamble that to diversify into an industry with a more positive outlook will preserve the firm that would otherwise decline (and by doing so preserve the market value of its managers in the employment market).

## **2.2 Why Diversification Might Not Be a Good Idea**

In recent years a number of arguments have been used to disrupt some of the standard justifications for diversification. Some have pointed out that reducing default risk by merging companies with (at least partially) uncorrelated income flows actually works by changing the relative positions of bond and equity holders. Any positive valuation effect is illusory.<sup>1</sup> Lenders to the company are more protected since the stockholders of each firm now have to back the claims of the bondholders of *both* companies.

When evaluating arguments about firms merging to reduce risk, another simple question remains: why should firms merge to reduce the volatility of their returns when shareholders are well placed to do so by diversifying their individual portfolios in the stock market? More controversially, it has been suggested that diversification may destroy value by interfering with shareholders' ability to diversify their portfolios (Levy 1991). A conglomerate forces its shareholders to hold stock in its component businesses in a fixed proportion (equivalent to the

value of the company's equity attributable to each of its businesses) which may not be compatible with shareholders' optimal portfolio decisions. Arguments of this type have been used to justify recent demerger activity, such as the separation of ICI plc into ICI (chemicals) and Zeneca (pharmaceuticals).

Another argument against diversification is that businesses that would optimally fold are able nevertheless, because they are part of a conglomerate, to continue to operate via subsidies from other parts of the conglomerate.

Finally, in opposition to arguments based on managerial economies of scope, it has been suggested that focused companies may realise managerial economies of specialisation, whereby managers develop special expertise in the production and marketing of particular products or services.

### 3. The Empirical Literature

There has been a huge amount of empirical work undertaken in the area of diversification and firm performance. No attempt is made to review the bulk of this literature here: rather, some key recent findings are described in the context of the arguments for and against diversification outlined above. (The reader is referred to Bosworth, Dawkins, Harris and Kells (1997), and the bibliography attached to that, for more detail.)

There has been some empirical evidence that diversification was management-driven rather than financially justifiable: that is, that conglomerate mergers made managers better off but did not increase earnings or market prices. The evidence about conglomerate performance is mixed, with only weak evidence if any to suggest that they do better than less diversified companies.

Taken together, these studies suggest that over recent decades there has been a substantial shift in the view taken of diversification. More sophisticated techniques in financial economics (including arbitrage and option pricing arguments) have shown that previously held ideas about the financial benefits of mergers were misguided. Also, there has been a shift in emphasis from looking at diversification in general to related versus unrelated diversification.

### 4. The Firms We Analyse

The data panel analysed here contains 942 firms in each of the six years between 1989 and 1994 (giving 5,652 observations). Foreign owned firms make up about 39% of the panel, while government owned firms

comprise 16%. Firms that are owned by the Australian private sector make up about 46% of the panel. Of the 942 firms, approximately 28% are listed on the ASX. Manufacturing firms make up the largest one-digit industry group in the panel (approximately 31% of the firms), while the agriculture, forestry, fishing and hunting classification has the smallest number of firms.

#### **4.1 Measuring Diversification**

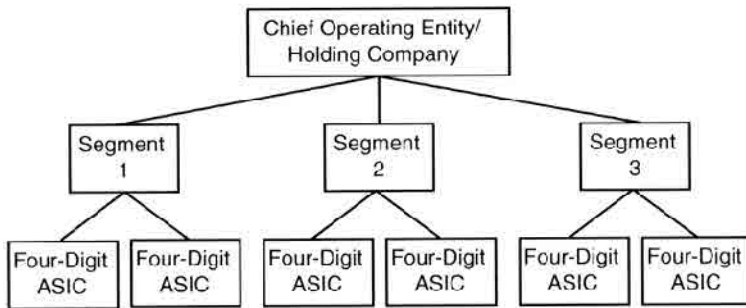
While in theory discussions of diversification all have a single concept in mind, in practice there are several ways to measure diversification. A very simple way to measure diversification is to count the number of industries a firm operates in. A more sophisticated measure might take account of the relative importance of these industries in terms of their contribution to the firm's revenue. It might also be desirable to capture how different the firms' various segments are to each other. Applying a farmyard metaphor to the task of managing a diversified company, the mother hen's job of managing her chicks is all the more difficult if the number of her chicks is high; so too, her job is harder if they are scattered broadly (in product space) rather than gathered closely about her.

The IBIS database permits the construction of four different measures of diversification (here called HERF, INDS, SUBS and REL).

HERF is a firm-wide Herfindahl index based on firms' segment revenues. It is the sum of the squares of the shares of each firm's operating segments' revenues in its total revenue. A firm with one division only will have a firm-wide Herfindahl index of one. A less than perfectly focused firm will have a Herfindahl index with a value less than one (though greater than zero). This measure is sensitive to the relative sizes of a firm's operating segments.

INDS is the number of four-digit ASIC industries in which the firm operates. In arriving at the number of industries, each four-digit industry is counted only once for each firm, so that a firm with several operations in the same four-digit industry is treated equivalently to a firm with only one operation in that industry (*ceteris paribus*).

SUBS is the number of contributing 'industry sub-segments' within the firm, and is similar to INDS. The sole difference between these two measures is that the latter (INDS) treats all the businesses operating in one four-digit industry as if they were only one business, while the former (SUBS) is the sum of all the industry sub-segments regardless of their industry. Accordingly, INDS measures diversification across industries, while SUBS provides a measure of diversification based on both industry spread and the operating structure of the company.



**Figure 6.1 Stylised Company Structure**

The last of the measures, REL, captures how closely related a firm's businesses are. REL is the average of the distances of each contributing business from the firm's main business. These distances take a value of zero if the contributing business is in the same two-digit industry as the main business; one if the business is in a different two-digit industry but the same one-digit industry; and two if the business is in a different one-digit industry. A totally focused firm will have a relatedness index of zero; a highly diversified firm will have a value that approaches two (though never reaches two, as one of the businesses in the average is the main business, necessarily having a distance of zero).

The relationship between the various diversification measures may be understood by reference to Figure 6.1 (above), which presents a stylised company structure. The connecting lines should not be understood as denoting ownership; rather, each lower level is contained within the preceding level. For example, the segments are each divisions of the topmost box in the diagram. The revenue Herfindahl index HERF is calculated using the revenue shares of the segments, represented by segments 1 through 3 in the diagram. INDS and SUBS are calculated at the lowest level in the diagram. REL is derived by comparing the two-digit industry codes of the sub-segments (at the lowest level of the diagram) with the two-digit industry code of the chief operating entity.

## 5. How Does Diversification Affect Performance? A Simple Analysis

In Bosworth et al. (1997), a simple bivariate analysis is performed by dividing the firms under examination into three groups: highly diversified, somewhat diversified, and focused firms. These groups were then

ranked by several performance measures which have been outlined in Chapter 3, as described below.<sup>2</sup> Means, trimmed means (excluding extreme outlying observations) and medians are reported.

In terms of average return on equity (ROE), the intermediate firms performed on average better than the diversified firms, and the focused firms performed better than both the diversified and intermediate firms (this is borne out in both the means and trimmed means). This ranking, however, was not borne out in the medians; the middle firm of intermediate diversification performed better than the middle focused firm, indicating that the average performance of focused firms was higher than that of intermediate firms due, to some extent, to the particularly good performance of a relatively small group of focused firms.

In terms of averages, the ranking of firms based on the EBIT (earnings before interest and tax) margin is the same as that described above with respect to ROE (though the difference between the average performance of intermediate and focused firms is much less striking in terms of margins than it is in terms of ROE). Diversified firms on average performed worst of all, while focused firms achieved the highest average EBIT margin.

In terms of return on assets (ROA) the three groups performed on average about the same. This illustrates the differences we observed between the three different measures of profitability. It is clear from our analysis that the results of research of this kind will be sensitive to the measure of profitability that is adopted. While the correlation between the measures is high, it is by no means perfect.

Also, the different measures of diversification used are associated in a sensible way (though again the association is not absolute). The firms operating in the highest number of four-digit industries (the 'diversified' firms) have the lowest mean Herfindahl index and by far the highest number of four-digit sub-segments. Also, the diversified classification has the highest mean value of the (un)relatedness index.

Finally, the analysis shows (not at all surprisingly) that the most diversified firms are on average the largest, in terms of revenue, net assets and employment. Similarly, the most focused are on average significantly smaller than firms in the other two classifications. This point indicates that tests of diversification can, if incorrectly specified, mistakenly be confounded with tests of the so-called 'small firm effect' (that smaller firms have higher profitability than larger ones). This is why, in the empirical analysis that follows, we include a firm-size variable to control for the effect of firm size on the results.

In general, while these bivariate results cast considerable doubt on the benefits of diversification, they can be described as mixed. We attempt to build a more satisfactory picture of the relationship between

diversification and performance in the multivariate analysis that follows.

## 6. How Does Diversification Affect Performance? A Detailed Analysis

In this section we present the results of the multivariate regression analysis we performed using the panel data set described above. (The details of the regression equation and tables of results are presented in the Appendix. For a discussion of estimation issues concerning the choice between fixed and random effects specifications, see Bosworth et al. 1997.)

In addition to the extent of **diversification** of the firm, profits are also likely to be affected by **company size**; by whether the company is **listed or not**; by whether the firm is **foreign owned** or not; and by its level of **gearing** (here defined as one less the ratio of average net assets to average total assets, rendered into percentages). Of these, only firm size, gearing and the extent of diversification are appropriate for a fixed effects model. There are problems in estimating equation (1) (see Appendix) directly however, as gearing, profits and firm size are all likely to be determined simultaneously. If this were not accounted for, the estimates would suffer from the well-known problem of simultaneity bias. To avoid this, equation (1) was estimated using *instrumental variables*, where the instruments for gearing and firm size, were one period lags of themselves.

The measure of profits employed was the ratio of earnings before interest and tax (EBIT) to revenue ('MARG'). The choice of this measure, in common with a number of other chapters in this book, was motivated by evidence that the ratio of profits to sales is a close proxy to economic profit. The panel used covers the period 1989 to 1994. The first two years of the sample (1989-90) were excluded, as the gearing variable is only defined from 1990 onwards (and its lagged value was required for an instrument). Firm size was proxied by annual revenue (in billions of 1990 Australian dollars, rendered real via the GDP expenditure deflator).

The estimation results using HERF as the diversification variable are presented in Table 6.1 in the Appendix.

The statistical interpretation of the tables in the Appendix shows that the specification with fixed firm and time effects is the preferred one. Although the effects of ownership and stock exchange listing cannot be identified (being time invariant), they are implicitly absorbed into the overall firm effect.<sup>3</sup> This specification has good explanatory power, and 'sensibly' signed coefficients. The positive effect of the

Herfindahl index on profits is significant (at 5%), suggesting that **increased focus does indeed increase profitability**. There also appears to be no significant (firm) size effect. Finally, the level of the firm's gearing is significant, and, as expected, positive,<sup>4</sup> such that reduced gearing is associated with lower profitability.

## 7. Conclusion and Discussion

The aim of this chapter was to examine empirically the relationship between diversification and firm performance. The results indicate that diversification has a negative impact on firm performance (measured by the ratio of profits to sales), controlling for firm size, gearing and whether or not firms are listed and foreign owned. That is, conglomerates are typically larger (in terms of variables like sales and employment) but perform worse in terms of returns.

There is significant scope for further research into the relationship between diversification and performance. Future research might expand the model presented here to consider variables such as industry concentration, import penetration and industrial relations considerations. Future research could also examine specific events that significantly change individual firms' level of diversification or focus, such as take-overs and divestments.

## Appendix

### Analysis

The basic model utilised was of the form:

$$y_{it} = \underline{x}'_{it}\underline{\beta} + v_{it}, \quad v_{it} = \alpha_i + \lambda_t + u_{it} \quad (1)$$

where  $y_{it}$  is a measure of firm  $i$ 's profits in period  $t$ ,  $x_{it}$  is a  $(k \times 1)$  vector of observed characteristics of the firm with unknown weights  $b$ ,  $a_i$  are *firm specific effects*, which allow for heterogeneity across firms,  $l_t$  are *time effects* which allow for heterogeneity over time and  $u_{it}$  the usual white noise disturbance terms. Between them,  $a_i$  and  $l_t$  can account for any variables not included (possibly unobserved) in  $x_{it}$ , which are specific to the firm and time period, respectively. Such a specification is often referred to as *two-factor* model.

### Results

Table 6.2 presents the results of one-factor models, which include individual but no time dummies.

Table 6.3 presents the final model specification using both time and firm dummies.

**Table 6.1 Regression Results:  
Homogeneous Models: Ordinary OLS and Simple IV  
(Dependent Variable is MARG; Double Log Form)**

	<i>Coefficient</i>	<i>t-Statistic</i>
Simple OLS		
Annual Revenue (A\$b)	-0.0434	-1.9585
Gearing	-0.7907	-14.1649
Herfindahl Index	-0.4189	-3.2864
Constant	5.6557	14.7174
Adjusted R <sup>2</sup>	0.095	
N	2027	
Simple IV		
Annual Revenue (A\$b)	-0.0513	-2.2706
Gearing	-0.7238	-12.1384
Herfindahl Index	-0.4313	-3.3740
Constant	5.5014	13.8064
Adjusted R <sup>2</sup>	0.094	
N	2027	

**Table 6.2 Regression Results:  
One Factor Models: Within Estimation and IV Estimation**

	<i>Coefficient</i>	<i>t-Statistic</i>
Within Estimation		
Annual Revenue (A\$b)	0.4756	5.1815
Gearing	-0.1472	-1.3617
Herfindahl Index	0.6174	2.2909
Adjusted R <sup>2</sup>	0.6779	
N	2027	
IV Estimation		
Annual Revenue (A\$b)	0.3836	1.9177
Gearing	0.3435	1.9702
Herfindahl Index	0.6129	2.2524
Adjusted R <sup>2</sup>	0.6732	
N	2027	



**Table 6.3 Regression Results:  
Two Factor Models: Within Estimation and IV Estimation**

	<i>Coefficient</i>	<i>t-Statistic</i>
Within Estimation		
Annual Revenue (A\$b)	0.1548	1.5993
Gearing	-0.0369	-0.3544
Herfindahl Index	0.5954	2.2855
Adjusted R <sup>2</sup>	0.6983	
N	2027	
IV Estimation		
Annual Revenue (A\$b)	-0.2095	0.8477
Gearing	0.5863	3.4745
Herfindahl Index	0.5748	2.1666
Adjusted R <sup>2</sup>	0.6890	
N	2027	
F-Tests (P-Values)		
H1: No Individual or Time Effects	4.1922601e-209	
H2: No Time Effects	8.7710425e-016	
H3: No Individual Effects	1.4996269e-203	

## Endnotes

1. See Copeland and Weston (1992) and Galai and Masulis (1976).
2. The details of the division of all the firms into these three categories is described in Bosworth et al. (1997).
3. Individual effects account for any time invariant omitted characteristics, and the time effects account for any individual invariant time effects. However, jointly they *do not* account for any omitted variables that vary across firms and over time.
4. Recall that the gearing measure employed is the ratio of shareholders' funds to total assets, so that an increase in the gearing variable implies a *reduction* in gearing (i.e. a reduction in the ratio of debt to equity).

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# 7 R&D and Profitability

*Derek Bosworth and Mark Rogers*

## 1. Introduction

Technological change, driven by research and development (R&D) activity, has long been recognised as a fundamental force driving company performance. A stylised view in management and public policy circles is that companies that consistently and successfully innovate will prevail over companies who do not update and improve their products, production methods and management techniques.

This stylised view does find some empirical support in the academic literature. The general finding from studies of the impacts of innovation was that the average private returns to R&D were positive and significant in magnitude (Mairesse and Sassenou 1991; Mairesse and Mohen 1995). The existence of formal R&D within a company not only contributes directly to the development of new products and to the reduction in production costs, but perhaps as importantly, also aids the successful adoption of technologies developed outside of the firm.

Regardless of the apparent benefits from R&D, Australia's track record in industry R&D is poor. Despite the fact that business R&D in Australia grew strongly in the 1980s, by the mid-1990s it was still significantly below the average for OECD countries (Industry Commission 1995a, p. 2). In summary, Australia looks relatively strong in terms of public support for R&D, but relatively weak in business R&D, ranking about seventeenth out of the 24 countries (DIST 1996b, p. 10). This leads to an imbalance between our large effort in basic research and relatively minor undertaking of experimental development.

Information about R&D at the company, as opposed to aggregate, level is much less common. The R&D scoreboard (DIST 1996a) reveals that, as in other countries, the company spending on R&D is highly skewed, with a few companies doing the vast bulk of R&D. The tenth ranked company in 1996 (CSL Limited, in pharmaceuticals)

spent \$26 million, with a level of expenditure just over one-tenth that of the top-ranked company, Telstra.

There are, then, at least two issues worthy of detailed consideration in the context of a study of the performance of large Australian companies:

- (i) what factors determine investment in R&D; and
- (ii) what impact does R&D have on the dynamic performance of Australian companies.

Focus in this chapter will be primarily on the second of these, although there will be some discussion of both. Despite a number of key data issues, which we return to below, the IBIS large firm panel database offers an opportunity to investigate the relationship between R&D, intellectual property and dynamic performance.

## 2. Market Structure and Innovative Activity

A theme that appears throughout this book is that of firm size, market share and market power. Much of the literature on business R&D since the seminal work of Schumpeter has stressed the possible interconnection between *market structure* and *firm innovation* (Kamian and Schwarz 1982). Put simply, Schumpeter argued that while larger firms with greater market power might be associated with greater static welfare losses — the sort analysed in Chapter 10 — they were also (and more importantly) likely to be more innovative and dynamically efficient.

There has been extensive empirical research on how firm size and market structure affect innovative activity and firm performance (see Bosworth and Rogers, 1998, for a brief review). A general summary of such work is that there are no universal relationships between firm size, market power and innovative activity. Individual studies have found significant relationships, but such results do not apply to all industries, countries and time periods. In many ways this is not surprising since there are likely to be complex inter-relationships between these factors that vary across industries, countries and time. This situation also means that it is important to undertake empirical analysis on Australian firms.

## 3. What Drives R&D?

### 3.1 A First Look at R&D in Large Australian Companies

In this section we present an empirical analysis of the R&D expenditure data contained in the IBIS database. As discussed in the previous

section, we are concerned with two basic questions. First, what determines the level of R&D intensity of large Australian firms? Second, how does R&D expenditure affect firm performance? These questions are analysed below. Firstly we provide an overview of the R&D data.

We examine four years of firm data from the IBIS database (for each of the financial years ending in 1991 to 1994). There are only 85 firms that have R&D expenditure in each of these four years. This raises the question of how much coverage of Australian R&D is provided by the database. To check this, Bosworth and Rogers (1998) compare the IBIS R&D data with Australian Bureau of Statistics (ABS) figures for R&D expenditures (see their Table 1), finding that the IBIS database has quite good overall coverage of R&D activity in Australia. Total expenditure on R&D by the 85 firms in the IBIS database included in the four year panel is more than a quarter of the total expenditure on R&D done by around 3000 firms in the ABS figures, and close to 70% of the R&D spending of larger firms (with greater than 1000 employees) in the ABS data. The coverage is particularly good for the mining and manufacturing industries, less so for wholesale, retail, property and service industries.

How has R&D expenditure for these firms changed over time? Empirical evidence from the US suggests that R&D expenditures there are relatively stable: is the same true here? Table 7.1 (below) reports the sample means, medians and standard deviations for the 85 firm sample. There are two sub-sections to the table. The first contains R&D expenditures in thousands of dollars, the second looks at *R&D intensity* (defined as the ratio of R&D expenditure to total revenue). The table alerts

**Table 7.1 Summary R&D Statistics for 85 Firm Sample**

	<i>Year</i>			
	<i>1990-91</i>	<i>1991-92</i>	<i>1992-93</i>	<i>1993-94</i>
R&D Expenditure (\$000s)				
Mean	6213	7245	8884	9034
Median	2042	2110	2000	1879
Standard Deviation	12146	13830	17710	19895
R&D Intensity (%)				
Mean	1.8	2.3	3.0	1.7
Median	0.7	0.7	0.8	0.8
Standard Deviation	3.0	5.0	11.3	2.6

*Note:* R&D intensity is the ratio R&D/total revenue expressed as a percentage.

us to the fact that the distribution of R&D across firms — for both expenditure and intensity — is likely to be skewed, since the mean and median are very different. Furthermore, the dramatic changes in R&D intensity in the last two years of data suggest a high level of volatility.

The firm level data enables further investigation of how R&D expenditures vary *by firm*, over time. Bosworth and Rogers (1998) show that while for some firms their R&D has exhibited considerable volatility, there is no obvious variation in volatility according to size of R&D expenditure. They also examine changes in each firm's R&D intensity: in this case the changes are small for most firms, but for a few firms there are marked differences between the highest and lowest values of R&D intensity.

What is behind the exhibited volatility in R&D? Possible explanations include: the 'lumpiness' of R&D projects; tax and policy changes; data reporting and accounting changes; mergers or acquisitions; and economic and competitive factors. (Note that volatility in R&D intensity can be contributed by fluctuations in revenue — the denominator — as well as in R&D expenditures.) Trying to separate out these factors is not something attempted in the present chapter. However, the volatility of the data suggests that any empirical analysis must consider the potential role of influential observations and outliers.

### **3.2 What Determines R&D Intensity?**

While the focus of this chapter is more on the relationship between R&D and firm performance, we will report results drawn from Bosworth and Rogers (1998) regarding the factors that influence R&D intensities.

The results of our analysis suggest the following. First, there is no significant effect of foreign ownership on R&D intensity. Thus, if low business R&D in Australia is thought to stem from a 'local management culture' which is averse to the riskiness of, or unaware of the benefits of, own-R&D, foreign ownership does not appear to alter that culture in favour of R&D activity.

Second, increased firm size has no significant partial correlation with R&D intensity, suggesting that there is little connection between size and innovative activity. Third, increased diversification reduces R&D intensity, suggesting there is no evidence of R&D synergies across different activities within a firm. These results are robust to various specifications, and generally hold when the analysis is conducted on a sub-set of manufacturing firms.

Moreover, when considering only manufacturing firms, higher industry concentration and greater market share do not result in higher

R&D intensity (the four firm concentration ratio and the share of industry output have no significant statistical relationship with R&D intensity). However, it appears that protecting industries from foreign competition may actually hinder their innovative activity.<sup>1</sup> This may be linked to the proposition, contra Schumpeter, that a greater degree of competitiveness in an industry (as opposed to greater concentration) may foster innovative activity (Harris and Kells 1997). There is also a view that 'openness' of an economy can lead to an increased exposure to new ideas, which may be being reflected in this result (discussed further in Chapter 13).

## 4. How Does R&D Affect the Firm's Performance?

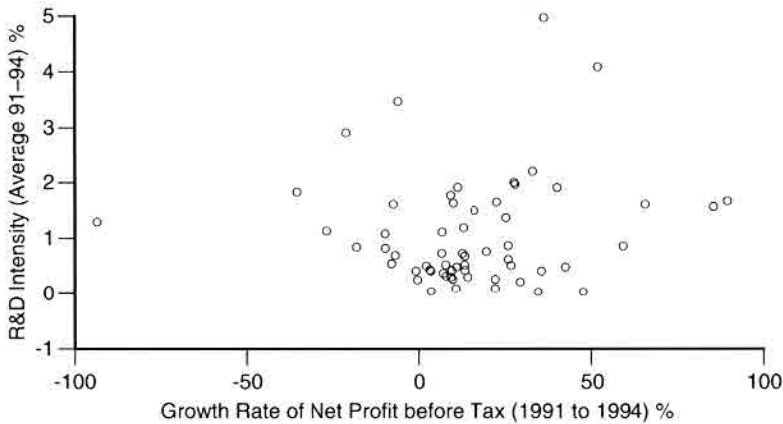
### 4.1 Preliminaries

In this section we analyse how expenditure on R&D is related to firm performance. The method is to examine, using regression analysis, how the *market value* of a given firm is affected by that firm's R&D activity. Market value is a more relevant performance measure in this context than the profitability measures used in other studies in this book, as R&D expenditure is an investment in intangible assets which will pay off as increased profits in the future, rather than now. Market value is, in principle, a forward-looking indicator that reflects the market's view of the discounted future profits (and dividends) that can be attributed to intangible assets, such as those resulting from R&D.

One drawback of using market value is that it is only available for a sub-set of the firms; those listed on the ASX. Given this we have analysed some more basic measures of firm performance such as output growth, employment growth and profitability. In each of these cases graphical analysis suggests a positive relationship with R&D intensity (Bosworth and Rogers 1998). However, in each case there is considerable variation between firms. Figure 7.1 (below) shows a graph of the average growth in profitability against R&D intensity, which although indicating a positive association, also illustrates wide variations (four firms with R&D intensity over 10% are omitted, which have average profit growth between -20% and 21%).

### 4.2 Does R&D Affect Market Value?

To analyse the effect of R&D on firm performance we examine the statistical relationship between a firm's market value and its collection of assets (physical and intangible). The physical assets of a firm include machines, buildings, cash, etc. while the value of its intangible assets



**Figure 7.1 R&D Intensity and the Growth Rate of Net Profit before Tax**

are related to its past investment in R&D, marketing, training, patenting, advertising and other areas. Such intangible assets are normally not well documented in the balance sheet of a firm hence there is a need to use variables such as R&D intensity to proxy for their size. The methodology used in this section is based on work carried out by Hall (1993).

To carry out this analysis, data are required for market value, tangible assets, R&D and other proxies for the stock of intangible assets. The IBIS database provides data on tangible assets, R&D and also, in some cases, for the book value of intangible assets. The market value of the firm was obtained from the ASX and represents the total capitalisation of the firm. Out of the 85 R&D performing firms in our sample, market value was available for 35.

Given the short time period being analysed (four years), and also the observations on the volatility of R&D made earlier, we choose to average the data across the four years of the sample and then enter this directly as an explanatory variable. This means we are using the average R&D expenditure to proxy a firm's R&D capital stock. No doubt this is an unrealistic assumption but it is difficult to avoid given the data limitations.

In addition to R&D intensity we also assess the influence of growth in revenue and the book value of intangible assets on market value.<sup>2</sup> Ideally other variables such as advertising and cash-flow — would be included in the analysis, but no data on these is available.

The results from the regressions are reported in the Appendix. These show that the value of physical capital is significantly correlated



with market value and, as one would expect, a 1% rise in physical assets is associated with a 1% rise in market value (the sign of the association between variables is given by the coefficient in the Appendix table). The results also show that R&D has a positive association with market value, although this relationship is not as significant as the relationship between physical assets and market value. More specifically, the R&D variable is entered in an intensity form (R&D/physical assets) which means that firms with a higher R&D intensity have a higher market value. The other explanatory variables that we use — intangible assets and the growth in revenue — also have positive associations with market value. Overall, these results confirm that there is a relationship between innovative activity — as measured by R&D performance and intangible assets — and firm performance.<sup>3</sup>

It is also important to interpret the economic significance of the relationship between R&D and market value. Since R&D is entered into the regressions at the ratio of R&D to physical assets we need to consider the effect of raising the R&D/physical assets ratio (a measure of R&D intensity). The impact on market value is given by the coefficient on this ratio (see Appendix). Assuming that the physical assets of a firm are constant, the coefficient of 1 suggests that increasing this ratio by 1% would increase market value by 1%. In conducting our analysis we found that the coefficient on R&D/physical assets varied with a value of 1 being the lowest found. Thus, it may be that the impact of R&D on market value is higher than the 1 to 1 relationship suggested above.

Lastly, as discussed earlier, many of the firms exhibit large fluctuations in their level of R&D expenditures. One interesting question that arises is whether firms with volatile R&D intensities have lower market values. To test this, the standard deviation of R&D intensity for each firm over the four year period was calculated. This represents a basic measure of volatility. Entering this variable as an additional explanatory variable in the regressions resulted in an insignificant coefficient. However, this result is driven by the Orbital Engine Company — which experienced by far the highest volatility of R&D intensity. Excluding Orbital from the regression results in a coefficient negative and significantly different from zero (at 12% level): higher volatility in R&D spending appears to reduce market value. In this augmented regression the coefficient on the R&D/physical assets variable also improves in significance to the 5% level (with a magnitude of 2.8).

## 5. Conclusions

The research reported in this chapter had two main aims: first, to investigate the determinants of R&D activity and, second, to explore the

effects of R&D on firm performance. In investigating these issues we found two principal areas of difficulty. The first concerns the scarcity of R&D data, particularly in early years. In practice, we found only 85 firms in the sample with non-zero R&D in all four of the years from 1991 to 1994. However, this problem decreases significantly in the most recent years and we feel that it will be important to revisit this issue in the near future. The second problem arose from the absence of market valuation data and, while we were able to match information from the ASX, this further reduced our effective sample size. Despite these problems, some interesting, if tentative results emerge, particularly (though not exclusively) relating to the role of R&D in firm performance.

In the exploration of the determinants of R&D expenditures, we found considerable variability over the sample period for some firms. While this is not a problem in itself, it was somewhat surprising as experience with other data sets had suggested relatively stable R&D activity (Stoneman and Bosworth 1994). However, dividing R&D by sales suggests a greater stability, with just a few outliers. None of the market structure variables appeared to play a significant role in explaining R&D intensity. However, two factors appeared to show through. First, technological opportunity matters, consistent with Cohen's (1995) conclusions from his review of the literature. Second (although not quite significant at the 10% level), the lack of focus of the company<sup>4</sup> has a deleterious effect on R&D intensity. In other words, firms whose activities were based in similar industries showed higher R&D intensity.

This chapter also investigated the link between innovative activity and firm performance. A positive relationship between R&D intensity and various dimensions of company performance were suggested by a simple graphical analysis. A more detailed analysis looked at the relationship between the market value of the firm and innovative activities. While the relatively small number of observations means that some caution must be exercised in drawing conclusions, nevertheless an interesting picture begins to merge. The results suggest that R&D matters: that is, market value is closely linked to the intangible assets of the firm and the current investment in R&D. A baseline result suggested that raising current R&D intensity by 1% is associated with a rise in market value of 1%. We did, however, find evidence that the influence of R&D on market value might be much larger than this. (This is an area for further work, which will be possible as the IBIS database is updated and expanded.) These results confirm why many firms spend considerable energy and resources in undertaking R&D and other innovative activities: R&D improves performance and this is reflected in share market prices.

Lastly, we also found some evidence that higher year-on-year volatility in R&D expenditures was associated with a low market value. If such a result is true it implies that firms need to view R&D as a core activity and should not, for example, reduce R&D expenditures in times of low cash-flows. This type of result is in agreement with the view that innovation is central to the performance of firms and that it should receive continuous attention and support from within the firm.

## Appendix

**Table 7.2 Regression Results for Log of  
Average Market Capitalisation over 1991 to 1994**

<i>Explanatory Variable</i> <i>n = 35</i>	<i>R5</i>	<i>R6</i>	<i>R7</i>
Constant	0.2250 (0.241)	0.1638 (0.176)	-0.2250 (-0.257)
Log (Physical Assets)	1.0167** (14.991)	1.0185** (15.204)	1.0397** (16.416)
R&D/Physical Assets	1.6014 (1.208)	1.6994 (1.320)	0.9978 (1.588)
Growth in Revenue		0.9996 (0.990)	1.4819* (1.692)
Intangible Assets/Physical Assets			0.4217** (11.555)
R <sup>2</sup>	0.84	0.84	0.89

*Notes:* All variables are averages over the 1991 to 1994 period. The t-statistics reported in brackets are calculated using White's robust method.

\* significant at 10% level \*\* significant at 5% level.

**Table 7.3 Summary Statistics for Market Value Regressions**

<i>Variable</i> <i>Average 1991-1994, n = 35</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Min</i>	<i>Max</i>
Log (Market Capitalisation in 000's)	12.83	2.13	8.35	17.00
Log (Physical Capital in 000's)	12.32	1.99	8.89	16.79
R&D/Physical Capital	0.0516	0.1217	0.0003	0.6887
Growth in Revenue	0.0345	0.1204	-0.1421	0.5148
Intangibles/Physical Capital	0.3507	1.0792	0	6.3926
Physical Assets (in 000's)	1408172	3509285	7240.25	1.96E+07
R&D Expenditure (in 000's)	12370	20736	113.5	95450
Intangible Assets (in 000's)	117678	278988	0	1343125

**Table 7.4 Summary Statistics for R&D Cross-Sectional Regressions**

<i>Variable</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Min</i>	<i>Max</i>
n = 80				
R&D Intensity	0.02	0.03	0.00	0.20
Foreign	0.44	0.50	0	1
Average No. of Subsidiaries	7.18	6.82	0.75	38.75
Log (Revenue in 000's)	12.71	1.37	10.31	16.61
n = 61				
R&D Intensity	0.01	0.02	0.00	0.13
Effective Rate of Protection	14.55	9.78	-0.67	44.67
Four-Firm Concentration Ratio	0.29	0.11	0.16	0.53
Firm Revenue/Industry Revenue	0.15	0.15	0.00	0.81
Firm Revenue/Industry Revenue	0.49	0.50	0	1
Average No. of Subsidiaries	7.24	6.37	0.75	38.75
Log (Revenue in 000's)	12.61	1.27	10.31	16.61

Notes: All variables are averaged over the 1991 to 1994 period, except for the number of subsidiaries (which for some firms is for only three years), foreign (which is for the single year 1994) and the effective rate of protection (which is averaged over the 1991 to 1993 period since the Industry Commission (1995b) report has no 1994 data).

## Endnotes

1. The coefficient on the effective rate of protection does appear to have a negative and significant partial correlation with R&D intensity.
2. Intangible assets will include the accountant's valuation of patents, trademarks and other intellectual property. The exact composition of the book value of intangibles will vary from firm to firm so it is difficult to check this directly. A major component of intangible assets is likely to be a valuation for goodwill, however, capitalised past R&D, patent, trademark and licence valuations may also be included.
3. The analyses were checked for the influence of extreme observations; that is, firms that were particularly influential in the data may have been driving the results. Omitting these firms from the analysis did not change the basic results.
4. As represented by the number of ANZSIC codes the firm has subsidiaries in.

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# 8 Management Principles and Profitability

*Danny Samson*

## 1. Introduction

What impact does management have on the productivity and profitability of firms? In this chapter we articulate a set of management characteristics that are common to the world's best companies and test their relationship with business performance using the IBIS Enterprise database.

Despite concerted efforts to turn many of our organisations around during the last decade or so, firms report that their performance and relative competitiveness today is little better, and often considerably worse than before these efforts began. Despite efforts to become responsive and customer focused, many companies report continued loss of business to other competitors and new entrants. Despite efforts to develop a committed and satisfied workforce, employee opinion surveys consistently show that employee morale is lower today than at any time in the past.

The number of books appearing almost daily, exhorting managers to follow a formula, recipe or adopt a certain approach, seems to be already large, and is increasing exponentially. Most of these books provide shopping lists of initiatives — such as strategic scorecards, reengineering, self managed teams or total quality management (Deming 1986) — which are too often presented as if *'this'* approach will be the saviour of the corporate world as we know it. Unfortunately, it is just not that simple (Kotter 1996). Even as firms are restructuring, revitalising, re-engineering and reskilling, these are only tactics. What is nearly always missing is a strategic and holistic view and approach of long-term, sustainable and systemic management fundamentals that is implementable and that increases shareholder value<sup>1</sup>.

The work reported in this chapter is based on closely observing the key differences between the best companies in the world and the many which are mediocre, distilling the common and the distinguishing features of the best and then gaining an understanding about what the best are trying to achieve in their future development. We will not focus on any particular type of initiative. Rather, we incorporate various advances in management knowledge and focus on the deeper issues that need to be put right first, before such initiatives are introduced. In our worldwide reviews of excellent companies and their management activities, we found no company that was doing everything in a 'best' manner, but a few which were well along the way. These 'best' companies could demonstrate a clear link between managerial action and customer satisfaction, business growth, environmental management, safety performance, unit cost, employee satisfaction and shareholder value. In a program of research undertaken over the last few years, we have studied and visited companies like Asea Brown Boveri, British Airways, Boeing, BHP, Chase Manhattan Bank, Du Pont, Ericsson, Hoechst, Honda, Kellogg, Kodak, General Electric, Intel, MBNA, Medco, Motorola, National Australia Bank, NUMMI, Procter and Gamble, Shell, Siemens, South West Airlines, State Farm Insurance, Taco Bell, WalMart and Xerox. We believe that it is both possible and very useful to develop a view of what 'best practice' looks like in order to plan progress towards that state.

## 2. Management by Principles

Most companies have spent the past two decades managing their businesses by applying interventions to them as if they were a series of fads. Virtually all of these initiatives have had very mixed success rates, usually with more failed implementation attempts than successes. This is the case with re-engineering, restructuring mission and vision statements, teams, leadership initiatives, total quality management, quality circles and a host of others.

It is noteworthy that the high failure rate of implementation has occurred despite the fact that many of these initiatives are compelling in concept. For example, total quality management usually involves the central ideas of:

- Getting it right the first time (zero defects, focus on error prevention not rework).
- An acute focus on satisfying customer requirements.

- Continuous improvement of all business processes.
- Employee involvement in achieving the above.

These four central planks of total quality management are compelling in the sense that they are hard to argue against in concept. Yet when companies try to implement this collection of ideas, more fail than succeed! Why?

In our visits to many of the world's best companies, we searched for and observed a set of principles that are common to most of these 'excellent' companies. The extent of existence of these principles is proposed as an explanatory variable, in terms of the success of firms in introducing improved practices, and ultimately, their ability to profit. The excellent companies that we visited in framing our list of principles do not grab at improvement initiatives as fads, but have chosen an enduring set of operating principles that are used to guide their actions.

What constitutes this consistent, enduring approach to management? We have identified fourteen key management principles in Table 8.1 (below). A subset of these principles has previously been individually described at length in the management literature. We have observed them in practice as being common to true, 'best in class' performers.

These principles act together. They are not fourteen isolated or separate ideas in great organisations, but they form a system that guides behaviour and improvement initiatives.

## **2.1 The Justification of Management Guided by Principles**

Why is it useful to have a set of guiding principles? Their goal is to provide a framework through which decisions and behaviour can conform to a consistent standard. Without principles, there is no long-term steering, or indeed if management does have some 'vision' it doesn't have a rudder which provides the mechanisms for getting there. A 'vision statement' or 'mission statement' often defines a desired endpoint or goal, or a sense of purpose, but is usually remote from being able to guide employee behaviour and day-to-day decision making.

The principles have been found to be the common drivers of behaviour in many of the world's greatest companies, and we propose that this set of principles represents a maturing of the field of management.<sup>2</sup> It is salient that the many excellent companies we have observed have many and varied vision/mission statements, but in pursuing these statements of intent or purpose, drive behaviour using a common set of principles! We propose that these are therefore the 'Principles of Sound



**Table 8.1 The Fourteen Principles of Best Companies**

<i>Principle</i>	<i>Description</i>
1. Alignment	There is good alignment of employee behaviour with stated company values and direction at all levels of the organisation.
2. Distributed Leadership	Individuals and work teams are assigned, and accept, responsibility for operational decision making and performance improvement.
3. Integration of Effort	The organisation is focused on value creation and process management, not functional needs and hierarchies.
4. Out Front	The business proactively strives to lead the pack in all industry standards and practices: safety, customer service, product and process design, environmental management etc.
5. Up Front	All employees demonstrate integrity and openness in all areas of their work and dealings with others.
6. Resourcing the Medium Term	The business is able to effectively balance short-term operational and medium-term development and growth issues and requirements.
7. Time Based	Time is developed as a critical organisational value. The business practices the principles of time-based competition.
8. Bias for Action	All employees demonstrate a willingness to embrace and accept change as an essential part of doing business. The organisation excels at implementing new ideas.
9. Learning Focus	All employees demonstrate a willingness to develop skills and knowledge and are involved in a learning/development program.
10. Enabling Disciplines	The organisation invests in policies, procedures and standards and applies a strong systems perspective in everything it does.
11. Measurement and Reporting/ Publication	The business measures and reports to all employees, the financial and non-financial performance information needed to drive improvement.
12. Customer Value	All employees understand the set of order winners and actively strive to enhance customer value creation.
13. Capabilities Creation	Business and organisational capabilities are defined and prioritised and drive critical development and investment decisions.
14. Micro to Macro	All employees know how their particular activities and individual efforts contribute to the 'big picture' of business success.

Management' and that unlike fads, change programs and even mission statements themselves, these principles are enduring.

The superior organisations that we have observed demonstrate a consistent and coherent approach to management. They do not engage in unplanned and ad hoc patterns of change initiatives, routinely changing the emphasis of their organisational improvement effort nor do they necessarily opt for the latest management panaceas. They are driven by a set of guiding principles that ensure that a systematic approach endures. Further, these are not just arbitrary principles but are a 'unique set' which demonstrably work in companies that excel.

Each principle will now be described. The principles do not just stand alone as separate from each other. There are many synergies between them.

### **Principle 1: Alignment**

At its highest level, this principle is reflected in two key elements: (1) alignment of employee behaviour with the set of articulated company values; and (2) alignment of employee mindset with the stated strategic direction, sometimes referred to as the strategic intent, of the firm.

In sum, we have identified at least eight distinct elements of alignment that can drive the practices and behaviours of people and organisations:

1. **VALUES.** Alignment of employee values with espoused company values means attracting the sort of people who genuinely want to work for the company, creates trust and allows efficient delegation, facilitates the ability of people to work alone toward common goals, facilitates teamwork as people with common views will help each other, facilitates collaborative individualism, creates identity, improves morale and liberates the workforce.
2. **STRATEGIC DIRECTION.** Alignment of employee needs and expectations with stated company direction means that employees understand and share the organisation's core strategic intent and are committed to making it happen. The company is moving in a direction that makes practical sense to those who work within it and who consequently aspire to become part of it.
3. **VALUE CHAIN.** Alignment within the direct value chain of an organisation ensures that the functions, departments, and processes such as sales, marketing, product development and design, operations, act such as to optimise the whole series of value adding processes as against sub-optimize their local environments.

4. **SUPPORT FUNCTIONS.** Alignment between the direct value-adding processes (see point 3 above) and support units such as accounting and information systems ensures that the infrastructure providers within the organisation appropriately support and are supported by those parts of the organisation that directly add value to the services and products that customers are prepared to pay for.
5. **GOALS AND MEASURES.** Alignment between the goals and performance measures adopted by employees at all levels and the company's goals and performance measures is critical to the efficient production of quality goods and services. The cascading of goals and measures from the CEO and the 'top floor' executives to the teams of people who add value to products and services ('shop floor') can drive effective behaviour in the workplace.
6. **SUPPLIERS.** Alignment with suppliers ensures that component design and purchased goods are suitable for the products made by the company and that the newer approaches to managing supplier relationships such as partnering can operate effectively.
7. **CUSTOMERS.** Alignment with customer requirements ensures that the organisation will continue to stay relevant in its market place and provides the information to the company about customer requirements that is necessary for the design of effective products and services. It also provides effective information to new and potential customers about the company's capabilities.
8. **REWARDS.** Alignment of rewards with desired employee behaviour helps to assure that appropriate behaviour is reinforced and therefore sustained. Well designed jobs and roles, skills development processes and career progression systems can be effective at motivating employees to change, but we have found that it is often difficult to sustain the momentum (Pfeffer 1998; Kohn 1993).

## **Principle 2: Distributed Leadership**

Senior managers in great companies are having less and less to do with running day-to-day operations. Responsibility and accountability for these issues has been devolved to individuals and work teams who have been given, and accept, increased decision making authority within agreed envelopes of control.

Senior managers have increasingly pulled back from managing the short term and focus on creating opportunities for business development and growth and resourcing the medium and long term for the

organisation. They have become strategists and change agents. In these excellent companies, general managers have 'learned to let go' of the reins of day-to-day business problems, even though they may have built their personal reputation and career by being a great 'trouble-shooter' over many years. They have handed over these reins to those at the coal face, and now add value by planning ahead on where to dig the next coal mine and how to increase the price or reduce the production cost of coal.

The principle of Distributed Leadership is therefore closely associated with the principles of Alignment and Learning Focus. So when pondering the question: 'Why do continuous improvement initiatives sometimes work and sometimes fail spectacularly?', we say question the existence of alignment and distributed leadership and you will have the answer!

### **Principle 3: Integration of Effort**

Leading companies have broadened the scope and span of all employees' mindsets and their cycle of objectives, performance and responsibility. Functional barriers and parochial mindsets (the 'silo' mentality) have been largely overcome and replaced by a unity of purpose and spirit of co-operation. This change is supported by a high degree of interdependency and interaction between employees and teams. To achieve an integration of effort and purpose across all areas, firms are often restructured, from a functional hierarchy to a value chain and process focus. We have observed that leading companies systematically manage by using processes as the unit of management. Business processes, capabilities processes and operational processes are typically used.

Integration does not stop at the organisation's boundaries. These companies are also involved in integrating their activities, values and goals with those of customers and suppliers, including material and technology suppliers. They focus on making all relationships partnership-like, and the commercial arrangements between suppliers and customers reflect this paradigm shift (from 'us and them' to partners). They have often taken a leading role in catalysing relationships with their suppliers, customers and even with their supplier's suppliers and customer's customers. This provides for the optimisation of investments and co-ordination of supply, delivery and production schedules across a complete value chain, allowing the ultimate consumer of the products and services which come from that value chain to achieve a higher level of benefits and features per unit price. In many of the leading companies we have visited, the talk and action is about 'adding

value to our customers' customers', or of 'getting into our customers' revenue stream'. Hewlett Packard and Dun and Bradstreet are leading exponents of this philosophy.

The same partnership-like behaviour applies to suppliers. Integration back through the supply chain causes great companies to address the question: 'How can I be a leading edge customer?'.

#### **Principle 4: Being Out Front**

Being out front means *leading* customer requirements, *leading* environmental policy and practice (rather than responding to regulations), *leading* industry standards, *leading* in supplier partnership development, *leading* in quality, *leading* in responsiveness to customer requirements, *leading* in product design and features, *leading* in technology management. Leaders generally make extensive use of information technology in order to look and act global. Leaders develop international networks, understand the big picture of international business and benchmark their operations on an international scale. They have learned to be industry leaders in every sense of the word. They are proactive and often use their leadership position in an industry to their great advantage by being able to take industry practices and standards to places and levels where competitors cannot follow or find it difficult to do so. Being out front provides leaders with marketing advantages of brand and image value.

#### **Principle 5: Being Up Front**

Being up front means being open, honest and acting with integrity in all areas of business and operating activity. Leading companies don't make promises to customers that they can't deliver. If they are unsure about whether they can comply with a request from a particular customer they let them know and give them the reasons.

Managers in up front companies tell employees the truth and encourage employees to tell the truth back to them. This is typically demonstrated by the use of performance appraisals employing effective 360 degree feedback processes. If downsizing and job loss is imminent, leading organisations don't confront the issue with a soft message: they tell all their employees 'the way it is'.

These organisations have a transparency about them that pervades their culture of openness and their sharing of information. In one leading service organisation we visited, no information is held sacred apart from that on possible acquisitions (which needs to be kept secret from the market until the appropriate time) and some information on new

product developments that is commercially sensitive and needs to be kept out of the hands of competitors. The accounts of this company in all respects are fully open and all performance information is available and shared with all staff. People become involved because they are consulted and are well-informed.

### **Principle 6: Resourcing the Medium Term**

Whilst being 'lean and mean', excellent organisations do not cut so close to the bone so as to stop their development. Compared to the average firm, significantly more attention is paid to the long-term health of the company than just the short-term wealth of the shareholders.<sup>3</sup> Leading organisations have enough professional resources to engage in key strategic projects. Managers are able to balance their time between business development, organisational improvement and self-development. Operators are able to balance their time between operating, improving processes and learning. Resources are provided to make the continuous improvement initiatives and investments work properly. When times get tough these companies somehow still manage to invest in their future, as against cut back on their improvement initiatives, which is a common practice of more short-sighted companies. This is not to say that cost reduction is not a driving focus in 'best practice' firms, as it invariably is, but by investing in learning and improving today, great companies build cost reduction and other capabilities for tomorrow. Cost reduction does not result in core capabilities depletion in great companies because it is not taken to the extremes where it does harm.

To be able to engage in key strategic projects looking three years out, senior managers in these companies have divorced themselves from day-to-day issues, hence, there is a strong connection between this principle and Distributed Leadership.

### **Principle 7: Being Time Based**

Leading companies have time itself as a critical value and set of measures, whether it's the order to delivery time, the product development time or precision itself. These organisations' relentless drive to reduce time is analogous to many organisations' efforts to improve quality during the 1980s. Moreover, focusing on reducing time requires these firms to have excellent cost, quality and flexibility. If quality is not right because processes are out of control, then it will be impossible to efficiently manage and compress cycle times. So a focus on the management and compression of time requires the organisation to have

previously developed a quality improvement and process management capability.

### **Principle 8: Bias for Action**

Leading firms are as good at executing ideas and strategy as formulating them: they have a bias for action. They recognise that there are times for consultation and times for action — they have not fallen prey to consultative overkill. They have developed change management capabilities and project management disciplines as core capabilities themselves.

We have often worked with organisations and found it possible to formulate, during a business retreat with a group of senior managers, ambitious change management plans. Then nothing happens! These managers go back to their businesses and the enthusiasm and sometimes even desperately strong commitment to change which is expressed at a conference or executive retreat gets diluted by the necessities of dealing with the day-to-day business. Some managers seem to lose the courage to implement change, even though they fervently committed to catalyse some change initiative. The issue is that courage is not enough! It is a necessary but not sufficient condition.

Good companies differentiate themselves from the rest of the pack by being able to manage change in a disciplined way.

### **Principle 9: Having a Learning Focus**

Learning for all employees is seen as critical to best practice firms. This is born from being always dissatisfied with performance and processes and realising that improved knowledge translates into improved processes and then performance. We have noted that employees in leading companies work actively to transfer knowledge to others. They do not feel threatened by knowledge transfer, but rather acknowledge the value of this activity in securing future firm prosperity. Ranging from multiskilling to management think tanks, excellent firms invest in the brains of all of their employees.

### **Principle 10: Enabling Disciplines**

Best practice firms have not simply empowered their workforces and 'set them free'. This is a ridiculous notion, ultimately leading to anarchy. By discipline we do not mean the notion of punishment, but instead a high degree of standardisation of work processes, 'structuredness' within the workplace and an adherence to doing things consistently in the right manner.

## Principle 11: Measurement and Reporting/Publication

Best practice companies measure a range of non-financial parameters as well as financials. They recognise that corporate value potential is similar to an iceberg. The financials represent the 10% you can see: the other 90% are the operational, technological and organisational systems you can't directly see in the company accounts and which need to be measured, evaluated and actively managed. The measures used by leading firms relate to business goals, business strategy and positioning, operational goals, organisational goals and external stakeholders.

Measuring and reporting/publication of operational parameters such as productivity, quality and safety close the loop on the firm's objective setting and planning process recognising that 'What gets measured (and reported) gets done' and 'You can't improve it unless you measure it'. Clearly the effective use of measurement reporting systems is related to the organisation's preparedness to act on deficiencies that are identified. Consequently, the degree to which this principle is applied effectively is related to the organisation's ability to change (Principle 8).

The operational performance measures need to be fed back in a timely, accurate manner to teams of shop floor people, whether it is in a factory or a service operation. The principle here is that these teams can relate their actions to the critical performance outputs they influence by their actions. Similarly, managers can relate their actions to the critical set of organisational and team capabilities that they influence by their actions. Effective measurement systems can be useful tools to help close the attitude gap between management and the workforce. This is why the feedback needs to be fast and at the right level of aggregation, so that all employees can clearly understand the impact of the actions that they take in areas outside their immediate sphere of responsibility.

In the operations of the best companies we have studied, there are attractive information centres with well-designed bulletin boards that graphically depict these performance attributes and trends. Workers congregate during break times and before and after their work shifts in these centres, which are usually well-lit and ergonomically styled, and discuss the *connections* between *what they do and how they are performing*. This builds commitment in the workplace, helps everyone understand the causal effect between actions and performance and builds an alignment between workers and their managerial control systems. We have seen the power of this in banks and in factories. Also, these leading firms don't fall prey to the measurement complexity we've seen in many organisations: they consider only a few key measures, typically five or six.



It is critical to our understanding of why this works to explicitly state that measurement alone is not enough. We have observed that it is the closing of the loop via the appropriate reporting of measures which are at the right degree of detail back to those who have control over the actions in the operation, which leads to improvement. In many firms, aggregation is not performed, or is performed poorly, resulting in an excessive number of measures and ill-directed organisational improvement effort. The people who should be exercising control over a system or who are operating a process need direct performance data on that system and the simpler and more direct the information, the better.

Measurement and reporting is closely associated with Principle 5, 'Being Up Front'. Indeed, a good, open performance management system is a major part of how companies can transform themselves towards being up front.

### **Principle 12: Driving Customer Value**

Leading companies do more than just know their customers' requirements. They drive to maximise customer value through their organisational activities. They

- create new customer demands
- predict changes in customer needs before they actually happen
- identify customer needs that the customer can't even articulate for themselves
- relentlessly pursue previously unserved customers

These companies can clearly envision future opportunities and articulate 'value propositions' that focus on providing high levels of 'benefits per dollar' to customers. In order to do this they need to clearly understand why customers buy from them rather than from their competitors. They therefore make extraordinary efforts to 'stay close to the customer' and carefully manage customer relationships.

Leading firms know what their current and potential customers value and strive to enhance it. They do not embark on 'feel good' change programs unless a clear link can be established between the outcome of that program and customer value. Competitive 'Order Winners' are prioritised from industry-wide 'Qualifiers'. Finally, managers in leading firms tell everyone in the company about their order winners so that decisions can be made throughout the company based on the same priorities and criteria.

### **Principle 13: Capabilities Creation**

In order to achieve, sustain and focus on order winners and customer value creation, leading companies invest in their core capabilities. These capabilities are clearly defined, widely communicated, highly valued and 'held sacred'. The principle of 'capabilities creation' directly supports the principle of 'driving customer value' as internal capabilities are the means by which superior order winners are created to attract and satisfy customers. Put differently, the principle of driving customer value considers the relationship between the organisational boundary and the external environment (the customer): the principle of capabilities creation considers the relationship between the organisational boundary and the internal operating environment.

Leading firms have effective processes for identifying, developing, transferring and exploiting their core capabilities that are tested and developed in conjunction with key customer groups. Capabilities serve as priority areas for investment and decision making and firms that adopt this principle do not trade off core capabilities during market downturns, corporate restructuring, departmental restructuring, downsizing, or cost reduction exercises.

### **Principle 14: Micro to Macro**

In leading firms each member of the workforce understands how his or her individual and team-based work effort connects with, and contributes to, the big picture of business success. Alternatively, each manager has a sound understanding of how his or her individual and team-based work effort connects with, and contributes to, organisational success. That is, a common platform of understanding has been established between the general workforce and management and as a result, micro and macro activities are closely interlinked. On an activity level, this connection between macro and micro is reflected in a close connection between the core work processes and critical business processes. Consequently, the activities of management and the broader workforce are consistent and effectively integrated.

## **3. Field Testing the Principles**

Empirical validation of the existence of these principles and their connection to organisational performance was conducted in two phases. First, a series of presentations of these to groups of executives were conducted. From these groups, valuable feedback was obtained as to how to best express the principles and they were refined in their

description to the state they are in as expressed in Table 8.1. The executive groups focused on modifying the description and meaning of the principles such as to maximise their crispness as 'guidelines for organisational tactics and action plans'.

Second, a survey was administered to CEOs of large companies in Australia, asking each one to evaluate the company on a five-point scale of strength of existence for each principle. From these evaluations, it is possible to test the strength of relationship between the principles and organisational performance.

The survey was sent to 800 companies and 122 useable responses were received. From these, 60 were from publicly listed companies that could be matched with performance data from the IBIS database of business performance. The desired dependent variable of interest was the organisations' bottom line namely net profit after taxes. Since a number of the CEO's questioned were part of Australian subsidiaries of multinational organisations, and because data was not available for all companies on in the survey from the performance database, there ultimately were 42 companies used in the analysis. These included a range of companies but were mostly large Australian corporates, across the banking, manufacturing and mining sectors.

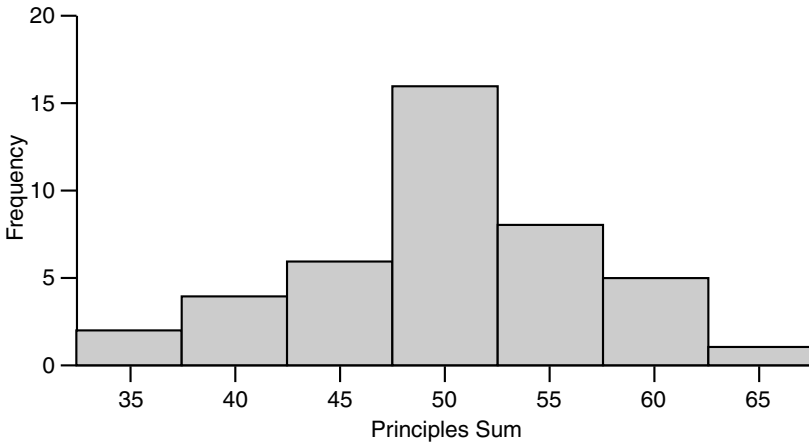
## 4. Results and Analysis

For the 42 companies analysed the performance variable chosen to represent organisational performance was net profit after tax (NPAT) per employee. This variable is particularly appropriate because the predictor variable which is the linear sum of all the assessments made of the principles, is concerned with management factors that mostly concern human resource and labour productivity and effectiveness issues. The underlying hypothesis is that a higher score on the sum of the principles would be associated with a higher value of NPAT per employee.

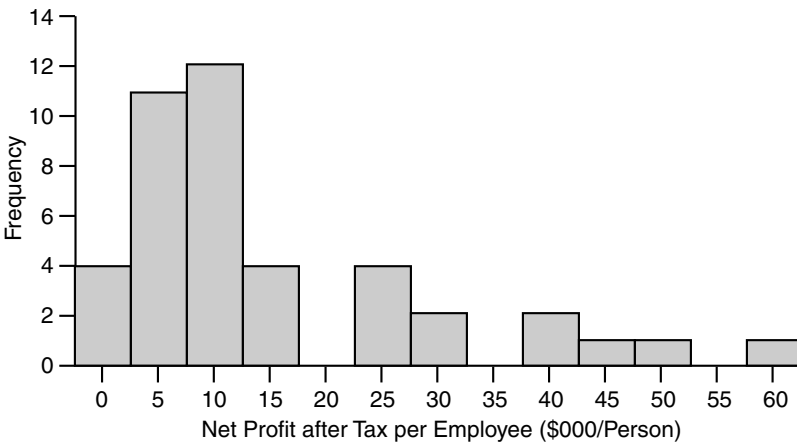
Figure 8.1 (below) shows the spread of scores for the 42 companies included in the study on their sum of principles. The scale of fourteen principles assessed from a score on each principle of 1 (low) to 5 (high), produced a range from 35 to 62, with a mean of 49.8 and a standard deviation of 6.9.

Figure 8.2 (below) shows the histogram for NPAT per employee for the 42 companies. For the 42 companies included in this analysis, NPAT per employee varied from A\$1,310 to A\$59,080 in the dataset, with a mean of A\$15,000 and a standard deviation of A\$14,280.

For these companies, the correlation between 'Principles Sum' and NPAT per employee was 0.321 ( $p = .019$ , one tailed test). Although it is not possible from this statistical association to deduce any causal



**Figure 8.1 Sum of the Fourteen Principles for the 42 Companies**



**Figure 8.2 NPAT per Employee for the 42 Companies**

inferences, this correlation does indicate a positive connection between the strength of variables. Perceived strength of the existence of the principles in aggregate does prove to be associated with higher profitability per employee.

To test whether the principles act more strongly on higher performing firms, a subset of the data was cut from the 42 companies with NPAT per employee being above A\$10,000, for the 22 companies in this subset, the mean of the 'Principles Sum' was 51.4 and mean NPAT per employee was A\$24,000. The correlation coefficient between these two variables was 0.361 ( $p = .050$ , one tailed test).

To further test the relationship, a smaller subset was drawn of companies that are particularly profitable, namely with NPAT per employee of greater than A\$15,000. For these companies the average value of 'Principles Sum' was 51.4 and the average NPAT per employee was A\$32,500. Interestingly the correlation coefficient between the two variables for this subset of highly profitable companies was 0.665 ( $p = .006$ , one tailed test).

Generally, more profitable subsets of companies demonstrated a stronger relationship between the strength of the principles and profitability. This may be explained by a number of factors. First, the principles were formulated by the researchers after observing in first hand detail a series of high performing companies. Therefore it is no surprise that the strength of principles is higher for the high performance subset and further that there is a stronger relationship between 'Principles Sum' and profitability within this subset than in the overall sample.

A second explanation arises from the fact that the lower performing 25 or so companies in the sample of 42 all had their profit per employee in a rather narrow range of between zero and A\$8000, so that relatively speaking there was less variance to explain.

## 5. Summary

This article proposes a set of guiding principles common to 'best' companies and has shown that there is a statistically significant connection between these principles assessed by company CEOs, and performance in terms of profit per employee. While there is considerable scope for an expanded empirical research program on these issues, the evidence presented in these chapters is reassuring. Better managed companies do make more money!

## Endnotes

1. Two knowledge platforms of the last decade were the works of Peters and Waterman (1982) and the Total Quality Management (TQM) movement. Each had its own strengths and weaknesses. Neither was anywhere near complete and never intended to be undertaken in isolation. Although Peters and Waterman's eight management principles accorded with common sense, they were narrow in focus, generally difficult to measure and difficult to put into practice as there was no framework for implementation. TQM had solid foundations and a good measurement system (quality awards frameworks). However it was mechanistic in style and failed to adequately address a broad range of cultural and behavioural issues.
2. We do not suggest that these ideas are all new. For example Peters and Waterman (1982) suggested a bias for action and Stalk and Hout (1990) have

described time-based competition. What is new is that the fourteen principles bring together what we have seen as the 'best of the best' in terms of the combined best practice of management in leading companies.

3. These companies have senior executives who have the fortitude and vision to be able to tell analysts and shareholders about building a future, not just optimising profits for today.

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## Part 3: Big Business and Public Policy



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# 9 Big Business and Policy

*Peter Dawkins, Michael Harris and Stephen King*

## 1. Introduction

Big business is important to Australia. It is a major source of employment, production and exports. But business does not operate in a vacuum. Governments control the laws of the market and these laws will be reflected in big business performance and its impact on social welfare.

The laws relating to big business fall into two broad camps. First, there are laws that prevent big business from distorting the market place in its own favour but to the detriment of broader competition. Big business often has considerable market power. A large firm may use that power to intimidate smaller competitors. Small firms may also seek to merge to become larger and limit competition. The rules of market conduct that control anticompetitive behaviour are presented in the *Trade Practices Act 1974*.

Second, governments may pass laws that aid either specific firms or specific business activities. Big business may complain that they are the victims of unfair or unsustainable competition, for example from imports, and ask the government to step in and protect them. Business may also argue that their activities provide spillover benefits to the wider community and ask the government to assist them in these socially beneficial activities. Australian governments at all levels have engaged in a variety of practices to assist particular firms or industries. Tariff protection, tax concessions and direct subsidies provide examples.

In this part of the book, we present a number of chapters that analyse the relationship between public policy and big business. Chapter 10, by Robert Dixon, considers the social cost of market power. Using a model of imperfect competition, the analysis in this chapter shows how market power can lead to a social loss due to an inefficient

level of production. The chapter provides an estimate of the annual cost of market power to the Australian economy for the early 1990s.

Chapters 11 and 12 consider mergers and takeovers. Mergers provide a policy dilemma for governments. By merging, smaller firms can become bigger or big firms can remove smaller competitors from the market. In this sense, mergers can create and increase market power. But if a merger removes an inefficient firm, or leads to lower costs and more efficient production, then society gains. In Chapter 11, Tim Brailsford and Stephen Knights analyse a broad range of mergers in Australia. They show that much of the debate about mergers is ill-founded. For example, they show that there is little if any evidence that mergers are used to downsize the workforce of firms. This discussion is continued in Chapter 12 where Charles Hyde analyses mergers in the petroleum industry. He shows that market power is unlikely to have been a driving force behind these mergers.

Chapter 13 considers innovation and big business in Australia. Mark Rogers considers the problems of ensuring an appropriate level of innovation and technological development through simple market mechanisms. He provides a detailed survey of actual and potential government policies to improve Australia's performance in innovation.

Chapters 10 to 13 focus on specific policies. This chapter provides a broad overview of public policy and big business. We first consider policies that aim to prevent anticompetitive behaviour. In particular, we focus on laws that prevent abuse of market power and restrict mergers. Then we turn our attention to policies aimed at promoting business activities. We look at both Australian and overseas examples to consider the desirability of these policies.

The conclusion from this overview is simple. Business depends on government to create the rules of the market place. To be effective, these rules need to be clear and precise. Laws that create confusion and dispute are generally bad for business and the economy. Creating clear and concise rules, however, is easier said than done.

## 2. Abuse of Market Power

Market power refers to the discretion held by a firm in pricing its output and setting its product quality. If a firm can raise its price above relevant production costs, either directly or by eroding product quality, without suffering significant loss of custom to competitive rivals, then the firm has market power. As stated by the Australian courts, '[m]arket power can be defined as the ability to raise prices above the supply cost without rivals taking away customers in due time'.<sup>1</sup>

Large businesses often command significant market power. As the European courts have noted '[a] large market share may well be evidence of market power'.<sup>2</sup> The relationship between market share and market power, as evidenced by profitability, was analysed in Chapter 5. Simply being 'big' does not necessarily imply market power. A large firm, such as gas distribution company AGL, will not have substantial market power if any attempt to raise prices simply leads consumers to switch to alternative fuels. The sole producer of a particular type of machine in Australia may have little ability to raise price if customers can easily import an equivalent product from overseas. Market power depends on both existing and potential competition.

This said, a large firm is far more likely to have market power than is a small firm. Policies to control market power are inevitably policies that are aimed at big business.

Market power, by itself, is not a cause for concern. A firm that is more efficient than its competitors can offer consumers a lower price and higher quality product. This firm will grow and be highly profitable. Such growth can significantly benefit society. Consumers gain from the efficiency of the firm's operations, its innovative management and the quality of its output. The firm's owners gain from improved profits and its employees gain as they share the company's prosperity with better job security, improved promotion prospects and, often, higher wages. The efficient firm will have market power. It can price above its own costs, while undercutting its competitors and potentially driving them out of the market. But this market power is not a cause for concern.

Market power, however, may have less benign origins. Many large firms operate in industries where technology constrains the ability of small firms to enter and compete. If production involves large initial capital costs and if average production costs tend to fall as output rises so that there are significant economies of scale, then the market may only be able to support a small number of firms. In the extreme, a natural monopoly technology will exist if one firm can supply all consumers at a lower cost than two or more firms. In these circumstances, market power reflects production technology and the benefit of being first into an industry.

If there are significant barriers to entry, this may also create market power. A mining firm that controls all sources of a relevant mineral will often have market power. This does not show their superior efficiency or lower costs but reflects their monopoly over an essential production input.

A firm with market power can exploit this power to raise prices. This will increase profits but reduce allocative efficiency. Some consumers

who would be willing and able to buy the product at a price that exceeds production costs are driven out of the market by monopoly pricing. Robert Dixon (Chapter 10) estimated this loss as approximately 1% of national income in the early 1990s.

Monopoly pricing may also distort resource use. If a firm with market power sells an input to downstream producers, then when they raise their price the firm forces downstream producers to substitute into other less appropriate inputs.

### 3. Controls on Monopoly Pricing

There is no general law against 'excessive' pricing in Australia. The Commonwealth government does not have general price setting powers under the constitution. However, governments may intervene to prevent specific firms from setting monopoly prices. For example, the owners of recently privatised airports, such as the Melbourne, Brisbane and Perth airports, are not able to arbitrarily set prices for the aeronautical services they sell. Similarly, Telstra, one of Australia's largest companies, faces restrictions on the prices it can set for some telecommunications services. In both of these cases, the firms are constrained by price-caps.

Price-caps are used in Australia and overseas to control specific firm's prices. The relevant firm is only able to set the price(s) for its product(s) so that it does not violate the cap. For example, if the firm sells a single product, then the cap will state the maximum price that the firm can charge for that product. If the firm sells a number of products then the cap may allow the firm to raise the price of one product so long as it lowers the price of some other products. The ability of the firm to re-balance prices depends on the specific type of price-cap regulation that it faces.<sup>3</sup>

In Australia, the regulator does not set the cap every year, but sets the price-cap formula for a three to five year period.<sup>4</sup> The formula usually includes an adjustment for general inflation (the CPI) and for industry and firm specific productivity gains (X). Hence, price-caps are often referred to as CPI-X regulation.

Having government appointed regulators set firm prices (even maximum prices) is problematic. How does the regulator know what is a 'fair' price for the firm to charge? In practice, when regulators set price-caps they often attempt to measure the firm's capital stock and provide the firm's owners with an equitable return on this capital. Using this rate-of-return procedure leads to a variety of well-known problems. The firm will often have an incentive to choose an incorrect mix of inputs, substituting capital for labour.<sup>5</sup> It can be profitable for

the firm to retain outmoded capital equipment on its books and continue to draw a 'fair' return on this irrelevant equipment. The firm also has reduced incentives to operate efficiently. Any cost reductions made by the firm are passed onto consumers when the price-cap is reviewed.

Governments may also abuse their own power when setting a firm's prices. It is often tempting to set prices to favour one group of constituents. For example, it is far from obvious that it is efficient to force Telstra to charge an untimed rate of 25 cents for local phone calls. But, in current circumstances, it would be political suicide for a politician to suggest that this price-cap be removed. Similarly, recent rules that force Telstra to maintain the same average local call prices Australia-wide may significantly damage Telstra. As the company faces local telephone competition in major cities, it will be unable to respond unless it lowers prices throughout Australia. These rules are meant to appease rural voters.

#### 4. Abuse of Market Power and the Trade Practices Act 1974

Section 46 of the *Trade Practices Act* prevents firms using market power for an anticompetitive purpose. This includes preventing other firms from entering a market or trying to force an efficient firm to leave a market. But this law has four problems.

- (1) It can be difficult for the main competition regulator, the Australian Competition and Consumer Commission (ACCC), or the courts to separate anticompetitive and procompetitive actions. For example, it is common for firms to claim predatory behaviour by large rivals. These rivals, it is claimed, are setting 'anticompetitive' prices and threatening to drive other firms out of business. Usually these claims amount to complaints about competition rather than anticompetitive behaviour. A highly efficient firm will set low prices and may drive out less efficient rivals. This is the very nature of competition. The claims may, however, reflect a real concern. A firm may 'predate' a rival, attempting to force an equally efficient firm out of business, allowing it to exploit subsequent market power.<sup>6</sup> It is up to the courts and the ACCC to try and separate those (few) situations of real abuse of market power from the general competitive battle of the market place.<sup>7</sup>
- (2) It is often difficult to prove that a firm has *used* its market power for an anticompetitive *purpose*. It is not enough to show that a firm with market power has acted to reduce competition. There must be a direct relationship between the firm's actions and its market\

power. Also, it is insufficient to show that the action had an anticompetitive effect. Purpose must be shown for the action to be illegal.<sup>8</sup>

- (3) The law does not prevent a firm with market power from setting monopoly prices. Rather the law is aimed at protecting existing competition and fostering increased competition. If a firm is already a monopoly and there is little prospect of increased competition then it has nothing to fear from section 46 of the *Trade Practices Act*. This said, it is unusual for a firm to be able to make monopoly profits for long without attracting the interest of entrepreneurs eager to seize their own slice of the monopoly pie. The main exception is where government prevents competition. We deal with this issue below.
- (4) The penalties for a violation of section 46 are substantial. The relevant firm may be fined and may have to pay damages to injured firms. These penalties, however, leave the guilty firm with its market power intact. Unlike, for example, the United States, the Australian courts cannot order that a firm that has abused its market power be restructured. The most famous case of court-forced restructuring occurred in the US in 1984 when the telephone giant, the American Telephone and Telegraph Company (AT&T), was broken into a long distance company and seven local 'Baby Bells'. The break-up of AT&T resulted from a case brought against the company by the US Justice Department. It was alleged that AT&T had used its market power to act in an anticompetitive fashion against a new long-distance company MCI.<sup>9</sup>

## 5. Competition Policy and Public Firms with Market Power

Many of the largest firms in the IBIS database are government owned. Traditionally, many of these firms have been immune from competition and accumulated considerable market power.

A government owned firm with market power is likely to operate differently to an equivalent private firm. The managers will have little incentive to raise prices and maximise profits, but may have an incentive to cost-pad and seize personal benefits through firm activities. The minister in charge of the government firm also has little incentive to maximise profits, but may seek to use the firm to favour particular constituents with hidden cross-subsidies or to pay-back political allies with directorships. The net effect for most customers will be higher prices, either directly or through tax payments.

A key part of National Competition Policy is the Competition Principles Agreement, signed by the leaders of the federal, State and Territory governments on 11 April 1995. Much of this agreement deals with government business enterprises.<sup>10</sup> The Agreement aims to change the incentives that face public sector managers and their political masters, so that public firms will act more in the interests of their customers and taxpayers.

Clause 2 of the Agreement sets out rules for overseeing the prices that are charged by large government businesses. Governments agreed to establish independent bodies to advise on pricing. The key objective of these pricing authorities is 'efficient resource allocation but with regard to any explicitly identified and defined community service obligations imposed on a business enterprise by the Government'.<sup>11</sup>

Clause 3 relates to competitive neutrality and is designed to eliminate 'resource allocation distortions arising out of the public ownership of entities engaged in significant business activities'.<sup>12</sup> Governments agreed to 'corporatise' their businesses, so that managers face incentives to operate profitably and efficiently, and to subject these firms to similar regulations and taxes as their privately owned counterparts.

Clause 4 requires governments to consider the structure of their businesses before they open up their industry to competition. In particular, public firms should not also be responsible for industry regulation. The government may also find it desirable to separate natural monopoly and potentially competitive parts into separate firms.

There has been considerable controversy over National Competition Policy in general and the Competition Principles Agreement in particular. It has been claimed that the policy is undemocratic and it has been blamed for the rise of right-wing extremist political parties in rural Australia.<sup>13</sup> In fact, much of the policy is about clarity of government and the removal of abuse of market power.

The review of the large government owned firm, Australia Post, undertaken by the National Competition Council as part of the National Competition Policy review, provides a useful example.<sup>14</sup> Australia Post has long enjoyed monopoly rights over the delivery of 'standard' letters. In return, it has offered a uniform rate of postage Australia wide for a standard letter. The rate is currently 45 cents. The Council report had two key parts. First, that business mail, which is currently covered by the Australia Post monopoly, should be opened to competition. In part, this recommendation simply reflects technological realities. Facsimiles, email and specialised courier services have been eroding the business mail monopoly in recent years. Competition for business mail may lead to innovative new services and prevent waste as firms 'work around' the monopoly.<sup>15</sup>



The second key element of the report is the treatment of cross-subsidies. The uniform postal rate together with Australia Post's universal service obligation creates a variety of cross-subsidies between users. These subsidies are difficult to measure and are hidden in general postal pricing. The report recommends retaining the uniform postal rate and universal service obligation for Australia Post but making the costs of these obligations more explicit. The obligations could be funded in a direct and transparent way by government, or through an industry levy on all mail companies.

The report really addresses two elements of abuse of power. First, Australia Post may be charging excessive prices for business mail. It can do this because of its legislative monopoly. Opening the business mail market to competition is the best way to prevent this abuse of market power. Second, politicians may be abusing political power by passing benefits to particular consumers through the obligations placed on Australia Post. As a country, we may believe that these transfers are socially desirable and should be continued. But a first step to allow the electorate to judge these benefits is to make them transparent rather than hiding them in general postal pricing.<sup>16</sup>

## 6. Mergers

If big firms can abuse market power, then a policy solution may involve preventing firms from artificially increasing in size. Merger policy deals with situations where two (or more) firms want to unify and become a single firm. The goal of merger policy is to distinguish between situations where a merger will be socially desirable and where it will lead to an undesirable increase in market power and reduction of competition.

To see the basic problem, suppose an industry currently has four equally-sized producers each competing for market share. Each firm will have limited market power. A firm may attempt to raise its price, but this will result in a significant loss of customers unless the other firms follow and also raise prices. The degree of actual competition between the four firms will depend on a variety of factors, such as the ability of customers to quickly move between alternative suppliers.

Suppose that two of the firms merge. This can have two potentially anticompetitive effects. First, the absolute number of firms decreases from four to three. We would not expect three firms to compete with each other quite as hard as would four firms. In addition, the new 'large' firm created by the merger is a natural price leader. If it raises its price then the other smaller firms may more readily choose to follow suit than if a smaller firm was the first to raise the price. The existence

of a single large firm may make it easier for firms to coordinate on high prices.

But mergers may also have beneficial effects. By merging, the two firms may be able to realise a variety of synergies that will lead to lower costs. For example, bank mergers in Australia are often followed by a rationalisation of the branch network. Where previously two branches stood side-by-side, one branch is now adequate. Manufacturing companies that merge may be able to close inefficient old plant and concentrate production in newer plant.

Merger analysis inevitably becomes an attempt to weigh up the two conflicting effects highlighted above. Under section 50 of the *Trade Practices Act 1974*, mergers that would result in a substantial lessening of competition are illegal. This law inevitably places considerable weight on any increase in market power and price that occurs from a merger while reducing the weight given to any potential cost savings. The ACCC, in its 1996 merger guidelines states that '[w]here there is a reasonable likelihood that prices in the relevant product market will be maintained at a significantly greater level than they would be in the absence of the merger ... the Commission will consider there to be a substantial lessening of competition'.<sup>17</sup>

Efficiencies created by a merger can better be dealt with through the authorisation provisions of the Act. If firms believe that their prospective merger might violate section 50, they can apply to the ACCC to have the merger authorised. If the Commission believes that there is a benefit to the public from the merger, despite the potential lessening of competition, then it can allow the merger to legally take place. The Australian Competition Tribunal, in reviewing merger authorisations, has accepted that efficiencies, in the form of lower costs, can be considered as public benefits.<sup>18</sup>

## 7. Picking Winners

Governments in Australia have also followed a variety of policies to encourage specific companies. Much of this assistance has been directed at large companies.

A common 'helping hand' policy over the post-war period has been protection from imports. Governments' desire to protect and support Australian industry in the immediate post-war period, in part, was driven by the fear of isolation generated by the war. It was believed that Australia needed to both increase its population and develop a domestic manufacturing base as insurance against future foreign aggression. This led to the policy of 'protection all round' which continued until the early 1970s. As the name suggests, rather than being focused on

individual firms or industries, this policy of import protection for the manufacturing sector was broad based and occurred in tandem with price support schemes to protect rural sectors of the economy.<sup>19</sup>

At the same time, some import protection was motivated by the desire to help specific industries in the economy. In response to growing imports, quotas were introduced in 1975 to protect the textiles, clothing and footwear, and motor vehicle industries. The original policy was supposed to involve temporary protection for these specific industries, but the quotas remained in place until the late 1980s and early 1990s.<sup>20</sup>

In the 1980s, there was steady progress to lower import barriers. This reflected, in part, a better understanding of the costs of import protection. By raising the price of both imported and domestic products, import protection acts as a tax on consumers. Reduced imports tend to raise the price of the Australian dollar and reduce our exports. While protection may create jobs in some industries, it destroys jobs in other industries.

Progress in tariff reduction stalled in recent years with the federal Coalition government rejecting recommendations from the Productivity Commission to continue tariff reduction for imported cars and footwear, clothing and textiles.

A variety of other government policies have been used to encourage specific firms or industries and recently the government has been exhorted by business lobbies and its own commissioned reports to follow an interventionist pro-business industry policy. The 1997 Review of Business Programs Report (the Mortimer report)<sup>21</sup> for example recommended that the government establish Invest Australia to promote investment in Australia (recommendation 5.2). One role of Invest Australia would be to provide 'tailored incentives packages ... to assist private sector investment projects' (recommendation 5.4). The report also recommended government tax concessions for firms undertaking research and development, and continued and new funding for 'export enhancement' schemes.<sup>22</sup> The report of the information industries taskforce (the Goldsworthy report) argued that '[t]o develop this nation the Government must be a productive partner with business'.<sup>23</sup> This partnership would involve copying a number of overseas countries such as Ireland and Malaysia, and paying large multinational companies to invest in new plant in Australia through tax subsidies.

Economists have generally been sceptical of policies that target 'strategic investments'. The experience of overseas countries shows that interventionist policies aimed at encouraging specific companies tend to fail at least as often as they succeed. For example, throughout the 1980s, Japan was held aloft as the model for strategic government intervention. But the evidence shows that specific industry intervention

in Japan was often aimed at poorly performing industries, such as paper and shipbuilding, rather than supporting growing industries. For example, the 1978 Industry Stabilization Law provided specific assistance for steel, aluminium, shipbuilding and textiles.

Even supporters of specific industry intervention in Japan admit that the policies took considerable time to have effect. 'When the Japanese government tried in the 1950s to promote new manufacturing industries such as synthetic fibers and petrochemicals, in addition to steel and automobiles, it took roughly two decades for these sectors to become competitive' (Sekiguchi 1991, p. 460). It is also interesting to note that, with the exception of automobiles, these same industries were in decline by the late 1970s. A more critical view, recently presented by Japanese economists, is that the spectacular post-war growth of Japan had little to do with government intervention. Rather than aiding development, specific government intervention was at best benign and at worst retarded development of the Japanese service sector.<sup>24</sup>

Other economies, often held to be models for specific industry intervention, also provide evidence that such intervention may be misguided. South Korea, for example, began its heavy and chemical industry (HCI) development plan in the mid-1970s. This plan, at best, had ambiguous results and was scaled back in the early 1980s as the government turned its attention to other industries.<sup>25</sup>

Recent attention has focused on high technology industries. Malaysia has aggressively sought overseas investment to establish a centre for high technology companies. One argument used to support these policies is that it is necessary to have a 'critical mass' of similar firms to create a competitive environment in which these firms can thrive.<sup>26</sup> For example, high technology firms require a trained workforce, but local workers will only train if they see a strong market for their talents. A critical number of potential employers are required to create a strong labour market for high technology workers.

While this argument has some substance, it could be used for almost any industry that relies on a skilled workforce. The creation of the critical mass of firms by using investment subsidies or tax concessions is costly to the government and care needs to be taken to ensure that the 'correct' industries are established. Where subsidies and tax concessions are used to gain investment by critical foreign firms such as Intel, then this can lead to a 'bidding war' between potential host countries. The benefits of the investment to the successful host country are likely to be dissipated. Overall, the main beneficiaries will be the (foreign) owners of the company that is targeted for investment assistance. Where subsidies and concessions are used to establish new domestic firms then this can lead to an oversupply of the relevant product on the

world market. The production of memory chips (DRAM) presents one example.<sup>27</sup>

The scepticism shown by many economists for specific industry intervention appears to be well founded. At the same time, it is recognised that spillovers may occur between firms and government intervention may be necessary to avoid market failure. The most common example of these spillovers is in research and development. We briefly consider these spillovers in the next section. They are considered in detail by Mark Rogers in Chapter 13.

## 8. R&D Policy

Governments around the world treat research and development (R&D) differently to other industrial activities. R&D, it is argued, provides positive spillovers to other firms that cannot be perfectly captured by the firm initiating the R&D. Without government support for R&D, potentially worthwhile projects will not be undertaken in the private sector.

The most obvious interventions to protect research are patent laws. However, Australian governments have also used tax concessions and direct subsidies to promote R&D. Other countries have relaxed competition laws for R&D projects. For example, US law treats R&D joint ventures between firms more leniently than other joint ventures.<sup>28</sup>

R&D assistance has both costs and benefits. These are illustrated by R&D joint ventures. Allowing firms to co-operate on R&D projects internalises any spillovers that would otherwise exist between firms. This may raise or lower the amount of R&D. If R&D activity by one firm benefits its competitors by allowing them to free ride on the ideas and processes developed by the R&D activity, co-operation internalises the spillover and will tend to raise the amount of R&D. Alternatively, with a winner-takes-all race for a patent, R&D activity by one firm harms its competitors and spurs them on to greater research. Co-operation between firms removes the patent race and decreases R&D activity.<sup>29</sup> Co-operation in R&D may also lead to co-operation in other activities. When the firms are competitors, additional co-operation will tend to dampen competition and harm consumers.

While R&D assistance has economic merit, it is clear that the type of assistance needs to be carefully considered. Specific assistance can lead to projects that are created purely to receive the assistance. Alternatively, public assistance may be provided to projects that would have been undertaken anyway. Weakening of competition laws can create incentives to act less competitively across a range of industrial activities. Strong patent protection may provide adequate R&D incentives.

However, it may lead to a patent race and socially excessive investment in research activities.

Clearly there are a variety of trade-offs that need to be considered for government research and innovation policy, and these are explored more fully in Chapter 13.

## 9. The General Economic Environment

Arguably the best form of industry assistance is a stable policy environment. Business is better able to do its job effectively when it does not have to deal with masses of bureaucratic red tape. Clear and simple laws for business conduct and tax laws that promote compliance rather than evasion are more likely to assist business, both large and small, than many of the specific 'promotion' schemes that are presented to government.

This does not mean that the government takes a 'hands off' position. Quite the converse is the case. The government needs to carefully establish the rules for market players and then enforce the rules. This is very different from arguing that the government should set minimal rules. Such rules are often imprecise and result in costly disputes that harm business.

A useful example is presented by the New Zealand experience with light-handed regulation in telecommunications. To minimise specific intervention, the New Zealand government decided to treat competition in telecommunications like any other industry, subject only to the provisions of the general competition laws. These laws are necessarily general and vague. Rather than promoting telecommunications competition, the reliance on general competition laws resulted in a dispute between Telecom New Zealand and Clear Communications that was appealed all the way to the Privy Council. The final resolution of this dispute satisfied legal requirements but did little to assist competition, leading the government to apply pressure to the relevant companies to settle their dispute in a way more conducive to competition in telecommunications.

It is arguable that the New Zealand experience in telecommunications competition has been no worse than the Australian experience, which has involved industry specific interventions. But this misses the key point. The light-handed approach adopted by New Zealand did not provide certainty for the industry. It failed the key test of good industry laws. The Australian laws, which involved selective entry between 1991 and 1997, may also fail this same test. Writing good legislation that establishes a stable business environment is not easy. It is, however, a critical feature of good policy to aid business.

## 10. Conclusion

Big business raises a variety of public policy issues. The chapters in this part of the book provide important insights for these policies. Overall, the chapters show that designing good public policy is difficult. Unfortunately, governments rarely seem to be willing to take the time or make the effort needed to design these policies. To this extent, poor performance by Australian industry may reflect poor government performance. This does not mean that firms need specific interventions to boost certain activities, but rather firms need clear concise rules to govern market interactions.

## Endnotes

1. See *Queensland Wire Industries Pty Ltd v Broken Hill Pty Co Ltd* (1989) 167 CLR 177 at p. 189.
2. See *Europemballage and Continental Can v Commission* (1973) 1 ECR 215 at p. 248.
3. For a more detailed discussion of price-cap rules see Armstrong, Cowan and Vickers (1994) and King (1998).
4. This is similar to the UK. In the US, however, price-caps and similar forms of 'incentive based regulation' are often reset each year. The relevant regulators in Australia include the Australian Competition and Consumer Commission (ACCC), the Victorian Office of the Regulator General (ORG) and the New South Wales Independent Pricing and Regulatory Tribunal (IPART).
5. This is called the Averch-Johnson effect. See Averch and Johnson (1962). For a general discussion on rate-of-return regulation, see Carlton and Perloff (1994).
6. See Philips (1995) for a survey of the economics of predatory pricing.
7. The Australian High Court explicitly recognised this problem in the case of *Queensland Wire v BHP*.
8. In response to this difficulty, legislators, when designing the rules for telecommunications under Part 11B of the Act, made it illegal for a telecommunications company with substantial market power to act in a way that has an anticompetitive effect.
9. For a discussion of this case, see Noll and Owen (1989) and Brennan (1987).
10. Much of the Competition Principles Agreement follows the recommendations of the Inquiry into National Competition Policy (the Hilmer report). See Commonwealth of Australia (1993).
11. Competition Principles Agreement at 2.4.b.
12. Competition Principles Agreement at 3.1.
13. Schmidt (1998) and Quiggin (1998).
15. For example, current limitations on delivery of standard letters by carriers other than Australia Post has led to a proliferation of courier companies. It is far from clear that the development of these companies is socially efficient.

16. While the arguments behind the report were compelling, Australia Post and relevant unions vigorously opposed the recommendations. The Coalition government rejected the report's recommendations in mid-1998.
17. See Australian Competition and Consumer Commission (1996) paragraph 5.18.
18. See Australian Competition and Consumer Commission (1996) paragraph 6.39.
19. See Quiggin (1996) for a brief review of Australian tariff policies.
20. See Gregory (1991).
21. Commonwealth of Australia (1997a).
22. See Commonwealth of Australia (1997a) chapters 6 and 7.
23. Commonwealth of Australia (1997b) p. vi.
24. See Hartcher (1998).
25. See Kim (1991).
26. The argument is similar to that presented in Porter (1990).
27. An interesting analysis of 'bidding wars' for sporting events in Australia is presented in Gans (1996). A similar issue arises with retaliation against trade barriers or other restrictions in foreign countries. It is sometimes argued that the government should selectively help firms that are disadvantaged by these barriers. In general, this retaliation tends to hurt other industries and reduce Australia's overall welfare. Distorting the domestic 'level playing field' is usually a bad response to international trading problems.
28. See Jorde and Teece (1990) for a discussion.
29. Whether an increase or a decrease in R&D is desirable depends on the relationship between the private level of R&D, both with and without the joint venture, and the socially desirable level of R&D.

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# 10 The Cost of Monopoly in Australia<sup>1</sup>

*Robert Dixon*

## 1. Introduction: Market Power and Inefficient Production

Market power, as we noted in Part 1 of this book, allows firms to make economic profits. A firm in a highly competitive industry will find that any economic profit it makes is swiftly competed away, while a firm in a less competitive industry can use its market power to raise the price it charges and maintain positive economic profits. But market power has broader social ramifications. When firms use their market power to raise prices, this leads to inefficient levels of production and a reduction in our standard of living.

To see this, take the standard static textbook case of a pure monopolist. In the simple textbook treatment, a monopoly raises price above the marginal production cost. Consumers pay a higher price than they would in a competitive market for the monopolist's product. The monopoly firm pushes up the price by reducing the amount it produces for sale. This has two effects. First, the monopoly gains increased profits at the expense of consumers who are paying a higher price for the good. This is a transfer from one group to another, which may or may not be viewed as a bad thing. Second, the reduction in output for sale leads to a loss to the economy that is NOT compensated by gains to the monopolist. As a result, not only do producers gain while consumers lose, but there is a loss to the economy which is unmatched by gains elsewhere. This net loss to the economy is what will be of interest here, and the IBIS database is well suited to generating estimates of the magnitude of this loss.

This analysis of pure monopoly can be generalised to take into account other forms of concentrated market structure: that is, situations where there is more than one producer, and hence not all the potential

monopoly power can be exercised. Some discussion of the implications of this for the estimates of the welfare loss calculated below, are presented later in the chapter.

Other costs may also be attributable to monopolistic outcomes. If firms achieve and maintain their monopoly position through lobbying government for legal monopoly status, then the lobbying or 'rent seeking' costs are a deadweight loss to society as well. It is essentially impossible to use the IBIS database itself to generate estimates of this cost to the economy. Therefore, any costs of this nature are in addition to those reported below.

Of course, bigger firms may not be all bad. If there are economies of scale, then as firms grow, they can exploit increasing returns to scale and produce at lower costs than could a smaller firm. There may also be 'dynamic benefits' to situations of market power that are missed in the static picture painted above. Market power may lead to greater product variety, faster rates of innovation and technological change and consequent faster growth.<sup>2</sup> If these dynamic benefits are more than simply illusory, then in principle they should be compared against the estimates of the costs of monopoly as found here.

There may be a relationship between market power and managerial quality. If a firm is run inefficiently then a takeover of this firm, while increasing market power, may also lead to more efficient production. This issue is explored in other chapters that focus on takeovers and mergers. The analysis in this chapter assumes that all firms are technically efficient — that is, all firms produce their chosen output at least cost — but that economic distortions arise through their pursuit of higher profits.<sup>3</sup>

In this chapter, the IBIS Enterprise database is used to estimate the size of the static welfare loss (particularly in the form of lost consumer surplus) due to the presence of monopoly elements in Australian business.

There has been only one previous published attempt to estimate the absolute magnitude of the welfare loss or the size of the welfare loss relative to turnover (and GDP) for this country. That attempt was by Hefford and Round (1978) and used ABS establishment (industry) data for Australian manufacturing for the years 1968/69-1973/74. They calculated that the welfare loss represented 0.15% of Manufacturing Turnover (Hefford and Round, p. 852). Their study essentially followed the method for measuring the cost of monopoly developed by Harberger (1954). That method has been subject to extensive criticism and today Harberger's method has been discarded in favour of methods which are derived explicitly from the formal analysis of the behaviour of profit maximising firms. Cowling and Mueller (1978) presented one

such method that is both widely accepted and which may be applied to datasets such as the IBIS Enterprise database.

The advantage of using the IBIS database to measure the size of the welfare losses due to monopoly is that it covers a large number of enterprises operating across a wide range of industries and markets in Australia.<sup>4</sup> This means that the results of this analysis, unlike previous studies for Australia, will not be restricted to manufacturing. Consequently, the results are likely to better capture the magnitude of the costs of market power to Australian society and to provide a benchmark against which any potential benefits of market power (should there be any) need to be weighed.

## 2. Estimating the Welfare Loss Due to Monopoly

The net loss of consumer surplus which is associated with the maintenance of a price higher than the competitive level for any one product depends on two key parameters: (i) the proportional deviation (or difference) in price; and (ii) the (own-price) elasticity of demand.<sup>5</sup> In other words, the uncompensated loss will depend on how far price deviates from the competitive level and how this price distortion feeds into the quantity of product sold. Once the loss associated with each product is determined, these values can be added together to yield an aggregate measure of the loss of welfare due to monopoly.<sup>6</sup>

Unfortunately, it is very difficult to obtain good information on either the proportional difference in price or the elasticity of demand for different products. Cowling and Mueller (1978) suggest a neat way to avoid this problem. Their method is based on the logic of profit maximisation for a firm which is either a pure monopoly or a member of a joint-profits maximising cartel.<sup>7</sup>

For a profit-maximising firm, there is a direct connection between the elasticity of demand for the firm's product and the extent to which price may be raised above marginal cost (i.e. the competitive price). If the elasticity of demand is very high then even a very small increase in price will be associated with a considerable drop in the quantity sold and thus revenue. In contrast, if the elasticity of demand is very low then firms may raise price a great deal and yet experience a very small drop in sales. A profit-maximising firm will take the elasticity of demand into account when setting its price. This means that the elasticity of demand is reflected in a firm's pricing behaviour, and we can infer the welfare cost from information about the firm. In particular, under certain assumptions it can be shown that the size of the welfare loss created by profit-maximising pricing by a monopolist is equal to one-half the size of 'monopoly profits'.<sup>8</sup> Once we have a measure of firm

profits, we can infer the size of the welfare loss from monopoly pricing.

The size of the monopoly profits may be assessed in various ways. One way is to use data on price — cost margins.<sup>9</sup> Another method, favoured by Cowling and Mueller amongst others, entails making a comparison of the actual rate of return on capital with a hypothetical 'competitive' rate of return. Using this method, the welfare loss due to monopoly depends upon the extent to which the actual returns are above the 'competitive' return and the size of the capital stock in the industry.

## **2.1 Limitations of the Cowling-Mueller Measure**

The Cowling-Mueller measure, like other empirical measures of the welfare loss due to monopoly, is subject to significant limitations. It is a measure of the static textbook cost of monopoly (in terms of lower social surplus), but it ignores other possible costs and benefits of greater market power. This may mean that it overstates the welfare cost of monopoly. Amongst other things, it neglects possible benefits from concentration such as greater product variety, faster growth and higher rates of innovation. It presumes that costs of production are independent of scale of plant, the size of firms and market structure.<sup>10</sup> The Cowling-Mueller method presupposes that all firms are either pure monopolies or members of joint-profits maximising cartels. Later in the chapter we weaken this assumption and see that it has a significant effect on the estimate for the costs of monopoly. In addition, the measure does not take into account trade. For example, if a firm was exporting 100% of its output then it would be treated the same as if 100% of its output was sold to domestic consumers. To the degree that market power raises foreign rather than domestic prices, however, we may be less concerned about any loss in welfare as this will reflect a loss of foreign rather than domestic consumer surplus.

The Cowling-Mueller measure may also underestimate the welfare cost of monopoly as it does not take into account costs such as advertising and other expenditures that may be regarded to be the costs of acquiring or maintaining monopoly positions. Judging by other studies, these costs could be very large.<sup>11</sup> Nor does it allow for the fact that the value of capital itself may reflect (at least in part) the profit earning capacity of the firm.

Put simply, there are a number of reasons why the Cowling-Mueller measure — or any other standard measure — may either overestimate or underestimate the welfare cost of monopoly. In this sense, the results in this chapter should be seen as a guide to the costs of monopoly, not the definitive 'final word'.

A technical issue that arises when measuring welfare loss is that we must make a decision about the treatment of observations where the actual return is less than the competitive return. We could regard this as a signal that the firm is over-expanded and assess the size of the welfare loss to the society, which is due to this. Alternatively, we could, following Cowling and Mueller (1978), treat these observations as indicative of disequilibrium and as unsustainable. In other words, they are temporary aberrations and can be ignored. This latter treatment is adopted in this chapter. In what follows, I will report estimates for the welfare losses arising from 'under-expanded' firms alone, that is for only those firms whose returns are above the 'competitive' level.

### 3. Estimates of Welfare Loss Using the IBIS Database

To compute the welfare loss we need to follow a number of steps using the data in the IBIS database. (a) First we need to calculate the amount of actual profits (defined below) for each enterprise in the database (in fact only private enterprises are included); then (b) we need to subtract from this an estimate of the amount of 'competitive profit' which that enterprise 'should' receive.<sup>12</sup> (c) The difference between the figure arrived at in step (a) and the figure arrived at in step (b) is then halved to get an estimate of the size of the welfare loss associated with each enterprise in the sample. (d) The estimate of the welfare loss for each enterprise where it is positive — and only where it is positive — is then summed<sup>13</sup> and the total computed. This is an estimate of the size of the aggregate welfare loss in dollars associated with 'monopoly'. (e) This total is expressed as a proportion of the total revenue for all enterprises, whether their return is above or below the 'competitive' return.

#### 3.1 Measures Used in this Study

1. The level of actual profits: For our purpose actual profits will be defined for each enterprise as net profit before tax plus the value of depreciation and net interest paid (this is defined as interest paid less interest received).
2. The hypothetical competitive rate of return: For a competitive enterprise the competitive rate of return is the minimum rate of profit compatible with long run survival, after allowing for risk. In the absence of anything better it is common to use the mean rate of profit for all enterprises in the sample.<sup>14</sup> For practical purposes this 'competitive' rate of return is best calculated by summing the actual profits (defined above as net profits before tax plus depreciation

plus net interest payable) of all of the enterprises in the sample and dividing the result by the sum of the value of capital (as defined below) for all enterprises in the sample.

3. **The value of capital:** There is no single measure which is satisfactory. One option is to measure it simply as the total value of assets. However, since the value of goodwill and possibly other intangibles are likely to be the capitalised value of monopoly profits, it could be argued that these should be excluded from the value of assets.<sup>15</sup> In this event the value of capital for each enterprise would be calculated as the value of tangible assets only. I actually performed two sets of calculations of welfare loss. One using Total Assets and one that uses tangible assets alone. It turns out that it makes next to no difference which of these two measures of capital or rate of return is used. In the main text only the measure of welfare loss that is based on the rate of return on tangible assets is reported. The size of the loss when calculated using the rate of return on total capital will be given in endnotes at appropriate places. It will be seen that the difference between the two is very slight.
4. **Total revenue:** This is defined as sales revenue plus 'Other Revenue'.<sup>16</sup>

### **3.2 The Time Period Considered**

The data used in this study is for the years 1992, 1993 and 1994. The sample period begins after the start of the 'recovery' from the recent recession (defined as when the unemployment rate stopped rising) and ends in the last year for which sufficient data is available. In addition the data for the three years has been averaged to reduce the influence of transitory phenomena on profitability.

### **3.3 Enterprises Included**

Only private enterprises that were in the database for all three years were included in the study. I have examined two groups of enterprises. First, I have made estimates of the cost of monopoly for only those enterprises classified as manufacturing. There are 377 enterprises in this group in the IBIS database over the study period and comparisons with ABS data suggest that these enterprises make up a very high proportion of manufacturing industry in Australia. Second, I have made estimates for a much larger group made up of all private enterprises in the IBIS database over the three years in question, excluding banks and non-bank financial institutions (NBFIs). There are 937 enterprises in this group.

### **3.4 Results for 'Manufacturing' Enterprises Alone**

The reason for looking at this group alone is that it will enable the results from the IBIS database to be compared with those from other Australian studies.

The average rate of return for Manufacturing Enterprises, when actual profits as defined above are expressed as a proportion of their total tangible assets, is 12.6%.<sup>17</sup> (Ten-year bond rates were averaging around 8% in nominal terms over the period.)

The welfare loss measured by the Cowling-Mueller method (that is, the loss associated with under-expansion and thus above average returns) when expressed as a proportion of total revenue (i.e. the revenue of all manufacturing enterprises in the sample — whether under- or over-expanded) is 1.33%.<sup>18</sup> Separate estimates based on establishment data from the ABS data suggest it was 1.37%<sup>19</sup> in the early 80's, so the IBIS data seem to be giving a 'sensible' figure. Recently published ABS data for both manufacturing establishments and Manufacturing Management Units suggest that aggregate manufacturing turnover is about 2.5 times the size of aggregate value added. If this were true of the manufacturing enterprises in the IBIS database this would suggest that the welfare loss associated with under-expansion (above average profits) is around 3.33% of manufacturing value added.<sup>20</sup>

### **3.5 Results for All Private Enterprises Excluding Banks and NBFIs**

The average rate of return for all private enterprises excluding banks and NBFIs over the period (1992-94) is 10.6% when capital is defined as tangible assets only.<sup>21</sup>

The welfare loss measured by the Cowling-Mueller method for this group of enterprises when expressed as a proportion of total revenue (i.e. the aggregate revenue of all private enterprises excluding banks and NBFIs in the sample: whether under- or over-expanded) is 1.38%.<sup>22, 23</sup>

## **4. Comparisons with Other Studies**

Unfortunately the IBIS database does not provide us with data for value added or contributions to Gross Corporate Product (GCP). For this reason, the results reported above cannot be compared with most studies undertaken overseas. There is one important exception however and that is the Cowling-Mueller study because, although they report welfare loss as a proportion of GCP, they do tell us the relationship between GCP and turnover for the US firms in their study. Cowling and



Mueller find that the welfare loss in the form of lost consumer surplus was approximately 1.4% of turnover for the 734 (large) US firms in their sample for the period 1963-66.<sup>24</sup> We may conclude that the size of the welfare loss for Australia appears to be comparable as a percentage of turnover with that for the US.

## 5. Estimates of the Welfare Loss Allowing for Departures from Pure Monopoly

The previous analysis rested on the assumption that Australian industry behaved identically to (as if it was) a single monopolist maximising total profits. We can relax this assumption and allow for the possibility that firms will compete with each other for profits. This implies that the economic inefficiency caused by market power will be less than it would be in the case of pure monopoly (or joint-profits maximising, perfectly collusive oligopoly).

In the event that firms are neither a pure monopolist nor part of a perfectly collusive cartel, the Cowling-Mueller measure will overestimate the size of the welfare loss. In Dixon (1997) I consider the way in which the Cowling-Mueller measure has to be modified if firms are colluding oligopolists but their collusion falls short of being perfect (i.e. where firms do not act to maximise joint profits). This seems an important adjustment because, although Australian industry is highly concentrated by conventional measures, it is not immediately obvious that pure monopolies or cartels dominate it. For this reason we must be concerned about the sensitivity of our results to the rather extreme assumption about seller structure and behaviour which lies behind the Cowling-Mueller measure. In what follows I describe how the estimates of the welfare loss reported in the previous section are affected if we allow for the case where firms can be characterised as belonging to (homogeneous) oligopoly but are not attempting to maximise joint profits.<sup>25</sup>

The important scaling factors — the items of information which would tell us how much the estimates above need to be adjusted when allowing for imperfect collusion between oligopolists — concern the degree of industry concentration (measured by the Hirschman-Herfindahl index, discussed in Chapter 6) and the degree of collusion between firms in an industry. Having information on both of these would allow us to quantitatively adjust the earlier estimates. However, we simply do not have measurable values of these parameters for the enterprises in the IBIS database. Dixon (1994) provides evidence on them for some Australian manufacturing industries. Using these figures suggests that the true loss of consumer surplus might only be one-third that indicated by the application of Cowling and Mueller's measures.<sup>26</sup>

In the absence of other information I will assume that the figure just arrived at for manufacturing (that the true loss is only one-third the loss arrived at under the Cowling-Mueller assumptions) may be applied to the manufacturing enterprises in the IBIS database. In this event, the estimate of the welfare loss due to monopoly amounts to around 0.44% of manufacturing turnover. It is not sensible to use this approach outside manufacturing. All we can say for all non-financial enterprises is that the welfare loss, once we allow for imperfect collusion will be only some fraction of 1.4% of turnover.

## 6. Conclusions

The IBIS database does allow estimates to be made of the social cost of monopoly due to lost consumer surplus. When only manufacturing enterprises are included, the estimates are similar to those which result from the application of other datasets for Australian manufacturing. When all private enterprises (excluding banks and NBFIs) are included the estimate of the loss is around 1.4% of turnover. However, this figure is biased upwards as it presumes that all enterprises are operating as a pure monopoly. If we take this into account the welfare loss may be only one-half of one per cent of turnover.<sup>27</sup>

### Endnotes

1. I would like to thank Stuart Kells for his assistance in preparing this chapter.
2. These claims are assessed in other chapters but overall the evidence in support of the view that market power leads to greater innovativeness is slender.
3. Stiglitz (1994) Ch. 7, discusses the changing professional view of the costs of monopoly to an economy. He also discusses issues not raised here, including strategic considerations and contestability.
4. It is estimated that these enterprises contribute around 60% of Australia's GDP.
5. This is a measure of the sensitivity of the quantity demanded to changes in price.
6. For an exposition in more formal terms using a little mathematics, the reader is referred to Dixon (1997).
7. This is the name given to the situation where there is more than one firm in the industry but they are colluding in such a way that they behave as if they were a single firm.
8. For mathematical proof and a statement of the assumptions required, see Cowling and Mueller (1978) or Dixon (1997).
9. This is the approach utilised by Hefford and Round (1978) and Dixon, Gunther and Mahmood (1996) in their studies of Australian manufacturing both studies relied on ABS four-digit data for value added and turnover to calculate margins.

10. Implicit is the assumption that firms produce a single product and face a single demand curve or can be regarded 'as if' this were the case.
11. For further discussion see Tullock (1967) and Posner (1975). The original Cowling-Mueller paper (1978) did attempt to measure the size of the costs. Unfortunately, the IBIS database does not provide information on selling expenses.
12. This latter figure (the level of profit which corresponds to a competitive outcome) is arrived at by multiplying a hypothetical rate of return (defined below) by the value of capital (defined below).
13. Following Cowling and Mueller we disregard enterprises where it is negative.
14. Note that this mean will itself contain a monopoly element and so the estimate of the welfare loss will be biased downwards on this account.
15. See Stigler (1956, p. 34f), Harberger (1954) and Cowling and Mueller (1978) for a discussion of this.
16. Other revenue is less than 5% of total revenue for all enterprises.
17. When actual profits as defined above are expressed as a proportion of their total assets this yields an average rate of return of 11.8% (intangibles and goodwill being only 5.3% of total assets).
18. If total assets are used as the base when calculating the competitive rate of return the welfare loss turns out to be virtually the same, 1.34%.
19. See Dixon et al. (1996, p. 10).
20. Dixon et al. (1996, p. 10) estimate that the loss was 3.5% of manufacturing value added in the early 80's.
21. It is 10.1% when capital is defined as total assets including goodwill and other intangibles.
22. If total assets are used as the base when calculating the competitive rate of return, the welfare loss due to under-expansion (above average profits) is 1.35% of total revenue.
23. If costs due to under- and over-expansion are both included, the figure for the welfare loss is 2.8% of total revenue.
24. Cowling and Mueller (1978) report the loss as 3.96% of Gross Corporate Product in Table 2 of their paper. In the last footnote to the paper they report that the ratio of corporate sales to GCP is 2.873.
25. A theoretical discussion of other variations on this theme, including the measurement of welfare loss if the group of firms is in a Nash-Cournot non-co-operative equilibrium, may be found in Dixon (1995). It may well be preferable, if data would allow, to measure the welfare loss against the Cournot outcome as a benchmark. The IBIS data do not allow this to be done.
26. See Dixon (1997).
27. One-third of 1.4 is 0.47. It should be remembered that the estimates reported in this paper do not take into account advertising and other 'Posner' costs of obtaining and maintaining a monopoly position.

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# 11 Mergers and Takeovers: Should We Be Concerned?

*T.J. Brailsford and S.R. Knights*

## 1. Introduction

In the hard world of business, takeovers are an emotive issue. When foreign companies seek to acquire Australian firms, such as Arnotts, there are howls of outrage. Public pressure leads federal governments of all political persuasions to oppose mergers in certain industries, such as banking. Even when takeovers do not raise public outcry, the acquisition must still pass the scrutiny of the Australian Competition and Consumer Commission (ACCC). As noted in Chapter 9, takeovers and mergers that lead to a substantial reduction in competition are unlawful.

But takeovers also offer many benefits and are a key feature in improving the efficiency of big business. If a firm is operated badly, then a takeover offers one way to improve firm performance. Poor managers who may face limited scrutiny from dispersed shareholders can be fired after a takeover. Firm assets that are being under utilised can be redeployed and synergies between the acquiring firm and the takeover target can lead to lower production costs.

The 'two-faces' of takeovers creates a problem for public policy. Are takeovers desirable as they lead to efficient production or are they harmful because they raise market power? To answer this question we need to more fully understand the motives behind takeovers and the consequences of takeovers. These issues are addressed in this chapter and Chapter 12.

## 2. Overview

The standard view of a takeover involves one corporation acquiring control over the net assets of another through the purchase of voting

equity shares. Invariably, the acquiring management team believes that it can do a superior job of managing the target's resources than the incumbent management. That is, the acquiring management believes that the target is currently undervalued relative to its potential value. Consequently, the acquirer is willing to offer a price above the current market value to induce the target company's shareholders to sell. Moreover, the acquirer can afford this control premium because it believes it will create additional value once it has control of the target's resources. The perceived increase in value is generally argued to arise from synergies between the companies such as economies of scale, cost reductions, enhanced efficiencies, and more effective use of free cashflows and complementary resources.

If markets work efficiently then takeovers are beneficial to the economy. Target shareholders receive a selling price for their shares in excess of market value when they sell at the higher offer price. Acquiring shareholders receive an increase in net wealth because of the synergies that flow to the enlarged entity as a result of the acquisition. Investors in general benefit from an efficient market for corporate control. The economy receives the benefits of a more efficient use of scarce resources. When takeovers act as an effective disciplinary tool, the threat of a takeover forces incumbent management teams to operate to maximum efficiency.

However, market failures may exist which reduce the effectiveness of takeovers. A takeover may create a large firm with substantial market power. The potential costs of market power were discussed in Chapter 9 and estimated in Chapter 10. In addition, takeovers that reduce value may occur. This may happen, for example, when acquirers make a mistaken assessment of the benefits of size in a given industry.

Empirical evidence on the benefits of takeovers is mixed. Differences in methodologies, samples and markets have yielded inconsistent results, especially concerning the returns to acquiring companies. The majority of research has concentrated on measuring performance by movements in (adjusted) stock prices. In both this chapter and Chapter 12, we re-examine the evidence on takeovers in Australia using information from the IBIS and other databases. In particular, in this chapter we consider the Australian evidence on the financial performance of acquiring companies following a takeover and examine the relationship between financial performance and various financial and non-financial measures which proxy for possible sources of change in firm performance.

Which firms are most likely to take other firms over? Do efficient firms that are intent on extending their good performance to other firms

carry out takeovers? Or do firms take other firms over in an attempt to 'drag up' their own performance? We find that bidder firms perform worse than average in their respective industries, both before and after a takeover. Rather than being 'star performers' seeking to spread their success, bidding firms are on average industry underperformers. But a takeover does not seem to drag up performance. Quite the converse, bidder firms perform worse after a takeover than before.

Do firms use takeovers to diversify their operations or are takeovers used to improve a firm's core business operations? We show that from 1981 to 1992, takeovers were more likely to reduce the degree of bidder diversification. In particular, horizontal takeovers usually increased the market share of the acquiring firm in its core business. Of course, this raises concerns about the effect of takeovers on market power and competition.

Do takeovers reflect synergies that reduce the bidder's costs? Or do takeovers create a new burden for the acquiring firm that drags down their performance? Our results indicate that bidder firms experience an increase in costs after the takeover.

Are takeovers an excuse to cut the size of a firm's workforce? The evidence is not consistent with the claim that bidders retrench large numbers of employees following takeovers.

We derive our results using both financial and non-financial measures. This is deliberate. There is little evidence of the impact of takeovers on non-financial measures in other studies previously conducted. Hence, our analysis offers some insight into the driving forces and motivation behind corporate acquisitions.

### 3. Measuring Financial Performance

Studies that examine the impact of takeovers generally fall into two groups. The first group deals with an examination of the effects of takeovers on share prices. The second group focuses on changes in reported accounting numbers, particularly profitability ratios, following a takeover.<sup>1</sup>

To the degree that share prices reflect an unbiased estimate of firm value, changes in share prices show the value of a takeover. In contrast, using accounting numbers to estimate the value of a takeover has traditionally been criticised for a number of reasons. For example, Stanton (1987) argues that accounting rates of return are biased measures because of distortions that can arise from the application of different accounting policies.

However, recently share price studies have also come under criticism for a number of reasons. Reliance on share prices for the purpose

of establishing performance implicitly relies on the assumption of an efficient stock market, but this assumption has been questioned. The focus on share valuation effects implicitly assumes that the market is able to forecast changes in market share (e.g. Limmack and McGregor 1995). In addition, there is now evidence of a strong relationship between accounting earnings and stock prices, particularly over the long term (Easton, Harris and Ohlson 1992), suggesting that accounting data may provide useful information.

Hence, recent studies of takeovers have focused on measures of performance other than share prices. Simon, Mokhtari and Simon (1996) study mergers in the advertising industry in the US using *revenues* as the primary variable of interest. They compare merged and non-merged firms and report an implied loss in firm value of around 16% for the merged firms. Healy, Palepu and Ruback (1992) examine the post-acquisition performance of the largest 50 mergers in the US during the 1980s. They focus on accounting data using industry ratios as benchmarks. Their results support a significant post-merger increase in the performance measure with 70% of firms demonstrating above-average performance. Kim and Singal (1993) and Singal (1996) examine changes in the product market following airline mergers in the US. Both studies report increased market power and more efficient operations following the merger activity.

In this chapter, we build upon recent approaches that assess performance using measures other than share prices, and analyse the performance of bidders in the Australian market following corporate acquisitions. The study focuses on *cash-flow from operations* as the primary performance measure. We examine the association of performance with a range of both traditional financial and non-financial measures. In particular, we are concerned with three non-financial aspects — employment, diversification and market share. The last variable implicitly captures a measure of industry competition.

This evidence provides an insight as to the possible sources of gains (or losses) following a takeover. Such evidence provides practical direction for management. Further, this evidence provides information to the policy-makers on whether and where takeover gains might or might not arise which has implications for setting future policy.

## 4. Results

The methodology behind our study is briefly summarised in section 5 below. For a more complete description, the reader is referred to Brailsford and Knights (1998). In this section, we present our key results.



## 4.1 Effects of Takeover on All Bidder Firms

Do potential bidder firms out-perform the market before a takeover? Does a takeover improve their performance?

Table 11.1 (below) provides descriptive statistics of a raw annual performance measure (cash-flow from operations) from three years prior to three years post the date of takeover. The figures indicate that nearly all bidder firms are profitable both before and after the takeover, with positive cash-flows for almost 90% of firms in each year. However, there is a drop in both the mean and median cash-flow following the takeover.<sup>2</sup> For instance the median cash-flow return in each of the

**Table 11.1 Annual CASHFLOW (Expressed as % of Total Assets) Before and After Takeover**

	<i>t - 3</i>	<i>t - 2</i>	<i>t - 1</i>	<i>Pre</i>	<i>t + 1</i>	<i>t + 2</i>	<i>t + 3</i>	<i>Post</i>
No.	251	267	275	793	303	311	318	932
Median	12.70	12.60	12.00	12.10	11.80	12.10	11.05	11.75
Mean	12.38	11.41	11.08	11.60	9.90	11.13	8.96	9.99
Std Dev	13.01	13.94	13.04	13.34	14.04	12.33	17.46	14.80
% Positive	91.2	92.1	91.3	91.7	89.1	91.3	89.3	89.8

*Notes:* CASHFLOW is defined as operating profit before interest, tax and depreciation divided by total assets.

The period 'Pre' covers all three years prior to the takeover.

The period 'Post' covers all three years following the takeover.

**Table 11.2 Annual Industry-Adjusted CASHFLOW (Expressed as % of Total Assets) Before and After Takeover**

	<i>t - 3</i>	<i>t - 2</i>	<i>t - 1</i>	<i>Pre</i>	<i>t + 1</i>	<i>t + 2</i>	<i>t + 3</i>	<i>Post</i>
No.	130	171	197	498	218	220	217	655
Median	-1.04	-0.08	-1.89	-1.35	-2.51	-1.47	-2.12	-2.11
Mean	-1.09	-2.44	-2.14	-1.97	-4.31	-2.65	-4.11	-3.69
Std Dev	9.06	11.75	12.81	11.56	12.62	12.24	16.66	13.97
% Positive	39.2	45.0	41.6	42.2	35.3	37.7	37.8	36.9
t-test	-1.37	-2.22*	-2.35*	-3.80*	-5.16*	-3.20*	-3.63*	-6.76*

*Notes:* Industry-adjusted CASHFLOW is CASHFLOW less the industry average CASHFLOW for each period *t*.

The period 'Pre' covers all three years prior to the takeover.

The period 'Post' covers all three years following the takeover.

t-test is difference from zero.

\* indicates significance at 5%.

three years prior to the takeover is 12.10% and falls to 11.75% in the three years following the takeover. The post-takeover period is also more volatile. A similar decline in performance has been noted elsewhere (Healy et al. 1992) but these numbers need to be further examined in light of industry movements.

Table 11.2 (above) presents the industry-adjusted cash-flow figures and results for the change in cash-flow. Given the difficulty in obtaining averages for some industries, the sample size is reduced compared with Table 11.1. On average, bidder firms perform worse than their industry average in all years surrounding the takeover. This difference is significant for all years except  $t - 3$ . This result is somewhat surprising as it is often argued that bidder firms are superior performers prior to the takeover. Share price studies typically find evidence of positive abnormal returns leading up to the bid. **Using cash-flow as the performance measure, we find no consistent evidence of superior performance either before or after the bid.** The industry-adjusted cash-flow figures show continued under-performance after the takeover. Moreover, the difference between the means of industry-adjusted cash-flow before and after the takeover is statistically significant. **This implies that bidder firms perform worse after the takeover than before.**

These results are generally consistent with the share price reaction studies that show few benefits to bidders from takeovers. Moreover, studies of long-run share price performance have generally shown bidders to under-perform over periods of three to five years post-takeover (e.g. Franks, Harris and Titman 1991). However, more recent evidence has suggested that aggregate tests 'hide' results and that bidder samples should be disaggregated. To check whether pre-bid performance is related to the success of a takeover, we decomposed the bidder sample on the basis of pre-bid performance. **Overall, there was no significant difference in post-takeover performance between 'good' (i.e. high cash-flow) and 'bad' (i.e. low cash-flow) pre-takeover bidders.**

## **4.2 Other Factors Affecting Performance of All Bidder Firms**

We now turn to other issues surrounding takeovers. Do tax laws motivate them? Do they lead to substantial labour shedding? And are they a way for firms to diversify operations?

Looking at Table 11.3 (below), the first row (MKTSHARE) indicates that successful bidders increase their market share by around 8% per annum in the three years following a takeover, although the increase is not reflected by a significant difference in means pre- and post-takeover. This increase is consistent with a reduction in internal diversification. **In general, firms appear to engage in horizontal**

**takeovers where their share of the market for their core business is enhanced through the acquisition of competitors.**

The second row shows that revenue as a percentage of total assets significantly increases post-takeover while the operating margin (third row of Table 11.3) significantly decreases post-takeover. This implies that bidding firms become more efficient in utilising their asset base to generate revenue but they are unable to translate this into enhanced cash-flow from operations. **Thus it appears that bidders experience an increase in costs in the post-takeover period.**<sup>3</sup>

Employment is considered in the fourth row. Employment growth is around 3-4% in each year and appears reasonably stable. **This evidence is not consistent with the claim that bidders retrench large numbers of employees following takeovers.**

The fifth row indicates that the effective tax rate increases post-takeover although again the change is not significant. **Therefore, this evidence does not support taxation providing a strong motive for takeover.**

**Finally, DIVERSE indicates that firms have become less diversified following a takeover,** although the difference in means is not significant. The small reduction in diversification is consistent with the arguments concerning corporate focus (see Chapter 8). Firms attempt

**Table 11.3 Median Values of  
Explanatory Variables Before and After Takeover[**

	<i>t - 3</i>	<i>t - 2</i>	<i>t - 1</i>	<i>Pre</i>	<i>t + 1</i>	<i>t + 2</i>	<i>t + 3</i>	<i>Post</i>	<i>t-test</i>
MKTSHARE(%)	-5.09	1.30	2.76	1.49	8.15	10.14	6.44	8.02	0.30
REV(%)	83.08	82.22	73.44	79.00	84.81	80.77	79.15	80.06	2.44*
MARGIN(%)	16.29	17.36	18.40	17.06	14.06	14.05	13.34	14.05	-4.85*
EMPLOY(%)	5.40	3.32	7.53	4.33	5.96	0.08	3.14	3.03	-1.06
TAX(%)	13.98	19.13	17.46	15.96	24.47	20.42	20.58	22.54	1.23
DIVERSE	0.585	0.567	0.635	0.585	0.627	0.627	0.653	0.627	0.75

Notes: t-test is for difference in sample means.

\* indicates significance at 5%.

MKTSHARE is the annual change in the ratio of a firm's revenue to total revenue of the industry.

REV is revenue divided by total assets.

MARGIN is cash-flow from operations divided by revenue.

EMPLOY is the annual change in the number of employees.

TAX is the effective tax rate.

DIVERSE is a measure of the level of internal diversification.

The period 'Pre' is each of the three years prior to the takeover.

The period 'Post' is each of the three years following to the takeover.

to enhance performance by returning to core activities and reducing the level of internal diversification.

## **5. Description of Data and Methodology**

### **5.1 Data**

The data on takeovers used in our study was derived from three sources. First, the Australian Stock Exchange (ASX) maintains an annual summary of takeover bids made on the ASX. Second, data on takeovers from 1974 to mid-1985 have been compiled by the Centre of Independent Studies (CIS) and used by Bishop, Dodd and Officer (1987). Finally, we also accessed Corporate Adviser, which is a commercial organisation which maintains a database on takeover activity in Australia.<sup>4</sup> The combination of these three sources was used to construct a takeover database for the purposes of this project. The period 1981 to 1992 was selected for our analysis to provide the largest possible sample given the requirement to match firms on the two takeover databases with firms on the IBIS database.

As the study aimed to examine the impact on bidding firms of a takeover, only successful takeovers were examined. A successful takeover was defined as one in which at least 50% of the voting shares in the target were acquired, unless otherwise specified. Over the sample period, there were 904 successful takeover bids initially identified.

For each takeover, the record was matched against the IBIS database using company names. Takeovers were eliminated if neither the bidder nor target resulted in a match. This process reduced the sample to 385 bidder matches and 394 target matches. We then focused on bidder firms so the initial sample was 385. From this sample, seventeen firms were subsequently excluded due to the lack of associated financial data.

The final data used thus came from 368 successful takeover bids. This represents approximately 40% of all successful bids during the period surveyed.

### **5.2 Methodology**

To reach the results presented in section 4 (above) we examined the association between takeovers and a number of economic variables.

First, we looked at the annual cash-flow from operations (CASHFLOW). The IBIS database provided a cash-flow variable but this was a crude construct. Instead, we used our own cash-flow measure constructed as net profit before tax, interest and depreciation, divided by

total assets. We believe that CASHFLOW provided an adequate measure of the annual return of a firm; and, importantly, it is not affected by a firm's capital structure or by accounting for accruals.

Next, we examined market share (MKTSHARE). This variable was constructed as the annual change of the ratio of a firm's revenue to the total revenue of its industry.<sup>5</sup> This variable provided some indication of changes in industry competition and the firm's potential for price-setting. The ASIC industry codes were used for the purposes of industry classification.<sup>6</sup>

We then examined revenue (REV). The variable was defined as a firm's revenue divided by total assets at year-end. REV seeks to assess whether performance is related to the firm's relative revenue base (instead of being related to relative reductions in costs).

Fourth, we examined margin on sales (MARGIN). MARGIN was defined as cash-flow from operations divided by revenue.<sup>7</sup> The greater the value of MARGIN, the lower the operating costs per unit of revenue. In theory, the product (REV times MARGIN) is equivalent to CASHFLOW.

The annual percentage change in the number of employees (EMPLOY) was examined next. This variable provided an indication of cost reductions following a takeover through changes in the labour base and an indication as to changes in the product cost and input mix. This variable provided some evidence to evaluate the often-cited claim that takeovers result in substantial redundancies and contribute to unemployment (e.g. Feros and Lewis 1989).

Sixth, we examined the effective tax rate (TAX). This variable was defined as tax expense divided by operating profit before tax.<sup>8</sup> This allowed us to assess the importance of tax-based incentives for corporate acquisitions (e.g. Brealey and Myers 1991).

Finally, we examined the level of firm diversification (DIVERSE). The higher the value of DIVERSE, the lower the level of diversification, so that a firm operating in a single industry 'segment' would have a value of 1. The variable was included to test recent work which appears to demonstrate that diversified firms are prone to poor performance and become targets themselves (e.g. John and Ofek 1995).

Some variables will change due to market and industry influences, thereby distorting time-series comparisons. To control for contemporaneous but unrelated events, we adjusted the variables CASHFLOW, REV and MARGIN for their industry trend.<sup>9</sup> For each variable in each year, the industry mean was subtracted from the variable to obtain an adjusted measure.

We selected three years either side of the year in which the takeover occurred as the window for examination. Studies that have used a

similar methodology have generally used either three or five years. For instance, Healy et al. (1992) used five years but also found that their conclusions were insensitive to the use of three years. Three years may be judged as sufficiently long to allow for the effects of the takeover to materialise but short enough to avoid extraneous effects. The year of the takeover is excluded because of potential distortions induced by accounting for the takeover. Moreover, once-off costs of the takeover are likely to be accounted for in the initial year.

## 6. Conclusions

This chapter has examined the performance of bidding companies in the Australian market for corporate control over the period 1981 to 1992. Our results indicate that bidder firms are profitable in the sense of positive cash-flow returns both before and after takeovers. However, the post-takeover performance indicates a decline in performance. When the cash-flow measure is adjusted for industry effects, we find evidence of under-performance both before and after takeovers. The post-takeover industry-adjusted performance is worse than pre-takeover performance. We also find a significant increase in bidder revenue following a takeover but a decline in operating margin suggesting that costs following a takeover increase.

There are a number of caveats to our results. First, we have some concern over the accuracy of some of the data. We found a number of instances where calculated numbers simply did not make sense. In these cases, we excluded the data. However, this is an ad-hoc procedure to data verification and potentially invalid data remain in the analysis. Further, the sample size varied considerably across variables making comparisons difficult. Second, the presence of outliers creates mixed signals as there are instances where mean and median values provide opposite interpretations. We have used parametric statistical tests and we have some concern over their appropriateness. Third, the measure of cash-flow is a relatively crude measure and still includes some accruals and hence is subject to distortions induced by accounting policies. Fourth, the data are subject to survivorship bias, although intuitively this would appear to militate against our findings. Fifth, the adjustments for industry effects rely upon correct industry classification and are subject in some industries to outlier influence when there are few data available within the industry. Moreover, the research method implicitly assumes that the industry average is the appropriate benchmark for performance. Finally, we suspect that the sample period is somewhat unique mainly covering the 1980s in Australia when the takeover market comprised some high-profile conglomerate raiders.

## Endnotes

1. Chatterjee and Meeks (1996) provide a review of the two groups of studies.
2. While we report the mean values, we prefer to focus on the median values given the presence of substantial 'outliers' in the data. For a brief discussion of 'outliers' see Chapter 3.
3. A direct test of this proposition is not possible due to the absence of cost figures in the database.
4. Corporate Adviser is now controlled by the Securities Data Corporation.
5. The definition of industry is limited to the IBIS database. Hence, total industry revenue is limited to those firms on the database and will probably understate true industry revenue. However, as we are interested in relative changes, there is unlikely to be any systematic bias.
6. There are thirteen ASIC industry groups. Further breakdown into industry sub-groups is possible but the sample size becomes so small such that a few companies dominate the grouping leading to extreme values of the variable 'market share'.
7. Ideally, sales revenue would be used. However, this variable was only available for 47% of the sample years. Hence, total revenue was employed. There is little impact of this change as the correlation between sales revenue and total revenue for those records for which data are available is 0.9913. Therefore, total revenue is a close proxy for sales revenue.
8. In cases where the effective tax rate is less than zero due to negative earnings, the value of TAX is set to zero.
9. It makes little sense to adjust the variable TAX for industry averages as large negative effective tax rates result which are difficult to place an economic interpretation on. Moreover, while some elements of the tax system are industry specific, the effective tax rate can be substantially influenced by company-specific circumstances.

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# 12 Mergers and Takeovers: The Case of Petroleum

*Charles E. Hyde*

## 1. Introduction

Size and market power may be socially undesirable characteristics of firms. As Robert Dixon showed in Chapter 10, market power may cost Australia around 1% of total income or more than \$4 billion per year. From a social perspective, bigger business may not be better.

Mergers are controversial for two reasons. They turn small and medium size firms into big firms, and they may help big firms avoid competition. But as Williamson (1968) noted, mergers may also enable firms to reduce costs and produce more efficiently. Mergers may help remove inefficient managers, but may also reflect managerial empire building, as Brailsford and Knights discuss in Chapter 11.

Other chapters in this volume consider mergers on a broad scale. They consider the effects of mergers and market power over all industries. This chapter in contrast, focuses on one industry. We consider the effects of mergers in the Australian petroleum industry. Have these mergers simply resulted in greater market power, to the detriment of consumers? Or have these mergers benefited society, for example, by lowering production costs.

The petroleum industry provides an excellent case study to analyse alternative theories of merger. The industry is clearly important, particularly in Australia where our economy has a large primary industry sector that is fossil fuel intensive. The industry has undergone considerable 'consolidation' in the last twenty years. In 1980 there were nine major oil companies ('oil majors') operating in Australia. By 1994 there were only five. Indicators of industry concentration, such as the *Herfindahl index* have consequently increased over this period.<sup>1</sup> Concerns about the level of competition in the Australian

petroleum industry have resulted in numerous studies and reports. For example, both the Industry Commission (1994) and the Australian Competition and Consumer Commission (1996) examined the industry to determine, in part, its degree of competitiveness. The two bodies came to quite different conclusions regarding the contestability of the industry, and thus the need for it to be regulated.<sup>2</sup> While contestability is supported by the entry into the Australian market that has occurred at various times, evidence from other countries where the industry has a similar structure (e.g., the US and Canada) suggests that it may not be very competitive (Borenstein and Shepard 1996; Slade 1987).

Of course, one industry study does not imply that other industries will behave in a similar fashion. Analysing historic data does not imply that the petroleum industry will behave in the same way in the future. But the type of case study presented in this chapter does provide an essential input into public policy debate.

In order to analyse the effects of consolidation in the Australian petroleum industry, we examine how the profitability of each of the major oil companies has changed over the period 1980-94, during which four mergers have occurred.<sup>3</sup> Specifically, we estimate the relationship between profitability and concentration for each firm. From this we infer whether there exists support for one of three hypotheses: that mergers have resulted only in an **increase in market power**; an **increase in efficiency**; or a **decrease in efficiency** for the merged firm. Our results show that there was a strong negative relationship between concentration and profit in the petroleum industry. In other words, as firms merged, industry profits were falling. Our results indicate that increased efficiency is the most likely factor to have driven petroleum industry mergers in Australia.

## 2. Previous Work

There are several strands of research relevant to this study. One is the research on the structure and performance of the petroleum industry. Another is the literature on mergers, the empirical studies being mainly event studies of particular mergers. Third, there is the literature on the relationship between concentration and profitability, which is clearly relevant since mergers directly alter the industry concentration. There are relatively few studies of the petroleum industry, the most notable being the US study by Gabel (1979), who attempts to estimate the relationship between concentration, profitability, barriers to entry and other conventional structure conduct performance variables. He observes a negative relationship between the refinery mark-up and

concentration, suggesting that mergers do not facilitate the exercise of market power.

Studies of the profit-concentration relationship, both theoretical and empirical, are numerous. We attempt only to summarise in general terms what has been learnt about this relationship. Not surprisingly, the results from a wide range of industries and countries are very varied. However, typically a positive relationship is observed — more concentrated industries mean higher profits for the firms in those industries — although it is often weak and not statistically significant (Fairburn and Geroski 1989). See Weiss (1974) for a survey of the early literature.<sup>4</sup>

However, the above analyses are typically cross-industry studies, which fail to account for important industry-specific explanators such as the elasticity of demand. Industry-specific studies indicate that the positive relationship is strongest in consumer good industries in which goods are highly differentiated, and in industries populated by large firms (Martin 1993). While the degree of differentiation between products in the petroleum industry is low, it is also clearly dominated by large firms. Thus, it is not clear whether to expect this industry to exhibit a strong positive profitability — concentration relationship or not.

There are also numerous event studies of mergers that compare stock prices pre- and post-merger. Stillman (1983) and Eckbo (1983) find efficiency considerations, rather than market power, better explain mergers. Using accounting data, Lichtenberg and Siegel (1987) also find that mergers result in increased efficiency of the merged firm. Thus, while event studies suggest that mergers are often desirable due to increasing economic efficiency, the balance of evidence from profit-concentration studies could be interpreted as saying the opposite.

### 3. Analysis

As stated, the three hypotheses are that mergers result in: increased market power; increased efficiency of the merged firm; or decreased efficiency of the merged firm. Each of these hypotheses has different implications for the relationship between industry concentration (which increases as mergers occur) and profits, which will enable us to assess which of the three sits most comfortably with the evidence.

We estimate the profit — concentration relationship for each firm in the industry. This enables us to determine the effect of mergers on both the merging firm and its rivals, allowing us to discriminate between the different hypotheses about the effects of mergers.

The hypotheses we test relate to two different models of the firm: the **owner — manager** model, and the **principal — agent** model, the key distinction lying in the degree of separation of ownership and control

of the firm. The former theory implies that mergers only occur if they increase the value of the merging firms. The two mechanisms we consider through which mergers can increase the value of the merged firm are increased market power and increased technical efficiency. In particular, we ask whether the data is consistent with all mergers having resulted purely in increased market power, or purely in increased efficiency of the merged firm.

If mergers have a purely market power effect, then this will benefit all firms: both the merging firm and its rivals.<sup>5</sup> If one firm can increase its price, then there is no reason why other firms selling the same product cannot do the same. Hence, in order for this hypothesis to not be rejected, the profitability — concentration relationship must be positive for *all* firms.<sup>6</sup> (Note that this industry-wide benefit occurs at the expense of consumers/downstream firms, and involves a reduction in economic efficiency.)

In contrast, if the mergers have a purely efficiency increasing effect, then mergers will increase the profitability of the merging firm but decrease that of its rivals. The merged firm gains a cost advantage and can now price-squeeze its rivals. Thus, the overall effect of a series of such mergers on a firm which is sometimes the merging firm and at other times a rival to the merging firms is ambiguous. The only way this hypothesis can be tested is to observe the effect of the mergers on a firm that is always in the role of a rival to the merging firms. Such a firm exists in our study, and should display a negative profitability-concentration relationship if all mergers result only in increased efficiency of the merging firms.

The principal — agent theory recognises that the separation of ownership and management in modern corporations can result in mergers occurring only if they make managers better off, possibly to the detriment of owners. If managers derive increased satisfaction from increased consumption of perquisites as the firm grows through merger, then it is plausible that mergers will result in a *less* efficient firm. Thus, the third hypothesis we test is whether the mergers have resulted only in lower profits for the merging firm (due to decreased technical efficiency). The impact on rival firms will be the opposite to that discussed for the second hypothesis: profits will increase following a merger, since the rivals now have a relative cost advantage. Thus, failure to reject this hypothesis requires that the profitability — concentration relationship for a firm that never merges is positive. As before, the implied relationship for firms involved in some mergers but not others is ambiguous.

The econometric estimation involved simultaneously estimating for each firm a linear relationship between firm profitability and the following explanatory variables: industry concentration, industry excess

refinery capacity, growth of industry revenues, and the total number of retail sites in the industry.<sup>7</sup>

Interestingly, no evidence of a relationship between firm profitability and world crude oil prices existed. This was unexpected given that this is obviously the basic material input of petroleum products. A linear time trend also did not appear to explain variation in profitability. We used the ratio of earnings before depreciation, interest and tax to revenues (i.e., the EBDIT margin) to measure profitability. Concentration was measured using the Lerner index.

It is expected that increased excess refinery capacity will result in lower profitability because it increases the incentives to price-cut. The incentives to operate at maximum capacity are high in an industry characterised by high fixed costs (as is the petroleum industry). Thus, when demand is relatively scarce (i.e., there is excess capacity), firms compete vigorously in order to win market share and increase capacity utilisation.

Growth in industry revenues has the opposite effect of excess capacity: in a rapidly growing market firms can increase prices without substantial loss of market share. We use the number of retail sites as a proxy for barriers to entry, which facilitate high profits.<sup>8</sup> All variables, except growth in industry revenues, are presumed to be simultaneously determined.

The regression technique of two-stage least-squares was used to estimate the system of equations. For specific details about the data, econometric procedures, and statistical tests, the reader is referred to Hyde (1997), which also contains a discussion of the various functional forms used for the estimation equations.

## 4. Results

The results of the regression analysis are reported in Table 12.1 in the Appendix. The only variable that could be rejected as being an important explanator of variation in profitability was growth of industry revenues.<sup>9</sup> However, the relationship between this variable and profitability was of the expected sign: positive. Also consistent with economic theory was the observed positive relationship between profitability and excess industry refinery capacity. The analysis also showed that as barriers to entry increased (i.e., the number of retail sites decreased), the profitability of firms increased, again consistent with theory.

Lastly, we observed a strong negative relationship between profitability and concentration.<sup>10</sup> This is a striking result: as firms merge and the industry becomes more concentrated, profits fall across the industry. A number of studies have observed this negative relationship

(Clarke 1984; Hirschey 1985). Philips (1971) suggests that this relationship may be observed in small open economies where imports are significant and profits are importantly affected by exports. However, this does not very accurately describe the Australian petroleum industry, where imports and exports are low relative to market size.

## 5. Discussion

What do these results tell us about the alternative hypotheses outlined above?

First, the hypothesis that all mergers acted only to increase market power can be rejected. As discussed earlier, this hypothesis implies a *positive* relationship between concentration and profitability for *all* firms. In fact, the opposite was true: the relationship was negative for all firms. Second, we can also reject the hypothesis that all but one merger had purely market power effects, while the remaining merger resulted in increased efficiency of the merged firm. In this case, the firm involved in the efficiency enhancing merger would display a positive profitability — concentration relationship (though the sign of this relationship for other firms involved in mergers would be ambiguous). Since no firm showed a positive profitability — concentration relationship, this hypothesis can also be ruled out.

The hypothesis that all mergers resulted only in increased efficiency cannot be rejected, since the results are consistent with the only clear prediction of this hypothesis: that a firm that never merges should exhibit a *negative* profitability — concentration relationship. Thus, there is evidence in support of the view that mergers have only increased efficiency, but not in support of the view that mergers have acted only to increase market power.

Since the hypothesis that mergers have resulted only in a *decrease* in the efficiency of the merged firm (due to managerial moral hazard) implies exactly the opposite of the efficiency hypothesis above, it follows that the results imply rejection of this hypothesis. Thus, both the owner — manager market power and managerial moral hazard theories of the effects of merger are rejected, while the hypothesis that mergers have increased the efficiency of the industry cannot be rejected.

Our results are consistent with those obtained by Gabel in his analysis of the US petroleum industry. This may reflect the fact that the industry has a similar structure in Australia and the US. Our results are also consistent with the conclusion reached in many of the event studies of mergers, which indicate increased efficiency as being the predominant effect of mergers. However, there is no real consensus on this issue. For example, Ravenscraft and Scherer (1989) observe that the

profitability of acquired firms declines more rapidly than for similar unacquired firms. They conclude that this is due to the loss of managerial control as the size, and thus complexity, of the firm increases.

Naturally, the quality of the results obtained here reflect the quality of the data. The accounting data we have used to construct the measure of profitability may or may not correlate well with true economic measures of profitability. Some argue that subsidiaries of multinational parent corporations, which four of the five Australian oil majors in this study are, are easily able to distort reported profits by strategic internal transfer pricing. The validity of this claim is difficult to substantiate and due to none of the oil majors being listed companies, stock prices cannot be used as an alternative measure of performance.

## 6. Conclusions

The findings of this analysis suggest that there is little evidence that mergers in the Australian petroleum industry have had negative welfare consequences. To the contrary, the evidence here points to the tentative conclusion that mergers have increased welfare due to increasing the efficiency of merging firms. If mergers have been *intended* to increase market power, this apparently has not been a successful strategy for firms. Our conclusions are consistent with the view that the instances of entry into the market over recent years are evidence that the market is indeed contestable.

While it would be useful to be able to test a larger number of more sophisticated hypotheses, unfortunately this was not possible. Even ignoring data limitations, many plausible hypotheses are consistent with the relationship between firm profitability and concentration being either positive or negative. Such hypotheses clearly cannot be tested.

Lastly, implicit in much of our discussion is the notion that mergers are used as a strategic tool by owners or their managers to affect profit (or utility). However, it is equally plausible that the direction of causation is opposite: that mergers are a *reaction* by owners and managers to declining firm profitability. Moreover, this decline could be due to a change in industry-wide conditions, thus affecting all firms. Mergers may be the only way to lower the costs of firms sufficiently to enable continued survival in the new environment.

We actually allow for the possibility that the direction of causation runs in both directions by modelling profits and concentration as being simultaneously determined. The reverse-causation view is entirely consistent with the results obtained here, since we observe that mergers are associated with falling profits for all firms (both merging and

non-merging firms). This argument, however, is not fundamentally different to the efficiency hypothesis we considered earlier, since both propose that mergers increase the efficiency of the merging firm.

The policy implications of these results are clear: we find no evidence to support the view that this industry warrants regulatory intervention in merger activity. Mergers appear to be occurring for reasons that are in the public interest.

## Appendix

The equation that we estimate for each firm is

$$\pi_i = \alpha + \beta_i H + \delta X + \eta G + \phi S \quad (1)$$

where  $i$  denotes firm  $I$ ,  $\pi_i$  refers to the EBDIT margin,  $H$  refers to the concentration index,  $X$  is industry excess refinery capacity,  $G$  is the growth of total industry revenues, and  $S$  is the number of retail sites in the industry.

**Table 12.1 Regression Results for EBDIT Margin**

<i>Coefficients</i>	<i>Estimate</i>	<i>t-Statistic</i>
$\alpha$	1.51	4.29
$\beta_1$	-3.85	4.89
$\beta_2$	-4.18	5.31
$\beta_3$	-4.34	5.50
$\beta_4$	-4.34	5.51
$\beta_5$	-3.87	4.91
$\delta$	-0.14	3.29
$\eta$	0.07	1.40
$\phi$	-5.24	2.18

$R^2 = 0.64$

## Endnotes

1. See Chapter 6 for an explanation of the Herfindahl index.
2. Contestability refers to the situation where the potential for new competitors to enter the industry is seen as a constraint on the exercise of market power even in a concentrated industry.
3. Mergers occurred in 1981, 1983, 1984, and 1991. The term 'merger' is used to refer to both mergers and acquisitions. For our purposes these two processes are equivalent: they both decrease the number of firms.



4. Note of course the result from Chapter 5, that concentration is a key determinant of firm profitability in the manufacturing sector in Australia.
5. This assumes firms produce identical goods, which is a plausible assumption for this industry. While some consumers may discriminate between the brands of the oil majors and independents, discrimination between the brands of the oil majors, who are the sole focus of this analysis, seems unlikely.
6. We ignore the possibility that so-called 'X-inefficiency' — the inefficiency that arises because a larger firm is harder to manage effectively — increases sufficiently with market power such that profits actually decline.
7. See the Appendix for a precise description of the system of equations.
8. Most of the decline in retail site numbers has been due to the exit of small independent sites, resulting in the oil majors becoming more dominant at the retail level as total retail numbers have fallen. This has made entry by new players into the market more difficult. All recent entry has been by importers of refined product, implying that minimum refinery size, although commonly used, is not an appropriate measure of barriers to entry here.
9. That is, the associated parameter estimate was not statistically significant at the 5% confidence level.
10. This held true for a large number of model specifications.

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# 13 Innovation and Public Policy

*Mark Rogers*

## 1. Introduction

Chapter 7 looked at the important link between research and development (R&D) and firm performance. It was shown that the market value of a company tends to increase with investment in R&D. But at the same time, the balance between public and private sector R&D in Australia was skewed towards the public sector by international standards. In 1995, Australia spent around 1.6% of its GDP on R&D. This figure is close to, but below the OECD average of 1.9%. The ratio of Australia's business expenditure on R&D (BERD) to GDP, however, was much lower than the OECD average — 0.87% while the OECD average was 1.45%. This is despite strong growth in BERD in Australia between 1988 and 1994.<sup>1</sup>

While commercial R&D is an important part of innovative activity, it is not the only part. The Australian federal government spends around \$3.75 billion annually in support of 'science and innovation' (DIST 1996a, p. 1.3), which includes expenditures on university research, basic research agencies and business R&D tax concessions.<sup>2</sup>

In this chapter we consider the economics of innovation and R&D. Why is BERD low in Australia, and what are the consequences for our economic performance? How does general innovative activity compare to R&D? Should decisions about innovation be left to the market or is there a role for government intervention in R&D policy or innovation policy more generally? If there is a role, how should the government intervene?

## 2. Why Should We Worry about Research and Innovation?

There are two reasons why R&D and innovation are important public policy issues. First, they matter for economic growth. Second, there are

good reasons to believe that the private sector will undertake too little research and innovation, and that government involvement is important to improve our national R&D and innovation performance. Taking these in turn:

## **2.1 Why Does Innovation Matter to Economic Growth?**

At least since the work by Nobel Laureate Robert Solow (1957), technical change has been regarded as the major factor behind economic growth, accounting for a large proportion of total economic growth (over and above the increases in available physical inputs). More recently, the 'new growth theories' give knowledge and technology the key role in driving economic growth through the spillover of new ideas (see Grossman and Helpman 1991, or Barro and Sala-i-Martin 1995). There is also empirical evidence that knowledge and technology are important determinants of enterprise productivity. The Australian situation was reviewed in Chapter 7. Griliches (1995) surveys the international evidence.

## **2.2 Will Private Firms Undertake Socially Desirable Levels of Research and Innovation?**

Managers of firms decide the level of resources they invest in knowledge and technology. In making these investment decisions, the managers will balance the costs with the expected benefits to the firm. These decisions are unlikely to take into account any costs and benefits that do not accrue to the firm but that do accrue to society more broadly. If there is a gap between the benefits from a project that accrue to the firm and the larger social benefits of the project, then managers, from a social perspective, will have too little incentive to invest in the project. This may be the case with certain investment projects that involve innovation and knowledge. If so, private managers will have too little incentive to invest and, as a result, private firms will underprovide innovation.

There are a number of broad reasons why this kind of market failure may occur in investment decisions concerning knowledge and technology. As might be expected, these are closely linked with the characteristics of knowledge and technology themselves.

### *Free Riding*

Knowledge is, to a large extent, not 'appropriable'. It is difficult to capture the value of knowledge since it is easily learnt and used by others.

If managers do not expect to receive much of the benefit generated by a costly investment in R&D, they may simply choose to reduce the amount they undertake. There is an incentive to 'free ride' on the R&D done by others. But because other firms face the same incentives, less R&D will be done than would be socially desirable.

This reasoning lies behind the decision to subsidise private sector R&D in many countries. R&D is normally considered to be the main method for creating new commercial knowledge and technology. Less than perfect appropriability of knowledge implies that firms can benefit without payment from the research efforts of others. When this occurs we normally say that there are 'knowledge spillovers' or 'technological externalities'.

The extent of the appropriability problem is a subject of significant debate. For example, some authors point out that complex and advanced knowledge is not easy to understand and implement in commercial activities, so that competitors cannot instantly steal the full value of others' R&D investment (see Geroski 1995). In situations where this viewpoint holds, the inappropriability of knowledge may only be a minor problem.

#### *Uncertainty*

High levels of uncertainty often surround the process of knowledge and technology generation. Uncertainty might be due to the unknown outcome of a research project. This is particularly relevant for pure (or basic) research. Uncertainty can also be due to technological developments in one area being dependent on uncertain developments in a separate area. For example, fibre optics originated in developments in both lasers and optical fibres.<sup>3</sup> Many authors consider that the market deals poorly with these types of uncertainty, implying the need for governments to encourage private enterprises to undertake research or for governments to undertake certain types of research themselves.

Uncertainty may also be associated with the market return from the research output, particularly if there are 'network externalities'. A network externality occurs when the benefit of using a particular type of technology increases with the proportion of total users in the economy. This can create a policy problem because new technologies may be excluded from the market not due to technological inferiority, but by 'being beaten to the punch' by a competing and, possibly, inferior technology. This creates a high degree of uncertainty for potential investors in new technologies.

A prime example is the Microsoft operating system. Part of the benefit of using the Microsoft operating system is its compatibility with

other users. As more people use computers based on this operating system, synergies are created for computer and software designers. For example, it is worthwhile to write software for computers that use the Microsoft operating system because it is commonly used, whereas it may not be profitable to write similar software for machines that use less popular operating systems. The availability of software, of course, makes the Microsoft operating system even more appealing to consumers. In cases like this, where the dominance of one technology may reduce incentives for others to invest in research, there may be a case for policy intervention.

#### *Short-Term vs Long-Term Focus*

Firms and financial markets may have a short-term focus that is biased against investment in long-term research projects. Hay and Morris (1991, p. 472) note that 'companies seek a short payoff period for projects and they avoid uncertain major projects, preferring to concentrate on small improvements in processes and products'. If this is the case, there may be an argument for government to encourage long-term research projects.

#### *Up Front (Fixed) Costs*

Investment in research often involves substantial set up (or fixed) costs. If particular research projects are extremely large, then the fact that firms or financial markets cannot sufficiently diversify risk, may mean that large (potentially beneficial) projects are not undertaken.

Large fixed costs may also create pricing problems. Once the knowledge or technology has been discovered the cost of disseminating the knowledge is often very small. In economists' terminology, the marginal cost is very low. In general, economists can show that it is socially desirable to price a good — including knowledge — at its marginal cost. In the case of knowledge the marginal cost might simply be the price of a computer disk. Such a pricing policy would, of course, offer very little incentive to invest in the research. Hence, policy-makers are faced with a difficult choice. They must balance the incentive to undertake research (which implies the ability to charge more than the marginal cost) against the welfare loss associated with non-marginal cost pricing.

### 3. Infrastructure Policy for Research and Innovation

If markets fail to adequately provide research and innovation, what should governments do? In this section we focus on how governments

can create a knowledge and technology infrastructure to alleviate some of the private market failures.

### **3.1 Basic Research and Education**

Many governments spend substantial amounts on basic research (which aims to extend knowledge of fundamental processes). A large part of this expenditure is on research related to defence, health, environment and other areas that are, to a large extent, public goods. However, other basic research is intended to provide a foundation for industry and business. In Australia, around 85% of basic research is funded by the government. The major institutions conducting this research are universities (with about 55% of basic research monies) and civil research agencies such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO).<sup>4</sup>

Assessing the overall benefit to an economy of this basic research is difficult. Mowery (1995, p. 523), in considering basic research, notes that there are over 700 federal laboratories in the US, with a total budget of US\$21 billion but they receive only US\$3 million in annual royalty revenues. This apparent imbalance, however, is likely to be misleading. Many of the benefits of basic research are indirect and largely unmeasurable. There are three reasons for this. First, it may be difficult or inappropriate to license and sell knowledge generated by government. Second, basic research often provides the training ground for scientists and researchers who may subsequently be employed by private firms. Third, basic research may lead to improvements in research methods and instrumentation that improve private sector R&D (Rosenberg 1994, Ch. 13).

There have been a number of attempts to evaluate the benefits of basic research in Australia. Most of these attempts are based around case studies or surveys which, although providing valuable information, make it difficult to form an overall assessment of the benefits of basic R&D. The Industry Commission (1994) summarises some studies on some specific CSIRO research projects, finding that the benefits from the research were generally high, with cost-benefit ratios in excess of 4 to 1. Another assessment of the CSIRO by the Bureau of Industry Economics (1992) found that research projects needed to be evaluated in conjunction with the research efforts of the industrial collaborators since 'the joint activity was the source of significant productivity benefits to the innovations' users' (Bureau of Industry Economics 1992, p. vii). More recently, a study by the Australian Manufacturing Council (1994) stressed the fact that private firms need to interact more with public R&D agencies. The government's co-operative

research centres (CRC) are designed to encourage private — public partnerships. Government funding for CRCs rose from \$18 million in 1991/92 to \$133 million in 1995/96.

A more general assessment of basic research in Australia is made by the Industry Commission (1994, Appendix QB) who use time-series regressions to assess the correlations between market sector multi-factor productivity and public sector R&D. The results indicated that the mining, agriculture and manufacturing sectors all received substantial benefits from public R&D. These results are in line with other international studies which suggest positive net benefits to basic research.

Although the basic research conducted by universities is a major part of Australia's knowledge and technology system, some authors consider that 'the major output of higher education is trained and educated people, many of whom are employed by research organisations and businesses' (Industry Commission 1994, p. C11). Assessing the impact of such output on private sector productivity is difficult. This said, there is empirical evidence that the broader concept of human capital is positively associated with economic performance (see Barro and Sala-i-Martin, 1995, for a general review, and Becker and Lewis, 1993, or Jenkins, 1995, for more specific studies).

### **3.2 The Intellectual Property System**

One potential solution to the problem of imperfect appropriability is legal protection to the creator of new knowledge. This argument is the basis for the intellectual property (IP) systems found in all advanced countries around the world. An IP right gives the owner the right to exploit the value of their innovation. The most common IP rights are patents, trademarks and designs. In effect, IP protection gives the holder monopoly power over their innovation. As discussed in Chapter 10, monopoly power implies non-optimal pricing and a (static) welfare loss. Thus, the IP system must balance the needs to encourage invention and innovation against potential welfare losses due to monopoly power.

Most forms of IP protection last for a set time period. In Australia a standard patent can last for up to twenty years, while a design can last for sixteen years. This means that the welfare loss due to the monopoly power created by an IP system does not exist forever. The length of protection is a policy choice that allows authorities to adjust the trade off between monopoly welfare losses and incentives to innovate.<sup>5</sup> Table 13.1 (below) shows the percentage of firms in the IBIS database using the IP system in 1996. R&D is also reported for comparison. Use



**Table 13.1 How Large Australian Companies Use the IP System**

<i>Activity</i>	<i>% of Enterprises in IBIS Undertaking Activity</i>	<i>% of Largest Enterprises Undertaking Activity</i>
Non Zero R&D	11.6	19.2
Patent Application(s)	4.5	8.2
Trademark Application(s)	17.6	31.0
Design Application(s)	2.1	4.3

*Notes:* Percentages based on 2,629 large firms in IBIS database. 'Largest' firms are defined as those with a turnover greater than \$100 million.

*Source:* Rogers (1998b).

of the IP system is defined as having made at least one application for either a patent, trademark or design.

There are a number of basic reasons why the IP system cannot fully solve the appropriability problem. First, not all knowledge can legally be protected (for example mathematical formulas and certain types of computer software cannot be protected using patents). Second, acquiring and protecting an IP right is a costly process and this can prevent small firms using the system.<sup>6</sup> Third, the IP system has a dual role that includes the dissemination of knowledge as well as the protection of this knowledge. For example, a successful patent requires that full details of the invention are made available to the public. This is known as 'disclosure' and it may allow others to gain some benefit from the knowledge in the patent, even if they are legally prohibited from using the invention directly. 'Inventing around a patent' is common and some companies deliberately do not use the patent system so as to keep certain knowledge secret.

The Bureau of Industry Economics (1994) discusses the various issues surrounding the use of patents by Australian industry. They report on a survey done in the early 1980s that asked firms whether the presence of the patent system would increase or decrease their R&D activity. The findings suggested about 50% of firms thought their R&D would decrease, with 36% suggesting no change would occur (Bureau of Industry Economics 1994, p. 37). More generally, around 60% of firms suggested that the patent system increased exports and profitability.

More recently, the ABS has conducted an innovation survey of manufacturing firms which includes questions on the benefit of the IP system. The survey found that patent disclosures were a relatively unimportant source of ideas for Australian manufacturing companies. Only 14% of firms suggested patent disclosures were a significant

source of ideas (Australian Bureau of Statistics 1995, p. 33). The most important source of new ideas was internal generation. The survey also asked firms what methods they used to protect product and process innovations. The choices were patents, designs, secrecy, complexity of product/process, or 'being ahead of the market'. Although respondents suggested that the latter category was the most important method, use of patents and designs were comparable with the use of secrecy and 'complexity'. These results suggest that the IP system provides an important role in supporting private investment in R&D and innovation.

## 4. Government Policy to Encourage Investment in Knowledge and Technology

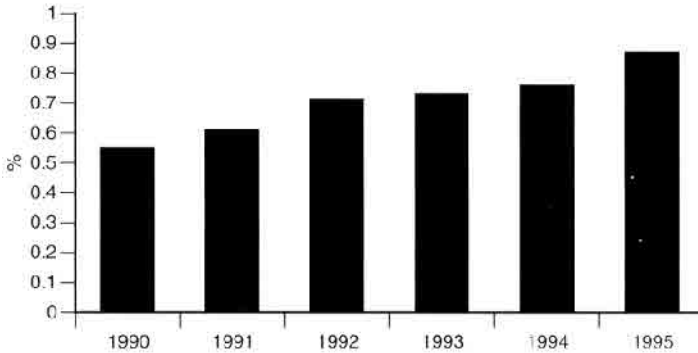
The discussion above has concentrated on institutional policies towards research and innovation. They range from the IP system, which involves setting up legal institutions to protect knowledge, to governments 'doing it themselves' through universities and other government bodies. Can government use more direct policies to encourage investment in knowledge and technology?

### 4.1 R&D Policy

From the point of view of Australian business the most prominent government R&D policy has been the tax concession. In 1985 the Australian federal government introduced a 150% R&D tax concession. This was a response to the relative low levels of Australian business expenditure on R&D, or BERD, by OECD standards. The original program was intended to run for six years, but in 1991 the program was extended indefinitely. An evaluation of the scheme in 1993 suggested that 'the tax concession has played a role in increasing the BERD/GDP ratio' (Bureau of Industry Economics 1993, p. xi), with around 10-17% of the overall 70% rise in BERD/GDP due to the scheme. The report concludes that the tax concession had an overall social benefit.

In 1996 the government reduced the tax concession to 125% due to 'the combination of the Government's clear need to achieve significant Budget savings, and Australian industry's growing commitment to research and development' (DIST 1996a, p. 2.6).

Figure 13.1 (below) shows the rise in the BERD/GDP ratio over the period 1990 to 1995. As noted in the introduction, the growth of BERD has been especially rapid since the mid-1980s. Despite the recent growth, the Australian BERD/GDP ratio in 1995 was still below the OECD average of 1.45% of GDP.



**Figure 13.1 Business R&D/GDP (%) for Australia (1990 to 1995)**

**Source:** OECD (1997).

The federal government launched a new incentive scheme — called the 'R&D Start Program' — in 1996. This program was designed to replace the R&D syndication scheme, which had grown rapidly from seven syndicates in 1989/90 (worth \$192 million) to 62 schemes in 1995/96 (worth \$857 million). The R&D Start Program aims to provide a mix of large grants, loans and interest rate subsidies to encourage research that has potential commercial benefits. The projects selected for this program are based on decisions by the Industry Research and Development (IR&D) Board. In contrast, the R&D tax concession scheme leaves such judgments to private firms.<sup>7</sup>

#### **4.2 The Decision to Adopt New Techniques**

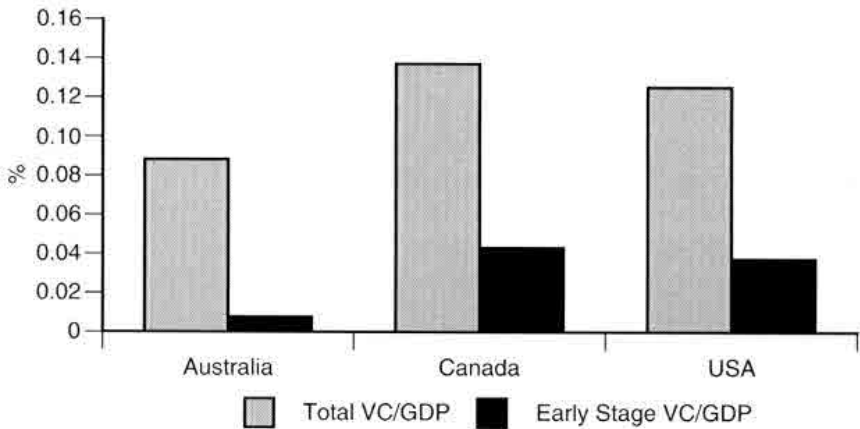
A key aspect of firm performance is the ability to efficiently adopt recent advances in technology and knowledge that are appropriate to the firm. In addition, awareness of the latest developments is also an important part of a firm's in-house R&D process.<sup>8</sup> The process of searching, evaluating and implementing new technology is subject to large fixed costs and uncertainty. Many OECD countries have programs designed to assist firms, especially small and medium enterprises (SMEs), to evaluate and adopt the latest technology. Currently, the Australian government has a number of programs to encourage technology diffusion. Overall the budget for these programs is estimated to be \$16 million (Mortimer 1997, p. 101), compared to around \$780 million spent on encouraging business R&D.

A report by Welbourn, Wardrop and Bryant (1994, p. xii) concluded that 'technology uptake in Australia appears to be proceeding more slowly than is desirable for maximum international competitiveness'. The report suggested that firms often had 'inadequate management and technological expertise' and do not exchange ideas and experience widely enough. The report draws attention to the idea of linkages between technology providers (research agencies and firms which have commercialised research) and other firms, indicating that in Australia these 'linkages' are inadequate. Reports such as this give an indication that market failure may be occurring and, correspondingly, there may be a role for increased government action. The federal government's Investing for Growth (Commonwealth of Australia 1997) took this view and outlines plans to allocate an additional \$72 million (over three years) to improve the situation.

### **4.3 Finance and Venture Capital**

Research and development expenditures are often correlated with the levels of past profits, suggesting that retained earnings are an important source of finance for R&D. This source of financing may be difficult for rapidly growing firms or SMEs, both of which may have relatively low profits. These types of companies are potentially very important in driving productivity growth due to their use of new technology and high growth potential. If internal finance is not available firms must turn to external sources such as family, 'business angels', venture capital funds and banks. 'Business angel' is the name given to individuals who lend money, normally by taking an equity interest, to entrepreneurs and small firms. A business angel will often have relevant business experience and will become a director of the venture. The amount of money raised through such means is normally less than \$500,000. Venture capital funds are designed to invest in high risk, high return ventures and normally consider investments of around 1 to 2 million dollars. This is due to the fixed transaction costs associated with making an investment.

The possible 'finance gap' between these two options has been noted in various studies (e.g. National Investment Council 1995). The lack of availability of venture capital in Australia has also been a concern. Figure 13.2 (below) shows a comparison of the share of venture capital to GDP for Australia, Canada and the US. Australia has a lower level of venture capital, especially in 'early stage' investments. The federal government has recently announced a major program that aimed at improving the flow of venture capital (called the Innovation Investment Fund). This fund will provide matching funds to venture capital funds in order to increase such investment.



**Figure 13.2 Venture Capital (as a % of GDP) for Australia, Canada and the US**

*Notes:* Data from Price Waterhouse surveys in the US and Australia and a survey conducted by the Canadian Venture Capital Association.

## 5. The Economic Environment

The previous two sections have considered the knowledge and technology infrastructure and the microeconomics of firms' decisions. It is also important to devote some attention to the broader economic environment. This section considers two issues: the level of competition faced by firms, and the extent of international openness.

### 5.1 Competition

How does the degree of competition in an industry affect a firm's investment in knowledge and technology? This question has been the subject of considerable debate in the economics literature. Theoretical arguments can be made that either less or more competition encourages R&D. For example, if investments in R&D, knowledge and technology are internally funded, then a firm may need to be large and profitable to generate the funds needed for these investments. This suggests that large firms in imperfectly competitive or monopoly industries might engage in more investment in knowledge and technology.

Arrow (1962) suggested the contrary. If a monopoly makes an innovation that reduces production costs then it will make more profits. But this gain will generally be smaller than a firm in a highly competitive industry that makes the same innovation and has the ownership of this innovation protected by the IP system. Intuitively, as has been

discussed in earlier chapters, a firm in a highly competitive industry will be able to seize market power and boost profits. In brief, innovation that creates monopoly power is more valuable to a firm in a competitive industry than to a firm that is already a monopoly.

There has been substantial theoretical work on these issues. Hay and Morris (1991) provide a review. Overall however there are few firm results for policy-makers. Authors have also noted that technology and market structure are likely to be jointly determined (endogenous), so it is difficult to consider the causality running from market conditions to extent of investment in technology (Sutton 1996).

Empirical work on the link between competition and innovation has also been extensive. The work has used various measures of competition to analyse if there are statistically significant associations with the level of R&D intensity, patent intensity or innovative activity more generally. A common proxy for the extent of competition is the industry concentration ratio and a number of studies have found that R&D intensity increases with concentration, although the presence and strength of this association does vary substantially. Other studies have found that the effect of concentration is initially positive but, after it reaches critical level, becomes negative. A comprehensive review of these studies is by Symeonidis (1996, p. 33) who concludes, 'there is no evidence of a general positive association between innovative and market structure or firm size, although there are circumstances where a positive association exists'. Symeonidis also stresses the fact that market structure and technology are endogenous which means that 'one cannot impose a level of concentration which, given all exogenous factors (including firms' strategic behaviour), results in margins so low that firms cannot cover their fixed costs (including R&D costs)'.

## **5.2 International Openness**

International openness refers to the flow of knowledge, people, goods and services into and out of a country. There is substantial evidence that the degree of international openness is an important determinant of economic growth (see Coe and Helpman 1995; Taylor 1995; Rogers 1997a). The mechanisms by which openness improves performance include having access to new knowledge and technology, as well as international competitive pressure. The study by Coe and Helpman looked at international R&D spillovers between OECD countries, finding that they play a significant and important role in generating productivity growth. Their study also suggested that Australia was relatively poor at benefiting from international R&D, especially when compared to other small economies. The potential reasons for this are discussed

in Rogers (1997b), but are likely to be linked to Australia's trade policy (Australia's import to GDP ratio over the 1970 to 1990 period was in the 15% to 18% range, while other small economies tend to be in the 20% to 50% range). Another aspect of international openness is the level of foreign direct investment (FDI). In 1995, Australia's FDI to GDP ratio was around 2% which puts Australia in the middle of OECD countries. Some small economies (Ireland, New Zealand, Sweden, Belgium) have FDI to GDP ratios about double the Australian figure. Australia's lack of international openness may therefore have resulted in lower productivity growth.

## 6. Conclusion

This chapter has considered some of the public policy issues surrounding the generation and diffusion of knowledge and technology. Policy issues can be divided into three areas: technology and knowledge infrastructure, enterprise investment in knowledge and technology, and the economic environment. Although all of these areas are ultimately concerned with the microeconomics of firm's decisions, they provide a useful way of discussing a range of complex and difficult issues. It should be clear that knowledge and technology are important factors in productivity performance. There are also strong reasons to expect that a laissez-faire approach to these issues will result in lower economic performance. Reflecting this, all OECD governments actively try to improve what can be termed the innovation system (OECD 1996b; Nelson 1993). What is less certain is the extent to which governments should intervene and which policies they should use. There is also the difficult issue of certain policies concerning knowledge and technology conflicting with static allocative policies. In such cases, the implications for dynamic performance must be balanced against short-term considerations.

## Endnotes

1. See the Science and Technology Budget Statement 1996-97. Further data and analysis can be found in DIST (1996b) and also the *Mercer — Melbourne Institute Quarterly Bulletin* 2.98.
2. Assessing an economy's overall knowledge, technology and innovation system has attracted recent interest. Nelson (1993) considers the 'national system of innovation approach', with Gregory (1993) providing an assessment of Australia's innovation system.
3. Rosenberg (1994, Ch. 11) also notes that when the laser was developed by Bell Labs (part of AT&T), AT&T initially saw no reason to patent the invention since they could see no useful application in telecommunications.

4. Data from OECD (1997) and relate to 1994. CSIRO does not only conduct basic R&D. According to Industry Commission (1994) only about 37% of the CSIRO's expenditures are on basic research.
5. See Geroski (1995) and Scherer and Ross (1990) for a discussion of these issues.
6. For example, although the initial cost of applying for a patent is relatively small (around \$5,000 to \$8,000) the legal cost of enforcing a patent can be substantially more.
7. The Australian government operates a range of other schemes (see Industry Commission 1994, or Mortimer 1997, for a review).
8. These are issues that have been stressed by a range of work (e.g. Winter 1993; Crafts 1996; OECD 1996a).

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## Part 4: Conclusions

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# 14 Big Business in Australia: The Lessons

*Peter Dawkins, Michael Harris and Stephen King*

## 1. Introduction

Two issues loom large in discussions of the operations of big business in Australia (or indeed anywhere). First, are businesses operating well on their own terms: that is, are they profitable? Second, are they performing well by broader, 'public interest' yardsticks? We have made these issues the key themes of this book, and utilised the rich and unique data from IBIS Business Information Pty Ltd. to investigate these issues. Here we summarise the findings and outline the remaining open questions and areas for future research.

## 2. Lessons About Performance

It is easy to pinpoint the obvious recipe for success in terms of private performance: become a monopoly! Controlling the entire market for your product is the simplest textbook way to extract the most profit from a given activity. However, becoming a fully fledged monopoly is simply not an option open to most businesses; nor would it be a desirable thing in terms of the broader public interest. But more useful prescriptions emerge from the analyses in Part 2 of the book.

We have found a range of influences on private performance ranging from the macroeconomic environment, to market structure to management practices at the micro level. Key findings however of special relevance to businesses seeking to achieve competitive advantage in the market place relate to the value of innovation and focus. By innovating, by moving ahead of competitors, firms gain market power and the potential for increased profits.

While these profits might in turn be competed away as other firms innovate, a key lesson from Chapter 7 was that R&D spending is associated with a positive impact on a firm's market value.

Companies that specialise rather than diversify perform better by being better able to manage the resources at their disposal. A firm that spreads its resources too thinly (is highly diversified) will not be able to make the best use of what it has. In Chapter 6, evidence was presented showing that 'sticking to your knitting' was indeed a wise course for achieving high performance in large firms.

Moreover, these two strategies — specialising and innovating — appear to be complementary, according to the evidence presented in Chapter 7. In that chapter it was shown that increased diversification tends to be associated with lower R&D intensity. This finding runs contrary to the assertion that R&D synergies ('spillovers') would make innovation a higher-payoff activity in more diversified companies. If R&D provides more 'bang for the buck' in diversified firms, it is not reflected in their relative R&D expenditures.

Over and above these two key sources of competitive advantage, Chapter 8 describes in detail a set of integrated management strategies that are common to leading companies, and according to the data, associated with greater company profitability.

### 3. Lessons About Policy

What lessons can be drawn from the material in this book for issues of public policy? While the private performance criterion simply requires that big business generate profits, the public interest is best served when businesses generate profits via efficient production of goods and services rather than through exploitation of market power. Much of the debate — and policy action — in this area in the 1980s and 1990s has focused on ownership as much as on market structure, in particular on whether the business was publicly or privately owned.

Privatisation has been seen as a key approach to improving the efficiency of many businesses. However, if a privatisation does not alter a fundamentally uncompetitive market structure, it may result in ambiguous outcomes. As outlined in Chapter 9, trade practices law and the National Competition Policy are aimed at ensuring competitive market environments wherever possible in both the private and public sectors.

Thus the extent and impact of market power is a key issue examined in this book. In particular, evidence was presented on the likely costs of monopoly power to the Australian economy. Acknowledging that the results are somewhat sensitive to the assumptions made (discussed

in detail in Chapter 10), this cost was found to be in the order of magnitude of 1% of GDP, which might be viewed as neither trivially low nor alarmingly high. Meanwhile, studies of mergers and takeovers in Chapters 11 and 12 showed few signs that market power is the driving force behind these actions. In fact over the period studied, mergers and takeovers seemed to lead to *worse* rather than better performance in terms of measured profitability.

None of this is to suggest that market power is a minor policy issue. In particular cases, market power can be substantial and damaging. A well-designed competition policy, which includes trade practices legislation and merger guidelines, may still be in the national interest. However, contributors to this volume find little evidence that overall, market power is a cause of major problems in the Australian economy. Thus a question that remains unanswered here is: how much effort should the government devote to 'anti-monopoly' activities? Given that anti-monopoly policies are also potentially harmful, the results herein suggest that this is an important area for further study.

Another key policy issue is the role of the public sector in industrial innovation. Not only is innovation a source of economic growth, it has the potential to be underprovided by the market due to 'spillovers'. That is, since innovations can potentially be copied or imitated, there is an incentive to free-ride on the innovations of others rather than undertake costly R&D within one's own firm. The policy solutions might involve stricter (and/or broader) intellectual property laws, or subsidisation of basic R&D, or some combination of these and other measures.

Evidence from Chapter 7 already suggests that R&D does benefit the firm undertaking it — as reflected in higher market values — which mitigates against the free-riding incentive. But Australia still has comparatively low business R&D expenditures. Again, whether they are 'too low' is not clear: it may be optimal for Australia, as a small trading nation, to import more of its ideas and techniques than a larger country might, but it may well be that Australia's low business R&D is retarding its growth performance. These remain open questions.

## 4. Conclusions

The starting point of this book was that big business is an important component of Australia's economic performance and well being. As discussed in Chapter 1, big business is a major contributor to economic activity, a large provider of jobs, and provides much of Australia's exports to the world. As a result, it is likely that improvements in the overall performance of Australian big businesses will yield dividends for Australia.



There is evidence that certain fundamental aspects of Australia's economic performance have improved markedly over the last decade. In particular, productivity growth has rapidly increased from a low base (by international standards), as measured by the Industry Commission (see Industry Commission 1997). Productivity growth is important as a key source of increased economic growth and higher living standards. It is arguable that the boost to national productivity is a dividend of the major economic reforms undertaken in Australia over the last two decades.

Whether this is the appropriate interpretation or not, there can be little doubt that Australian businesses face more stringent competitive pressures than in the past, both from more competitive internal markets as well as an increasingly open trade regime. The productivity dividend suggests that the Australian economy — and thus its component parts — has 'lifted its game' in the last few years. If this is so, what scope is there for further improvements in performance, and how are such improvements to be achieved?

The contributors to this volume have taken useful steps to inform decision makers in both the private and public sectors of key factors that affect the performance of Australian businesses and how that translates to improvements in broader economic well-being. While many areas of further research remain, this book has made a large contribution to our knowledge of this important sector of the Australian economy.

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