An Analysis of the Competitiveness of the Manufacturing Sector in Australia between 1983 and 1996: Implications for Manufacturing and Industry Policy

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A Thesis submitted for the degree of

Doctor of Philosophy

to the

Graduate School of Business

The University of Adelaide

August 2006

Table of Contents

Appendices

List of Tables

List of Figures

Abstract

This thesis seeks to establish whether Australia's manufacturing competitiveness improved during the Hawke-Keating period of government (1983-1996), based on its performance prior to 1983. To achieve this aim it was necessary to identify what are the key characteristics impacting on competitiveness, and indeed, how do these factors interact? Importantly, the review was conducted from a broad-based strategic management perspective and not from an econometric standpoint.

As a means of determining the above a detailed examination of the development of competitiveness was undertaken. It was found there was no single determinant insofar as, competitiveness cannot be attributed to one specific aspect, but is in fact influenced by a number of factors acting simultaneously. This involved a review of the informed contributions reflecting the development of competitiveness. Findings suggested the roots of competitiveness could largely be traced back to the doctrine of comparative advantage. However, much of this thinking was inevitably surpassed, when the correlation between competitiveness and strategy was better understood. Thus, in terms of manufacturing, this demanded the analysis of factors which appeared to independently and jointly influence competitiveness. It also showed within the manufacturing sector there was an inextricable link between productivity, increased competitiveness and growth.

The contribution to the assessment of competitiveness by Professor Michael Porter was also studied in detail. The application of his work was examined with a view to the appropriateness of using his Determinants of National Advantage model in an Australian manufacturing context. Notably, this model provided a process which consistently explained the unique differences between participants within industrial environments. It also facilitated the identification of specific reasons for failure within an industry, which if left unchecked impacted on a nation's competitiveness. Relative to competitiveness and, to the significance of Porter's theories, an amended version of the 'Diamond Model' was considered more appropriate for this thesis.

Historically, Australia's manufacturing sector has been traditionally underpinned by tariff protection to sustain its existence. Political efforts to counter the impact of competition appeared to remain a central part of industry policy. For instance, politicians such as McEwen shaped Australia's post-war interventionist role by the use of politically imaginative industry policies to help shelter manufacturing from the threat of growing international competition. In 1965, the manufacturing sector underwent its first major restructure, driven by the objective to make it less reliant on government subsidies and support. This was followed by similar reform initiatives such as the Jackson Report (1977) and Crawford Committee Report (1979).

The Hawke-Keating Government came to office in 1983 amidst a shattered economy. Mid-way through its administration period, however, the Hawke-Keating Government had to contend with the internationalisation of world economies. This led to a deliberate change in industry policy, particularly at a microeconomic level to a free market persuasion. An accelerated tariff reduction program was also introduced. Whilst there was genuine support for the manufacturing sector to improve its competitiveness, many thought a more measured and strategic change was warranted. Research suggested Australian manufacturing was highly dependent on multinationals for technology and employment but by the same token, lacked specialization, and economies of scale and scope in terms of utilising its capabilities. Australia's manufacturers similarly failed to capitalize on aspects of research and development and innovation, languishing in a climate devoid of competition. Moreover, the manufacturing sector was not considered a prime investment target for international finance. In order to test these assertions a number of key hypotheses were developed. Following analyses, with the exception of the impact of manufactured imports on the economy, it was determined that manufacturing had improved in each of the categories assessed. However, largely, the sector's performance was well below that of its international counterparts.

Overall, these results add to the body of knowledge of competition literature, and also contribute to a better understanding of the factors which influence growth, sustainability, and the competitiveness of Australia's manufacturing in general.

Statement of Original Nature of Thesis

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being available for loan and photocopying.

Signed

12 OCT '2006

Dated

Acknowledgments

I would like to express my sincere gratitude to Professor Fred McDougall, my supervisor, for his invaluable support and encouragement and at times limitless patience during the preparation of this thesis. The numerous corrections and rewrites must have frustrated him as much as it compelled me to ensure I completed this work. I would also like to thank Dr Georges Baume my second supervisor for a short time, for his balanced perspective and insightful critique. In addition, it would be remiss of me not to acknowledge Mr Les Howard from the University library whose assistance was often called upon. I am similarly deeply indebted to my wife, Suzi, for her perseverance throughout the length of my candidature, which I am sure seemed to her never ending. Lastly, I wish to take this opportunity to thank my two daughters Cheryl and Ashley for their continued support and understanding of my long preoccupation with this thesis.

Chapter 1 Introduction

1.1 Background and Purpose of the Research

Manufacturing contributes substantially to Australia's wealth creation and GDP. More importantly, it plays a significant role in the employment of a wide range of skills, ages, education levels, gender and ethnic diversity. Similarly, by transcending differing cultures it create career opportunities, training prospects, and helps generate opportunities for more lucrative job choices elsewhere. However, between 1983 and 1996, the manufacturing sector witnessed unprecedented levels of economic change. Fundamentally, competition, particularly from international companies was quickly eroding traditional markets previously dominated by local manufacturers. In essence, Australia's manufacturing industry could no longer be sustained through domestic production alone (Hawke, 1983).

To deal with increasing international competition and the need for structural improvement the new Hawke-Keating Government orchestrated major industry policy changes. Both micro and macroeconomic reform epitomised the Government's political focus. Amongst the broad-based initiatives pursued, the nation was subjected to deregulation, floating of the exchange rate of the Australian dollar, and major transformation of its industrial landscape. Indeed, with respect to manufacturing, the Government set in place an agenda based on a tripartite agreement between itself, the trade unions and employers to primarily address the sector's lack of competitiveness. Through means of collective participation, the Government sought to realign manufacturing to a more open and internationally competitive outlook (Hawke, 1983).

This leads to the major purpose of this study which is to investigate whether competitiveness in Australia's manufacturing sector improved during the Hawke-Keating period relative to its competitive standing in 1983. Importantly, this thesis is not intended to reflect detailed econometric rigour, but will in fact follow a broad-based strategic management perspective. Given the proliferation of factors related to manufacturing

competitiveness, it is an empirical assessment of the key characteristics impacting on competitiveness at an industry and company level.

1.2 Justification for the Research

Very little empirical research has been carried out on the assessment of the factors contributing to improving manufacturing competitiveness in Australia. Moreover, the concept of competitiveness, and indeed, the definition of 'what is competitiveness' and how can it be measured has been the subject of considerable debate. As noted, Australian manufacturers had been weaned on tariff protection and a plethora of government support mechanisms which helped shelter them from international competition. In 1982-83, for example, the average effective rate of assistance (ERA) to manufacturing, which is defined by the ABS as referring to 'the percentage change in returns per unit of output to an activity's value-added factors due to the assistance structure'. The measure of net assistance stood at 25 per cent of value added (ABS, 1985). This level had been reduced to 8.1 per cent by 1995-96 (PC, 2000a).[1]

Between 1983 and 1996 the new Labor Government faced an industrial climate not previously witnessed. Precipitated by globalisation and as noted, the threat from overseas manufacturers, the necessity for improved competitiveness became central to the reform process (Hawke, 1983). On a wider front, Australia could no longer rely on primary industries for the bulk of its export income. This was exacerbated by the fact that the manufacturing sector was less competitive against imported manufactured goods, and from more technologically advanced industries overseas. While numerous structural problems were to be addressed, fundamental to the Government's election platform was the need to revitalise the whole sector, and at the same time reduce manufacturing unemployment, particularly as a consequence of previous government policies (Bell, 1993).

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[1] The effective rate of assistance is the percentage change in returns per unit of output to an activity's value adding factors due to the assistance structure. It measures net assistance, by taking into account not only output assistance and direct assistance to value added factors, but also the costs and benefits of government intervention on inputs (IC, 1999).

Prior to Labor taking office, total employment in the manufacturing sector stood at 1,154,700 (ABS, 2001a). Given the wealth generating potential of the manufacturing sector, a massive increase in this level was pronounced a major priority. Yet, in 1995-96, employment levels in the manufacturing sector had actually declined by 231,000 or about 20 per cent to approximately 924,000 employees (ABS, 1997a).[2] There are several reasons attributable to the above which undoubtedly provide a strong argument as to why this period of time was critical to the economy. As noted, to remain viable, Australia's manufacturing industries had to become more internationally competitive. Indeed, this period reflected a shift in national policy from tariff protection to corrective industry policies. This meant phasing out manufacturing tariffs and facilitating this through structural adjustment. Yet, amongst the planned reform processes the Labor Government could not abandon its traditional industry-wide support-base.

It had been stated that Australia is devoid of an appropriate blend of industry policies (Capling and Galligan, 1992). Accordingly, the justification for this study will attempt to determine the impact of the key components of competitiveness and the implications for Australia's industry policy in the future. The answer to this has remained illusory to industrialists, trade unionists and academics alike. It will be argued in this thesis that the lessons learned from investigating this important period of time will provide pragmatic suggestions to underpin the sustainability of Australia's manufacturing sector and thus facilitate competitive growth.

In the same way, the peripheral constraints that impede manufacturing competitiveness will be investigated. For example, during the early period of the new Hawke-Keating Government the Trade Unions advocated industry restructuring, public sector reform and importantly, the need to improve management and work practices (Capling and Galligan, 1992). Arguably, these issues were taken up as part of the Accord agreement.

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[2] The compilation of source data needs to be clarified. Some disparity exists between Reserve Bank and ABS statistical compilation methodologies. Typically, RBA (1996a) statistics show a decline of 14 per cent in manufacturing employment over the period reviewed. Part of this difference is represented by conceptual interpretations between ABS Labour Force Survey data and the Manufacturing Industry Survey, particularly encompassing the period since the late 1980's.

Nonetheless, the manufacturing sector continued to decline. Importantly, however, opportunities to significantly improve competitiveness between 1983 and 1996 appeared to have been missed, even although, Australia had experienced increased levels of manufactured imports. These are key issues, amongst others, that need to be addressed in order to improve our understanding of the relationship between industry policy and the competitiveness of manufacturing in Australia. Hence, with respect to manufacturing in general the Government's role is crucial. What is more, the diverse character of Australia's geographic location, its manufacturing resources and political framework offers a unique sphere for academic inquiry.

1.3 Methodology and Data Collection

The methodology adopted in this thesis will consist of a number of steps. It first examines the meaning of competitiveness by undertaking a comprehensive literature review. Contributors to the development of the concept of competitiveness such as Smith (1776), Ricardo (1812), Ohlin (1933), Heckscher (1949), Andrews (1971), Mintzberg (1973), Rumelt (1974), Scherer (1980), Ohmae, (1985) Grant (1991), Rugman (1991) and others will be discussed in conjunction with Porter's contribution to industry competitiveness. Secondly, it will analyse and assess the basis of establishing a suitable framework of analysis for this thesis. Thirdly, a detailed examination will be conducted on the appropriateness of Porter's (1990) Diamond model to determine its suitability for assessing the competitiveness of Australia's manufacturing sector. The aim will be to establish the key characteristics of competitiveness identified in Porter's cross national studies.

Arguably, Porter's (1990) contribution has pioneered the detailed assessment of industries and nations in terms of providing a comprehensive framework to compare competitive advantage. In his notable work titled *The Competitive Advantage of Nations* (1990) the focus primarily concentrated on 'competitiveness' *...at the level of the nation, the same framework can and has been readily applied at the regional, state or city level* (Porter, 1998, p.xxi). Emanating from a study of ten highly successful nations, Porter's (1990)

Determinants of National Advantage model was used to determine microeconomic foundations and the role played by companies. Porter had argued that most thinking and policy perspectives had previously concentrated on macroeconomic conditions for growth and prosperity. He suggested, however, there was a need for a new paradigm. Porter maintained that a nation's wealth is governed by productivity which can be captured in a framework graphically depicted by the diamond metaphor. Through this means he was able to compare the discrete parameters of what had been identified as each nation's competitive success. He noted the four primary facets of the diamond... *addresses the information, incentives, competitive pressures, and access to supporting firms, institutions, infrastructure, and pools of insight and skill in a specific location that support productivity and productivity growth in particular fields* (Porter, 1998, p.xxi).

It is reasonable to suggest that a similar framework is appropriate for this thesis as it is also concerned with assessing competitiveness at a company and industry level. Notably, Porter's examination of single sectors of an economy using time series data for comparative purposes provided continuity across nations. Given the objectives sought for this thesis there is justification in adopting a similar analytical approach.

Building on this, the specific nature of this thesis has been confined to a single nation, and single sector of an economy. To differing extents, this will provide a more confined review as the focus is on enterprise based activities. This decision was justified on the basis that measures of competitiveness in the manufacturing sector emanate primarily from enterprise-based initiatives. For example, factors which contribute to improved productivity, innovation, increased exports, research and development (R&D), and financial investment, are largely derived from strategies implemented at a company level.

This thesis will progressively examine the nuances of competitiveness, industry policy, publications, industry specific reports, political speeches, major policy announcements and the publications of commentators on competitiveness in Australia. Following detailed analysis of the literature, further rigour will be applied to evaluate the key parameters of competitive success by the use of statistical techniques. Out of this will

form a number of specific hypotheses which will be tested. These hypotheses will be examined in the context of the data collected and analysed.

In order to investigate these interrelated parameters, data will be collected from predominantly secondary sources. These data are preferred because of the abundance of Australia-wide 'official' archival sources and documentary evidence in both qualitative and quantitative form. Importantly, they are accessible from the public domain and can be independently verified. The adoption of this approach offers significant benefits to more traditional approaches. In essence, these data have been compiled from 'national' data gathering institutes such as the Australian Bureau of Statistics (ABS) the Industry Commission (IC), OECD, and numerous government departments and specialist industry bodies.

1.4 Outline of the Thesis

The primary purpose of this thesis is to determine whether the competitiveness of Australia's manufacturing sector improved during the Hawke-Keating period of government relative to its competitive standing in 1983. In Chapter 2 an historical overview of the roots of competitiveness and a range of attempts to define and measure it will be considered. Chapter 2 will also trace the level and extent of analysis which surrounded key concepts used in decision-making models, particularly the correlation between competitiveness and strategy. This will be reviewed in the context of competitive advantage and the intrinsic links between competitiveness and growth.

In Chapter 3 the work of Professor Michael Porter will be discussed, specifically covering his extensive contribution to the notion of industry competitiveness, and theories on the competitiveness of nations. Firstly, discussion will focus on the link between Porter's work and other writers, in particular, whether his theories influenced the industry policy positions of small and diverse manufacturing nations such as Australia. This critique will aim to determine the impact and logic of his models in general, and to the consequences of regional clusters and networks. The possibility of developing an analytical framework

within which to examine government changes to industry policy with respect to competitiveness will also be considered. This will involve a detailed examination of Porter's (1990) Diamond of National Advantage model and the key attributes which influence industry policy decisions of governments.

The focus of Chapter 4 will be on Porter's (1990) Diamond framework especially on how it was used to assess the competitiveness of ten nations. Fundamentally, this will determine the suitability of this model, or an amended version as the basis for the methodological approach to be used in this thesis. In this regard, it is important to highlight the comprehensive nature of Porter's studies. Examination of the work of other writers who have applied his methodology to other nations and different industries will also be discussed. A key aspect of this assessment will be to ensure Porter's methodology has sufficient flexibility to encompass a single nation and a specific economic sector to facilitate detailed analysis of factors contributing to competitiveness.

In Chapter 5 the link between the importance of manufacturing competitiveness and industry policy will be considered. Accordingly, a brief review of the historical development of industry policy up to World War 2 will be provided. This will illustrate the changing nature of industry policy and the importance of manufacturing to Australia. Part of this discussion will touch on macro economic issues to investigate the extent of Government intervention and the degree to which successive governments used tariff protection to underpin the viability of Australian manufacturing. The 1960's and 1970s stimulated periods of unprecedented change in terms of industry policy. Several reports were commissioned to help improve manufacturing performance. The implications of these reports and their impact on competitiveness provide a measure of the challenges which confronted the new Hawke-Keating Government.

Australia was in recession in 1983 when the Hawke-Keating Government came to office. Faced with enormous political pressures the Government sought to resolve the nation's economic problems by realigning its industries to become more internationally competitive. In Chapter 6 the Government's interventionist approach founded on macro

and microeconomic initiatives and the need to bring industry, government and trade unions closer will be discussed. The Accord evolved from the success of this initiative. Major changes were made to industry policy during the period between 1983 and 1996 in an attempt to revitalise and restructure the economy.

Based on a comprehensive literature review, the purpose of Chapter 7 will be to form specific research hypotheses in relation to changes in the level of competitiveness in the manufacturing sector. It is anticipated that the key constructs and variables developed will be strongly influenced by the work of Porter and others. Importantly, the hypotheses to be tested will be based on measures similar to the parameters used in Porter's (1990) study. In this way, attributes analogous to those identified in his studies as crucial to the sustainability of a nation's competitive advantage will be replicated. As previously discussed, however, due to the discrete focus of this thesis, a modified version of Porter's Diamond model may need to be developed. The basis of modification will take account of the competitiveness literature and accommodate the unique factors and idiosyncrasies inherent in Australian manufacturing.

In Chapter 8 the research methodology and the data collection methods will be reviewed. As noted, the need for an amended methodological approach more appropriate to Australian manufacturing will be considered. Consistent with the examination of the key research question, justification for a modified version of Porter's research methodology and for employing secondary-source data will be discussed. Given the specific focus the analysis and classification of these data forms a major part of the discussion. The chapter also considers the statistical processes to be used for testing the hypothesis about various parameters.

Chapter 9 will test each of the hypotheses in the context of the data collected. Statistical tests will be undertaken to investigate various parameters to determine if there is enough statistical evidence to conclude the parameters are reasonable. As the basis of the research relates to a single nation and single sector of an economy, these data will then be considered against the performance of other nations. Results will provide evidence to

determine whether manufacturing competitiveness improved during the Hawke-Keating period consistent with the parameters tested. This knowledge is vital to support the empirical and theoretical arguments posed.

Given the level of manufacturing competitiveness in Australia, Chapter 10 will review the potential of maximising the nation's limited resources in the context of the hypotheses. In light of these parameters the efficacy of the revised competitiveness model will also be discussed in terms of the implications for industry policy. Fundamentally, establishing if there is a link between Australia's determinants and the factors which appear to drive competitiveness is paramount. The subsequent outcomes could well have compelling implications for industry policy in the future.

Chapter 11 will present a number of major points discussed in previous chapters. In addition, this will be complemented by some concluding remarks regarding the sustainability of Australia's manufacturing. The effectiveness of industry policy will also be discussed with respect to the onslaught of globalisation, and in particular, with regard to the Government's role in achieving an internationally competitive manufacturing sector. This last chapter will similarly consider whether or not the specific aims and objectives of this thesis have been met.

Chapter 2 A Review of Competitiveness

2.1 Introduction

Consistent with the continued development of international trade, observers have attempted to determine 'what is competitiveness' in terms of its origins and relevance to trade activity and country based production. In this chapter the roots of competitiveness and a range of attempts to define and measure competitiveness will be considered with the objective of establishing a basis of reference and suitable framework for discussion and analysis.

However, prior to discussing the changes in competitiveness in the manufacturing sector in Australia, it is necessary to have a clear meaning of what is competitiveness. Initially, the attempts of economists and others to define competitiveness will be considered. Discussion will then focus on how competitiveness became increasingly more important following World War 2, and how the link between competitiveness and strategy underpinned company growth. These aspects will be reviewed in the context of achieving and sustaining competitive advantage.

2.2 What is Competitiveness?

Historically, economists have largely led the debate concerning the concept of competitiveness. There have been several connotations of the meaning and impact of competitiveness that have been widely used to illustrate specific micro and macroeconomic variables that, together, define the level of competitiveness of a company, nation or a sector of a nation. In general terms, economists measure competitiveness in terms of price. In order to provide a fuller interpretation of how this relates to this thesis, it is necessary to touch on the basic economic theory of competition.

According to Baumol, Blinder, Gunther and Hicks (1988) in relationship to competitiveness, a 'market' is a set of buyers and sellers whose activities affect the price

at which a particular commodity is sold. Markets are distinguished relative to how many firms there are and whether the products of different firms are identical or somewhat different, and how easily it is for firms to enter the actual market. Manifestly, the economic theory of competition occupies a number of guises. At one extreme 'perfect competition' exists. For instance, this would include many small firms selling an identical product, while 'pure monopoly' based on a single firm, would be at the other end. Indeed, some entities demonstrate the characteristics of both. This encompasses 'monopolistic competition' which includes production by many firms with different products and 'oligopoly' which describes production by a few firms.

For 'perfect competition' to exist, economists suggest that the following four conditions must be satisfied, a 'market' must contain:

1. Numerous participants
2. Homogeneity of product
3. Freedom of entry and exit
4. Perfect information.

Clearly, in practice, these characteristics would be infrequently met. Under 'perfect competition', a firm would be a 'price taker' meaning it would have no choice but to accept the price determined in the market. In terms of the linkage between 'perfect competition' and 'efficiency' the output from competitive industries would be produced at the lowest possible cost. Importantly, 'perfect competition' has been used as the 'standard' for analysis of the structure and behaviour of an industry. A firm in a 'perfectly competitive' industry makes three key decisions: how much to produce, should they temporarily shut down or should they leave the industry? It is worthy of note that Smith (1776) argued some two centuries prior 'perfectly competitive' firms use society's resources with maximum efficiency. Moreover, as Engels (1848, cited in McTaggart, Findlay and Parkin, 1996) later observed, competition serves the interests of consumers by ensuring commodities are supplied in the amounts required, rather than some commodities being oversupplied while others are undersupplied.

Additionally, the theory of 'contestable markets' has been used to supplement the concept of 'perfect competition'. Scherer and Ross (1998) suggested that a market is defined as 'perfectly contestable' if a firm's entry and exit are costless and unimpeded. Thus, in relation to domestic forms of competition, firms operating in highly contestable markets would be forced to operate as efficiently as possible and charge as low a price as possible in order to survive. Alternatively, if a firm is inefficient, or sets its prices too high, it will be threatened by replacement from another entrant. At an international level, the standard measure of competitiveness would be related to the 'real exchange rate'. This is measured in terms of the changes in a country's prices relative to the prices of other competitor countries, after taking account of exchange rates (Keating, 1998).

Yet, the non-economist view of competitiveness is reflected more so in practical terms and usually articulates factors such as high profitability and lower labour costs consistent with the internal efficiency of a company. Most individual enterprises seek innovative ways to improve their level of competitiveness and profitability. Typically, this is achieved by increasing the scale and scope of their current products and services, or by adopting ways in which to differentiate themselves from competitors in the marketplace. The term 'competitiveness' has also become entrenched in the vocabulary of most politicians, businessmen and academics as a colloquialism for expressing the performance of companies and industries, or for comparing nations based on specific econometric measures.

Amongst this rhetoric, however, there is still no 'single' interpretation of an acceptable 'international standard of competitiveness' (Porter, 1990a). This problem is further compounded by the fact there is equally no academically resolute agreement for the precise measurement of competitiveness. It is acknowledged, however, that the academic literature provides a number of definitions and theories that support arguments pertaining to the economic reasoning that depicts company and industry level performance. Nonetheless, there is a need for further discussion to determine an international standard (Zysman and Tyson, 1983; Porter, 1990; Grant, 1995). This debate has continued since World War 2 with no apparent resolution. However, Porter (1990a) in his work on

measures of competitive advantage moved some way towards it by concentrating on exports, productivity, and foreign direct investment, amongst other facets.

2.3 Early Contributions to the Development of the Concept of Competitiveness

The roots of competitiveness can be largely traced back to the doctrine of 'comparative advantage'. Adam Smith, the founder of modern economics emphasized the notion of absolute advantage, in particular, the correlation with specialisation and the consequent 'division of labour'. Smith (1776) observed that by dividing work into specialist categories each worker became skilled in their own particular specialty, and the productivity of a group of workers as a whole was enhanced enormously. Smith also noted that people were very astute at pursuing their own self interest, and that a 'market system' was a good way to harness this self interest. In doing what is best for themselves, Smith argued that people are 'led by an invisible hand' to promote the economic well being of society (p.5). Also, Smith is credited as being the architect of basic economic theory that is still applicable today. Renowned as the first economist he was also instrumental in probing the workings of capitalism in order to explain how the 'invisible hand' of the price mechanism could actually guide resources to their highest value use.

Some of the early writers on trade implied that one nation could gain from trade only at the expense of another. Smith contended, however, that this assertion was more complex. In the context of his now famous term to 'beggar its neighbours' Smith developed the notion that one nation's gain must be at another's loss, meaning that a country could promote its own welfare only by disadvantaging others. However, Smith emphasised that in any voluntary exchange, both parties must gain something from the transaction. Otherwise, why would both parties agree to exchange? His thesis was based on the assumption that the breadth and specialisation of supporting industries is enhanced by the extent of demand for a product.

Ricardo (1812) further developed the concept of comparative advantage. This work is generally recognised as the origin of the general theory of international trade. Ricardo

asserted that trade enabled each country to specialise in the pursuit of its comparative advantage that arises from differences in production technologies between countries. By specialising in the production of a particular commodity that a country could produce relatively more cheaply than others, each country could consume as much as it needed and trade the excess for alternative products it did not produce. Ricardo suggested that to identify a country's comparative advantage in terms of goods would require a comparison of production costs across countries. However, the most important aspect to consider was the country that could produce a good at a lower opportunity cost than any other would gain a comparative advantage resulting in a greater level of competitiveness and productivity. Ricardo attributed this to 'unexplained differences' within the industrial environment or 'climate' of nations that favoured particular industries.

Ohlin (1933) and later Heckscher (1949) refined Ricardo's theory by including what they termed 'factor endowments'. This idea was based on the fact that nations could access the same technology but would differ substantially in terms of their natural endowments, through so called 'factors of production' such as land, labour, natural resources, and access to capital. They argued that countries with low cost of labour would export labour intensive products, countries rich in land resources would export agricultural and mineral products, whilst a country with high skill levels and an abundance of capital would export sophisticated manufactured goods. By achieving comparative advantage based on factors of production and national differences in factor costs, a country could specialise in exporting goods that utilised resources they had in abundance or could produce more efficiently. Similarly, they could import those goods that other nations produced more cost effectively.

Accordingly, the early stage growth patterns of international trade continued largely on the basis of comparative advantage. This occurred essentially because industries were fragmented and concentrated on production systems based on the use of 'craft' labour. The success of trade reflected the availability of skilled labour, capital, location, mineral and agricultural resources and also, the close convenience of efficient transport systems. It should be noted that the standard 'theory of comparative advantage' is unrealistic as it

assumes there are no economies of scale, all technologies are identical, products and services are undifferentiated, and the availability of national factors of production are fixed. Indeed, the basis of comparative advantage also assumed that factors such as skilled labour and capital did not move amongst nations.[3] In a short time, however, this theory was being largely questioned by some authors who noted factors could be created, a point noted earlier by List (1856).

During the early 1900's the industrial world witnessed the emergence of formal planning processes as an aid to controlling the future of organisations, in areas such as formalised thinking, productivity, and the response to market competitiveness. Arguably, the origins of manufacturing competitiveness emanated within the early forms of mass production. For example, Ford in the automobile industry demonstrated powerful linkages with competitive strategy that can be traced as far back as Taylor (1911) and Fayol (1916). Fredrick Winslow Taylor as the pioneer of work measurement became known as the father of 'Scientific Management'. Taylor was renowned as an avid champion of productivity and competitiveness in the workplace. Similarly, Fayol clearly understood the ramifications of the breadth and holistic nature of planning and competition when he stated that:

> *...The maxim, 'managing means looking ahead', gives some idea of the importance attached to planning in the business world, and it is true that if foresight is not the whole of management at least it is an essential part of it* (Fayol 1949, p.43, published in French 1916).

From 1900 onwards the prevailing thrust of competitiveness embodied a much wider sphere of the management process to secure competitive market positions. Indeed, this encompassed a broad range of strategies. For instance, where to locate an industry became an integral part of the competitiveness process. Weber (1929) set forth a theory

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3. In classical and neoclassical trade theory, the stock of factors in a nation is taken as fixed. Companies utilized the available factors within the constraints of this fixed total. It can be deduced therefore, that if a nation's comparative advantage is based purely on factor advantages, the sustainability of a company's competitiveness would be vulnerable at some future point in time as factor advantages have a limited relationship with actual competition. See, for example, Helpman and Krugman, (1985).

that suggested the objective of any new industrial location was to maximise available resources in order to minimize total costs, particularly transportation and the imperative to acquire the latest technology. Gains made from first mover initiatives, such as the opportunities to create economies of scale, and the establishment of brand names and customer relationships, could be optimised with little or no direct competition.

It was largely around the 1930's that the appropriateness of comparative advantage as the cornerstone of competitiveness theory came into question. Much of the traditional thinking embodied a static view that, for example, cost efficiency was due to factor or scale advantages achieved as a result of exploiting a country's natural resources. This proposition for the most part supported the Ohlin (1933) and Heckscher (1949) models previously noted, which explained how certain countries achieved comparative advantage in particular products or processes. However, Schumpeter (1934) stressed there was no 'equilibrium' in competition and that static efficiency at some point in time was rapidly overtaken by a faster rate of progress. Notably, Schumpeter recognised that competition is profoundly dynamic in character and in a perpetual state of change. He further argued that because of this, new companies would inevitably surpass previous industry leaders (Schumpeter, 1942). Whilst stressing the importance of innovation, he maintained a large company with market power would be more innovative than a group of rivals. He noted that innovation is not undertaken because of stability and ample resources, but because of pressures and challenges from competitors. Consequently, internal improvement and innovation within an organisation would become a never-ending process[4]. Thus, in his view, while risk is ever present, companies that maintained dynamism would undoubtedly sustain leadership in the specific characteristics of business they pursued.

Other writers have also challenged the legitimacy of comparative advantage by suggesting it is an incomplete explanation for trade. For instance, in the next section it will be shown that as more industries became knowledge intensive especially following World War 2, the role of factor costs weakened even further. Indeed, the prevailing

[4] The work of Michael Porter that will be discussed later relies heavily on Schumpeterian theory.

Ohlin-Heckscher model was substantially contradicted by Leontief's (1954) notable work in which he showed that capital rich countries such as the United States could exploit the characteristics of a nation's comparative advantage and simultaneously export labour-intensive goods (Leamer, 1980; and Hindley and Smith, 1984). Yet, amidst the growth of western economies predicated upon comparative theory, the wealth of a nation was determined by how effectively that nation could strategically manage its natural resources and its domestic capabilities better than its international competitors. By the mid 1940's the notion of competitiveness in industries and nations based on factor costs and price was considered unsustainable because, generally, there was no inherent strategy for moving beyond that position.

The next section will discuss the advancements in technology and the use of differentiated techniques and concepts. Fundamentally, this facilitated significant market growth in industries and segments of industries through the adoption of sophisticated tools to reconfigure the competitive paradigm that existed.

2.4 Competitiveness in the Post World War 2 Period

The literature on competition suggested the affect of newly developing internationalisation of industries and companies stimulated the forces of post World War 2 competitiveness. Advancements in technology, improved systems, and inter-firm collaboration led to massive increases in production efficiency and competitive behaviour. Accordingly, it is useful to provide a broader perspective of how adoption of these new strategies and technologies facilitated companies, industries, and indeed, countries to pursue dominant market positions. The early studies of Rothbart (1946) and Habakkuk (1962) showed the value and influence of induced technology factors and innovative processes were fundamental to securing a competitive stance. Whilst there is some controversy in the literature regarding whether factor costs had an impact, others maintained that companies would always seek to maximise profits by investing in innovation to reduce factor intensity regardless of factor cost (Denison, 1962).

In the post World War 2 period, greater access to new technology and more effective production methods provided companies with the capability to pursue several initiatives simultaneously. For example, the correlation between quality management systems and company performance came to prominence. Understanding the real cost of 'poor' quality had created a major impact on company competitiveness and efficiency. Importantly, this occurred both internally, and at a customer level, and impinged on the profitability of manufacturing companies throughout the United States of America, and Europe (Moroney, 1951). It is useful to demonstrate the international extent of competitiveness which had evolved. In 1946, for example, General MacArthur initiated one of the most noteworthy episodes of competitive improvements of the time by his insistence on introducing formal quality management processes to Japanese manufacturers (Blakemore, 1989).

Ironically, Shewart, Deming and Juran who were basically ignored by manufacturers in the United States, were seconded to Japan to implement a series of quality management processes within the manufacturing sector. During the ensuing period they played a significant role in the successful revitalisation of the whole of Japan's post-war manufacturing industry. Arguably, the power of this metamorphosis secured Japan's leadership in manufacturing up until the mid 1980's. Blakemore (1989) noted that Shewart, Deming and Juran were revered in Japan and became known as the fathers of the quality revolution. It was not until the late 1950's and the early 1960's that the rest of the world recognised Japan's competitive success and pursued similar strategies. The work of Scott (1994) also adds an interesting dimension contrasting the neo-classical perspective with a revisionist approach in particular, with respect to the interventionist role played by the Japanese Government following World War 2.

In the same way, the pursuit of increased competitiveness introduced significant changes to the management thinking that prevailed. Aspects of culture, work ethic, values, economic structures and the focus on highly localised processes contributed profoundly to the competitive success of companies and industries. Moreover, change and improvement occurred at an accelerating rate throughout the manufacturing sector and

took into account a number of issues such as manufacturing costs, efficiency, productivity and, as noted, the importance of site location based advantages and exploitation of resources. Importantly, however, the search for superior competitiveness between companies and industries encroached on many other strategic and operational disciplines.

Losch (1954) developed a stylised model in which spatial supply and demand considerations were measured against the optimum location of a company. Also, concepts such as "agglomeration economies", a term coined by economic geographers developed to identify the concentration of industries within a region, were increasingly adopted. This had significant relevance to the pursuit of competitiveness because it highlighted the wider spectrum of strategic initiatives being pursued by advanced nations. In particular, those that acknowledged the importance of economies of specialisation and the benefits to be gained from industry concentration (see Lloyd and Dicken, 1977; and O'Sullivan, 1981). Certainly, the stimulus generated through the creation of international firms was responsible for much of the market growth that evolved during this post war period. No more so than the benefits attributable to international trade, especially related to the export of products and services, technical and intellectual know how, that quickly found favour with advanced nations.

Consistent with the embryonic theories of vertical integration and networks that existed, the concept of industrial 'development blocks' first mooted by Dahmen (1950) became more prominent. He stressed there were crucial links between the ability of one sector to develop and progress in another. Dahmen argued these stages or vertical activities that existed between industries created the basis for gaining advantage over competitors. Porter (1985) later expanded Dahmen's theory in his work on 'value chains'. Also, in support of the concepts of vertical integration Chandler (1977) traced the emergence of modern industrial enterprises and concluded that the wholesale shift toward vertical integration in the late 19th century and 20th century had been the ultimate step in 'perfecting' modern enterprises. Moreover, given the importance of reliable supplies of raw materials such as steel and oil, notwithstanding the limitations of communications

and transport, it is easy to appreciate why vertically integrated firms were considered an important function of competitiveness at the time.

Further, Hirschman (1958), in his work on economic development, emphasized as part of the competitiveness process, the importance of inherent dependent and interdependent linkages between industries. Hirschman noted that these developments were instigated principally through the volume of demand for each other's products. In the same way, domestic demand for a product or service was recognised as an important part of the competitiveness of trade. Linder (1961) argued that there must be local demand for a product before a nation will export that product. He considered it necessary to fully understand the nuances of production and local demand as an essential aspect of 'how to succeed' in that industry. Trade would be greatest between nations with similar demands, because the experience gained by local companies would result in the production of goods and services other nations would value. Linder also argued that similar per capita income was the best measure for similarity in demand, and therefore, trade would be most intense between nations with similar per capita income. Although Linder's research came at a time when globalisation was not yet a predominant influence, nonetheless, his theories highlighted the importance of local demand on competition and identified the fact that broad similarities between markets are essential in order for successful trade to occur.

Complementing this, the literature relating to innovation contained strong empirical and theoretical support for the notion that increased competitiveness was closely associated with the achievement of greater rates of company success (see Arrow, 1962, and the review by Scherer, 1980). Also, Schmookler (1966) studied the significance of market size and the main reasons for the rate of market growth. He maintained that the stimulus of technological innovation had underpinned the growth and competitiveness of most industries. The work of Bain (1956) is significant in this area, especially with regard to his theories on economies of scale. Yet, it must be conceded that there are many other factors that impact on this assertion. For example, Dreze (1961) argued that small countries with ethnic and cultural diversity, such as Belgium, which he studied, were

unable to attain scale to be competitive in style and design-sensitive goods because local market segments were too small.

The notion of competitiveness achieved by economies of scale also found favour with Vernon (1966) who discussed at length the benefits of mass production systems in the United States in terms of achieving lower manufacturing costs. He noted the importance of adopting innovative concepts in concert with the need to develop labour-saving devices. Vernon's work was similarly complemented by Franco (1976), who had highlighted the prevalence and use of automated systems and devices in Europe primarily because of the shortage of skilled labour. Undoubtedly, the stimulus created by increased competition in the manufacturing sector forced international firms to concentrate on internal efficiency and growth as a fundamental aspect of their existence.

Other initiatives that evolved in support of technological competitiveness can be found in the so called 'product cycle and technology gap' theories. According to Vernon (1966), the main reason why the United States was a leader in so many advanced manufactured goods concurrently was based on the fact that the early 'home demand' for these advanced goods stimulated the United States to pioneer the development of new and innovative products. This, in turn, resulted in the development of the most cost effective means to produce them. Vernon recognised that when American companies exported during the early phases of industry development, this process would involve the establishment of foreign production. As demand grew for these products, foreign companies and foreign subsidiaries of these American companies would eventually export to the United States.

Thus, based on technology diffusion, the 'product cycle' theory represented the beginning of 'real dynamic theory' and suggested how the home market arguably influenced innovation and product research in manufacturing. Moreover, in support of Vernon, Wells (1972) argued that the 'gap theory of trade' allowed nations to export from industries where the companies involved were perceived to hold some lead in technological competence over their competitors.

It has been demonstrated in this section how a greater understanding of the concept of competitiveness in manufacturing advanced the capability of companies and industries to compete in the post World War 2 period. Arguably, growth in the capabilities of international companies and the use of innovative techniques and concepts had enabled industries to become more efficient as a result of competition. Manufacturing efficiencies were being pursued relentlessly. Furthermore, Buzzell (1968) pointed out that the rapidity with which barriers to standardisation were falling was attributed in many ways to cheaper and more advanced methods developed and used to manufacture products. To a large extent this highlighted the turning point in manufacturing whereby efficiency, distribution services, marketing and management resources had become more focused on reducing price and manufacturing costs. Competition between companies had become based on the formation of 'value propositions' or at least the use of the best combination of price, quality, design, reliability, and delivery (Ackoff, 1970).

2.5 The Correlation between Competitiveness and Strategy

The doctrine of competitiveness took on a new dimension from the 1960's. Whilst earlier writers focused on the competitiveness of nations and industries, the emphasis now changed from defining competitiveness to maintaining and indeed pursuing increased competitiveness at the industry and the firm level.

It became increasingly accepted that planning procedures and effective strategy was fundamental to the development and sustainability of a company's success (see, for example, the various works of Nutt, 1983, 1984). New disciplines such as strategic planning, marketing, human resource management and industrial psychology became more prevalent. The adoption of these influences also placed significant emphasis on the measurement and performance of companies and workforces. The ensuing commercial opportunities that occurred from what was fundamentally the start of the internationalisation of markets had, in turn, created increased competition between companies and thus, fertile grounds for analysis. Similarly, the debate broadened to

encompass a wider range of issues. The globalisation of world economies had changed the context and perception of competitiveness and had certainly become more mobile. While economists still played a large part in the subsequent competitiveness debate, a whole new genre of political and academic commentators entered the discourse.

As domestic and international markets and intra-company competitiveness intensified, the level of planning concepts and techniques similarly became more sophisticated. What was previously largely intra-company competition at a domestic level had grown to encompass international companies and highly competitive global forces. This phenomenon demanded more comprehensive market information and indeed, a greater level of management intelligence for effective decision-making purposes.

There is sufficient evidence to suggest that to counter the offensive strategies of competitors demanded a more belligerent attitude to planning. In effect, *'planning means control'; at the very least it encompasses the processes by which decisions are made and interrelated* (Mintzberg, 1994, p.198). A similar theme had been postulated earlier by Drucker (1959, p.239) who spoke of the 'futurity of present decisions', and by Ozebakhan (1969, p.151) who described planning as a 'future directed decision process'. Relative to the competitive nature of an industry, Ansoff and Brandenburg (1967, B220) similarly characterised planning as *...a process of setting formal guidelines for the behaviour of the firm.* It is in this context that each of the above writers argued that the role of competitiveness and the subsequent development of offensive and defensive strategies to counter competitor initiatives are considered key to maintaining the longevity and viability of a company.

Ansoff (1965) provided one of the first modern explanations of strategy as a business tool to differentiate organisations by means of competitiveness. Through the use of conceptual and methodological frameworks, it was possible to assimilate information by the use of his 'capability profile matrix' (pp.98-99). In order to improve competitiveness, the identification and subsequent analysis of inherent capabilities was essential. This allowed the efficient management of a company's resources as part of a strategically

driven decision-making process. Others such as Andrews, Learned, Christensen and Guth (1965) deepened the competitiveness debate and spoke about structure, systems, culture, values, attitude to risk, key processes, people, technology and capital. This approach was later elaborated upon to emphasise the importance of understanding and effectively managing competition related to a company's external environment, stakeholder interests, consumer needs, economic and political trends and the implications of its industry structure (Porter, 1985, 1990). In essence, business strategy became synonymous with the development of competitiveness and sustainability.

Along similar lines, Steiner (1969) demonstrated the integration of competitive strategy with formal planning. In essence, articulation of competitive strategy was initially accomplished at a corporate level, then at a business level which actually encompassed products and markets. Finally, it was achieved at a functional level which took into account the competitive approaches to the development of superior production systems, marketing and research and development and the like. The comprehensive models of Steiner (1969) together with Ansoff (1965) provided pragmatic tools for planning which encompassed virtually every aspect of a company's operations. Arguably, the contributions of Ansoff and Steiner articulated the basic theories of strategic management later postulated by numerous advocates.

During the 1960's and early 1970's the development of analytical tools to assist in the improvement of management decision-making increasingly occurred. To a large extent, strategic tools and models gained prominence specifically designed to enable companies to analyse their competitiveness and better understand the competitive environment in which they operated. Important contributions by the Harvard Business School and the Boston Consulting Group (1973), noted for its 'Portfolio Analysis' model, played a significant part in the generation of business models that are still used to a large extent today.

Andrews (1971) is attributed with the development of the SWOT Analysis model that focused on a company's strengths, weaknesses, opportunities and threats. These ideas,

however, can be traced back to Selznick (1957) who recognised that companies operated in internal and external operating spheres which both encountered the idiosyncrasies of economic influence. The simplicity of the SWOT Analysis process lies in its categorisation of each of the competitive elements of a company's internal and external operating environment. Thus, from a company's perspective, it was essential to identify all relevant information which might impact on the company prior to generating unique offensive or defensive competitive strategies. Mintzberg (1990a) later classified this technique as part of the 'Design School' model because it is built on the belief that strategy formation is a process of conception.

A second phase of planning and strategy emanated from Ansoff's (1965) work that became known as the 'Ansoff Matrix'. The Ansoff mapping took more of a 'position' than a 'perspective' stance towards planning. This contribution formed the basis of strategic modelling for management writers and represented a 'crescendo' in the development of strategic planning theory (Mintzberg, 1994). Ansoff's model purposely adopted a narrower perspective mainly due to the bullish mood of the 1960's US market. In essence, the difference between the two models was fundamentally that 'The Harvard Process' concentrated more on strategy development. Andrews (1982, p.164) stated that economic strategy will be seen as the match between qualifications and opportunity that positions a firm in its environment, while Ansoff's model focussed on product market strategy

> *...the end product of strategic decisions is deceptively simple; a combination of products and markets is selected for the firm. This combination is arrived at by addition of new product-markets, divestment from some old ones, and expansion of the present position*
> (Ansoff 1965, p.12).

Other notable contributions that reflected the competitive stance of companies can be found in the works of Stewart (1963), Chapman and Gabrielli (1976), and Rothschild (1980). Rumelt (1974) also noted that an essential ingredient of successfully competing amidst the volatility of industries and nations is based on the need for systematic strategy

and structure in areas familiar to the organisation. Rumelt stressed the importance of holistic planning to incorporate each of the relevant organisational linkages.

Aligned to discrete models of strategy, writers such as Abernathy and Utterback (1978), Toledano (1978), and Rosenberg (1979) reported on the importance of technological interdependences to sustaining competitiveness. Their work highlighted the dependent relationships that existed between different industrial sectors of an economy. They provided empirical evidence to show that related sectors are necessary in a nation for their mutual advantage. In hindsight, this offered logical justification as to why clusters and industry networks occurred. These data also suggested that leaders in specific industries achieved their status through a well-defined concentration of alliances created through a highly localised process.

Jelinek (1979) was possibly one of the first to provide reasoned arguments in favour of 'formalised' strategic planning and the ability to 'institutionalise' tasks through the use of formal systems to facilitate the separation of management tasks. Basing her arguments along the lines of Taylor's (1911) factory planning and control mechanisms, she exposed the key premise that through the powers of 'formalisation', planning becomes the means to create, differentiate and operationalize unique strategy. In other words, strategic planning is strategy formation and hence, allows the management of operational activity to be separated from the development of actual strategy. Extensions of Jelinek's argument enabled intensive assessment of a company's internal activities alongside the discrete management of its external activities with respect to the nuances of the competitive environment (see also, Gluck, Kaufman and Walleck, 1980).

Later, Quinn (1980, p.14) spoke of 'logical incrementalism', a process of gradual evolution of strategy driven by conscious managerial thought. Arguably, Quinn's assertion implied that the various parameters identified by a company as the most appropriate strategy to pursue was a result of the ongoing analysis of the company's markets, performance, and its available resources to exploit viable opportunities. By the mid 1980's, however, academic commentary largely moved into more sophisticated

analyses of management techniques, productivity and market positioning within the manufacturing sector (Mintzberg, 1989). In essence, academic models, theoretical concepts and decision-making tools had won favour with many of the large corporations, and had largely permeated the strategies of medium and small enterprises (Hammer, 1990).

Marsh, Barwise, Thomas and Wensley (1988) argued that the acceleration of world competitiveness had been stimulated by investment decisions and the results of cost-benefit analysis. They contended this accounted for the breadth of competitive focus at both domestic and international levels. Indeed, this led some authors to hypothesise on the specific reasons for this, in terms of company success and market failure. It also provided the impetus to segment industries into groupings such as traditional, knowledge-based, resource intensive, scale or mass production, and high technology or science based. One such taxonomy can be attributed to Pavitt (1984). The aim of such categorisation was to reflect the various determinants of competitive success that occurred within different industries at different times (see, for example, Arndt and Bouton, 1987). Also, the development of tactics and strategic manoeuvres to outwit competitors was eloquently defined by Schelling (1980), and in the notable article of Williams (1984) regarding competitive strategy evaluation.

Clearly, by the mid 1980's much of the competitiveness debate centred round strategy. According to Grossman and Lindhe (1984), the tactical arguments involved a broader context that now encompassed a company's internal activity, its inter-company behaviour and the competitive stances it developed at a national level. Predominant amongst the various debates was the increasing use of strategic management as a means of developing information systems. In particular, this contributed towards the proliferation of analytical techniques used to generate appropriate competitive responses. Hayek (1988) for example, contended when explaining the connection between markets and spontaneous discovery, that - 'evolution rests on competition'. He maintained that useful knowledge arises from a process of experimental interaction of widely dispersed, different, and even conflicting beliefs. Renowned for his disdain of modern macroeconomic reasoning he

contended it concealed the character of competition as a discovery process. He suggested growth stemmed from trial and error, or in effect, through the competitive forces that emanate from the survival of and imitation of successful companies. Hayek strongly argued that a successful company seldom knows it will be successful, as success is invariably gained through unintended consequences, and from endless episodes of unpredictable causes and effects.[5]

2.6 Competitive Manoeuvring

Much of the commentary on competitiveness thus far has been confined to aspects of comparative advantage. However, the 1980's witnessed the birth of the new phenomenon of competitive advantage. The concept of competitive advantage was initially instigated in the context of US industry policy debates that emerged during the late 1970's and the 1980's (Zysman and Tyson, 1983). Now closely associated with Michael Porter, the development and analysis of competitive advantage for companies and industries had been based on the work of a number of writers that led to significant advances in business thinking.

Fundamentally, the notion of increased competitiveness evolved as the key differentiator between companies, industries and nations. Thus, the sophistication of diagnostic and decision-making models, strategic initiatives, and market positioning previously discussed, inevitably became the primary focus of most company's competitive strategy (Peters, 1982). This in turn led to a greater concentration in developing ways to become more competitive through differentiation, internal efficiency, new technology, research and development, computerisation of systems, and the increased use of intellectual resources as part of a structural approach.

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[5] Other contributions to the assessment of competitiveness can be found in the work of Mintzberg (1973, 1987, 1989, 1990, 1994). Minzberg fashioned numerous critiques of strategic planning. However, his incisive contribution to planning and crafting strategy is fundamental to the accumulation of knowledge of management systems and the competitive environment in which companies operate.

The analysis of competitiveness had become one of continuous dynamism inspiring insightful analysis and debate across a wide-range of industries. Academic and industrial commentators revelled in an environment of critique and conflicting assessments of competition with respect to the comparison of manufacturing companies. As noted, much of the debate emanated from the emergence of competitive advantage increasingly perceived to be the fundamental ingredient of a company's profitability and long–term survival (Porter, 1985). Also, the hype associated with the inevitable threat of globalisation similarly posed an imperative on manufacturing nations to become internationally competitive. This, in turn, stimulated the desire to identify further levels of internal and external efficiency through the ongoing pursuit of improved competitiveness and productivity. Porter (1985), for instance, argued that increased competition demanded companies adopt competitive stances based on internal attributes which they considered would provide an edge over their competitors. Yet, this constant drive for increased competitiveness demanded a different paradigm. It necessitated improvement of a company's total operations at both an internal and external level in order to be sustainable.

Levitt (1983) had already stated that a powerful force drives the world toward converging commonality, and that force is technology. He went on to note that it had homogenized communication, transport, and travel. Levitt was alluding to the consequences of globalisation, competitive markets and the implications of industrial change and efficiency that had impacted on industries. Unquestionably, the threat of competition stimulated strategic responses by companies on numerous fronts. Hamel and Prahalad (1985), for example, argued that global competition should be countered from the adoption of a sequence of competitive actions and reactions. Basically, they contended that an aggressive competitor will use the revenues accrued from its home market to subsidise an attack on markets of domestically oriented foreign competitors. The defensive competitor then retaliates not necessarily in its home market where the attack had been staged, but in foreign markets, where the aggressor company is most vulnerable (see also, Watson, 1982).

Hamel and Prahalad (1985) suggested that to succeed in global markets a company must distinguish between its competitive strategies and also whether to pursue (1) low-cost sourcing, (2) minimum scale, (3) a national profit base, (4) retaliation against a global competitor, and (5) benchmarking products and technology in a state-of-the-art market. They concluded that competing globally required the capacity to think and act in complex ways and that simultaneously, companies must develop varied criteria and analytical tools to justify the associated risks. Yip (1995) added weight to the Hamel and Prahalad argument through the incisive development of 'industry drivers', 'descriptors' and his account of the characteristics of 'competitive drivers'.

It could be argued that the same basic reasoning is applicable to the achievement of increased levels of exports for a nation through the use of innovation and economies of scale. This in essence links the benefits attributable to scale economies and lower costs to greater export potential (Helpman and Krugman, 1985). It can be similarly concluded that global competition requires novel ways of competing. Yet, different markets offer different competitive opportunities. Maddock (1995, p.31) argued that competitiveness is guided by the belief that markets should be exploited as much as possible *...to perform allocative tasks with benefits expected in terms of allocative, productive and dynamic efficiency.* Thus, greater competitiveness is synonymous with the achievement of market advantage. Gilbert and Strebel (1986) had earlier explained that competitive advantages are built on the ability to utilize the business system to provide final customers with the desired perceived value, at the lowest possible cost. They went on to note such competitive formulas are the basis of all successful strategies. However, other factors need to be considered. For example, Prahalad and Hamel (1990, p.81) noted...*competitiveness derives from an ability to build, at a lower cost and more speedily than competitors, the core competencies...*

Bartlett and Ghoshal (1995) also spoke of 'global chess' by which they meant the competitive strategy company's adopt to manage their worldwide operations. With changes in technology and the potential of increased competition came the need to access new resources at the lowest possible cost. Often this created opportunities for companies

seeking to expand into new markets where there were no home country sources of supply. Moreover, as companies with extensive worldwide operations began to match each other in global scale, the competitive forces shifted to a new set of forces that redefined the competitive arena. In essence, the company that could most effectively develop, diffuse, and implement innovative products and processes more effectively on a global scale, would win out.

Ohmae (1989) argued the field of vision is dominated by home-country customers and the operating units that serve them. People want to buy the best and the cheapest products irrespective of where in the world they are produced. As Ohmae contended, the pressure for globalisation is driven not so much by diversification or competition but by the needs and preferences of customers. A company must be wedded to the notion of innovation by offering favoured products in such combinations of ways, means, places, and at such prices and prospects that customers prefer doing business with one particular company rather than with others (Levitt, 1983).

In 1980's the goals of companies and industries became more sophisticated through better knowledge and understanding of the elements that underpinned growth and profitability. The work of Professor Michael Porter had made a significant impact on competitive advantage and to the ensuing debate. Porter (1979) stated that the essence of strategy formulation is coping with competition. Yet, the notion of competition can be viewed too narrowly or indeed, too pessimistically. Porter argued that intense competition in an industry is neither coincidence nor bad luck. In the struggle to gain market share, competition is not manifest in other competitors; it is rooted in the market's underlying economics, politics, resources and the competitive forces that go well beyond the competitors that exist in a particular industry.

According to Hout, Porter, and Rudden (1982) competitive advantage could be achieved through exploiting economies of scale through global volume. By taking pre-emptive positions through quick and large investments, and managing interdependently to achieve synergies across different activities, these actions were considered crucial to sustaining a

winning position. So, in essence, competitive advantage could be sustained by optimising a company's achievement of these different and, at times, conflicting goals (Bartlett and Ghoshal, 1995).

Rumelt (1984) argued that to sustain competitiveness required the existence of barriers to imitation that he termed "isolating mechanisms'. The more effective these isolating measures were the longer competitive advantage could be sustained from the onslaught of competition. As noted, the literature suggested that competitiveness between companies is readily understood at an enterprise level. This can be accomplished through analysis of price factors, exchange rates, wages, and from the use of various non-price factors such as technology, design, quality and productive efficiency. Indeed, the competitive assessment of oligopolistic markets was founded on the comparison of non-price factors. These included, for example, research and development, technological innovation, quality, export sales, and in particular the specific issues which impact the overall competitiveness of companies, industries, national and international markets (Krugman, 1991). (See for example, Tirole 1988; Reinganum 1989; Shapiro 1989; and Kuenne, 1992).

Thus, it can be argued that there is a strong correlation between competitiveness gained through low cost or differentiation strategies and high levels of productivity. Competitive companies achieve either position by the efficient use of their resources to create higher value products and by using more cost effective manufacturing processes. According to Porter (1990a), based on the application of new technology and efficient production processes, the pace at which manufacturers convert this capability to action will manifestly create a company's competitive advantage.

Competitive advantage could therefore be described as a company's ability to outperform its rivals on what is presumed to be the company's primary goal. It should be noted, however, that there are many different sources by which competitive advantage could be promoted. The potential to establish competitive advantage largely depends on a company's capability to change and improve and the extent of the differences in a

company's resource base. Yet, once established the basis of competitive advantage is subject to erosion through the counter strategies of competitors (Grant, 1995). So fundamentally, a company must relentlessly pursue new and innovative ways to sustain their market advantage.

Fuller and Stopford (1992) provided compelling evidence to show that strategic innovation is the primary basis for competitive advantage and is the principal driving force for change in industries. They argued that the critical element of innovation is to create customer value. This corresponds closely with Hamel and Prahalad (1994) who maintained competition in the future means creating and dominating emerging opportunities, and necessitates staking out new competitive space. Their proposition is founded on the basis that companies need to reinvent their industry and regenerate their strategy through innovation. This requires an understanding at a broad level that competition will be different in the future and that companies need to identify the 'future' in terms of opportunities to develop the capacity to outrun competitors without undue risks.

Moving briefly to international markets, several commentators suggested the pursuit of international competitiveness entailed the successful adoption and implementation of unique competitive strategies at a company, industry and ultimately national level (Porter, 1985, 1990; Mills, 1991; Mintzberg and Quinn, 1991; Peters, 1992; Bartlett and Ghoshal, 1995; Hitt, Ireland and Hoskisson, 1999). Porter (1990a) concluded, however, that national competitiveness is generally associated with a country's wealth generating capability and would typically include its industries' export performance and also the extent of its international competitiveness standing. It is therefore logical to suggest that a country's manufacturing success will be determined on how well it can exploit the total capability of its local manufacturers. On that basis a nation's success is intrinsically linked to the collective performance of its individual companies and industries. This would suggest that the pursuit of manufacturing competitiveness is synonymous with the successful adoption and implementation of unique competitive strategies and processes at

a company, industry and ultimately national level. These points will be expanded upon in Chapter 3.

2.7 Competitiveness and Growth

Emy (1993) argued that the keys to building a competitive industrial base are knowledge, innovation and productivity. Moreover, the literature on competitiveness suggested there is an inextricable link between a company's productivity levels acquired through the pursuit of increased competitiveness and profitable company growth (Shapiro, 1989).

Porter (1990a), for instance, stated that the world was witnessing a change in the basis of competition. Notably, his thesis was based on the rigorous assessment of how markets react and how the elements of industry structure interact. By building intellectual bridges between the fields of management and industrial organisation theory, Porter elaborated on the earlier views of academics, particularly on issues that concerned the performance of industries as a function of their competitive characteristics. Porter (1980) previously recognised that firms evolved three types of competitive strategy that included:

(1). Cost leadership, which reflected a company's capacity to design, manufacture and deliver products at a lower price than competing companies;

(2). Product differentiation, which focused on the provision of unique products or services better than competitors and;

(3). Market niche, in which companies occupied a specific segment of the market through specialisation or focused product or service strategies.

Implicit in Porter's theorem was the fundamental proposition that to achieve either of the above market characterisations was an inalienable requirement to address the present weaknesses and threats existing in an organisation. Hence, there is an inextricable link between the achievement of profitability and, for example, the demonstration of competitiveness in the marketplace.

Given the above proposition, it is important to recognise that highly competitive companies are not necessarily low cost companies, primarily because their products or services may be sought due to their quality and uniqueness. Conversely, low cost products and services could retain elements of differentiation and market niche positions because of economies of scale and accessibility. Porter (1998a) explained the link between productivity, competitiveness and growth as follows:

(i) Productivity growth is upgrading or moving to more sophisticated ways of competing. Sophistication in that context would determine the price that companies can command and the efficiency with which goods and services could be produced.

(ii) Company sophistication is represented by technology and skills levels in competing. This can be considered in two ways. The first and most fundamental is based on operational effectiveness or the extent to which companies utilise best practice techniques and concepts in areas of production and management techniques. The second aspect relates to the type of strategy that companies employ, such as the ability to compete through differentiation rather than cost, and the range of services that can be provided as part of the company's specific approach to securing international markets.

(iii) Applied innovation reflects the extent of novelty adopted in the various activities performed in the value chain from concept design to delivery, including after-sales service, and are a basis for competitive advantage.

(iv) The measure of sophistication is determined by the quality of the national business environment. These aspects include government regulations, skilled resources, logistics and the level of demand. Therefore, the relative efficiency of the environment dictates the extent of many of the costs that individual companies incur.

(v) Company growth is largely dependent upon the efficiency of the business environment and the competitive nature and capabilities of the companies competing in that environment.

There is also an argument to suggest that competitiveness is highly stimulative and dramatically improves the adoption of new technology and innovation. Grant (1995) argued the effects of competition created through the dynamism of markets and the attempts to create new market opportunities assists company growth. Thus, competitiveness can be aligned to manufacturing sophistication and the strategies that achieve market leadership. The extent to which that challenge is addressed will depend to a large degree on the dynamic and multi-disciplinary forces that integrate technology, management skill and workforce capabilities. Hamel and Prahalad (1994) also argued that a company must accrue the resources and capabilities to refocus their internal activities and therefore, realise greater market scope and profitability through adherence to performance related strategies and solutions.

Yet, there is some justification for an alternative model. While competitive pressures play a critical role within the broad categorisation of the manufacturing sector, it is companies that invariably generate the determinants of the competitive process. It has been suggested that global influences play a major part in stimulating enterprise level activity. However, most participants are small to medium sized enterprises with limited resources. It can also be argued that economies of scale and scope disadvantage small to medium sized manufacturers entering global markets. Similarly, access to leading edge research and development can be prohibitive. The challenge to be faced by manufacturers is both demanding and multifaceted.

In light of this, there is some justification for testing the validity of an alternative model. Overall this would assist in improving the competitiveness of the manufacturing sector of a country where there is a concentration of small to medium sized companies. Indeed, resolving these various issues and dilemmas demands the investigation of the unique drivers of competitiveness. It is on this basis that the work of Michael Porter is extremely relevant to this thesis and will be examined in more detail in the next chapter.

2.8 Summary

This chapter provided an overview of the development of our understanding of the concept of competitiveness. 'What is competitiveness?' was discussed in the broad context, which then led to a brief review of the academic literature of competitiveness up to World War 2. The examination showed that competitiveness had its roots in 'comparative advantage' and this had moved through natural patterns of change to encompass a number of other stimulative factors.

Turning to the assessment of competitiveness in the post World War 2 period, it was shown that innovation, particularly technological factors and allied disciplines, played a major part in changing the competitive landscape of manufacturing industries. The section went on to discuss the escalation of competitiveness over various stages of development in different manufacturing sectors of the world. This addressed aspects of strategy and its links with competitiveness, and the use of strategic models and techniques designed to assist management decision-making. The contribution of a number of writers was reviewed with respect to company and industry performance. The notion of competitive manoeuvring and competitive advantage was also discussed. This showed that underlying principles of competitiveness had expanded to become much more comprehensive. Companies and industries became more sophisticated through the use of better knowledge and understanding and from the adoption of new management concepts and techniques.

The chapter concluded by examining the correlation between competitiveness and growth. It was found there was a strong link attributable to a company's market share and its ambitions to gain further growth and profitability. By extending its competitive advantage over competitors through innovation, new technology, low cost or differentiated strategies could help sustain its longevity. This raised the need for an alternative competitiveness model. Due to the unique environment of manufacturing it was suggested there is some justification to test the validity of introducing a new model to improve the productive capability of small to medium sized manufacturers.

Chapter 3 Framework for Analysis

3.1 Introduction

Chapter 2 examined a number of the elements of competitiveness and provided a brief overview of the history of competition. The review encompassed the evolution of competitiveness and its links with strategy, and the logical development of competitive advantage. Largely, it was during the 1980's that the work of Professor Michael Porter was recognised for its contribution to management and to the wider issue of competitiveness in the manufacturing sector. In this chapter the work of Porter will be examined, in particular, his extensive contribution to the topic of industry competitiveness, and his theories on the competitiveness of nations.

This chapter will consider the link between Porter's work and that of other writers. It will also discuss the relevance of Porter's theories to industries and nations. A critique of Porter's contribution to the assessment of competitiveness will also be undertaken to determine the impact and logic of Porter's Five Forces model, the notion of value chains, and the inherent consequences of regional clusters and networks to the manufacturing sector. Also, a core component of this chapter will be to investigate the possibility of developing an analytical framework within which to examine government changes to industry policies in respect to the manufacturing sector. This will involve a detailed analysis of Porter's Diamond of National Advantage model and the key attributes that impact on the industry policy decisions of governments to improve manufacturing competitiveness.

3.2 The Transition from Comparative to Competitive Advantage

Comparative advantage was founded on the principles of efficient use and application of a country's natural resources. Sheehan, Pappas and Cheng (1994, p.67) described comparative advantage as a country's ability to produce a commodity at a relatively lower

price on the basis of factor endowments and prices prevailing in a pre-trade situation, based on comparisons across commodities and countries.

Porter (1990a) argued that factor comparative advantage had long been an incomplete explanation for trade advantage. He maintained the theories that underpinned comparative advantage had to be revised to reflect the notion of the competitive advantage of a nation. Porter contended the competition an enterprise faced had become more sophisticated since markets had become more global and internationally focussed. However, although comparative advantage was primarily useful for explaining broad tendencies in the patterns of trade, there was a growing awareness that the assumptions underlying comparative advantage theory of trade were to a large extent unrealistic for today's industries. New theories had to be developed which went beyond cost to explain why companies from some nations do better than others at creating advantages based on quality features, process innovation and innovative products. Porter concluded that a new theory must begin from the premise that competition is dynamic and evolving, and that all nations can benefit from trade by specialising in the export of commodities in which they have a competitive advantage.

Kohler (1991) and Shapiro (1989) also criticised the underlying theory of comparative advantage arguing that while goods and services move internationally and thus provide support for a free trade ideology, factors of production cannot move freely across countries. Instead, they maintained that trade actually takes place in the goods and services produced by these factors of production. Kohler and Shapiro considered the theory was static rather than dynamic, and ignored symptoms of uncertainty, economies of scale, and the technology brought about through exposure to international trade.

Similarly, Ohmae (1990) and Reich (1992) argued that modern industries had moved away from high volume production to that of high value production. In support of this notion Porter (1990a) and Emy (1993) and others concluded that industrial production typically created by labour and material intensive means had now been transformed to more knowledge-based and capital-intensive processes of production. Increasingly, this

would demand a greater focus on the design of specialised and sophisticated luxury items, and less so on the cost and effort to achieve market differentiation and economies of scale.

National competitiveness had become the central preoccupation of governments and the manufacturing industries of every nation. Yet, while a significant proportion of the debate concentrated on the regulatory trading relationships between nations emanating from GATT and more recently the World Trade Organisation (WTO), to a large extent, Porter's theory of competitive advantage became the pre-eminent focus of the international competitiveness debate.

3.3 The Significance of Porter's Contribution to Assessing Competitiveness

It is imperative to validate the theoretical perspectives advanced by Porter that are supported by Yetton (1992), Grant (1991) and Rugman (1991) and others. Porter's philosophy provides a framework for understanding the determinants of competitiveness. Fundamentally, Porter's contribution is based on theoretical models that reflect how a nation's economic environment bestows strengths and weaknesses on individual companies and industries based in that country. Moreover, his work provides an explanation of how these country-level relationships shape the dynamics of competition and international trade. Yet, Teece (1990) and others have argued that understanding the attributes that help sustain a manufacturing environment conducive to international competitiveness have remained somewhat theoretical. This aspect needs to be investigated.

In his book *"The Competitive Advantage of Nations"* (1990), Porter presented comprehensive analyses of national competitiveness undertaken in a number of industries and countries. Asking the question, what constitutes a competitive nation? Porter provided a number of solutions. While his conclusions have been debated at length and in some cases dismissed, Porter, nonetheless, successfully argued that the only meaningful concept of competitiveness at a national level was productivity. Supporting

this assertion, Foss (1996) noted that although there had been significant analysis completed on the published literature of competitiveness, no apparent counter theory to contradict Porter's 'productivity' thesis had been offered as a viable alternative.

Porter (1990a) argued that factors crucial to establishing and sustaining competitive advantage are those that are developed by a nation and not inherited. They do not grow out of a country's natural endowments, its labour pool, its interest rates, or its currency value, as classical economics insisted (Porter, 1998a). Hence, given the importance of factor endowments to creating competitive advantage in individual companies, Porter (1990a) argued that the role of these factors is different and more complex than those involved in comparative advantage. Correspondingly, the stock of factors at any particular time is less important than the rate at which they are created and upgraded. Depending upon the abundance of factors accrued by a company, and thus, acquired by a nation, provided they can be successfully converted they can influence a nation's potential to innovate, upgrade, and achieve improved competitiveness.

Porter (1990a) referred to competitiveness as the ability of a company to survive and prosper in a competitive environment. In other words, the success or level of competitiveness of a company is directly linked to achieving competitive advantage relative to other companies in the same industry. What is more, achieving competitive advantage is a consequence of a company's ability to produce products or services that offer more value to the customer than rival products or services. For that reason, this would in turn lead to higher sales and greater profitability (Porter, 1985).

Given the inextricable link between competitiveness at the national level and national productivity, Porter (1990) reasoned that this is because productivity is the prime determinant in the long run of a nation's standard of living. He contended that productivity is the value of the output produced by a unit of labour or capital and depends upon the quality and features of a product and the level of efficiency with which that product can be produced. To a large extent this provides some correlation with the eventual price demanded, and would suggest that if improvement in productivity is the

prime determination of a nation's long run standard of living, it is also the major factor of the rise in national per capita income over time. According to Porter, the inherent productivity of human resource activity will determine employee wages and subsequently, the productivity with which capital is employed to ultimately generate the return it earns for its stakeholders.

Yet, as a counter argument, a company's capability to create added value and greater profitability is not sufficient to maintain a sustainable competitive advantage. Competitors are quick to copy products or processes and will enter markets if there is a perception of sustainable growth and profit. Porter (1990a, p.32), however, stated that:

> *...understanding the reasons for the ability of a nation's firms to create and sustain competitive advantage in particular industries is addressing the right question, not only for developing company strategies but also for achieving national economic goals.*

That said, the position a company pursues in the marketplace is extremely relevant. In order to succeed in an industry companies must position themselves competitively from a strategic perspective. Positioning has been defined as "a firm's total approach to competing, not just its product or target customer group" (Porter, 1998a. p.37). Arguably, competitive positioning is an inherent aspect of attaining competitive advantage. As part of the development of his competitive strategy theory, Porter (1980) categorised the two basic types of positioning in terms of comparative advantage as 'lower cost and differentiation'. Lower cost enables superior returns on equal prices, whereas differentiation seeks through superior performance or value adding to support a premium price. Later, however, Porter redefined this theory by adding the dimension of focus to the model.

With reference to a firm's competitive scope, or the extent of its targets within an industry, an important variable exists. In essence, this variable underpins the basis for the strategies used to service different segments of the market. Yet, companies in the same industry can adopt different competitive scopes. The type of competitive advantage and the scope of advantage can be successfully combined within the notion of generic

strategies, or the application of different approaches to superior performance in an industry. Porter (1980) defined three generic strategies for achieving above average performance in an industry, as follows:

- cost leadership,
- differentiation, and
- focus.

Figure 3.1: Three Generic Strategies

		Competitive Advantage	
		Lower Cost	Differentiation
Competitive Scope	Broad Target	1. Cost Leadership	2. Differentiation
	Narrow Target	3A. Cost Focus	3B. Focused Differentiation

Source: Porter (1998a p.39).

Figure 3.1 represents Porter's Three Generic Strategies. Each of these strategies represents a fundamentally different means of how an organisation can compete. Underlying the concept of generic strategies is that competitive advantage is at the heart of any strategy. The generic strategies suggest there is no one type of strategy that is appropriate for every industry. Indeed, as Porter maintains, many different strategies can coexist successfully in dissimilar industries. Depending upon the various constraints of an industry structure, variations of the same generic strategy may be possible. However, Porter strongly argued that the worst strategic error would be to be 'stuck in the middle', or for a company to attempt to pursue all strategies simultaneously. As Thompson and Strickland (2003) noted, adaptations of Porter's work have since extended the positioning theory to include:

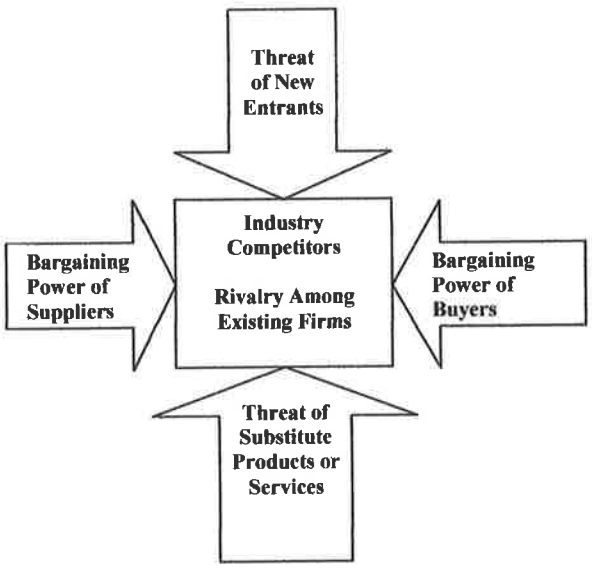
1. A *low cost provider strategy* – appealing to a broad spectrum of customers based on being the overall low-cost provider.
2. A *broad differentiation strategy* – seeking to differentiate the company's product offering from rivals.

3. A *best cost provider strategy* – providing customers with more value for money relative to rival's offerings.
4. A *focused (market niche) strategy based on lower cost* - concentrating on a narrow buyer segment by offering customised attributes better than rivals.
5. A *focused (market niche) strategy based on differentiation* – concentrating on a narrow buyer segment by offering customised attributes better than rivals.

Porter (1980) argued that the nature of an industry's competition is embodied in five competitive forces. These include the following:

(1) the threat of new entrants,
(2) the threat of substitute products or services,
(3) the bargaining power of suppliers,
(4) the bargaining power of buyers, and
(5) the rivalry among existing competitors.

Figure 3.2: Porter's Five Forces model of determining industry profitability.



Source: Porter (1985) Figure 1-1, p.5.

Figure 3.2 represents a model designed to analyse the structure of an industry as a basis for developing a firm's strategy. The model reflects the nature of competition embodied in each of the five forces that represent the key characteristics of a company's operating

environment. From knowledge and understanding of the impact of the five forces, analysis undertaken by a company can determine the market power of buyers and sellers, the threat of new entrants to the market and substitute products or services. To achieve competitive advantage a company has to cope with these rules and accordingly, utilise the existing rules of competition in its own favour. Most importantly, however, as a result of the analysis of the rivalry that exists within the industry, these data provide a company with the market intelligence to develop counter strategies to that of its competitors. Thus, based on Porter's Five Forces model, a company's strategy can be built on the understanding of the specific rules of competition. The adoption of this process will also facilitate the determination of the overall attractiveness and constraints of the industry, thereby providing the basis for value adding and growth. Accordingly, the company may as part of its competitive strategy create barriers to entry or exit to shape the intensity of competition for its own benefit. Porter argued that structurally attractive industries often involved high labour productivity and generally earned more attractive returns on capital employed.

With respect to national level competition, similar to the rivalry that exists at a domestic level, strong competition also occurs between nations seeking to win international business. Yet, Porter (1990a) stated that it is companies that compete, not nations. It could be argued however, that globalisation has superseded this thinking. There have been numerous examples cited of intra-nation competitiveness, so much so that the adoption of this tactic by some governments has become a key strategy for growth amongst those participating nations (Bartlett and Ghoshal, 1995; Fagan and Webber, 1997; Genoff and Green, 1998; Porter, 1998a). In particular, countries such as Canada, Ireland, and Singapore to name a few, have arguably prospered by international standards through the adoption of innovative industry attraction policies. These specific policies generally entail the provision of unique incentive packages tailored to meet the needs of companies, individuals and indeed, certain industries in an endeavour to entice them to a specific locality. This issue will be discussed in detail later, in conjunction with a critique of Porter's arguments.

3.4 Porter's Value Chain

To understand fully how the internal activities of a company should be aligned in order to contribute to a company's cost position or as a basis for differentiation, Porter (1985) introduced the concept known as the 'value chain'. He noted that competitive advantage grows out of the way companies organise and perform discrete activities. Thus, the operations of a manufacturing company can be divided into a series of tasks that function in a chronological manner. Porter classified these as 'primary activities' which entail aspects such as the functions involved in say production, marketing, delivery, and servicing the product. The others were classed as 'support activities' which involved purchased inputs, technology, human resources, and general infrastructure support activities.

Undoubtedly, activities vary according to their importance with respect to the perceived competitiveness of different industries. Also, a company's value chain could be described as an interdependent system or network of activities, connected by linkages. Porter went on to note that a company's value chain for competing in an industry is embedded in a larger stream of activities in what he termed as the 'value system'.

The value system provides a powerful concept to identify the 'key drivers' of competitiveness within the manufacturing sector. It can be argued that gaining competitive advantage requires that a company's value chain should be managed as a 'system' as opposed to merely manipulating a collection of disparate parts. The concept integrates the activities of suppliers who provide the various inputs such as materials, components, machinery and purchased services and the like to a company's production value chain. It follows, therefore, that each sequence of the value chain process would be part of a product distribution channel, on its way to the ultimate buyer. The point to be emphasised is that a company can create competitive advantage by better optimising or more efficiently coordinating the operational links or processes performed within the value chain.

In terms of competitiveness, the value systems theory underpins the dependence and interdependence of supply chain participants. Consequently, all manufacturers, their suppliers, and channels of distribution can benefit from the recognition and exploitation of the value chain process. The performance improvement opportunities made available to individual suppliers can also jointly increase their collective efficiency and thus, the productivity of the whole chain. Clearly, this logic could be adopted by all supplier industries to enhance the improvement of manufacturing capability at a national level. For instance, by working collaboratively to exploit the linkages created between local suppliers and customers could lead to a more effective use of resources. As an outcome, the creation of unique economic multipliers to enhance a nation's competitive position could be possible.

Porter (1985) noted that the value chain also provides a tool for understanding the sources of inefficiency and indeed, cost advantage. Typically, a manufacturing company's cost position is directly related to the inherent costs associated with performing the required activities to produce a product more effectively relative to its competitors. Cost advantage or disadvantage can obviously be incurred in any activity throughout the process. Similarly, the value chain exposes the benefits and sources of specific differentiation. In this instance, Porter was referring to the structural determinants of cost relative to competitors, which he termed 'cost drivers'.

Also, differentiation can result from the way a company's product or service impacts on the purchase decisions of a buyer. Consequently, if a company creates value for a buyer, hence meaningful differentiation, it lowers the buyer's cost or raises the buyer's performance in such a way that the buyer cannot match this benefit by purchasing from a competitor. The value chain similarly facilitates a deeper insight not only into the types of competitive advantage but also into the role of competitive scope, as alluded to earlier, to gain competitive advantage. The breadth of scope is vitally important as it determines the nature of a manufacturing company's activities how they are performed, and how the value chain is configured. In essence, companies can gain competitive advantage through the pursuit of narrow target segments based on activities focused precisely on the

segment's needs to achieve lower cost or differentiation. Alternatively, the pursuit of a broad scope can also achieve competitive advantage providing the company can share the activities across industry segments or when competing in related industries.

In summary, relative to competitiveness, the value chain disaggregates a company's 'strategically relevant activities' such as research and development, marketing and the unique aspects of its production and supply processes. This will facilitate a better means of assessing the behaviour of costs as a means of isolating potential sources of differentiation. Moreover, the collective response of value added processes in value chains enables manufacturing companies to create competitive advantage by discovering new and better ways of competing more effectively than their competitors. Thus, the adoption of these concepts will allow them to pursue a different scope from their competitors and to focus on different market segments. It could similarly involve altering the geographic breadth of the market, or alternatively, combine the products and experiences of related industries (Porter 1985).

Following this line of argument, Porter (1999, p.345) later stated that

> *...a company's value chain for competing in a particular industry is embedded in the value system. Competitive advantage is increasingly a function of how well a company can mange this entire system.*

He also reiterated that *...the home base location should be seen as the root of competitive advantage.*

3.5 Porter's Diamond of Competitiveness

It has been argued previously that the sustained competitive advantage of a particular company emanates from its capacity to innovate and continually upgrade its internal capabilities more effectively than its competitors. However, as noted, the primary focus of this thesis is at an industry and sector of an industry level.

By 1996, the OECD described national competitiveness as a nation's ability to sustain higher productivity that would thereby lead to the generation of higher standards of living for its citizens. Thus, at a national level it is the competitive forces that exist in a nation's industries that effectively produce and utilize innovative capacity. Hence, to assimilate greater knowledge and expertise demands the adoption of differentiated strategies to create and sustain unique examples of a national competitive advantage. Moreover, the dependent and interdependent factors that exist within the nation's industries and within individual companies need to be focused, as invariably they are stimulated by different means.

In his book, "*Competitive Advantage*" (1985), Porter established an important link between 'static position and dynamic change' in terms of competitiveness. He described how a company creates competitive advantage by building up skills and know-how from the effective management of its value chain. This theory subsequently provided the basis for his 'innovation-driven' competitive advantage theory that he later developed. In the context of this thesis, there is a crucial link that needs to be stressed pertaining to Porter's competitive strategy concept. The common element sustained through "*Competitive Strategy*" (1980), and in his later book the "*The Competitive Advantage of Nations*" (1990) needs to be highlighted because of the importance of the external environment to a company's overall performance. In both works, the 'industry' was categorized as the main unit of analysis. Furthermore, the success of individual companies, it was argued, was largely dependent upon their ability to operate within the structure of their industry. This is extremely relevant here as Porter substantiates the consequences of the move from static competition to dynamic competition in "*The Competitive Advantage of Nations*" with clear references to the work of Schumpeter[6] and evolutionary economics[7].

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[6] Porter (1990a), p.20 and "...My fundamental perspective is more Schumpetarian than neoclassical. Entrepreneurship and innovation prove central to national advantage". Ibid.p.778 N46 referring to Schumpeter (1993) p.100.

[7] Such as Nelson, and Winter (1982), referred to in Porter (1990a) p.731, who developed a theory on the evolution of the capabilities of firms. It should also be noted that Porter's books have their intellectual origins in the academic discipline of Industrial Organization Economics, whose concepts of industry analysis he has applied to business strategy.

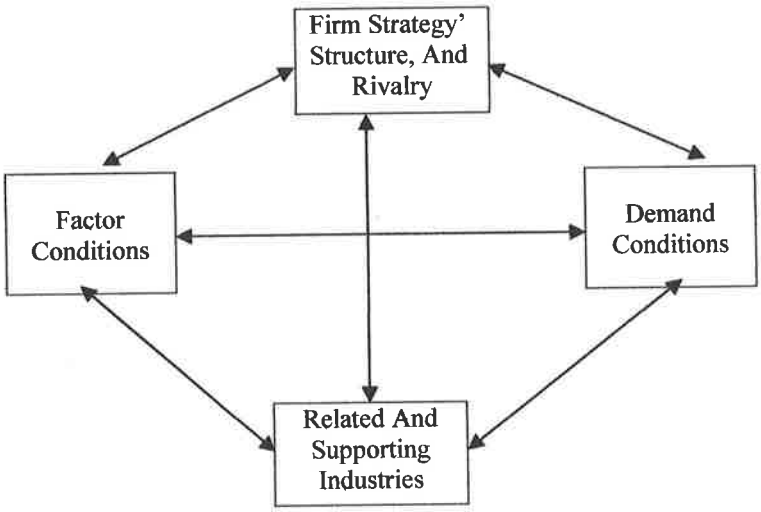
Porter argued that a company's strategy is responsible for the creation of competitive advantage, but the strategy must be assessed within the structure of the industry in which it operates. Therefore, the 'rules' and influencing factors of an industry become the fundamental basis for the strategic actions of that company, and this subsequently influences its skills, organizational arrangements, and success in particular fields. These industrial climates are for all intents and purposes unique. Consequently, they demand 'unique' strategies and definitive market solutions. It could be argued that a standard characterisation or text-book strategic solution for a company or industry is inappropriate to cope with the nuances of diverse markets and competitor initiatives.

It was in this vein that Porter developed the "Diamond of National Competitive Advantage. Porter (1990a) argued that the 'Diamond' model was developed as a means of creating national advantage in an international context. This point is critical to discussions in later chapters. He maintained that it provided a method of analysing the degree of advantage a company holds in the marketplace. Importantly, this must also be considered in conjunction with Porter's earlier assertion of the Diamond's 'vital relationship' with a company and an industry's productivity. That said, much of the 'Diamond Theory' deviates somewhat from the general IO perspective that Porter reflected on previously, in as much as it focused on the sources and implications of national differences of industries and business styles.

Consistent with the development of competitive advantage and the intrinsic links with the 'determinants of productivity", it is also necessary to understand which national conditions typically enhance or constrain productivity improvements. Porter (1990a) argued that industries within a certain country are internationally competitive because of very specific national conditions. Thus, it stands to reason that the effective utilisation of one or more determinates would enable these industries to generate competitive advantage. Porter (1990a, p.71) called these determinants the "Diamond of National Advantage", four broad attributes that individually and as a system constitute the *...playing field that each nation establishes and operates for its industries.* Jointly, they

'create an enabling microeconomic environment that generates the basis for sophisticated corporate development'.

Figure 3.3: The Determinants of National Advantage



Source: Porter (1990a) Figure 3.1, p.72.

Porter (1990a) contended that competitive advantage is maximised when each of the four key attributes identified in the 'Diamond Model' are present in an economy. These key attributes are as follows:

(1) *Factor conditions*. The nation's position in factors of production such as skilled labour or infrastructure, necessary to compete in a given industry.

(2) *Demand conditions*. The nature of home based demand for the industry's product or service.

(3) *Related and supporting industries*. The presence or absence in the nation of supplier industries and related industries that can be considered internationally competitive.

(4) *Firm strategy, structure, and rivalry*. The conditions in the nation governing how companies are created, organised and managed, given the nature of domestic rivalry.

Importantly, however, while companies adopt different strategies at a domestic level they usually pursue a unified strategy to retain some uniqueness from the industry strategies of potential competitors in other countries. Indeed, at an industry level, vertical and horizontal relationships exist, as does the potential to form industrial networks or clusters. This subsequently creates the potential for increased competitiveness through economies of scale and scope if this is appropriate. Moreover, the competitive nature of an industry facilitates national level competitive advantage which will in turn, allow the industry to generate high value added products and also, greater profits than rival industries overseas.

An underlying theme similarly existed in Porter's work that suggested there is a significant role for the government to play. While Porter's theory does not necessarily condone government protection, according to Emy (1993, p.186) it does acknowledge a role for selective forms of government intervention that stresses the importance of domestic competition and the desirability of free markets. Emy argued that Porter's theory provides a middle way between free markets and interventionism, and presented a counter argument for modifying the ideological opposition of neo-classical theory to intervention.

Similarly, writers such as Ohmae (1990) and Reich (1992), and Porter (1990a) himself noted the significance of research and development, innovation and product development as fundamental tenets of competitive success. Indeed, based on Porter's model, the 'Diamond of National Competitive Advantage', Porter contested that competitive advantage is maximised when each of the four key attributes identified are present. Porter's ideas focused on the process of skill formation, technological innovation, the structure and management of trading organisations. The theory also encapsulated the supporting policies of governments particularly by identifying how some countries actually trade more effectively than others. Porter's later revision, illustrated in Figure 3.4, subsequently included a more definitive role for government.

It is important to recognise, however, in the 'revised diamond' shown later in (Fig.3.4) that the role of government and chance do not constitute the fifth and sixth determinants.

The government's role as noted is primarily in influencing the four determinants, either positively or negatively. However, with respect to this thesis, the extent to which government industry policies can influence the industrial landscape needs to be amplified. Factor conditions are undoubtedly affected through government subsidies and incentives. Similarly, policies regarding capital markets, investment, industry attraction, research and development, education and the like are also subject to government intervention.

Yet, the government's role in manipulating local demand is often more subtle. A government can introduce local product standards and impose certain regulatory specifications that mandate or at least influence buyer needs. Moreover, governments are major buyers of numerous products and services that entail major capital expenditure on such items as defence, telecommunications, aircraft purchase and large-scale infrastructure programs. Governments can also shape the circumstances of related and supporting industries through measures that control or regulate operational functions, limit advertising and even specific corporate acquisitions. Government industry policy can, in addition, influence a firm's strategy, structure, and rivalry, through such devices as capital market regulation, taxation policy and through the use of competition policy.

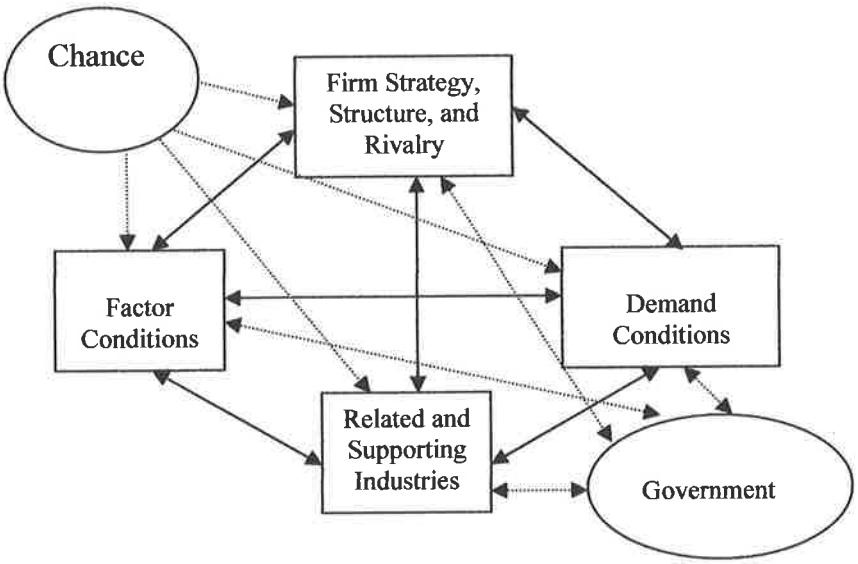
In the same way, Porter (1998a) argued that government policy can be influenced by the determinants of national advantage. Decisions about where educational investments are made, for example, are affected by the extent of local competitors. Likewise, strong local demand for certain products may lead to the introduction of government safety standards. Porter also noted that while a government has an important influence on national competitive advantage its role is ...*inevitably partial* (p.128). Chance events are also crucial to creating the discontinuities that allow shifts in competitive position. Chance can also nullify the advantages of previously established competitors and create the potential for new firms to achieve competitive advantage in response to new and different market conditions (Porter, 1990a).

In support of Porter, Emy (1993) argued that a government's role should be pragmatic rather than ideological. He reported that nations pass through stages of competitive

development as a result of which nations, and companies, have to contend with the vagaries of aspects such as multinational decisions. Emy concluded that to successfully compete amongst multifarious global competition has necessitated, amongst other things, a policy balance between market forces and government intervention. According to Emy (1993, p.190), as a basis for economic improvement *...nations would be well advised to address the sources of competitive advantage suggested by Porter.*

Figure 3.4: The Diamond of National Advantage

(The Complete System)



Source: Based on Porter (1990a) Figure 3-5, p.127.

3.6 The Determinants of Porter's Diamond of Competitiveness

Porter (1990a) noted that the determinants, individually and as a system, create the climate in which a nation's firms compete. These are brought about by the availability of resources and the skills necessary to develop competitive advantage within an industry. The determinants also encompass the information that shapes the opportunities and the directions in which resources and skills are deployed to allow firms to become competitive. Importantly, however, the goals of company management and employees involved in these processes are singularly focused. Consequently, decisions to invest or innovate are taken in conjunction with the detailed analysis of domestic market

opportunities or assessment of entry to potentially lucrative export markets. Thus, through effective management of relationships between characteristics of determinants, certain companies and industries become internationally competitive.

Central to Porter's 'Diamond' thesis was the provision of a framework that facilitated an explanation of how the presence of specific conditions inherent in a nation make certain industries successful. As noted, the ability of a nation to create higher standards of living depends ultimately upon the competitiveness of its industries and companies. Porter (1990a) maintained that understanding the determinants of productivity growth is based on understanding how companies and industries improve their competitiveness. Importantly, however, this is contingent upon knowledge of which national conditions support or prevent the improvement of actual productivity and company or industry competitiveness.

Porter's (1990a) theory of national competitive advantage was prefaced on four basic platforms.

(1) The nature of competition and individual sources of competitive advantage differ widely amongst industries and within various industry segments.

(2) Global competitors often perform a number of specific value chain activities outside their home country.

(3) Firms gain and sustain competitive advantage in international competition through continuous improvement, applied innovation, and continuous upgrading.

(4) Firms gain competitive advantage in an industry because they have identified a new market need or have the potential to adopt a new technology. Similarly, they aggressively pursue first mover advantages to exploit a perceived market advantage.

It is imperative to reflect on the fact that previously Porter (1985) had stressed the basic unit for analysis of competition was the 'industry'. Therefore, the creation of commercially valuable skills and technology are only meaningful at this level in

particular industries. Further, extending this logic suggests that conditions for securing competitive advantage would be created by a highly competitive localised process. Invariably, this would incorporate differences in economic structures, cultures, personal values, institutions, and the history associated with a particular industry (Porter, 1990a). Thus, the nation would benefit in general, as the source of the skills and technology would actually underpin its competitive advantage.

It was stated earlier, that the general role of government was to influence the effective workings of the determinants of national competitiveness. Importantly, certain governments can offer more attractive incentives than in other countries in order to entice firms to their nation. Indeed, the manipulation of national attributes can also create industry environments conducive to high levels of productivity through its internal workings. Likewise, a government can strengthen and reinforce the conditions within their control that lead to competitive advantage for companies or industries. Favourable taxation and regulatory conditions might also be developed but, by itself, a government cannot create competitive advantage.

Governments can equally develop an effective industry infrastructure to encourage the development of industry clusters and networks. The systemic nature of the 'Diamond' promotes the concept of clustering a nation's competitive industries (Porter, 1990a). Based on the notion that a nation's successful industries are linked through vertical and horizontal relationships which facilitate buyer/supplier, common customers and technological relationships, clusters magnify and accelerate the process of factor creation. Arguably, clustering has grown from the impact of the determinant's systemic character, which in turn, manifests in the increased performance of downstream industries. Porter (1990a, p.151) argued that the formulation of clusters fosters mutually supporting benefits for industries that flow backward, forward, and horizontally. Consequently ...*the cluster becomes a vehicle for maintaining diversity and overcoming the inward focus, inertia, inflexibility, and accommodation amongst rivals that slows or blocks competitive upgrading and new entry.* As clusters develop, resources in a nation flow toward them and away from isolated industries that cannot deploy the resources as productively.

Therefore a cluster of competitive industries becomes more than the sum of its subsequent parts (Porter, 1998a).

Similarly, the impact of 'chance' represented a prominent feature of Porter's model. Yet, 'chance' is fundamentally a consequence of luck. Chance in terms of a specific determinant is obviously uncontrollable. Intuitively, the randomness of 'chance or luck' could occur at any time. But, from an industry perspective, a unique opportunity, for example, could result from a breakthrough invention, ongoing innovation, competitor initiatives, or possibly the political decision making of foreign governments. Ostensibly, this could occur in any manufacturing industry sector throughout the world.

However, what can be concluded is that government industry policy and the circumstances related to chance could influence the four determinants of national advantage in a number of ways. Serendipity aside, as alluded to, this might involve the provision of effective infrastructure, shaping the environment conducive to high levels of productivity, negating unfair competition, and applying political influence to minimise potentially inefficient processes or loss of essential services.

Porter's (1998a, p.144) explanation of the 'Dynamics of National Advantage' suggested that a favourable 'Diamond' lays the foundation for the creation of an environment that supports highly efficient industries. He also articulated the proposition of the 'determinants as a system'. This point is vital to any consideration of adopting the 'Determinates of National Advantage' as a robust methodology for use in this thesis. As appreciated, it facilitates a workable concept that appears to influence government industry policy. Whilst the requirements for success in an industry and in sectors of industries obviously differ markedly, understandably, resource limitations preclude success in all industries. Needless to say, nations can enjoy dominant success in one industry and yet, fail in another. Nations can also prosper in one particular industry sector and lack competitive advantage in another due to a deficiency of certain factors. Porter (1990a) noted the system was also constantly in motion, and that the national industry continually evolves to reflect shifting market circumstances, or it falls into decline.

Finally, one of the more important aspects to consider is that pursuing advantages in the entire 'Diamond' is not always necessary. Different industries can effectively survive with varied levels of technology and resources, and therefore, varying strengths and weaknesses. The idea postulated here is that it is the 'collectivist nature' of the effective networking of the available resources of a nation that can in combination, facilitate productive strength and national level competitive advantage.

3.7 Critical Considerations of Porter's Work

Following a review of the strategic management literature, specifically regarding the various critiques of Porter's work by his contemporaries, somewhat of a dichotomy exists. In particular, the perceived quality and relevance of his academic contributions to management regarding the nuances of competitive strategy, would suggest there is divided agreement as to their academic and pragmatic value.

Porter (1980) placed the dynamic relationship between enterprise strategy and industry structure at the centre of his competitive strategy thinking (Harfield, 1998). Further, the possibility of determining a strategy based on a well-defined position in the marketplace supported by 'analysis' rather than 'prescription' underpinned his theory (Ansoff, 1965; Rumelt, 1974). Porter also maintained he had sought a theoretical context to add to his analysis that focused on both content and process as called for by Fahey and Christensen (1986) and Huff and Reger (1987). Arguably, he had determined this from his previous work on Industrial Organisation theory. Porter's (1980) philosophy was based on the economic model of Structure-Conduct (strategy)-Performance, also known as the Bain/Masson paradigm. This theory claimed that forces within the industry determined the conduct of firms, which in turn, determined the firm's performance (Thorelli, 1977; Masson and Quall, 1976).

Yetton, Craig, Davis and Hilmer (1992) suggested that the structure of Porter's thesis is a theory about competitive advantage of firms and industries within a nation. However,

their studies only partially supported Porter's theory. Grant (1991) similarly recognised that the 'Diamond Model' makes an important contribution to the strategic analysis of an industry. Likewise, he was critical of Porter's models.

By the same token, Harfield (1998) found from his studies that Porter was not a constant contributor to management journals. Rather than suggest this was by choice, Harfield's assertion is that Porter's work was possibly considered irrelevant to mainstream academic thinking. Fahey and Christensen (1986) also questioned the value of Porter's work. The mere lack of inclusion of Porter's theory and his discussions on 'generic strategies or industry structure' in any part of their work, supports this. In the same way, Knights (1992) suggested that Porter's prescriptions for generic strategies were difficult to implement. He also argued that to attempt their implementation required a sense of 'reality' based on the effects of forgetting, neglecting or denying the subjectivity. Knights advocated that this condition is necessary to render the strategies possible. Rugman (1991) added to the criticism of Porter's models within an international context by suggesting they were inappropriate to effectively analyse key issues of international competitiveness.

There is a certain irony here, particularly because Porter's theories are often the study of empirical testing and theoretical debate (Bowman, 1992; Miller and Dess, 1993; Sharp and Dawes, 1994; Foss, 1996; and Hill and Deeds, 1996). Moreover, a number of other commentators have extolled the virtues of Porter by offering substantial and convincing accounts of his work (Enright, 1990; Barney, 1991; Knights, 1992; Whipp, 1996; and Barry and Elmes, 1997).

Mintzberg (1990) located Porter in the 'positioning school' that advocated strategy formation as an analytical process. He considered Porter's '*Competitive Strategy*' (1980), to be 'a watershed' as it met the needs of both academics and management in the search for a theory of strategic management. Yet, while using Porter's theories to support his arguments on the relevance and fallacies inherent in strategic planning, Mintzberg (1994) dismissed many of Porter's assumptions. For instance, with reference to 'detailed

analysis', Mintzberg documented several examples where this had caused *...conspicuous failure* (p.298) and additionally, where Porter *...considered strategic thinking as synonymous with strategic planning, why he favoured a set of analytical techniques for developing strategy, and why he claimed strategic thinking rarely occurs spontaneously* (pp.313-4). Mintzberg (1994) maintained that this did not occur and that competitive strategy must be based on 'conscious thinking and reality'. Mintzberg's criticism of Porter concluded by suggesting *...insight cannot be seen in analysis, because it is not believed. Nor can strategic vision* (p.314).

Before moving on to discuss further aspects of Porter's Diamond theory, it is worthwhile to reflect upon Porter's positioning model or the Five Forces model. Porter's 'Positioning Model' appeared to dominate much of the 1980's academic debate on business strategy. The model became the standard not just in strategic management textbooks, but also in other disciplines such as marketing and information management systems and the like. Numerous companies and industries throughout the world have similarly been known to adopt Porter's theories on management and marketing strategy (Enright, 1993).

Yet, it has been questioned whether the Five Forces model as formulated actually captured the essential elements that shape industry dynamics. Oster (1994) considered it to be incomplete, and asserted that two additional boxes were needed. One refers specifically to government, in order to capture aspects of regulation, industry protection or subsidisation, and government intervention. The other is history, referring to the origins, evolution, and unique characteristics of an industry. Oster argued that the systematic non-inclusion of these factors renders the Five Forces model overly abstract.

The second area of criticism of the positioning schema involved the notion of the industry as central to shaping firm behaviour and choice. Teece et al. (1990, pp.5-6) argued that:

> *...the basic positioning framework relies on a number of questionable premises that industries or group boundaries are meaningful, that industry structure determines the 'competitive rules of the game" ...and that cash is perhaps the only constraint to repositioning the company. An additional*

weakness is that while there is some recognition given to firm-specific assets, differences among firms are highly stylised and relate to scale.

In effect, Teece et al. questioned whether an industry could be conveniently defined. Furthermore, they suggested that even if it could be, they questioned whether 'industry effects' are as crucial a competitive factor as Porter maintained. They also questioned whether generic ideas such as 'cost leadership' or 'differentiation' do not dangerously oversimplify the idiosyncratic, firm-unique ways in which competitive strategy can be pursued. Their opposition to Porter appears to reflect the notion that managerial choice and firm-specific characteristics are the salient factors shaping competitive environments, and not merely industry structure.

Adding to the body of criticism from an Australian perspective, Morkel, Osegowitsch and Lewis (1999) reported that Porter's research methodology and the sweeping generalisations presented are being questioned. They contended Porter's theories are unsuitable for countries such as Australia, New Zealand or Canada primarily because they do not reflect small and diverse manufacturing nations. Typically, Yetton et al. (1992, pp.89-119) maintained that Porter's philosophy *...is best suited to explain the competitiveness of large industrialised nations specialising in internationally traded manufactures that incorporate advanced levels of technology.* That said, Rugman (1991) argued that Porter's theory is heavily biased towards the United States economy, and largely unsuitable for small to medium sized resource-based economies.

Rugman (1991) also stated that much of Porter's analysis was superficial and wrong when applied to a Canadian situation. He went on to note that in analysing Canada's international competitiveness, Porter's work required modifications that represented an entirely different way of conceptualising and testing the nature of Canada's competitiveness within an integrated global economic system. Rugman argued that Porter's treatment of inbound foreign direct investment (FDI) and the role of Canadian multinationals, combined with his lack of knowledge of Canada, tended to devalue the application of his Diamond theory. In addition, due to the superficial nature of some of

the theories, Porter's models fail to explain key aspects of Canada's international competitiveness. The most apparent weakness noted by Rugman is of Porter's flawed understanding of the two-way nature of foreign direct investment in Canada. He concluded that the thoughtless application of Porter's model to Canada could result in discontent and misplaced policy initiatives. This criticism is similarly supported by Van Egeraat and O'Malley (1999). In an Irish context, they maintained Porter largely excluded foreign owned Multi-National Enterprise (MNE)'s as contributors to the competitive advantage of advanced economies unless they were part of the host country's diamond.

Interestingly, Rugman (1991) also contended that the clusters constructed to operationalize the model were not appropriate for Canada. Along similar lines Morkel et al. (1999) noted that very few, if any, Porter type clusters existed in Australia. They contended that for small to medium sized economies, the advantages of cluster type rivalry will, in all likelihood, be offset by certain disadvantages such as the lack of economies of scale, particularly where there are a large number of competitors contesting the domestic market. Morkel et al. did acknowledge the fact, however, that the presence of business networks in Australia appears to have a more 'symbiotic and choreographed quality', but the intense rivalry, as described by Porter, is lacking (p. 375). In summing up, they suggested that Porter's theory is a derivative of neoclassical doctrine inasmuch as it deals with the global success of companies and industries with reference to their local environment. They also argued that networks and clusters can only provide limited guidance to Australia, and that Australia must look elsewhere for strategies on how to become internationally competitive. However, Jacobs and de Jong (1992) contradicted Morkel et al. somewhat, and found that with respect to the Netherlands, Porter's approach to clusters was an extremely valuable tool. However, they did concede that the concept was considered too one-sided with regard to its emphasis on national specificities.

Later Rugman and D'Cruz (1993) resurrected the same argument focused on Canada's Free Trade Agreement with the United States. Their initial commentary stated that Porter's (1990) 'Diamond of National Competitiveness' explained the success of US,

Japanese, and EC-based multinational corporations, but it was not applicable to small, open, trading economies that were not parts of this triad. They also documented information on other instances and countries where the model was not totally appropriate. Again, they argued that substantial modification to the Porter framework was warranted in order to effectively analyse the nature of Canada's institutional arrangements. Rugman and D'Cruz (1993) proffered a double diamond or multiple diamond model as a more appropriate alternative. Their idea of a double diamond model was based on the fact that smaller economies such as Canada or even Australia could be closely linked to a larger one such as the USA. Hence, it would be necessary to consider the two nations together as one framework. This would allow for the inclusion of more than one country as a potential source of influential determinants of competitive advantage for industries operating in that small economy (Cartwright, 1993).

What can be concluded from this critique of Porter's work? Possibly the most fundamental assumption to be drawn from Porter's framework of reference is that, if every business and industry adopted the philosophies advocated, none would be able to secure competitive advantage. However, writers such as Harfield (1998) have suggested that unequal market power is derived from specialist knowledge that in turn facilitates competitive strategies, and thus, competitive advantage in the marketplace. Moreover, Knights (1992, pp.514-36) argued that Porter's work is attractive to management precisely because it is expert knowledge that provides *...some illusion of control, legitimacy and security in the face of uncertainty.*

Yet, fundamental to this argument, Porter's model is not founded on one particular economic theory. Foss (1995, p.17) criticised what he termed 'increasing eclecticism', the fact that Porter had moved away from Industrial Organisation theory to a more eclectic view. Foss suggested that the evolution of Porter's thinking was much more practically driven than purely theoretical. He contended the 'National Diamond' focuses on both the sources and implications of national differences in industries and business styles. Crucially, it had been determined how the determinants of national advantage reinforce each other and proliferate over time in fostering competitive advantage in an

industry. Miller and Dess (1993), for example, suggested that although Porter's strategic theories were initially developed for large mature corporations they could indeed accommodate different sized companies. Importantly, however, the frameworks presented academics with models that could be empirically tested. And, in addition, Forster and Browne (1996) offered the thought that Porter's approach adds the required complexity to industry analysis.

In summary, this section has discussed how Porter's theories and contributions, including the National Diamond of Competitiveness have been applauded as well criticised. Even amongst the damning criticism from writers such as Rugman and D'Cruz (1993), Porter's 'Diamond theory' has never been summarily dismissed but merely modified to suit specific purposes.

Within an international context, Porter (1998) argued that achieving success in international markets demands that firms translate domestic positions, or strategies into international competitive positions. Central to this, Rugman and D'Cruz also added that international hierarchies are crucial to explaining global trade patterns. They maintained that the export flows of a specific industry are correspondingly linked to the strength of a partner country in that industry. This appears to offer some justification for the consideration of their 'double diamond' thesis.

3.8 The Relevance of Porter's Concepts to an Industry and a Nation.

A four-year study based on the 'Diamond of National Advantage' theory was used by Porter to highlight the success of various industries in a number of leading industrial nations (Porter, 1998a). Ten specific major case studies were documented in the *Competitive Advantage of Nations* (1990) to explain the significant characteristics that complement national competitiveness. In addition, other writers have successfully adapted Porter's theories and applied them in country specific situations (Borner and Weder, 1990; Van der Linde, 1991; Enright, 1991; Jacobs and de Jong, 1992; Rugman

and D'Cruz 1993; Fairbanks and Lindsay 1997; Van Egeraat and O'Malley, 1999). Some of these studies will be reviewed in the next chapter.

Porter's studies showed that certain 'patterns' exist in successfully competitive nations. Results from his analysis suggest that competitiveness was not necessarily based on cheap labour costs, or bountiful natural resources, but rather on a nation's propensity to form factor creation mechanisms, and from the competitive pressures of selective factor disadvantages. Accordingly, a nation developed competitive advantage through the creation of advanced and specialised systems and processes more effectively than its competitors. Notwithstanding, where there was a shortage or absence of locally available resources, this stimulated breakthroughs in technology or innovation to address these deficiencies. Indeed, arguments have been proffered to suggest that competitiveness is driven by government policy, which by inference could include the provision of protection, subsidies, import-promotion, export-promotion and specific targeting (Capling and Galligan, 1992; Emy, 1993; Bell, 1993). These factors will also be addressed more fully in the next chapter.

Porter (1990a) posed another popular notion that national competitiveness may be founded on effective management practices, or good employee labour relations, or indeed, the latest systems and procedures. Likewise, competitiveness does not necessarily mean job creation. Borner (1986), Bartlett and Ghoshal (1989), Mintzberg (1989), and Porter (1985) have all argued that it is the type of jobs that matter, not just the ability to employ people on the lowest possible wage. Undoubtedly, this would be decisive for economic prosperity. Yet, none of these explanations categorically provides the sole criterion of competitive success. Several writers have argued that while each of these aspects complement competitive advantage, none is sufficient by itself to rationalize the competitive position of industries, or of nations (Porter and Miller, 1985; Bartlett and Ghoshal, 1989; Grant, 1995). Thus, returning to the initial dilemma previously posed, what constitutes the decisive factors that allow industries and nations to create and sustain competitive advantage?

With reference to studies conducted by Christopher (1998) on Nike, and by Dicken (1992) on the Ford Motor company there are several contentious points. Porter (1990) seems to be at odds with the numerous examples cited in these studies. For example, the conclusions drawn by both Christopher and Dicken categorically show that the competitive advantage of the enterprise stems from cross-border cooperation and coordination rather than from what Porter asserted, namely, a single home base. This correlates closely with Moon, Rugman and Verbeke (2001) who argued that:

1. Sustainable competitive advantage related to value added production within a specific country can result from both domestic and foreign owned enterprises.
2. The demonstration of international competitiveness suggests that a firm's specific and geographical advantages are maximised in several nations simultaneously and will complement each other.

Foss (1996) suggested that Porter's findings had indeed provided something unique in terms of determining a nation's competitive advantage. It is argued here that there is no single panacea! Research suggests that Porter's work attempted to provide a theory that can explain phenomena that exists in very different industrial settings for both companies and industries. Analysis also suggests that even the most prolific critics of Porter's work have failed to develop an alternative hypothesis. In a number of cases Porter's models have been merely extended or enhanced to meet specific criteria relevant to the workings of an industry or nation's trading relationships.

In summary, it is argued that Porter's work has added two important dimensions to the study of the 'competitiveness of a nation'. The first is through the development of a consistent model that can explain the unique differences between the participants within industrial environments. Typically, these scenarios would include for example, how and why could Italy support a highly successful fashion industry? In a completely different national industrial setting how could Germany develop a successful automobile manufacturing and machine tool industry? The second and more profound aspect relates to the results of the analysis presented by Porter (1990a) from these studies. His findings categorically identified the specific reasons for failure within an industry that, if left

unchecked, would ultimately impact on national level productivity and on a nation's competitive success. Similarly, Porter was able to recommend solutions to improve the performance of an industry, and also, how to enhance the specific attributes impacting on the competitiveness of a nation.

Moreover, Porter's work on value chains and clusters has remained somewhat aloof from criticism. The bodies of literature have to a large extent shed light onto the value of clusters and to the phenomenon of value chains in the manufacturing sector (Hirshman, 1958; Lloyd and Dicken, 1977; Piore and Sabel, 1984; Enright, 1993; Enright and Roberts, 2001). Porter (1990a) argued that the role of clusters in competition raises important implications for industries, governments and other institutions. Their broader role clearly impacts the subsequent efficiency of value chains that interrelates and integrates them. Moreover, the advantages of clusters and value chains in terms of increased productivity and for the development of sources of competitive advantage are well documented (See, for example, Enright, 1993, 1998, 2001, and Eriksson, 1997).

Thus given the above, sufficient justification exists to utilise Porter's theories, in particular, the Diamond of National Advantage as a basis for further analysis and development in this thesis.

3.9 Summary

In this chapter it has been shown that labour and material intensive means of production had been superseded by the design of specialised and sophisticated knowledge-based production systems. Invariably, these factors focused more on innovation, and less so on cost. The significance of Porter's contribution to assessing competitiveness was also reviewed in detail. This involved an investigation of Porter's various models that in general, have been widely used by academics, industrialists and others. However, Porter's work had come under criticism. Indeed, while criticism could be justified in certain circumstances, nonetheless, later revisions to the configuration of his strategic models were found to be highly appropriate for use.

Discussion highlighted Porter's move from Industrial Organisation theory to a more pragmatic model that enabled detailed analysis of an industry's factor conditions, demand conditions, related and supporting industries, firm strategy, structure and its competitive rivalry. Porter later added the dimensions of government and chance to his model. Fundamentally, this facilitated a more robust assessment of a company's total operating environment and also emphasised the important interrelationship between the determinants. Analysis of the ramifications of the determinants of Porter's Diamond of National Advantage followed. This allowed a deeper understanding of the impact and consequences to industry structure, and of the conditions in which national competitive strategy evolved.

A critique of Porter's work was undertaken. This entailed a comprehensive survey of his contribution to determining the various facets of national competitiveness. As noted, there has been much criticism of Porter's work concerning the relevance of his competitiveness models. Equally, there has been as much compelling support for his academic and industry contribution to competitive strategy. It was found that Porter's models facilitate an empirically based methodology that had been utilised in the study of numerous industries and several different countries. Importantly, the models can be adapted to suit unique national industrial environments.

Finally, the relevance of Porter's concepts to industry and nations was reviewed. In particular, the Diamond of National Advantage was shown to be resilient and could withstand different national agendas. Notwithstanding certain criticism, research revealed that as a consequence of a nation's determinants, clusters and value chains can be derived to provide a logical and effective means to help generate wealth and competitiveness for industrial sectors. The next chapter will discuss how other researchers have used Porter's models to explore the national competitiveness strategies for other countries and situations.

Chapter 4 Use of Porter's Methodology to Assess the Competitiveness of Nations and Industries

4.1 Introduction

Chapter 3 discussed the importance of Porter's contribution to assessing the competitiveness of industries. It also reviewed a number of his models to better understand how these models can be used to help companies and industries compete. This chapter will extend the discussion in Chapter 3 by reviewing the applications of Porter's Diamond methodology.

An examination of the appropriateness of Porter's Diamond methodology will be undertaken to determine its usefulness in assessing competitiveness. In this regard, Porter's use of his methodology to examine the competitiveness of ten nations will be considered with particular attention paid to the significance of government policy on competitiveness. It will also examine the work of a number of writers who have applied the methodology to other nations, and to different industries.

Finally, an assessment will be made as to the effectiveness of Porter's methodology for examining the competitiveness of the manufacturing sector or, indeed, any sector of the economy, as a means of deriving a basis for determining what actions can be taken to improve competitiveness.

4.2 Porter's Methodology

In his book *The Competitive Advantage of Nations* (1990), Porter summarised the findings of his four-year study into a series of systematic and actionable frameworks to better understand competitiveness and its links with productivity. Based on an analysis of ten important trading nations his objective was to demonstrate the usefulness of his methodology to establish why certain nations attain competitive advantage in particular industries, and to determine the implications of these findings for industry strategies and

for national economies. The countries studied included: Denmark, Germany, Italy, Japan, Korea, Singapore, Sweden, Switzerland, United Kingdom and the United States.

At the time of the study, these ten nations accounted for approximately 50 per cent of total world exports. Importantly, the nations chosen were already competing successfully in a range of relatively sophisticated industries or, in the case of Singapore and Korea, had the capability to do so. Porter sought to represent the capability of the entire economy of the countries studied to avoid bias that might result from only analysing highly visible industries. This approach included manufacturing, agriculture, and service industries. His goal was to assist firms and governments develop better strategies and make more informed allocations of national resources (Porter, 1998a). Also, by studying nations with widely different characteristics and resources he hoped to isolate the fundamental forces underlying national competitive advantage from the idiosyncratic ones.

The research was conducted on a case study basis by over thirty researchers, most of whom were residents of, and based in, the nations they studied. To ensure continuity and maintain the validity of data, a common methodology was employed in each nation. Importantly, data were complemented by the four attributes of the determinants of competitive advantage, discussed in Chapter 2. Porter (1990a) argued that the international success of a nation is predicated upon acquiring the determinants that shape the environment in which its companies and industries compete. Because of the inextricable links between the four determinants, he argued they influence a nation's competitive environment and the likelihood of achieving national competitive success.

4.2.1 The Development of the Methodology

The first part of the methodology sought to identify all of the internationally competitive firms in each of the nation's industries through the compilation of applicable data. Porter (1990a) narrowed the basic unit of analysis to the 'industry or a distinct segment' of an industry. He also defined the international success of a nation's industry as possessing

competitive advantage relevant to best worldwide competitors. It is important to emphasise this fact because many of the nations studied relied on protection, subsidies, and had different accounting conventions.

Recognising the difficulty of measuring competitive advantage statistically, Porter (1990a, p.25) established common benchmarks across each nation. Two specific aspects were defined and they included the following:

1. The presence of substantial and sustained exports to a wide array of other nations.
2. Significant outbound foreign investment based on skills and assets created in the home country, for the statistical phase of the research.

Foreign investment and trade were considered integral to global strategies and measures of international success, and invariably the methodology encompassed both. The nation was also treated as the home base for a firm if it was either locally owned, an indigenous firm, or a firm that was managed autonomously though owned by a foreign company or investors. If an industry consisted largely of production subsidiaries of foreign companies, Porter did not regard it as competitive.

Time series data were used as the basis for assessing each nation's performance. Specific data were compiled on various categories extending over the years 1971, 1978 and 1985. These data served to provide an assessment of each nation's relative competitive position measured against international criteria across these specific time frames. Importantly, a major feature of Porter's (1990a) analysis stemmed from judgements compiled from the presence of significant exports or foreign direct investment within a nation. He deemed these measures to reflect true competitive advantage in international terms drawing on the particular nation's various industry strengths and capabilities. (Refer to Table 4.2).

Profiles were created of all industries in each nation that were considered internationally successful at the time. These data were then tabulated by industry sector. In addition, the connections or specific relationships that existed between competitive industries were charted. The starting point for preparing the charts was UN trade statistics. Porter

(1990a) employed what he called a 'cluster chart' to map the successful industries of each nation. Because of Porter's strong emphasis on demand conditions as well as the vertical linkages that existed between industries, the chart was based on end use application of the actual product. Industries were positioned on the chart using best judgements of the researchers, given their extensive knowledge of the nation's industries. The placements were then reviewed by independent experts from each nation. It should be noted, however, that the same industry could be placed at a different location on the chart of a different nation dependent upon the researcher's judgement of the relative strength in that particular industry sector.[8]

Table 4.1 has been sourced from Porter (1998, pp.22-23) and reflects the base data collated within each country for comparison purposes.[9] Statistical data was compiled on each of the above characteristics encompassing the ten nations studied. Analysis of these data was replicated over the years 1971, 1978, and 1985 to facilitate examination of specific patterns of change over time. Importantly, the extent and breadth of demographic information allowed accurate comparisons of employment and growth measures between nations related to population and land mass.

Table 4.1 shows each nation's trade balance, and reveals how the United States had considerably lower exports and imports as a percentage of GDP to most other trading nations, even though it represented the highest dollar value GDP. However, the United States recorded the second highest average unemployment rate from 1951-1987. Singapore, Korea and Japan data show significant compound annual workforce growth. This can be attributed to impressive compound annual productivity growth, almost double the other seven nations. Singapore's growth, in particular, is clearly remarkable during the periods assessed. Exports of 144 per cent of GDP and corresponding imports of 163

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[8] Data used to prepare the cluster charts was sourced from a number of areas. The basic source was the *United Nations International Trade Statistics Yearbook* (various years). Other sources included national data on foreign investment and services trade, trade association data, and field interviews.

[9] To overcome the problem of presenting economic and demographic data acquired from different sources, Porter sought to use standard sources and methods in order to facilitate international comparisons. All figures were expressed in 1980 prices and exchange rates. However, while comparisons using different base years or exchange rates may differ, the ranking among nations does not change significantly except for absolute measures.

per cent undoubtedly highlight their spectacular economic growth as a nation. These data subsequently served as the basis for further analysis, in particular, for specific measures of productivity. Importantly, however, they also provided a common datum point for international comparison.

Table 4.1: Selected Economic and Demographic Characteristics Used for the Nations Studied, (1987-Data)

Economic and Demographic Characteristics
Population in 1987 (millions)
Land Area (Sq Miles)
Population Density in 1987 (persons/sq. mile)
Gross Domestic Product (GDP) in 1987 @1980 Prices & Exchange Rates ($US b)
Compound Annual Growth in GDP in 1980 Prices, 1950-87
Compound Annual Growth in Industrial Production, 1950-87
Compound Annual Population Growth, 1950-87
Compound Annual Workforce Growth (Number Employed), 1950-87
GDP per capita in 1987 at 1980 Prices in $US
Compound Annual Growth in GDP per capita in 1880 Prices, 1950-87
Compound Annual Productivity Growth (GDP per employee), 1950-87
Net National Investment (Gross fixed capital formation less depreciation as % of GDP), 1950-87 average
Exports as a % of GDP (1987)
Imports as a % of GDP (1987)
Unemployment in 1987
Average Unemployment, 1951-87

Sources: International Monetary Fund, International Financial Statistics, Yearbook, September 1988. National Bureau of Economic Research. Foreign Trade Regimes and Economic Development, OECD Economic Outlook, Historical Statistics, 1960-86.United Nations Statistical Yearbook, Monthly Bulletin of Statistics, US Department of Labor, Comparative Real GDP Figures, unpublished data.

Porter (1990a) argued that most empirical studies of national competitiveness or in this case, the patterns of trade, had been based on statistical tests of trading patterns at only one point in time. He maintained that analysing specific criteria on an international basis over a longer period would generate more robust data. In addition, the comprehensive nature of national performance criteria captured highly specific trade and foreign

investment data separately, thus providing accurate information of a nation's economic growth. To supplement library research and statistical sources, interviews were conducted to classify successful industries and segments and to assist in excluding industries where success was a reflection of foreign investment and other anomalies. Similarly, to gain an understanding of each nation's institutional context which included attitudes towards industry, social, political, and economic structures was ascertained. Likewise, interviews were conducted with government officials, bankers, leading industrialists and observers considered to have a broad perspective on a nation's economy.

4.2.2 Mapping the Successful Industries

Porter's (1990a) methodology examined the history of each particular nation and industry in order to understand the dynamic process by which competitive advantage occurred. Notably, assessments were conducted from historical sources and documentation (Porter, 1990a). Industries considered attributable to the nation's competitive success were singled out based on that industry having a significant international market position using 1985 data as the benchmark. These industries had to represent more than 20 per cent of the total exports of the nation, and in emerging countries such as Korea and Singapore, around 40 per cent of total exports. Porter avoided using industries highly dependent upon natural resources, arguing that these industries did not form the backbone of advanced economies.

Table 4.2 provides an example of the typical format used by Porter to identify a nation's 'Top 50 Industries in Terms of World Export Share'. Each of the categories reflected the extent of a nation's export and import trade with respect to a specific industry. This mix was deemed to be representative of a nation's industries, and considered comprehensive enough for researchers to gain an understanding of a nation's patterns of competitive success. Table 4.2 also demonstrates how Porter's analysis technique operated. It shows how each industry category was classified according to its share of total world exports. This measure is interpreted in terms of its export value to the nation, shown in column 2.

The corresponding value of the same category imported product is shown in column 3. The last column represents the nation's relative share of that product with respect to the nation's total exports. It is crucial to note the significance of this. The generation of export revenue, albeit within the confines of the constraints of Porter's framework reflected one of the key components underpinning Porter's Diamond model. It also represented what he considered to be the basis of a nation's competitiveness, and thus, indicative of its international competitive success.

Table 4.2: Top Fifty Industries in Terms of World Export Share (Example)

Industry Category	Share of Total World Exports	Export Value ($US millions)	Import Value ($US millions)	Percentage Share of Total Exports
Motor vehicle parts	32.3	2,175,245	1,070,173	5.0
Measuring, controlling instruments	32.0	463,004	61,750	1.1
Electronic measuring, control equipment	29.7	417,330	83,370	1.0
Other telecommunications equipment	28.8	492,649	243,036	1.1
Non-electrical power machinery	25.8	1,187,741	921,674	2.7
Photo Film	27.3	259,298	1111,0008	0.6
Total				**11.5**

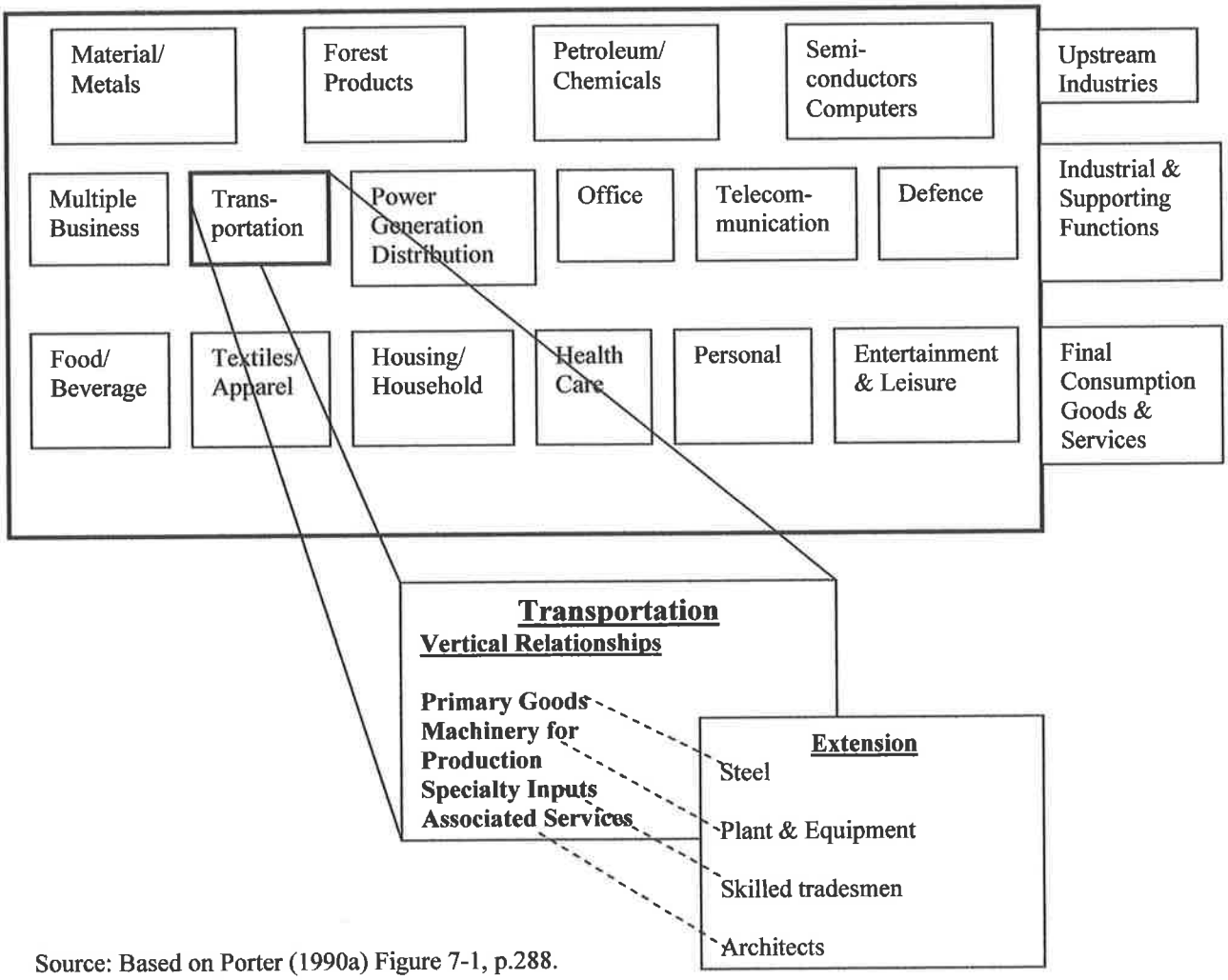
Source: Based on Porter (1990a, p.286) United States Economy, 1971-examples.

The case studies sought to examine the entire industries of each nation, including the successful and less successful ones. Basically, the industry in which a nation was considered to have competitive advantage would be detailed on a cluster chart, as shown in Figure 4.1. The full extent of each nation's competitiveness could then be assessed by analysing the dependence and interdependence of each industry, given its particular position in the value chain. In this way, Porter was able to examine the performance of a relatively broad cross-section of a nation's industries using a standardised model. Importantly, this also facilitated a more comprehensive comparison between nations than would have been otherwise possible.

Building on Porter's (1990a) methodology, the design of each nation's cluster chart was constructed according to these criteria. The basis of international success was

subsequently determined by the presence of significant exports or the extent of foreign direct investment attributed to that nation. It is also important to note, by design, industries were defined in a narrow context such as: farm tractors, as opposed to agricultural machinery, for instance.

Figure 4.1: Cluster Chart Delineating Competitive Patterns



Source: Based on Porter (1990a) Figure 7-1, p.288.

Figure 4.1 represents a Porter style cluster chart which has been configured to highlight the pattern and linkages of various competitive industries within a nation. Essentially, the model represents an effort to depict all the industries in which a nation had competitive advantage. This process denotes the pattern of competitive industries and the connections that existed between them. Across the top row of Figure 4.1 are broad sectors containing industries whereby the primary products are inputs to products in other industries. Porter

(1990a) termed these as upstream industries. The middle row constitutes broad end-use sectors that involve industrial and supporting functions. Most sectors are related in some way to particular end-uses such as 'Transportation'. The bottom row shows end-use sectors usually associated with final consumption goods or products. Within each broad sector, internationally successful industries are grouped into primary goods, machinery used in making them, specialised inputs to the goods, and services associated with the goods or their production. These have been purposely extended in the chart to show the typical product down-stream interface.

Grouping industries by the three broad end-use categories on the vertical axis, in this case, from primary goods to final services allows evaluation of the existence and depth of national clusters. Importantly, it also facilitates the development of improvement strategies to address any perceived shortfalls. In Figure 4.1 for example, 'Transportation', would determine the industry's competitive position relative to the nation's total exports and its relationship with other nation's exports. Similarly, each nation's share of world exports would be determined from its actual industry's competitive position in world trade, based on the sum total of international exports of that product.

4.2.3 The Bridge to the Diamond of Competitive Advantage

The final part of the methodology cements the relationship of a nation's broad based industry analysis to the Determinants of National Competitive Advantage. The identification of a nation's strengths provided the foundation with which to exploit its unique capabilities. Similarly, its weaknesses highlighted the basis for strategic improvement in whichever determinant of the diamond that warranted change. Porter (1990a) maintained that the Diamond model was a self-reinforcing system that created an environment within a nation in which innovation was rapid and continuous. Each nation and industry has its own unique sources of competitive advantage. This allows analysis of the dynamic and interconnected character of national advantage to be better understood. By closely examining the processes that emerge in a nation to achieve and

sustain international competitive success, the determinants of the diamond and the interactions amongst them combine to provide the basis of national advantage.

Findings from Porter's (1990a) studies also confirmed that each nation faced its own set of issues as well as its own opportunities and constraints in dealing with them. For that reason, Porter developed a series of national agendas for the specific nations studied. Predominantly, he focused on aspects of factor creation and upgrading a nation's capability based on a series of unique strategies and goals to achieve and retain international competitiveness. He perceived revolutionary technologies as the way of the future and this would provide opportunities for an era of innovation and productivity improvement.

Porter (1990a) further argued that as a consequence of the system of determinants a nation's competitive industries are not spread evenly throughout the economy. He maintained they are connected by a series of clusters that consist of various industries linked by mutual trade gains and benefits. Hence his reason for the design and development of the cluster chart concept represented in Figure 4.1. More importantly, however, while competition underpins a nation's relative success, the systemic nature of the conditions created in a nation ultimately generates specific mechanisms that foster the development of specialised and unique sources of competitive advantage. It also follows that government influence and the impact of industry policy are crucial aspects of competitiveness. Thus, given the focus on manufacturing and industry policy in this thesis, a brief review of Porter's findings from the ten-nation study with respect to the role of government will be discussed. This will demonstrate how industry policy can affect each of the determinants, which arguably influences the competitiveness of a nation's manufacturing sector.

4.3 The Role of Government in Porter's Ten-Nation Study

To demonstrate how the Diamond model impacts on the manufacturing sector, the ten nations studied by Porter (1990a) will be briefly reviewed. Discussion will be confined to

aspects of government influence pertaining to the manufacturing sectors of the nations studied based on the Determinants of National Competitive Advantage framework touched on in Chapter 2. The 'Diamond of National Advantage' showed how each of the elements of the diamond operated individually, and as a system to influence the competitive advantage of a nation. Accordingly, the productive output of a nation's competitive industries enhanced its economic performance. By following this logic a synthesis of the nation's competitiveness from an international perspective can be ascertained by assessing the industries considered to be a nation's most competitive.

Table 4.3 and Table 4.4 show that by using Porter's Diamond model, it is possible to summarize the status of a nation's workings consistent with the four Determinants of National Competitive Advantage. Furthermore, based on the application of a simple ranking procedure, it is also possible to categorise the status of each determinant according to the nation's strength of commitment. This can be accomplished by determining the level of industry intensity as - strong, moderate, or weak.

To provide a more holistic evaluation of the power of the determinants, commentary regarding the extent of government intervention has been included. For the purpose of this exercise, two nations will be considered in some detail to illustrate the customised use of Porter's framework. The performance of the United States and Japan have been chosen to demonstrate the model, primarily because they offer a broad perspective of trading conditions and also they contributed significantly towards crucial aspects of Porter's findings (Porter, 1990a).

Table 4.3 provides a summation of the United States determinants of competitive advantage based on Porter's philosophy. The summation described in Column 2 has been generated from an evaluation of the summaries and commentary noted in Porter's ten nation study. Column 3 denotes a ranking of the status of each specific determinant in accordance with how pertinent these issues appear to be to the United States economy[10]. This procedure is similarly replicated for the other nations assessed. In turn, each of the

[10] Categorization and ranking of the determinants have been determined from the author's opinion. It is appreciated that this list could identify different elements.

four major determinants impacting on the nation's economy has been systematically reviewed. An appropriate ranking is thus allocated according to the strength of the actual determinant.

4.3.1 United States

Table 4.3 Assessment of the United States Determinants

Determinants	Status	Ranking
Firm Strategy, Structure & Rivalry	Leadership in Many Industries Benefit from Economies of Scale and Scope Leadership in Management Disciplines Highly Competitive Infrastructure Extreme Wealth Generation Potential Innovative and Entrepreneurial	Strong
Factor Conditions	Well Endowed with Natural Resources Focus on Education Research and Development Training and Development of Staff Highly Effective Infrastructure	Strong
Related and Supporting Industries	Wide Spread Clustering. Leading Positions in a Number of Industries Modern Marketing Highly Innovative Leading Edge Technology	Strong
Demand Conditions	Market Size and Potential Affluent Society-Lifestyle Demands Sophisticated Buyers Culture and Values (Patriotic)	Strong

In terms of Porter's Diamond model, factor conditions arguably underpinned the United States trading success. The United States has an abundance of natural resources and natural factors of production, and according to Porter (1990a), is the world's largest and most successful market. Subsequently, this has led to the achievement of a significant international position in the production of sophisticated manufactured goods. Affluence has also resulted in the United States developing advanced markets for variety and choice of goods, as suggested by Fagan and Weber (1997). This would invariably include markets for manufactured goods from many newly created industries. For instance, the evolution of unique products, new processes and specialist materials, computerisation, electronics, and automation were largely stimulated through innovation underpinned by the United States wealth.

Porter (1990a) argued that government policy in the United States reflected a nation with strong and growing national advantage. He reported that the extent of government intervention in industry was among the lowest in the world with the government playing only an indirect role in industry. Predominantly, this has been in factor creation, which, as noted, is the United States strongest determinant with respect to the application of Porter's framework.

Porter also noted that an important government role was as a protector of competition. According to Porter (1990a) whilst championing free trade and an open market system, the United States maintained a vigorous antitrust policy. Through its defence and aerospace strategies, largely involving Government funded projects it helped stimulate manufacturing sector demand and the important competitive developments which surrounded this. For instance, the enhancement of innovative R&D capabilities, manufacturing specialisation, and the extent to which specialist feeder industries evolved as part of the nation's vital supply chain mechanisms were encouraged.

Although Porter (1990a) concluded that explicit United States government attention to industry was modest, it is argued here that he may have underestimated its rankings. Given the industrial power and influence of the United States, while Government policies have undoubtedly contributed substantially to the productive environment of the nation, there is sufficient justification to suggest that in all likelihood, it also underpinned the success of the United States manufacturing sector and its interrelated support industries (see for example Wade, 1990; Yoffie, 1993; Fagan and Webber, 1997). Therefore, in terms of specific ranking, it is probably more realistic to rank Government influence in the United States as **moderately strong**.

4.3.2 Japan

The data compiled in Table 4.4 replicates the assumptions used to generate Table 4.3. It can be deduced from these data that according to Porter's criteria used to classify determinants in general, Japan's industries reflect a significant breadth of scope.

Arguably, Japanese industries represent the full extent of Porter's model in action, and provide an excellent example of the interactions of the determinants, albeit, in this instance, based on the Government's influence

Table 4.4: Assessment of Japanese Determinants

Determinants	Status	Ranking
Firm Strategy, Structure & Rivalry	Hierarchical and Disciplined Organisations Long Term Planning Horizons Extremely Strong in Many Industries Highly Competitive Infrastructure Large Mix of SMEs Innovative and Entrepreneurial Strong Export Focus/Culture	Strong
Factor Conditions	Limited Natural Resources Highly Educated/Trained Workforce Research and Development Focus Effective Processes for Capital Generation Strong Professional Engineer Focus Highly Effective Infrastructure	Moderate to Strong
Related and Supporting Industries	Significant Manufacturing Clusters. Leading Position in Manufacturing Industries Highly Innovative Strong Imitation Focus Leading Edge Technology Developers Profusion of Relatively Small Companies	Strong
Demand Conditions	Competitive/Large Domestic Market Sophisticated/Discerning Buyers Strong Culture and Values Strong Marketing Presence (Consumer goods)	Strong

The Japanese Government similarly played a large part in the nation's economic success. Following World War 2, government policy was the principal tool used to develop and reshape the nation's determinants. Achieving early success in its industries was unashamedly the role of government. Porter (1990a) noted that in a number of cases the government deliberately limited the number of Japanese competitors. Other examples of intervention included industry policies geared towards greater assistance for 'national champions' to assist companies and industries that had an implicit bearing on state efficiency and wealth generation.

Japan has, to a large extent, adopted a 'governed approach' philosophy. In particular, Japan is noted for developing its industry policies based on the exploitation of its

perceived competitive advantages largely by maximizing its strengths and actively addressing its weaknesses. The Government has two major arms of policy development. These can be described as Sangyo Kozo Seisako (Industrial Structure Policy) and Sangyo Giorika Seisako (Industrial Rationalization Policy). The first entity relates to the management of industry composition, and the second retains the responsibility for enterprise composition and efficiency within industries. In combination with lending and banking facilities the strategies of the Ministry of International Trade and Industry (MITI) develop and coordinate Japan's industry policy. Since World War 2 MITI has effectively utilised this type of economic/political mechanism to manage Japan's industries that have until recently been an unmitigated success.

Japan operates through what is known as a 'keiretsu' which effectively links the Government with privately owned companies. This strategy provides substantial economic leverage that combines free enterprise with government intervention. The Japanese have progressed to varying degrees from the close management of the nation's determinants.

As noted in Chapter 2, the post-war period of reconstruction exemplified by Deming and the like, has in just a few decades completely reengineered Japan's industrial landscape. Even amongst the recent banking debacle, Japan is considered an economic powerhouse in the production of highly sophisticated value added goods marketed throughout the world.[11] A crucial aspect of Japanese industry protection, however, is that foreign rivals often entered industries based on agreed operating parameters (Porter, 1990a). This strategy stimulated the upgrading and competitiveness of Japanese manufacturing industries in general. Moreover, the influence exerted from industry policy, and thus, government, has been instrumental in forcing the rapid standardisation of products and productivity. Clearly, this led to intense rivalry on product and features improvement within the domestic market (Wade, 1990).

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11. It is recognized that this model is somewhat in disarray in the aftermath of the Asian financial crises. Nevertheless it does not detract from the thrust and principle of multi-faceted government–industry policy initiatives, witnessed at the time of Porter's studies.

As successful as Japanese industry had been, Porter (1990a) argued that government industry policy largely undermined competition and sheltered inefficient companies and industries. Although Japan is characterised by some of the strongest domestic rivalry in the world, in other areas it has engineered the sustainability of certain industry sectors by limiting domestic competition. Examples include, steel, the automotive industry, machine tools and computer manufacturing. Nonetheless, in terms of Porter's philosophy, Japan provides one of the best examples of managing its related and supporting industries, and its demand side factors.

Table 4.5: Summary of the Ranking of Determinants Relevant to Porter's Ten Nation Study

	Firm Strategy, Structure and Rivalry	**Factor Conditions**	**Related and Supporting Industries**	**Demand Conditions**	**Government Influence**
Nation	**Status Ranking**				
Denmark	Strong	Strong	Extremely Strong	Moderate to Strong	**Moderate**
Germany	Strong	Moderate to Strong	Strong	Moderate	**Moderate**
Italy	Moderate to Strong	Weak to Moderate	Moderate to Strong	Strong	**Weak**
Japan	Strong	Moderate to Strong	Extremely Strong	Strong	**Extremely Strong**
Korea	Moderate to Strong	Moderate	Moderate	Moderate to Strong	**Extremely Strong**
Singapore	Moderate to Strong	Strong	Strong	Extremely Strong	**Strong**
Sweden	Moderate to Strong	Strong	Strong	Extremely Strong	**Strong**
Switzerland	Moderate	Strong	Extremely Strong	Moderate to Strong	**Weak to moderate**
United Kingdom	Moderate	Moderate	Strong	Strong	**Weak to Moderate**
United States	Strong	Strong	Strong	Strong	**Moderate to Strong**

It could be argued that industry policy has effectively positioned the direction and focus of the nation's domestic manufacturers. This led to deep clustering of specialist providers across a wide range of interrelated industries. In terms of specific ranking, the Japanese Government influence would be rated **extremely strong**.

4.3.3 Impact on the Role of Government

A summary of the Determinants of Competitive Advantage of the ten nations studied by Porter is shown in Table 4.5. Each determinant has been ranked according to the process previously described. The table shows the relationship between the strength of commitment, and intensity of the specific nation to each of the four determinants. Column 5 reflects an overall summary of the extent to which the government has influenced each nation, according to the same criteria. It is clear from this analysis that the determinants are predominantly strong for each category. This may, however, be indicative of the sample of nations chosen by Porter. Yet, the data shows no reason to suggest that any of these nations are drastically underperforming. Though, Column 5 does suggest that government influence is not the major criterion underpinning the success of these nations.

Whilst the role of government is an integral part of the Diamond model, it is not necessarily the defining factor that dictates a nation's competitive success. Issues such as culture and globalisation for example, have been largely ignored. It can be argued that in a large number of circumstances relative to the competitiveness of nations - government influence is crucial. Certain nations have benefited from high levels of government involvement, while others have operated quite independently of it. Porter (1990a) always maintained that the Government's role is essentially catalytic, and that nations must recognise that the Diamond is a system, which makes policies in many areas interdependent. Arguably, this is the key to Porter's methodology. While these issues will be discussed at length later, it can be said that Government has a legitimate role in creating the necessary infrastructure to assist its manufacturers compete.

4.4 Application of Porter's Model to Resource–Based Countries

It has been shown how Porter's Diamond model provided a useful tool to identify the specific strengths and weaknesses of a nation's determinants of competitiveness. This section will examine the validity of the Diamond model with respect to resource-based

economies, such as Australia's. The result of this discussion is vital to the appropriateness of Porter's methodology for use in this thesis.

Yetton et al. (1992) applied Porter's methodology to Canada, New Zealand and Australia. Their purpose was to review the findings from Porter's original ten–nation study undertaken in 1990. Two additional Porter studies of Canada and New Zealand published in 1991 were also jointly assessed.[12] They argued that Porter's Diamond model had limited application to small less mature economies with home markets that have virtually no strong diamonds. For instance, the industries studied by Porter were in predominantly mature, manufacturing-based economies. Relatively little analysis had been conducted on resource-based less mature economies such as Australia, New Zealand and Canada. Porter (1990a) preferred instead to use the traded sector because it was larger and more visible in the economies of developed nations, than industries whose markets were predominantly domestic and not a reliable indicator of international competitiveness. Also, the performance of the traded sector was perceived to have an increasing impact on most nations, which allowed more effective comparison (Crocombe, Enright and Porter, 1991).

Porter's (1990a) assessment implied that resource-based industries are not that worthwhile. It can be argued that in reaching this view, Porter assumed that resource-based industries demonstrate low technology or low skill, in the sense that both depend upon basic factors. He also argued not only are the returns on basic factors low, irrespective of their location, but in addition, the competitive advantage of such industries is unsustainable because global competitors can easily circumvent the basic factors on which they depend (Porter 1990a). This is a crucial point. It will be argued in the following sections that the classification of resource-based industries categorized as low technology and low skilled is, at best, tenuous.

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[12] Notably, the critique undertaken by Yetton et al. (1992), in addition to assessing Porter's *The Competitive Advantage of Nations* (1990), included the publications of *Upgrading New Zealand's Competitive Advantage* (1991) and *Canada at the Cross Roads* (1991).

Furthermore, Porter's (1990a) preoccupation with innovation and export statistics had underestimated the contribution from companies and industries that focused entirely or largely on the domestic market. Indeed, as noted in the previous section, there is a strong argument to suggest that in some situations where countries have no identifiably strong 'diamonds', Porter neither explicitly noted this absence nor dealt with the subsequent impact on the theory expounded (Yetton et al. 1992).

4.4.1 Canada and New Zealand

Yetton et al. (1992) studied a total of twenty industries in New Zealand, which accounted for 85 per cent of the country's 1989 export earnings. Ten of the industries studied were traditional resource-based exporters, which comprised 76% of exports from all twenty industries, and 64% of New Zealand's total exports (p.97). The other ten were categorised as emerging industries, most of whom contributed little to New Zealand's export revenue, accounting for only 2.1% of total 1989 exports.

Yetton et al. (1992) also assessed twenty-five industries in Canada, these industries contributed to 37 per cent of Canada's 1989 export revenues. Importantly, these data reflected the exclusion of most resource-based and foreign owned manufacturing exporters located in Canada. This is significant because Porter's methodology by design negated the input from multinational companies located in home nations such as New Zealand, Canada, and Australia. Also, Porter's focus was on major exporting industries and companies, not on companies and industries that largely concentrated on domestic markets. As will be discussed, Yetton et al. (1992) argued that this demonstrated a weakness in the methodology and a threat to Porter's findings.

Of the eleven innovation driven industries studied in Canada, only three were 'high' on at least three of the four main elements of Porter's diamond model. It should be noted, however, that Canada has a relatively successful export industry albeit driven by resource-based, market-access based and innovation-driven industries that did not necessarily conform to Porter's theory of export success. Yetton et al.'s criticism reflects

the fact that the application of Porter's model essentially ignored resource-based companies and industries, irrespective of their national level of competitiveness. It can be argued, however, that the Canadian economy does not necessarily conform to the characteristics or determinants of Porter's diamond model. In support of this, analysis shows that Canada's trading performance is relatively strong by any international measure (Yetton et al. 1992).

Furthermore, in the case of New Zealand, Yetton et al. showed that factors such as the 'cost of isolation' and 'size' were far more relevant than allowed by Porter's Diamond model. Similar to Canada, New Zealand has a relatively small domestic market, yet Yetton et al. (1992) argued that Porter's analytical frameworks bore little relationship to the resultant recommendations about the nature of New Zealand diamonds. Arguably, given the formation of New Zealand's industries, the nation's overall performance was not adequately assessed as its industries were largely domestically focused. Yetton et al. (1992) concluded that Porter's empirical findings drew more upon economic theory to develop answers to New Zealand's trade situation than to consider the contribution of resource–based industries as central to the success of New Zealand's economy.

They also found that there was a clear mismatch between empirical findings and the theoretical framework elucidated in Porter's book and his Harvard Business Review article on the one hand, and from the results of the case studies conducted in New Zealand and Canada on the other. Yetton et al. (1992, p.90) maintained that *...both countries have virtually no strong diamonds.* This they suggested contradicted Porter's findings and contended his approach suffered from two problems. First, the methodology lacked a control group, and therefore, suffered from well-recognised validity threats; and second, Porter's work attempted to generalise from a few particular cases. They argued that devoid of a sound methodological framework or the use of objective measures, Porter's work was flawed. Moreover, in a number of cases they considered many of Porter's categorisations were subjective and descriptive.

On Porter's behalf it could be argued that he maintained industries with no competitive advantage or strong diamonds had to develop relevant strategies to achieve competitive advantage. Based on export statistics as the measure, companies and ultimately industries collectively developed competitive advantage by improving their diamonds. Fundamentally, they moved through a continuum (low exports/no diamonds to high exports/strong diamonds). Accordingly, industries with high exports but with no strong diamonds had to be supported to develop those diamonds. Industries with high exports and strong diamonds would endeavour to reinforce their existing competitive strategies.

Yetton et al. (1992) also raised concerns that Porter's focus on exports highlighted another major deficiency in his methodology. From Porter's initial premise in starting with successful exporters, and then identifying the common characteristics of successful industries, namely the presence of a strong diamond, Yetton et al. argued that Porter did not use an appropriate testing methodology to justify his findings. For instance, they suggested that by analysing a more representative industry sample which included some non-exporting industries or firms would have provided a less biased approach. In other words, Porter's hypothesis should have been possibly stated in terms of 'strong diamonds exist in strong export industries'.

Rugman and D'Cruz (1993) also experienced similar problems in their use of Porter's methodology with respect to Canada. Not unlike Yetton et al. they found that Porter's model was not appropriate to Canadian industries, mainly because of Canada's predominance of resource-based industries and the domestic focus of many industries. They argued the Diamond model required substantial modification to be able to accommodate Canadian institutional arrangements. These included for instance, the Canada-US Free Trade Agreement and the extent of foreign-owned firms operating within Canada.

Rugman and D'Cruz identified that Canadian managers and policy makers, in searching for answers to the question of how to improve Canada's international competitiveness, would need to supplement Porter's methodology. They proposed a significant

modification to Porter's model to accommodate these difficulties, namely the development of a 'Double Diamond Model'. By way of explanation, earlier, Rugman (1991, 1992) had taken issue with Porter's definition of Canadian rather than North American diamonds for Canadian firms. Porter had equated 'localised' with 'domestic' without establishing how or why.

Rugman and D'Cruz (1993) had determined from their studies that each country has to position its own home-country diamond against the 'relevant triad diamond'. This meant that contrary to Porter's belief nations could not ignore the economic contributions of multinationals to an economy, or indeed, the wealth generation created by resource-based industries to the competitiveness of a nation. They argued that there was an inextricable link between small nations and one of the three major powerhouse nations that was closest to them. Notably, the 'Triad nations' consisted of the United States, Japan and the European Economic Community (EEC). For instance, most Asia-Pacific nations would assess their competitive diamonds against Japan. Canada, Mexico, Latin America, and the Caribbean countries would invariably position their diamonds against the United States diamond. Also, the European nations outside the Economic Community would set theirs against the Economic Community.

The significance of this relates to the geographical and trade linkages possible, notwithstanding the trading power of these large nations. In particular, this provided the ability for smaller trading nations to develop globally integrated strategies from the inclusion of larger country 'determinants of competitive advantage'. Simultaneously, this would provide the capability to make decisions based on exploiting the benefits of the relevant triad nation in conjunction with a nation's home-based national differences. Implicit in this proposition was that multination coordination was an inherent part of the role of government.

Furthermore, Porter's framework placed the major emphasis on indigenous home-based industries with the capability to become important players in related and supporting industries through concepts such as self aligned competitive clusters. Reflecting this

orientation, he excluded predominantly foreign-owned companies when identifying the competitive industries covered in his ten-nation study.

Counter to Porter, and in support of the benefit of national clusters and cross border value added activities, Dunning (1992) had, for example, proposed to internationalise Porter's Diamond theory along similar lines to Rugman and D'Cruz. This proposition included amongst other things the inclusion of the activity of foreign owned MNEs. Dunning also emphasised the significance of the globalisation of production, and the need to re-evaluate the role of government. It was perceived this would positively impact each of the Diamond model determinants of competitive advantage. Notionally, improvement in each diamond would correspondingly contribute to the competitive advantage of the host nation. In essence, this supported the Rugman and D'Cruz (1993) suggestion of a 'double diamond model' or 'multiple diamonds' which allowed for the inclusion of more than one other country in the model. Therefore, aspects of foreign investment in multi-domestic industries would subsequently provide a significant source of influence to the determinants of competitive advantage for industries of a small economy (Cartwright, 1993).

4.4.2 Australia

Yetton et al. (1992) also applied Porter's methodology to Australian industries. Their conclusions were based on an analysis of Australia's top fifty exporter industries, all of which were resource-based. They found some support for the use of Porter's model for certain situations, but also found situations where the framework was of limited use in identifying the key factors underlying the creation of national diamonds of competitive success.

As Yetton et al. (1992) noted, most successful Australian manufacturing firms have a strong resource base but tend to have disproportionately low levels of exports. They contended that Australia's domestic competition occurs essentially between small to medium sized companies and the competition that exists from imported products. Thus,

consistent with Porter's analysis, at an industry level this would describe low exports–weak diamonds. However, according to Yetton et al. (1992), the four determinants as explained by Porter operate as a virtuous cycle. In Australia's case, Porter's model offered little insight as to 'how' or by the use of 'what specific strategies' are required for triggering or guiding the improvement process for companies and industries. Yetton et al. argued that most of Porter's focus is on the qualifications and difficulties that are experienced by companies and industries, not necessarily in providing workable strategic solutions for their improvement.

Likewise, Porter's theory, as alluded to, does not provide a method or any specific details of a strategic outline to actually develop a company or industry's capability. Mostly this is accomplished in Porter's studies through the use of broad and wide-ranging recommendations. As Yetton et al. noted:

> ...*He does not address how to ensure that more new firms emerge in those upgrading industries, or deal with how to ensure that most of those emergent firms become strategic exporters* (Yetton et al. p.111).

Instead of a theory focused towards the development of companies, Porter (1998) suggested two, much more general views of the dynamics that enhance the formation of new company growth. One is based on the model of national competitive development, which is derived from factor-driven to investment-driven forces, then innovation-driven and finally wealth-driven forces.

The second view is intrinsically linked with the Diamond model, whereby Porter illustrated that the development of the Diamond usually parallels the four stages, namely, from factors to investments to customer-driven innovation (Porter, 1990a). In Australia's case it can be argued that the subsequent mix of industries, in particular the high level of resource-based industries, do not strictly fit the criteria defined by Porter. Indeed, because of Australia's heavy reliance on resource-based industries, his theory cannot be readily translated into any specific industry policy or workable strategy. Proponents of Porter insisted, however, that the Diamond model is essentially generic, although the methodology must be applied at two levels - the industry and nation (see, for example,

Miller and Dess, 1993; Foss, 1996; and Hill and Deeds, 1996). Nonetheless, the lack of clarity suggests that the relevance of Porter's framework to Australia's manufacturing sector in this form demands a more robust examination.

4.5 Other Applications of Porter's Methodology

Porter (1990) argued that the internationally competitive industries of a country are not just a group of diverse unconnected sectors or companies. He maintained that the Diamond theory provides an holistic concept which allows businesses and governments to develop a competitive environment at a national level. It follows, therefore, that competitive and successful industries form specialised clusters of indigenous or 'home-based' industries through natural linkages of vertical and horizontal trading relationships. Porter argued that this is empirically supported from the results of his ten-nation study, and that industry clusters are so pervasive that they appear to be a central feature of advanced national economies.

The proposition that internationally competitive companies and industries need to be interlinked through clusters as a means of collectively generating competitive advantage is clearly a significant cornerstone of the Porter framework. Indeed, due to potential efficiency benefits it can be argued that a cluster approach facilitates productivity, and also highlights the interdependencies, joint activities and capabilities of each of the related participants operating within a competitive manufacturing industry.

Enright (1991, 1993, 1995, 1996, 1998, 2000) investigated the value and appropriateness of industry clustering and networks as significant benchmarks for industrial, regional and economic improvement. His extensive research found that as globalisation accelerated, interest in localised groups of manufacturing companies in the same or related industries became more prominent. Accordingly, he maintained there was a strong correlation between the formation of regional clusters and the success of prosperous regions. In Australia, for example, Enright and Roberts (2001) built upon the contemporary references to clustering developed by Morkel, Osegowitsch and Lewis (1998) to show

how smart infrastructure and core competencies can be nurtured. In turn, Morkel et al. had drawn from the ideas of Porter (1990) and Prahalad and Hamel (1990) to identify the importance of clusters and value chains to the industrial output of Australia. Interestingly, Morkel et al. had argued that the best prospects for clustering were in the natural resource sectors where Australia had a significant competitive advantage.

Besides Yetton et al. several other researchers have adopted the Porter Diamond model and applied these concepts to different countries. For instance, Jacobs and de Jong (1992) used Porter's work to assess the competitiveness of the Netherlands' economy. They used the determinants as a basis for the identification of the basic factors impacting on the industrial economy. Jacobs and de Jong found that, in particular, the geographical scope and the strong integration of companies and industries within the Netherlands provided extremely fertile ground for the adoption of clustering concepts. Their findings also suggested that too much emphasis was being placed on national specificities. This had led to an overly focused concentration by government on establishing the key characteristics of the diamond, rather than pursuing factors of improved productivity and competitiveness. Nonetheless, the use of the model was positive, and through industry policy initiatives helped stream-line the Dutch manufacturing industries.

In Ireland, Porter's findings influenced the 'Culliton Review of Industry Policy' (1992). The Industrial Policy Review Group (1992, pp.72-73) recommended the government should adopt Porter's methodology, in particular, to exploit the natural clusters of related industries building on the sources of national competitive advantage. Three specific industries were singled out for detailed study. They included: dairy production (O'Connell, Van Egeraat and Enright (1997), the music industry (Clancy and Twomey 1997), and the Irish indigenous software industry (O'Gorman, O'Malley and Mooney (1997). Clancy and Twomey (1997) noted, however, that while the methodology could be successfully applied to smaller more specialised industries, these industries could not be regarded as fully developed industry clusters of the type and scale described by Porter. Nevertheless, the studies showed there were significant benefits attributable to a form of

groupings of connected or related companies and industries, and from the interactions between them (O'Malley and Egeraat, 2000).

A more broad ranging analysis of Ireland's manufacturing sector was subsequently conducted by O'Malley and Egeraat (2000). Closely following the Diamond model, they assessed the competitiveness of the Irish manufacturing industry on the basis of an individual industry's export contribution to the economy. O'Malley and Egeraat argued that competitive advantage generated through host-country industry clusters had merit to Irish industries. Not dissimilar to the Australian economy, they noted that foreign owned companies and industries, as opposed to indigenous industries generate a substantial proportion of Ireland's exports, which are largely peripheral to Porter's analysis.

O'Malley and Egeraat (2000) found only limited evidence of substantial indigenous industry clusters. However, it is conceivable the reason for this result was not because they did not exist, but because Porter's framework for identifying them worked poorly in the case of Ireland. To reiterate, Porter concentrated on home based industries and largely omitted the contribution from multinationals to a nation's economy. Moreover, the distortions apparent in the Irish economy could be caused by specialisation. Data showed that the vast majority of Ireland's indigenous industries were based around certain types of food products. Meat and dairy products alone accounted for 59 per cent of the total value of exports of Ireland's indigenous industries in 1995 (Census of Industrial Production, 1995). Clearly, this would limit the scope of a number of Ireland's exports to qualify for inclusion in a Porter style analysis.

Clancy et al. (1998) in fact, built upon this notion by reporting that the evidence supported some variant of a 'multiple linked diamond' model was more appropriate to Ireland, similar to the arguments postulated by Dunning (1992) and Rugman and D'Cruz (1993). They argued strongly that a modified model could have greater applicability to Irish industries. They contended this would allow for the inclusion of more than one country as a potential source of the determinants of competitive advantage. Arguably, it is the influence of foreign trade that stimulates a nation's demand conditions, suppliers

and competition. In addition, Clancy et al. (1998) noted that with respect to the Diamond model, multinational subsidiaries located in Ireland play key roles as related and supporting industries for the Irish economy. They also argued that the rivalry created though the impact and nature of the environment faced by indigenous industries would encourage greater competition.

Two conclusions can be drawn from the Clancy et al. comments. First, the extent and range of foreign multinationals and indigenous industries residing in a country will in all likelihood vary according to the requirements of the specific industry concentration. This, in turn, lends support to the importance of the Diamond model to a country's overall competitiveness. Second, by extending this logic, the focus of an industry's competitive advantage (assumed to be achieved by applying the rigours of the Diamond theory) must similarly be underpinned by the quality and design of the natural cluster formation. Thus, for improved competitiveness this strategy cannot be left to a reliance on single 'multiple linked diamond' models which generally apply to all industries. In this way, there is strong interaction between the industry specific companies and supplier industries based on the notion of dependency and interdependency.

Cartwright (1993) argued that it is this area where Porter's methodology is deficient. He maintained the influential role of investments by multinationals, as well as a managerial commitment to being close to customers is a fundamental aspect of competitive advantage. Similarly, knowing the competitive environment, the link with related industries and the use of research and development resources in foreign markets is vital to ensuring a nation's competitiveness.

Porter's Diamond model has also been applied to Scotland. Danson and Whittam (1999), for instance, applied the model to the Scottish Whisky Industry. Their research identified several attributes that could be positively improved by its use, even though, a high level of co-operation and networking already existed. This was considered crucial to forging successful clusters, as well as fostering links between various organisations, suppliers and customers. Also, relationships were created with universities to help spawn new courses

in brewing and distilling methods. The research also showed Porter's framework inspired the development of geographically specific clusters able to enhance the heart of Scottish distilling and its peripheral suppliers. Moreover, research assisted in the role of exploiting niche marketing opportunities, further economic development and job security (Mackinnon, 2000).

Mackinnon (2000) reported on other Scottish industries that had successfully used the Porter methodology. This encompassed diverse areas such as jewellery, and book-town opportunities. He concluded the formation of successful networks depended upon the existence of specific local conditions. This supported Enright (2000) inasmuch as, networks and clusters operate effectively in circumstances where the presence of entrepreneurial values and a tradition of civic involvement existed. Similarly, Mackinnon maintained effective networks are underpinned by trust and the goal to succeed in forming reciprocal working relationships between local businesses.

Whilst the use of Porter's model has demonstrated the breadth of its applicability, it has also highlighted some limitations. In particular, when applied to resource-based economies such as Canada, New Zealand, Australia, and to some extent Ireland. Notwithstanding the role of government, nations need to operate within the constraints and opportunities of their diamond. Prior to determining the appropriateness of Porter's philosophies to Australian manufacturing, a number of other relevant issues need to be addressed.

4.6 Influences that Underpin National Competitiveness

Country-based discussion related to the usefulness of Porter's Diamond model has occupied the majority of this chapter. However, it is necessary to expand this discussion to determine its suitability to the Australian manufacturing sector. Certain questions remain unresolved. Is the full extent of Porter's model appropriate for a country such as Australia? If not, what modifications are required to ensure its applicability to industry policy and thus, the role of government in enhancing the competitive nature of Australia's

manufacturing sector? To address these key questions it is necessary to understand how factors of competitiveness are created.

Notionally, this reflects a company's ability to either produce high value added products more economically, or to create more cost effective processes that generate higher levels of productivity using resources more efficiently than competitors. Such capabilities are founded on the application of sophisticated strategies, and in the context of the influence of a government's microeconomic and macroeconomic policies. Arguably, the competitiveness of Australia's manufacturing sector was sustained through targeted industry policy, based on high levels of protection.

Porter (1990a) argued that no nation can be competitive in all industries. He also noted that international trade provided the opportunity to boost national level productivity by negating the need to produce all goods and services within the nation itself. As discussed, Porter predominantly focused his analysis on the significance of a nation's exports. Yet, as shown, the empirical focus of his major studies on exports favoured only the highly traded goods sectors of a country. Yetton et al. (1992) and Rugman and D'Cruz (1993), for example, considered this highlighted the methodology's inability to offer insights for resource-based or multi domestic industries that are common in Australia. The latter they defined as industries in which goods are generally sold in the location or country in which they are being produced. Furthermore, they contended that Porter's 'Diamond model' lacked the rigorous attention to the dynamics of creating successful companies, or even diamonds in nations that are not heavily industrialised.

Applying the value of the Diamond framework to Australia, however, requires further consideration. Porter (1990a) argued that world economies are governed by a new set of dynamics. He maintained that international competition is driven by competitive advantage in advanced industries rather than the ability to exploit the comparative advantage of national or inherited endowments of a nation's production factors. He also argued that knowledge intensive industries now support a high and rising standard of

living based on aspects such as innovation and advanced technologies. Porter (1990a, p.67) summarised this as follows:

> *...Creating competitive advantage in sophisticated industries demands improvement and innovation - finding better ways to compete and exploiting them globally, and relentlessly upgrading the firm's products and processes. Nations succeed in industries if their national circumstances provide an environment that supports this sort of behaviour.*

Notably, behind the 'Diamond framework' was an implicit theoretical construct. Fundamentally, this has a pervasive influence on the model's scope and its causal implications. What is more, the core concept underpinning the model is the centrality of innovation to sustained performance. Porter addressed this in a number of different ways and at different levels. He also identified the importance of two other critical forces that interact: pressure and proximity.

Porter (1990b) suggested that firms are usually reactive and unable to overcome inertia and vested interest. The fundamental characteristic that supports a firm's existence is that it increases its performance as a consequence of pressure from a competitive threat. It is argued here that the existence of pressure is the key driver of innovation, and ultimately, performance. More to the point, the model is responsive to the competitive pressure exerted on it from each of the points in the diamond. As a result, rivalry is invariably the most critical element of generating pressure on a firm and, as Porter maintained, it is only domestic rivalry that really counts (pp.86-87).

Porter argued that proximity or the close location of companies further intensifies the pressure on companies. Indeed, the process emphasises the competitive impact of domestic rivalry and local clusters. The explicit theory on proximity is presented in terms of information, inasmuch as it relates to the concentration and sources of data and information and to the extent of how quickly it will be acted upon. The two factors of 'pressure and proximity' appear to answer most of the questions about innovation and knowledge creation that are critical to Porter. Thus, the pursuit of competitive advantage

frequently demands unsettling adjustments and the continual need to exploit technology, by a sustained and cumulative investment in physical facilities, research and development and in market intelligence. Porter (1998a) noted that the process of competitiveness in many respects is unnatural for companies. Few companies make significant advances voluntarily. Most are forced to modify and update their business strategies based on external competitive pressures.

Firms either apply focus and concentrate by employing a global strategy, or disperse and are multi-domestic (Porter, 1990a). Moreover, global strategies involve exporting, while dispersing activities usually involve overseas direct investment. It could be argued that multi-domestic companies located in Australia would be limited by their opportunities for intra-firm learning because, as subsidiaries, they would be geographically separated from other parts of the multi-domestic parent company. Accordingly, companies with a multi-domestic strategy and, by inference, dispersed organisations, contribute little to national economic performance, either for the headquarters nation, or for the host country. None of these organisations meets Porter's requirements for global industries as the *...battleground on which firms from different nations compete in ways that significantly affect national economic prosperity* (Porter 1990a, p.54). This has a significant bearing on the pattern of Australia's manufacturing sector that ostensibly operates on intra-firm learning within a multi-domestic structure.

Porter's Diamond model undoubtedly plays a significant part in explaining and understanding competitive advantage of industries and nations. Yet, the constitution of Australia's manufacturing industry in certain situations is not conducive to this approach in isolation. A broader perspective is required.

Bell (1993) argued a large number of Australia's manufacturers are relatively successful. Yet, according to Yetton et al. (1992), they do not fit Porter's model. Capling and Calligan, (1992), Bell, (1993), and Fagan and Weber, (1997) and others have argued that Australia's manufacturing sector suffers from its high dependency on multinationals for investment, technology, and employment. Relating this to Porter's model which

predominantly favours indigenous industries, Australia as a manufacturing nation has an obvious dilemma.

There are a number of lessons to be learned from Porter's work. Research has shown that while Porter failed to examine fully the contribution of multi-domestics, or indeed, recognise them as an effective form of global competition, this is understandable from an American perspective. However, in Australia, due to the size of the domestic market, this is unlikely to apply. Moreover, Porter's discounting of overseas operations and investment is the greatest weakness in his theory about the centrality of physical proximity for effective learning and innovation (Yetton et al. 1992, p.117). As noted by Yetton et al. (1992), Australia's experience of multi-domestics and strong multinational presence provides an alternative perspective.

While this discussion has highlighted a number of positive aspects as well as criticism of Porter's work, nonetheless, his basic theories and 'Diamond model' is sound. However, its adoption will require modification. Indeed, the size of Australia's manufacturing sector has unique characteristics that demand unique solutions based on the efficient use of its national resources. Five key factors constrain the full applicability of Porter's framework. Accommodating these will require adjustment to the model as follows:

(1) Australian manufacturing is largely dependent upon multinationals for its existence. Hence, their input/output must be included as an integral part of the revised model.

(2) Porter's studies included the combined outputs of a nation's economy including services. This thesis will be confined to Australia's manufacturing sector. Only manufacturing related services will be considered.

(3) The contribution of resource-based industries is an integral part of the Australian economy and must be included in the analysis. Porter's studies excluded this input.

(4) Porter's studies compiled a broad range of 'nation specific' statistical data as the basis for the initial analysis. The corresponding data for this thesis will be

confined to aspects of Australian manufacturing activity integral to the hypotheses being tested.

(5) Porter's framework excluded factors such as globalisation and culture which, from an Australian perspective, is problematic. As a nation Australia consists of six major States and two Capital Territories, each of which operate somewhat independently, and thus, compete directly with each other.

This discussion has shown that with respect to Porter's ten-nation study the Government has a crucial role to play. Accordingly, it is argued that given the composition of Australia's manufacturing industries a more globally-focused industry policy is warranted in the future. In that respect, with the above modifications, Porter's Diamond model provides an adequate framework with which to examine competitiveness and the effectiveness of industry policy relative to Australia's manufacturing sector.

4.7 Summary

An assessment of the use of Porter's methodological framework as part of his ten-nation study was undertaken. The focus was to assess the suitability of Porter's model to identify and assess the factors that influence international competition. This chapter also reviewed the work of a number of writers who have adopted Porter's Diamond of Competitiveness model as a means to assess industry-based national competitiveness. Findings suggested that in some cases Porter's model was appropriate to provide policy prescriptions to address certain economic problems. However, in a number of circumstances his framework was found to be insufficient to address adequately the particular nuances of a country's unique economic situation. Findings also suggested that government influence occurs to varying extents, though this was not considered to be crucial to a nation's success. It was found to be largely catalytic.

In general terms, Porter's model did not provide an all-embracing solution to improve the productivity of each country assessed. Indeed, a number of writers suggested the model was more appropriate for large economies such as the U.S. and for larger, more mature, manufacturing industries. However, it was noted that, generally, a country must develop

its own unique characteristics to become globally competitive. In addition, the 'model' was considered too limiting to cope with economies with small to medium sized resource-based industries, and with a large population of foreign owned enterprises, such as in Australia.

A number of specific influences underpinning national competitiveness were also investigated. This showed that pressure and proximity were crucial aspects of competitiveness. Manifestly, they provided the basis for strategic improvement of an industry, and also an effective means to achieve increased knowledge and efficiency. The importance of innovation and exports was also discussed. Notably, the review highlighted the fact that Porter's focus was primarily on exporting as the singular goal for manufacturing enterprises. This, it was argued, had distinct shortfalls. The consequences of Porter's work to the Australian manufacturing sector also demonstrated the logic of building effective cluster mechanisms as a means of harnessing competitive advantage.

Lastly, it was shown how Australia's manufacturing sector does not conform to the full extent of Porter's criteria defined. While the inherent framework was considered to be sound, a number of amendments were necessary to facilitate its adoption. The next chapter will review the relationship between industry policy and competitiveness. This will provide a better understanding of the industry policy direction pursued by the Australian Government.

Chapter 5 A Review of Manufacturing Competitiveness and Australian Industry Policy prior to 1983

5.1 Introduction

Previous chapters have documented the increasing significance of competition and concentrated on the development of a framework for assessing the competitiveness of industries and nations, largely based on Porter's work. Discussion highlighted the importance of industry policy, its impact on the manufacturing sector, and in particular, the imperative for companies to develop and sustain competitive advantage. The assessment confirmed that the Government's role is crucial in facilitating an effective link between industries, notably in respect to enhancing relative competitiveness at a domestic and international level.

A primary objective of this thesis is to assess the impact of industry policy on the competitiveness of Australia's manufacturing sector between 1983 and 1996. However, there is a need to understand the changes made to industry policy towards the manufacturing sector prior to this time in the context of the situation prevailing when the new Hawke-Keating Government came to office in 1983.

In this chapter a brief outline of the historical development of industry policies up to World War 2 will initially be provided. This will illustrate the changing nature of industry policy and the growth and importance of the manufacturing sector to the nation. Following World War 2, however, several reports were commissioned to assist in improving the competitiveness of the manufacturing sector. The implications of these reports and their impact on Australian manufacturing will form the major part of the discussion.

It is not the intension to undertake a detailed examination of Australian industrial history. Rather, the emphasis will be on providing sufficient information and analysis to enable an understanding of the measure of the challenge in this area facing the Hawke-Keating

Government when it assumed office. Part of the examination will investigate the extent of Government intervention and the degree to which successive governments utilized protectionist measures to underpin Australia's manufacturing competitiveness. The chapter will conclude by providing a brief summary of the state of the manufacturing sector prior to the advent of the new Hawke-Keating Government.

5.2 Industry Policy in a Developing Nation

Historically, Australian manufacturing was sheltered from the vagaries of competition through the benefits of expedient industry policies administered by successive governments. In terms of industry policy, the purpose of this section will be to briefly describe some key events that occurred as part of the development of Australia's manufacturing sector leading up to World War 2.

The 1850s were recognised as the start of the first long boom, reflecting Australia's growing trade with Britain and other countries. This inspired a strong period of investment, immigration and entrepreneurial spirit that formed the basis of Australia's manufacturing sector and its international economy.

However, recognition of the nation's growing wealth rapidly attracted competition to the fledgling industries from manufactured goods produced overseas. To contend with the threat of overseas competition and indeed, the trade between colonies, industry policy in Australia became driven by a protectionist mentality that permeated most aspects of government decision making related to the manufacturing sector. The Governments of each state colony introduced tariff barriers to counteract the threat to Australia's infant industries.

Tariffs are duties imposed on imported goods. Fundamentally, by increasing the cost of imported goods in Australia and providing a price advantage to locally produced goods, the objective was to encourage and protect the development of existing and new industries. Indirectly, tariffs assisted in maintaining and also creating jobs so as to attract

and retain population and be able to pay the high wage levels that the workforce in Australia had become accustomed to.

Governments of the day also become supportive of 'populate or perish' policies. Notwithstanding defence considerations, it was well documented that the nation's manufacturing development across such a large, geographically dispersed land mass was severely exacerbated by its lack of resources (Clarke, 1992). A shortage of labour, in particular, underpinned the belief in political circles that protectionist policies reduced direct competition to manufacturers which, in turn, helped to create jobs that would otherwise not have existed in Australia. To that extent, the growth and development of Australian industries was influenced by political intervention, policies focused on short term expediency and, in certain cases, nefarious arguments that supported party political preferences (Pincus, 1995).

During the late 1880s and the early 1890s, the free trade versus protection argument raised its head. The Australian economy had noticeably deteriorated with fiscal problems dominating the nation. Governments sought to redress the situation by increasing tariff protection to safeguard its industries. Of note, the Federation of Australian states in 1901 provided the impetus for radical changes to industry policy. As part of the provisions of the new constitution of the Federation, the Federal Government assumed exclusive responsibility for customs and excise, and in September 1902, the Customs Tariff Act became law. At that time tariffs ranged between 5 and 25 per cent ad valorum duty (Copland, 1936).

The Government's Tariff acts of 1902, 1906, and 1908 introduced progressively more protection for manufacturers (Lewis, Morkel and Stockport, 1999). Legislation was also passed between 1905 and 1908 by the Deakin Government to incorporate what was to be known as 'new protection'. The rationale for this was to couple protection with enhanced wages to improve employee working conditions.

From the advent of World War 1, Australia was for all intents and purposes cut off from import and export markets. This allowed some manufacturing industries to flourish as they faced limited domestic market competition from overseas manufacturers. Following the war and the resumption of trade, however, persistent high levels of unemployment brought pressure on the Government to introduce more comprehensive tariff protection. The Green Tariff of 1920-21 expanded the range of protected goods to cover 72 per cent of all imported products entering Australia (Glezer, 1982). In what was to become crucial to Australia's manufacturing competitiveness, the Tariff Board was also established at this time.

The election of a new Federal Labor Government in October 1929 led to tariffs being raised not once but seven times in their first year of office. This was known as "Creeping Protectionism", a term coined by Butlin et al. (1982). This action signalled the pinnacle of Australian Government protectionist measures.

However, these decisions came under attack due to political concerns. In response, the Government convened the Brigden Committee in 1929 to assess the economic impact of tariffs. The Committee's findings, in general, supported the continuation of high levels of tariff protection. Some commentators, however, found the report contained intellectual weaknesses. In particular, it was considered the report was prejudiced against 'services' and was unconvincing in its discussion of the redistribution mechanism through which import duties raised the level of real wages. Supporters of free trade also challenged Brigden's protectionist argument. It was suggested that it was Australia's natural endowments and improvements in technology that allowed Australia to prosper. It was also argued that overseas borrowing had led to Australia's apparent prosperity, and that undoubtedly, this money would have to be repaid (Benham, 1926; Viner, 1929; and Capling and Galligan, 1992).

With the economy in turmoil, tariffs were increased in 1931 and 1932. Furthermore, in January 1931, to stabilize the economy, a 10% wage reduction was ordered by the Arbitration Board. This policy was synchronised with a 20% devaluation of the

Australian currency. Ward (1978, p.163-4) reported that the effect of these actions on the economy caused unemployment in Australia to rise, from 8 per cent in 1932 to an average level of 23.4 per cent for the whole of the Depression period. To ensure continuity of trade, by the end of the 1930's tariff rates had been substantially amended. Australia administered a three-column tariff structure: the lowest tariff was the British preferential rate, followed by the intermediate rate for most favoured nations, and the highest rate was the general tariff.

5.3 Postwar Reconstruction of Australia's Manufacturing Sector

World War 2 provided an impetus for Australia's manufacturing industry to grow, predominantly from the lack of competition from overseas producers (Bell, 1993). The value of manufacturing to the economy was also being increasingly recognised. Labor's wartime Prime Minister, John Curtin, stressed this when he pointed to the large part manufacturers were expected to play in ensuring post-war full employment.

Following the death of Prime Minister Curtin in 1945, he was succeeded by Ben Chifley. Chifley immediately set about rebuilding the Australian economy. The Chifley Government promoted an activist approach to economic development, using policy instruments such as immigration and protectionism to underpin economic growth.

It could be argued that Chifley also broke new ground on the industry policy front. Recognising the need for increased competitiveness to contend with the escalating levels of imported goods, the Government introduced a comprehensive range of industry policies. These policies encompassed the promotion of research and development in the manufacturing sector, and the provision of technical and managerial advice to assist in planning. Processes were also introduced to monitor and coordinate the extent of government policies which impinged on manufacturing, such as tax and trade policies, and the selective allocation of finance (Butlin and Schedvin, 1977). Initiatives such as these represented the basis of innovation strategies and improvement programs promoted

by the Government. The majority of these policies, however, were dumped by the subsequent Menzies Government, which was elected in 1949.

Favourable government incentives had attracted significant foreign investment to Australia. In particular, the vehicle industry received special attention in terms of the introduction of the Government's discrete sectoral assistance policies, designed specifically for the benefit of foreign car manufacturers (Butlin and Schedvin, 1977). Also, policy measures to assist import competing industries through the relative use of tariffs were used to ensure that jobs were created in this sector.

International trade agreements also permeated the political landscape. Australian industry was required to comply with GATT regulations, which were developed and established in 1947.[13] Consistent with the Agreement, Australia was required to reduce tariffs. At the same time, export trade was being influenced by a new opportunistic phenomenon known as non-tariff protection, which included quotas, voluntary export restraints, export subsidies and dumping tactics. It is worth noting that the design and implementation of non-tariff policies became extremely innovative. Policies increasingly encroached upon every conceivable trading advantage an industry could generate (Pincus, 1995). Yet, with respect to the GATT in general, Pomfret (1995) reported that its impact was weakened somewhat by Australia's non-effective participation in the establishment of free trade objectives. Largely, this non-compliance lasted for the first 25 years of GATT's existence.

State Governments also offered special regional inducements to industries following the war (Warhurst, Stewart and Head, 1988).[14] These in effect decentralized industry and

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[13] GATT is an acronym formed from the first initials of the General Agreement on Tariffs and Trade.

[14] Interestingly, both these inducements mirror a similar proposition put in place by the Hawke-Keating Government in 1986 through the National Industry Extension Service (NIES). The Chifley Government also proposed the establishment of an Australian Trading Corporation as a means of seizing unique opportunities to expand Australia's manufactured exports overseas. May (1968) argued that this Corporation was designed to have wide ranging functions including overseas market research, the local placement of orders, export delivery functions, and the financing of local production excesses in cases where this would actually promote supply or demand continuity. By way of comparison, this policy proposal to a large extent suggested the embryo of AUSTRADE.

involved the delivery of a range of grants and measures such as direct subsidies and loan concessions.

With the defeat of the Chifley Labor Government in 1949, the Menzies Liberal-Country party coalition took office. Despite some major policy reversals from the Chifley era, the Menzies Government fostered a period of prosperity and stability. Interestingly, Menzies spoke of the Government's role in the provision of industry assistance and was happy to claim credit for Australia's rapid post-war industrialisation under pervasive government protectionism.

In 1956, following a reorganisation of Government portfolios, John McEwen was appointed as the Minister for Trade and Industry. The fundamental tenet of McEwen's vision saw protectionism as a central platform of national development.
He spoke enthusiastically of the economic multiplier effects created by the manufacturing sector. McEwen also focused on securing support from manufacturers as the rural electorate base of the Country Party was declining. To ease the chronic shortage of foreign exchange, import quotas imposed earlier in 1952 were retained until 1960. These measures, covering 98 per cent by value of Australian imports, actually increased the effective rate of protection (Lloyd, 1973). As a consequence, there was now more dependence than ever on Government assistance by the manufacturing sector.

During a speech in November 1957, McEwen spoke of his vision for Australia as a powerful industrialised nation. To this end, he expected the manufacturing sector to carry the additional population load in terms of job creation. Thus, the growing levels of protection were justified on the basis that benefits from an increased manufacturing sector would ultimately generate economic growth and prosperity. By inference, however, this also meant a sustained policy of high tariff protection for manufacturers. Arguably, McEwen's tariff philosophies encouraged a plethora of means to obtain financial assistance. Bell (1993) concluded that irrespective of the level of competitiveness manufacturers presented a collection of spurious arguments to access government assistance. This became known as 'Protection all Round'.

Researchers have suggested that the 1960s demonstrated the worst case of inept industry policy in Australia's manufacturing history (see, for example, Capling and Galligan, 1992; Bell, 1993; and Fagan and Webber, 1997). The evidence suggested that Australia's competitor nations were dramatically improving competitiveness through their pursuit of increased productivity and adoption of new technology. It can be argued that the Australian Government had failed to provide incentives through policy changes to cause the manufacturing sector to follow a similar path.

In 1963, McEwen appointed R.A. Rattigan as chairman of the Tariff Board to administer the Board's tariff responsibilities. Serious concerns were emerging about the competitiveness of the manufacturing sector and the efficacy of industry policies, which still supported tariff dependence with little focus on efficiency or a strategic direction for the nation's future. These concerns led the Government to appoint Sir James Vernon to conduct an independent assessment of Australia's manufacturing industry and inquire into the effects of the tariff. Among it recommendations the Vernon Report (1965) argued for a more stringent evaluation of Australia's highly protected industry sectors. It was suggested the Government should seek different economic policies to secure full employment. Also, future tariff claims should be assessed according to a 30 per cent benchmark rate. Moreover, it was the Report's view that the Tariff Board should divorce employment considerations from tariff recommendations. A number of important issues regarding foreign investment and local borrowing issues were similarly recommended. For instance, the Report tabled specific guidelines to amend the Government's 'open door' investment criteria.

Multinational companies were also imposing widespread export restrictions on local subsidiaries to their detriment. Vernon (1965) considered that without adequate competitive rivalry at a local level indigenous industry would stagnate. Several issues were not being addressed: symptoms of truncated industrial development, poor export orientation, and extremely weak performance in research and development in

manufacturing existed.[15] Within the manufacturing sector, industry policy and the market context in which post-war industrial development occurred in Australia placed little emphasis on efficiency or increased performance.

Vernon also claimed that Australia suffered from poor and erratic post war industrial planning. To address this, he recommended the establishment of an independent agency to assist in the Government's economic planning. For instance, one of Vernon's more controversial recommendations was based on the need for industry-wide economic growth. This idea was meant to inject some forward momentum into the Government's economic policy agenda. However, it clearly did not sit well with the Menzies Government, who unceremoniously rejected the whole independent agency idea.

In summary, many of Vernon's recommendations were ignored by the Government. Overall, however, the Report is significant because it highlighted the massive inefficiencies occurring throughout the manufacturing sector, and indeed, raised the need for a more competitive approach to be adopted in Australian manufacturing.

5.4 The Imperative to Create an Internationally Competitive Manufacturing Sector

Throughout the 1960's and 1970's Australia experienced an unprecedented period of change in industry policy. At that time, Australian and New Zealand tariff rates were the highest in the industrialised world (Anderson and Garnaut, 1987). The Tariff Board under Rattigan, which was later to become the Industries Assistance Commission (IAC), announced in 1967 that it would undertake a systematic review of all heavily protected industries.

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[15] 'Truncated industrialisation' is a term coined by J. M. Gilmour in his publication of the Industrial Policy Debate in a Resource Hinterland (1982). This occurs when the foreign subsidiaries which dominate domestic industrialisation do not carry out all of the basic functions of the production cycle. Typically they rely on the parent company to undertake these functions, thus minimizing the potential of local manufacturing input.

International competition was severely impacting on Australia's manufactured goods sector. This impact increasingly highlighted the fact that the existing industry policy framework was insufficient. This demanded an immediate response and a more comprehensive approach from the new Whitlam Labor Government elected in 1973. To ensure improvement in the manufacturing sector and at the same time provide a solution politically acceptable to the bodies representing manufacturers and employees, the Government sought advice from both outside and within government as to what was needed.

As part of a key initiative, Whitlam broke with Labor Party tradition by paving the way for a program of improved competitiveness. Pursuing a policy platform of microeconomic reform, his central focus was tariff reduction and industry restructuring. One such measure in 1973 included an across the board tariff cut of 25 per cent. This was the largest single tariff reduction in Australia's history. In heavily protected industries this reduced the average effective tariff rate from 36 to 27 per cent in real terms (Anderson, 1987).

However, a year after the 25 per cent cut, the Government reassessed its fervour for tariff reform. Indeed, immediate action was required as a result of rising unemployment and the highest inflation rate since the Second World War. The Government was pressured to restore tariff rates to their previous levels, and ironically, to increase them to contend with the continuing growth of imports and fall in most companies' profitability. Over 30,000 job losses in the textile clothing and footwear industry were attributed to these manufacturing sector tariff cuts (Capling and Galligan, 1992).

The pressure for changes was driven by a strong cultural imperative of many manufacturers for the need for protection in some form. Bell (1993) suggested that this reflected an industrial welfare mentality that existed in certain manufacturing industries. In similar vein, the competitive threat from overseas manufacturers may have influenced shifts in the corporate strategies of a number of Australian companies during the early 1970s. For instance, aware of rising manufacturing costs, firms increasingly became

engaged in importing finished products and components for use in local manufacture. Several manufacturers also closed local factories and moved offshore in what was termed Australia's 'offshore exodus' (Southern, 1976). Plainly, manufacturers were responding to growing competitiveness and integration of international economies with strategies focused on company profit and less support for nationalistic values (see, for example Peetz, 1982; Gordon, 1988; Fagan and Webber, 1997; and Bryan and Rafferty, 1999).

Moreover, it appears the role of management had been side stepped throughout the industry policy debate. In terms of Australia's manufacturing growth and success, Whitlam's initially stated goal of improved competitiveness and increased employment was supplanted by the profit motives of manufacturers. It is plausible to suggest that the major deficiency in the competitiveness debate in Australia at this time stemmed from the fact that governments do not run companies - managers do.

Circumstances were similar for the new Fraser Government elected in 1975, which inherited a situation of substantial retrenchments in the manufacturing sector. In order to prevent further job losses in the labour intensive industries, the Government was willing to defy its international obligations. To sustain its industrial base, the Government increased the level of tariffs to protect Australia's manufacturing sector against the vagaries of world competition. Increased protection was provided to the TCF and motor vehicle industries through the application of additional import restrictions. Some so called 'positive' measures were also introduced, such as incentives for export, research and development, and bounty payments (Stanford, 1992). Most of these initiatives were introduced in response to reducing employment levels. On balance, the Government may have found it politically expedient to use the protectionist measures of the past rather than confront the industrial realities of the 1970s.

There is some justification in suggesting that both the Whitlam and Fraser Governments lurched between free trade and protectionism depending upon the state of the economy. Indeed, the political clout of certain industries, especially those that were heavily unionized, had maintained high levels of protection (Bell, 1993). Nonetheless, the

realization of the need to improve the efficiency and competitiveness of the manufacturing sector did begin to bring about a change in government industry policy. As discussed below, competition had previously been viewed domestically.

It is argued that tariff protection provided a cushion for Australian manufacturers against overseas competitors. However, it became increasingly obvious to government that as manufacturers were sheltered from competition there was no requirement for them to improve their organizational capabilities or efficiency. In other words, tariff protection provided a mechanism to support mediocrity which was now increasingly recognized as counter-productive to the nation's competitiveness as a whole (Capling and Galligan; 1992; Bell, 1993; and Mahony, 1993).

The Fraser Government eventually modified its industry policy approach to pursue key elements of what could be considered as fundamental components of competitive advantage. In Porter's (1990a) terms, the new policy direction was focused precisely at the 'firm strategy, structure and rivalry' level, which had largely been ignored by governments previously. Yet the Government was aware that industrial restructuring at an enterprise level would be politically sensitive. Thus, as a means of ascertaining an objective assessment of the dilemma facing Australia's manufacturing industries, the assistance of independent bodies was sought during the mid and latter parts of the 1970's.

5.5 Government Reviews of the Manufacturing Sector

During the period 1974-79, the Commonwealth Government commissioned three significant reviews of industry policy to investigate the apparent problems of the manufacturing sector. These were:

- Jackson Committee (1975) - Report of the Committee to Advise on Policies for the Development of Manufacturing Industry.
- Commonwealth of Australia (1977) - White Paper on Manufacturing Industry.
- The Crawford Study Group (1979) - Study Group on Structural Adjustment Report.

This section will briefly discuss each of these reports with respect to their views on the competitiveness, and influences on government policies.

5.5.1 The Jackson Report

The Jackson Committee (chaired by Gordon Jackson, Managing Director of CSR) was established in 1974 by the Whitlam Government to inquire into the problems of the manufacturing sector. This Committee was commissioned principally to advise on policies to improve the manufacturing industry (Bell, 1993). The Committee was particularly alarmed at the continuing decline, and deep seated and long standing malaise of Australian manufacturers.

In its Report the Committee argued that Australian manufacturing was largely created to serve the domestic market, which had little room to grow. It was also suggested that most manufacturing was stalled and lacked purpose. The Report noted the industry structure created by earlier government policies was not well suited to the challenges of international competition. It was also stated that the strategy of post-war protectionism had outrun its usefulness, and that a new policy framework and set of goals was required to contend with manufacturing competition at a domestic and an international level (Jackson, 1975).

The Committee's recommendations included a wide range of restructuring and assistance measures to improve the competitiveness of the manufacturing sector. It was suggested that the perceived negative consequences associated with tariff cuts should be matched by positive measures of equal force and effectiveness designed to facilitate improved competitiveness. The Committee maintained that the problems of Australian industry could not be solved by the perfect administration of tariffs.

Wide reaching changes were sought by the Committee inasmuch as the policy approach of the IAC was considered too academic and far removed from the practical day to day realities of the manufacturing industry. Not dissimilar to Vernon, the Committee

proposed a system of 'industry councils' composed of manufacturers, unions and government, with participation from consumer representatives. These councils would develop policy options for particular industries within the manufacturing sector. However, even though Rattigan was a member of the Jackson Committee, in his critique of the 'Jackson Report' he totally rejected the 'council' concept.

Nonetheless, a balanced reductionist program was eventually promoted by government. The recommended approach embraced a new interventionist stance with an objective to assist in the competitiveness of the manufacturing sector. From the industry's perspective, the proposed policy of industry restructuring meant that Australia had to either rationalise or retire its uncompetitive industries and move towards a more specialised industrial structure. In effect, this policy would have to reflect Australia's comparative advantages, particularly in capital, knowledge-based, and resource-intensive manufacturing industries. It was widely agreed that domestic manufacturing had to achieve international competitiveness with a greater export orientation (Jackson, 1975; Bell, 1993). Despite this agreement, the revised goals of industry policy met considerable opposition in some quarters.

The industrial climate during this period is worth noting. Resource industries were seen as driving national wealth, and the service sector was increasingly perceived to be the key area for employment growth. Bell (1993) argued that while manufacturing was not considered expendable, it was given a less prominent place in terms of the nation's future direction.

5.5.2 White Paper on Manufacturing Industry

Observers noted that the White Paper which followed the Jackson Report represented an attempt to reconcile the Government's apparent policy contradictions (Bell, 1993). It also aimed to provide a way beyond protection and free trade issues. The Jackson Committee had argued that 'positive policies are needed to develop particular industries'. The Committee preferred a key industries approach to industry policy. Meaning that, for

example, the traditional focus on protection for labour-intensive industries would be less prominent. Instead, it opted for a key attributes approach that suggested 'new investment having certain attributes should be encouraged'. For example, the aim here was to promote new growth industries in order to facilitate competitiveness and encourage an export orientation. Measures which were considered essential to an industry's strength and vitality should be supported. The IAC (1977) however, formally rejected this approach as it required the Government to be directive in character. The IAC maintained that the Government would become locked into providing continued support. This ideology was not wholeheartedly accepted by Fraser, as the Government endorsed the idea of industry attributes and formerly rejected the more selective key industries approach.

The following passage from the Government's White Paper (1977) on industry policy describes the sentiment of the day:

> *The Government's future approach to long term industry policy is concerned primarily with the development of a stronger and more specialised manufacturing industry in Australia than in the past. The Government endorses the view expressed in the Jackson Report that it is desirable to give encouragement to new investment that will be efficient, internationally competitive and export oriented* (p.17).

In his speech to the New South Wales Chamber of Manufacturers in 1977, Prime Minister Fraser stated that *...clearly, in a country that has a relatively small domestic market, and a high cost structure, continued assistance to industry is inevitable.* He went on to criticise the IAC (1977) proposals of reductions in assistance and industry restructuring by saying that *...to talk of structured change in a time of economic difficulty, is sheer nonsense* (Fraser, 1977, pp.3-4). As noted, the IAC maintained that industry policy should not involve government assistance to industry, arguing that governments should not guide or direct the use of resources to industries. As shown, however, this state minimalist approach clearly did not sit well with the political sentiment of the time.

Bell (1993) noted that while the White Paper attempted a compromise between protection and free trade, it actually signified a prevailing tariff and industry policy stalemate. Henderson (1977, p.12) suggested the Paper was largely a failure by arguing that *...it is disturbing that while the government approach is predicated on change, it is not prepared to make funds available to ensure that change can actually take place.* Nevertheless, although this reflected apparent concerns, it appeared that the manufacturing sector suffered wider patterns of inchoate and often contradictory industry policies. Bell (1993) argued the manufacturing sector was in all likelihood incapable of achieving the growth of its international counterparts because of its inward thinking.

Concerns were raised by members of the Jackson Committee who suggested the Government had not recognized the importance of managing change. They also argued that governments should not be involved in the day-to-day management of commercial decision making. They asserted that the responsibility for shaping the structure of major industries and the encouragement and direction of the economy remained crucial aspects of the Government's role (Jackson et al. 1977).

In support of the Jackson Report recommendations, the Fraser Government appeared to take a stronger stance in policy terms to ensure the manufacturing sector took responsibility for improving its structure and efficiency. This tact, however, seemed short lived. The real problem was to reposition Australia's manufacturing sector. Yet, as discussed, neither Whitlam nor the Fraser Government was willing to enforce restructuring plans. It can be argued that this simply reflected the power key industries and certain industry bodies exerted on industry policy, and on the Government's stance. Furthermore, this lack of action seemed indicative of past Government's inability to effect change, and of the failure to resolve the protectionist debate.

The formation of the Crawford Study Group just after the release of the 1977 White Paper may have reflected the Fraser Government's dissatisfaction with the situation (Bell, 1993). The Government wanted a more appropriate industrial strategy given the political and economic pressures it felt it was exposed to.

5.5.3 The Crawford Report

In 1979, the Crawford Study Group was commissioned to conduct a comprehensive assessment of Australian industry structural mechanisms. The outcome of this work was a publication titled the 'Study Group on Structural Adjustment Report'. The Report described the 'plight of manufacturing'. It spelt out a new interventionist approach to industry restructuring, and sought to reach beyond the traditional terrain of conflicts over tariff policy to a more active and strategic level (Bell, 1993).

Notably, the interventionist approach presented as part of the Jackson Report recommendations was supported by the Crawford Report. Part of that approach had been that tariff reductions should be postponed until unemployment fell below 5 per cent. The Crawford Report stated that prior to any reductions in protection it was vital that a range of 'positive' industry policy measures should be operating. As noted previously, the most effective measures were those that encourage the development of industry attributes regarded as essential to the industry's strength and vitality in the years ahead. Interestingly, this sentiment closely correlated with the conclusions of Porter's (1990) ten nation study which was discussed in a previous chapter.

The Report severely criticised the Government's industrial policy stance in terms of its industry restructuring agenda. It noted that government-industry relations were typified by poor communications, and in some cases, industry was unaware of available assistance measures. It was also stated that non-tariff industry assistance was restricted to only a few policy instruments. Investment allowance, export assistance, and R&D assistance suffered from poor design and administration problems. The Committee similarly argued that the Government's export market focus was insufficient, as it did not have an adequate 'incentive value'. Basically, incentive grants declined as exports increased, which was considered impractical and ineffectual. The Report, however, levelled little criticism at manufacturers for blindly ignoring the imminent threats of international competition.

Moreover, it must be recognized that manufacturers constantly lobbied government for increased protection and special dispensation. However, the reality was that poor productivity permeated the industry. Several commentators had reported that Australia's lack of competitiveness and limited export focus exacerbated the manufacturing sector's long term predicament. According to Bell (1993), and Bryan and Rafferty (1999) for example, Australia struggled to come to grips with the domestic ramifications of global manufacturing, and thus largely depended upon industry policy prescriptions to ameliorate competitive rivalry.

This reliance is in direct contrast with the conclusions reached by Porter (1990a) in his ten–nation study, that the Government's role should be purely catalytic. In an Australian context there is an argument to suggest that corporate welfare had become an acceptable component of sustaining a company's existence.

The new interventionist approach proposed by the Crawford Report involved a strategy to reduce protection, but at the same time required positive assistance programs and discrete expenditure to help industries improve. Regrettably, however, nothing tangible was achieved in industry policy terms by the Government. Indeed, according to the 1982-3 IAC Annual Report, despite the inclusion of provisions which allowed for modest growth in imports, the effective rate of protection in the clothing and footwear industries actually increased from 140 per cent in 1980-81, to over 200 per cent in 1981-82. Much the same situation applied in arrangements made for the vehicle industry in the post 1984 car plan, which was originally unveiled in 1981. And, as the IAC (1981) commented, this was because of an open-ended commitment to protectionism built into industry plans.

In spite of the deep seated set of ideological and institutional divisions, the Fraser Government did attempt to impose some direction on the industry policy process. But overwhelmingly, manufacturing related policies were constantly undermined by contradictory policies in other areas (Bell, 1993). The role of Government in terms of industry policy still appeared to be indeterminate. Despite the various reports completed, all of which recommended the need to improve the manufacturing sector's capability,

significant complacency seemed to exist. Successive governments appeared unwilling or incapable of correcting this malaise. Australia's manufacturing competitiveness still looked abysmally poor by international standards. This fact had been monotonously repeated in each of the industry reviews completed. Yet, management seemed to completely abrogate any responsibility for this predicament. There seemed to be a lack of recognition that while industry policy links the nation's resources and capabilities in manufacturing, importantly, there is a strong and indisputable link with individual company actions.

5.6 The State of Manufacturing prior to 1983

The growth of low wage manufactured exports from newly industrializing countries had altered the competitiveness of Australian manufacturing (Anderson and Snape, 1980). This predicament was further exacerbated by an increasing level of technological sophistication by leading industrial nations. As discussed, it was clear to many there was an urgent need for Australia's domestic manufacturing base to be realigned to more specialized, knowledge intensive value added processes. Predictably, amongst the deteriorating economic conditions confronting the manufacturing sector, a key feature of post 1974 industry policies was resurgent protectionism.

The Fraser Government, however, attempted to mount a more systematic approach to restructuring by simultaneously employing a more supportive government role. This involved strategies to reduce protection on the back of offsetting positive assistance programs to the manufacturing sector. Various initiatives were introduced to encourage increased levels of manufacturing investment. For example, it was postulated that the economy in general could be stimulated through increased foreign investment programs. Bell (1993) argued, however, that a concentration on foreign dominated investment attraction was problematic. He contended that a policy which facilitated major acquisitions of existing Australian manufacturers as opposed to the pursuit of domestic manufacturing sector investment was wrong. Bell maintained that the Australian

manufacturing sector needed programs that focused on improved efficiency through increased investment in plant and equipment.

As a result of the incentives provided to foreign companies to invest in Australia, while the Government was achieving its industry policy aims of investment and increased employment, the net effect showed that by 1972 approximately 50% of Australia's largest 200 manufacturers were foreign owned (Treasury, 1972). It was suggested this was detrimental to the long term future of Australia's manufacturing sector due to the increasing presence of and dependency on overseas multinational enterprises (Bell, 1993; Fagan and Webber, 1997).

In 1975 unemployment had reached unprecedented levels, but unlike all previous post-war situations, the post 1974 recession brought about high levels of inflation (Catley and McFarlane, 1981). Pressures for structural adjustment became more difficult as the impact and consequences of overseas competition and imported products increased. Several industries in the manufacturing sector were decimated during this period. For instance, between 1972 and 1978, 1368 factories were closed in the TCF industry resulting in the loss of over 48,000 jobs (Carr, 1980).

The results from a 1979 IAC survey helped clarify what was happening. It categorized the manufacturing sector into quartiles and compared their performance. Industries linked mainly to the resources and extractive industries sector had fared well, with employment growing by 21 per cent which created 59,000 jobs. However, the lower quartile industries, which were predominantly labour intensive enterprises, had experienced a 46 per cent reduction or 126,000 job losses (IAC, 1979, p.93).

Manufacturing companies declined from 37,143 to 27,696 as a result of the shake-out which occurred between 1974 and 1983 (ABS, 1986, p.392). In the same period the manufacturing sector's share of GDP fell from 22.5 per cent to 18 per cent, with the manufacturing sector shedding over 280,000 jobs, with 100,000 of these jobs lost in 1982 alone (IAC, 1985, pp.41-43).

It could be argued that the effects of international competition affected other manufacturing nations in the same way. But the fall in Australia's manufacturing sector employment appeared to be more damaging as job losses accounted for 5.5 per cent of the total workforce compared to the OECD average of 4.2 per cent (DITAC, 1986, p.111). Imports of manufactured goods, ironically comprising numerous products that could be produced in Australia, increased from 17.5 per cent to 25 per cent of industry turnover during the period 1973-74 to 1983-84 (DITAC, 1986, p.114). Australian manufactured exports, however, decreased from 21.1 per cent to around 14 per cent of turnover during the same period (ABS, 2001). Bodies such as the IAC used these data to support a case for Australian manufacturing to be restructured based on its perceived competitive capabilities.

It was evident to government from the previous reports of Jackson and Crawford that Australia's long term manufacturing problems could not be resolved by continuously increasing protection. The corollary was manufacturing had to be rationalized to retire its uncompetitive industries and move towards more specialized means of production. This proposition, however, had to harness Australia's perceived competitive advantages. Arguably, what was required was a change in industry policy direction in support of expanding knowledge-based and resource-intensive manufacturing industries.

Amidst this uncertainty in the manufacturing sector, it is understandable why innovation and the need for increased productivity had rarely featured in any of the Government's policy platforms. However, it can be argued that because of this deficiency in policy terms, Australia's manufacturing sector had suffered. As noted, the manufacturing sector lacked direction, displayed little concern for competitiveness and showed limited interest in research and development. Indeed, in comparison with international developments the fundamental premises of Australia's manufacturing sector appeared devoid of knowledge intensive processes and any specific expertise of manufacturing value adding concepts. A shift to a focus on enhancing competitiveness needed to be driven by industry policy. It is

not unreasonable to suggest that the lack of manufacturing sector competitiveness was directly related to Australia's poor productivity and abysmal export performance.

In a comparative analysis of industry policy, McKay and Grant (1983) found that policy coherence was facilitated by a broad acceptance of the need for governments to play an active role in assisting industries adapt to change. Despite attempts discussed above, particularly the reviews conducted by Vernon (1965), Jackson (1975), and Crawford (1979) the rationale of such strategic change was not adequately promoted by governments, or indeed, accepted by industry. Bell (1993) argued that a more 'developmentalist' role should have been adopted by governments to ensure that continuity of industry policy was accepted by associated parties and built upon. Australian Governments, however, appeared to persist in promoting industry policies for political purposes. Inevitably, this merely perpetuated the focus on support for highly unionized, uncompetitive companies in declining industries (IAC, 1983).

Bell (1993) argued that the Government's efforts to promote positive industry policies were limited and poorly administered. Moreover, amongst the plethora of reports commissioned, the capability and responsibility of Australia's managers had rarely been highlighted or discussed. This is relevant because the complexity and processes of increasing national productivity are not solely reliant on industry policy. Similarly, the elements of competitive advantage, particularly those identified by Porter (1990a), underpin the comprehensive and interrelated character of Australia's determinants of national competitive advantage. According to Porter's (1990a) theory, the notion of 'Australia's productivity' insofar as its correlation with the manufacturing sector appeared to be largely ignored by the architects of industry policy. Thus, due to the Government's failure to recognise the significance of competitiveness, industry policy was devoid of specific imperatives to foster improved productivity. The Government's position, it seemed, merely persisted in maintaining the protectionist stance that had previously existed. This was, of course, 'politically positive' to the majority of Australian manufacturers and hence, avidly supported. It can be argued that the above dilemma was further exacerbated by the recession of 1982. It was within a climate of indeterminacy,

lack of leadership and importantly, Australia's poor manufacturing performance and rising unemployment, the Hawke-Keating Government came to power.

5.7 Summary

Chapter 5 provides a short overview of the evolution of Australia's industry policy in the post war period up to 1983, which shows the nation's manufacturing history was dominated by political debate centred upon free trade and protectionist issues. Aspects of geographical isolation and the lack of specific resources were considered to be major factors justifying the need for protection. Through their interventionist role Governments shaped Australia's post-war manufacturing growth. Whilst the economy had grown substantially under post-war immigration plans, aspects such as manufacturing performance and the industry's long-term sustainable future were largely ignored. This resulted in growing concerns about the implications for employment and the increasing dependence on multinational companies.

The Vernon Report showed that manufacturing had to be restructured to become less reliant on government subsidy and support. In line with this Report the Government introduced measures to improve competitiveness and reduce protection. However, it was the outcomes of the Jackson and Crawford Reports that set the agenda for genuine industrial reform founded on a new interventionist approach. Central to the recommendations of each of these reports was the imperative to raise the competitiveness of Australia's manufacturing sector. Notably, the results of successive industry policy prescriptions of both Liberal and Labor Governments were to a large extent ineffectual. Arguably, they had failed to effectively manage a number of policy facets simultaneously.

International competition and globalisation were gaining momentum and transforming the economic landscape more quickly than the policy take-up. Yet, from a government perspective, whether through apathy or poorly focused industry policy, the unproductive culture of Australia's manufacturing sector remained. Although many of the policy initiatives introduced reflected the desired characteristics of the determinants of national

competitive advantage postulated by Porter (1990a), the effectiveness of Australia's manufacturing restructuring process was questionable. Increased productivity and need to become internationally competitive was not considered a priority for the manufacturing sector.

In truth, the manufacturing sector seemed incapable of replicating the improved competitiveness achieved by its overseas counterparts. The extent of the corrective industry policies developed to contend with these issues and the underlying culture will be discussed in the next chapter which deals with the Hawke–Keating period in office.

Chapter 6 The Hawke-Keating Period in Government

6.1 Introduction

Chapter 5 provided a brief chronological overview of industry policy covering events from Australia's early trade development up until the Fraser Government left office in 1983. While the policy process reflected similar characteristics to Porter's Diamond model in terms of the determinants, Australia's industry policy was largely based on protectionist measures. Indeed, in terms of increasing manufacturing competitiveness, the outcomes of successive government industry policies appeared ineffective. Australian manufacturing was still manifestly uncompetitive by international standards.

As noted in the previous chapter, Australia was in recession when the Labor Government took office. Faced with enormous political pressures, the Government sought to resolve the nation's economic problems by realigning its industries to a more open and internationally competitive outlook. To this end, the Government introduced several macro and micro-level policy initiatives in support of its interventionist approach, and also attempted to bring industry, government and trade unions closer together.

The impact of a globalising economy and an imperative for Australian industries to become world competitive underpinned the Government's industry policy thrust. Confronted by the legacy of the Fraser Government's poor political performance, a comprehensive approach was called for to address the structural problems that existed in the economy. In this chapter, the major changes the Government made to industry and related policies between 1983 and 1996 will be discussed. Notwithstanding the important implications of macroeconomic policies, the focus of this chapter is confined to microeconomic issues impacting on the manufacturing sector at an industry and company level. For this reason discussion will focus on the interrelated policy measures introduced as part of the Government's tripartite participatory approach aimed at increasing the overall competitiveness of the manufacturing sector.

Porter's (1990a) studies identified several factors unique to a particular nation's international competitive standing. This chapter will review the intention of a number of industry policy constructs introduced by the Hawke-Keating Government along similar lines to Porter's (1990) model of competitiveness. As noted, an industry's structure and competitive position is dynamic and can be shaped by several forces. Thus, the outcome of this assessment will be the identification of specific research hypotheses relevant to Australia's manufacturing competitiveness.

6.2 The Challenges Ahead

Halevi and Kriesler (1993) argued that when the Hawke-Keating Government came to office the economic problems they faced were not the result of cyclical fluctuations in economic activity, but rather reflected long term deterioration that had existed for well over a decade. They identified the cause of Australia's poor performance as structural problems inherent in the decline of the industrial sector and arising from increased volatility of export markets. In particular, capital goods producing industries were in dire need of structural change and technological improvement. Halevi and Kriesler concluded that the impact of industry policies constrained manufacturing growth to such an extent that conventional industry policy solutions were inadequate for the global economy.

Bob Hawke, the new Prime Minister had been a member of the Jackson and Crawford Committees. Thus, he was patently aware of Australia's poor economic performance, and of the requirement to restructure the economy, particularly the manufacturing sector. In that context, the corrective assistance measures proposed by the Hawke-Keating Government to revitalise and restructure the manufacturing sector were eagerly awaited. The Government's challenge was also to improve the relationship between industry, government and the trade unions.

During the 1983 election campaign, Hawke had promised that an ALP Government would bring about a period of ...*national reconciliation, national recovery and national*

reconstruction (Capling and Galligan, 1992, p.120).[16] There was also a secondary aim to strike a bargain between trade unions and employers on the basis of unions agreeing to wage restraint, in return for the continuation of business acceptance of a centralised wage fixing agreement. Within 6 weeks of gaining office, Hawke had convened a National Economic Summit Conference in Canberra. The actual agreement between the three parties was to become known as 'The Accord', or more fully, the 'Statement of Accord by the Australian Labor Party and the Australian Council of Trade Unions Regarding Economic Policy'. The Accord was described by Singleton (1990, p.154) as a *...prescription for a comprehensive prices and incomes policy ...to facilitate economic recovery and to reduce unemployment and inflation.* It was also referred to *...as a philosophical statement and a program for social reform.* The Accord also underpinned Treasurer Keating's fiscal program, which was designed to restore profitability and investment in the manufacturing sector in order to provide the basis for strong employment growth (Keating, 1983).

The Government's early strategies were essentially stimulative. For instance, financial deregulation in 1983 was an important step in internationalising the economy. The decision to deregulate the financial market, float the Australian dollar and remove exchange controls was intended to increase the economy's exposure to international pressures (BIE, 1996). In combination with the broad politics of the Accord, industry policies reflected strategies to reduce unemployment, increase national productivity, and also institute labour market reform based on a series of sectoral plans. These initiatives were enhanced by an increasing focus on R&D, export facilitation, skills training, and improved access to investment and venture capital (Capling and Galligan, 1992).

While the Government was committed to traditional interventionism, closer analysis shows this approach was highly selective and focused predominantly on the most visible and politically sensitive industry sectors. A series of special assistance programs were designed for the steel, motor vehicles, and textile, clothing and footwear industry sectors

[16] The Government's economic strategy of fiscal expansion was designed to restore economic growth and reduce inflation and unemployment. It was presented at the National Economic Summit Conference, 11-14 April, 1983.

(Button, 1984). The Government's emphasis on sectoral assistance for mature industries was also extended to include shipbuilding and the heavy engineering industry. Most policies were in essence designed to reduce protection and foster efficient industries, while minimizing the disruption to the workforce (BIE, 1985).

The majority of sectoral plans were in place by 1986. The focus of industry policy then shifted to include the provision for support and development of technologically advanced sunrise industries. These industries were considered to be capable of increasing manufactured exports more quickly (Dawkins, 1982). Similar to key aspects of Porter's (1990a) Diamond model, government policies were aligned to factor creation and the improvement in firm strategy, industry structure, and rivalry.

However, the Government was driven by the need to help industry out of recession and to arrest the nation's increasing unemployment. Consistent with the Government's interventionist ideology, it sought a political solution to ensure that industries it believed were of strategic importance to the economy, such as steel and motor vehicles, would survive (Stanford, 1992). This, by inference, meant the continuation of financial support for labour intensive industries, invariably located in politically sensitive regional areas of Australia. In terms of Porter's (1990a) methodology, this acted against the development of international competitiveness. It can be argued that this type of policy was politically motivated and would not necessarily enhance the basis of the nation's competitive factors.

6.3 Industry Plans and Labour Reform

As discussed, a distinctive feature of the Hawke-Keating Government's industry policy approach was the unprecedented nature of its industry reform process. It what might be called Labor's 'interventionist surge', central to this notion was the need to stimulate Australia's mature industries (Bell, 1993). Whilst acknowledging the need for a supportive Government role, Minister Button attempted to steer a mid-course between interventionism and the wider elements of industry policy (Button, 1987).

Manufacturing in Australia in the early 1980's accounted for about 19% of gross domestic product (Anderson, 1995). This was a significant decline from the levels attained during the 1960's, when manufacturing provided up to 30% of GDP. At the time of the election of the Hawke-Keating Government, inflation was running at between 10 and 11 per cent, with unemployment at 10.3 per cent (ABS, 1985). During this period, Australian manufacturing was traditionally diverse and unspecialised. It essentially comprised a large number of small companies that supplied a high proportion of domestic demand, but contributed little to export revenue. As a consequence, there was little focus on productivity issues or for the need to become internationally competitive (Pappas Carter, 1990).

Given the mandate to reinvigorate the economy, the Government set in place a long-term strategy with the immediate focus directed towards:

- reducing unemployment;
- reducing inflation;
- microeconomic reform; and,
- achieving international competitiveness.

As a means of improving manufacturing performance at an enterprise level, the Government narrowed its focus by addressing a number of key policy areas concurrently. In support of this, the Department of Industry and Commerce commissioned several reviews, audits and consultancies. Keating and Dixon (1989, p.62) summarised the task on hand as the 'judicious blending' of policies. The Reports encompassed a wide sphere of government concern and included:

- The Cashman Report (1984) - Establishment of an Advisory Service on Computer Assistance in the Manufacturing Industry.
- Reports of the Auditor-General on Efficiency Audits 1984 - Administration of the Offsets Policy, Administration of the Australian Industry Participation Program in Relation to Overseas Procurement.
- The Inglis Report (1984) - Report of the Committee of Review on Offsets.
- Industrial Research and Development Incentive Scheme Review (1984/5).

- The Ferris Report (1985) - Report of the National Export Marketing Strategy Panel, 1985, "Lifting Australia's Performance as an Exporter of Manufactures and Services".
- The Clark Report (1985) - A National Extension Service for Australian Manufacturing Industry: Report to the Australian Industry and Technology Council.

Findings from these reports offered Government substantive proof to confirm the lack-lustre performance of Australian manufacturers. Indeed, a number of the recommendations from these reports provided the foundation for the Government's enterprise level improvement programs.

In addition, the Department of Industry and Commerce, the Department of Science and Technology, and the Department of Trade were consolidated to become the Department of Industry, Technology and Commerce (DITAC). Senator Button, as the new Minister, assumed responsibility for this initiative. This development was prompted by the Government's aim to address the needs of the manufacturing industry more effectively, and at the same time, to assist in facilitating nation wide manufacturing sector improvements (DITAC, 1985). One of the more important initiatives introduced by the Government was the 1985 Passenger Motor Vehicle Plan (PMV Plan).

In October 1983, Senator Button established a key tripartite body, The Car Industry Council. The Council was charged with reporting on the long-term future of Australia's car industry. Button himself chaired the Committee. The Government considered it important for Australia to capitalise on the economic multiplier effects generated by the nation's automotive industry (BIE, 1996). Along similar lines to Porter's (1990a) model, the overall purpose was to exploit factor conditions and other determinants of national advantage to enhance the competitiveness of Australia's manufacturing sector in general (Button, 1984).

The PMV Plan, commonly known as the 'Button Plan', was launched in 1985. The fundamental objective of the plan was increased efficiency from all aspects of the automotive industry. To achieve this, the Council recommended the establishment of an Automotive Industry Authority (AIA) to mediate and encourage production sharing and joint use of facilities. In addition to rationalising model production, the Button Plan sought improved capacity utilization, component standardisation, and economies of scale in Australia's car assembly plants. The inherent inefficiencies of component suppliers were to be addressed through encouragement and adoption of modern management techniques and philosophies. With respect to Porter's methodology, while the process demonstrated the value of networks, it is questionable whether Australia's manufacturers recognised the real dilemma they faced or indeed, were '*au fait*' with the concepts of value adding and manufacturing clusters. Similarly, volume focused manufacturing concepts were being outmoded by flexible production systems (Friedman, 1983). Nevertheless, the Button Plan sought agreement that, collectively, the car industry should operate as a closed loop system.

The car plan encompassed a number of key elements fundamental to Porter's 'Diamond' model. For instance, the formation of manufacturing networks was encouraged between foreign multinationals and indigenous manufacturers and their suppliers. However, there were a number of differences in the development of Australia's determinants. Notably, Australia's program involved substantial government intervention and financial assistance to the program participants. To encourage R&D within the automotive sector, the Government offered $150m as proof of its support for keeping the technological skills in Australia (BIE, 1996). It is worth noting that Porter (1990a) argued this type of association between governments and industries was counter-productive to a nation's competitive success due to financial incentives being the overriding catalyst for change.

Sectoral assistance policies, however, gradually moved away from crisis-ridden industries to newer high technology and resource-based industry sectors. This direction incorporated discrete assistance for industries such as space, pharmaceuticals, information, scientific and medical equipment, biotechnology, food processing, mineral

processing and forest products (DITAC, 1989). Importantly, the change in direction was inextricably linked to productivity improvements and international competitiveness. These newly devised sectoral plans incorporated reduced protection with the aim of fostering efficient and competitive industries, and were more consistent with Porter's views on increasing competitiveness.

To compensate for the inevitable job losses that would occur, the Government's revised policy position encompassed a number of industry modernisation schemes. For example, labour adjustment programs, support for training and skills upgrade, bounty payments, research and development grants, and export market development initiatives were introduced. Other measures included reductions in barrier protection through the abolition of import quotas, and certain tariffs (BIE, 1985). Predictably, given the modified industry focus, the need to sustain employment in the highly unionised mature industry sectors such as the automotive, textile, clothing and footwear, and steel industries supported this momentum.

In relation to Porter's competitiveness model, the Government's focus on increased levels of productivity and exports during the mid 1980's was consistent with improved national competitiveness. Yet little productivity benefit was being achieved in manufacturing industries (BIE, 1996). Positive impacts on Australia's competitiveness were predominantly the result of depreciation in the exchange rate following its float in 1983. Moreover, in terms of competitiveness, the existence of high tariff levels negated the pursuit of lower costs, and the need for manufacturers to develop export opportunities (BIE, 1996).

6.4 Enterprise Approach to Improve Productivity

As the principle architect of corrective industry policy related to the manufacturing sector, Senator Button shifted the focus of Australian industry policy from a defensive orientation to a more forward looking approach based on innovation and export-focused industries (Capling and Galligan, 1992). Central to this notion was the need to

dramatically improve the productivity of Australia's manufacturers. Button (1984) argued that the dynamics of technology and international trade depicted specialisation, and government had to be more selective in what it supported in industry policy. He bemoaned the fact that Australia had reaped the 'horrible consequences' of import replacement and failed to develop sophisticated industries that differentiated Australian manufacturers from international competitors.

Button's reflections on Swedish manufacturing helped develop and crystallize the Government's direction for improved competitiveness, insofar as effective change had to occur at an enterprise level (cited in Capling and Galligan, 1992). To facilitate improvement and reduce unemployment levels, the Government introduced several policy initiatives specifically focused on attaining increased manufacturing productivity. Notably, the prices and incomes guidelines negotiated as part of the Accord were crucial in pursuing this outcome (Singleton, 1990).

Overseas experience had suggested that assistance focused at a company level would improve efficiency and theoretically flow through to increased export performance (Emy, 1993). Porter (1990a, p.45) maintained that *...firms create competitive advantage by perceiving or discovering new and better ways to compete in an industry and bringing them to market*. It follows that generating competitiveness in Australian manufacturing demanded enterprise level improvement through innovation. Moreover, achieving competitive success at an international level necessitated a superior competitive stance at a domestic level. In Porter's terms this would provide home-based advantages to be levered and reinforced through the firm or industry's global strategy.

The best measures of international competitive advantage were considered to be a nation's level of productivity, its export performance and its significant outbound foreign investment (Porter, 1990a, p.25). However, the Government had to accommodate balancing financial assistance, trade liberalisation, and the affects of corrective policies as part of its economic reconstruction. Statistics showed that Australia's ranking as a global exporter had actually fallen from 8th place in 1950, to 23rd in 1985 (IAC, 1986).

To achieve a world competitive manufacturing sector, the major program promoted by the Federal Government was the National Industry Extension Service (NIES). The Clark Report recommended that Government establish an independent corporation to take responsibility for the national delivery of Federal/State industry assistance programs. The role of NIES was to rationalize and coordinate existing Federal and State Government assistance in agreed fields. Its overriding purpose was to promote employment and prosperity in Australia's manufacturing industry through the development of internationally competitive products and services (Clark, 1985).

The Commonwealth and State Governments agreed to share equal costs of the program. Clark argued that an independent body such as the NIES would inhibit the existing proliferation of conflicting and confusing government assistance programs. It was suggested NIES would minimize bureaucracy and ensure focus on effective national activities by providing industry with a 'one stop shop'. Appendix 1 provides a summary of the NIES programs introduced during the Hawke-Keating period.

The need to develop an internationally competitive manufacturing sector was not unique to Australia. During the mid to late 1980s Porter's influence in particular, was instrumental in fostering a new level of consciousness and academic debate. Internationally, nations such as Australia could no longer rely on domestic markets to sustain economic growth. Accordingly, governments internationally sought to improve productivity and the competitiveness of their nations in response to the impact of global trade (Lieberman and Montgomery, 1988; and Barney, 1991).

Porter (2000) argued that a nation's efforts to improve productivity emanated from the innovative responses of its local industries directly impacting on the cost of trading internationally. As global competition placed greater pressure on prices, efficiency alone would no longer be sufficient. Nations had to add value to their products and services through the application of advanced technology, marketing, and from the benefits of innovation. Porter (1990a) argued that international competitiveness could not be

maintained by a nation's concentration on manufacturing standardised products at the lowest cost. With respect to Australia's industry policy direction, it appeared that the global impact of competitiveness was being increasingly recognised by Government (DITAC, 1989).

During the latter part of the 1980's soft assistance measures evolved. These were tailored packages to assist in the identification of market opportunities, improve regulatory environments, address skills shortages, and coordinate the various policies that impinged upon 'key' industries. For example, some of these 'packages' included the provision of incentives based on negotiated access to the public sector market (Bell, 1993). Through leverage of government regulations the Pharmaceutical Industry Program offered higher prices for certain products under the Federal Government's Pharmaceutical Benefits Scheme. These opportunities were made available to companies (predominantly multinationals) in return for commitments to undertake product development, local manufacture, and export market development in Australia (DITAC, 1989).

The Government's Partnership for Development Program, for instance, was heralded as an innovative means of creating down stream value for several industries (Head, 1987). This program was instrumental in accelerating the growth of 'high tech' industries, especially for those companies assisted through the Government's Information Industries Strategy announced in 1987. The Government waived offset obligations for trans-national companies if they entered joint venture agreements with Australian companies. Head (1987) reported that this quid pro quo aimed at facilitating development of local R&D, and securing export markets. However, the imperatives of achieving international competitiveness had still not impacted on the strategies and culture of many of Australia's manufacturers. Capling and Galligan (1992, p.135) summarised this by stating *...industry's reluctance to spend money on R&D can be attributed to a number of causes.* Not the least of which included *...poor management skills, an opportunistic business tradition which limits its horizons to short-term profits, a lack of venture capital, and the absence of economies of scale.* Industry surveys showed Australian manufacturers had a

poor record of formal planning (DITAC, 1989). Indeed, attempts to resolve these problems were implemented through NIES with mixed success (Roberts, 1989a).

6.5 Industrial Relations and Competitiveness

Mansfield (1994) contended that under the Hawke-Keating Government, the unique relationship that evolved between industries and trade unions helped shape Australia's industry policy. Prominent amongst this was the Government's obligation to deal with Australia's poorly performing industries and the imperative to reduce unemployment levels (Hart and Richardson, 1993). This section will briefly discuss some of the broad industrial relations issues the Government faced. Notably, the tripartite mechanisms of the Accord were central to the subsequent outcomes.

The challenge for Government was to increase Australia's international competitiveness through an immediate improvement in labour efficiency, and simultaneously, maintain trade union participation (Hawke, 1986). Notwithstanding Australia's record of industrial disputation, this would only come at a cost (BIE, 1996). Moreover, Australia's wage agreements usually resulted from decisions or 'awards' made by tribunals as part of the settlement of industrial disputes. This situation was compounded by the fact that 'crafts and occupations' were the focus of these awards, rather than the enterprise or the industry. Also, the presence of 'industrial muscle' was highly prominent in some industries (Chapman and Gruen, 1989).

It should be emphasised that manufacturing labour costs were considered high by international standards (Button, 1987). This had important consequences for Australia's industrial relations climate as the cost of labour is integral to the whole productivity equation. Any move to reduce labour costs, or alternatively, cut employment levels would impact on the principles of the Accord.

In 1985, over 5000 industry awards existed, covering approximately 5 million employees, or 85 per cent of the workforce (ABS, 1988). As noted, the Accord and its centralised

wages policy (various versions) were considered crucial to the Labor Government's economic strategy (Stilwell, 1986). The negotiation of labour productivity improvement would by necessity involve compromise. In order to achieve an outcome acceptable to both employers and trade unions, award restructuring and wage increases consistent with the Government's competitiveness agenda were subsequently negotiated. To meet the changing circumstances of the economy, no less than eight updates to the Accord 'principles' occurred during the Hawke-Keating period in office (Singleton, 1990).

Certain elements of Australia's centralised industrial relations were, however, the target of wide ranging criticism particularly from employers (see for example, CAI, 1984; ACC, 1984). Employers argued the existence of so many different industry awards had institutionalised restrictive work practices and had reduced the capacity of many enterprises to respond flexibly to changing market pressures. They lamented that the multiplicity of trade unions representing a firm's different employees increased the cost of negotiation and actually encouraged demarcation disputes. Employers contended that the restrictive wages system made it difficult to link remuneration directly to productivity performance. Nonetheless, statistics showed the industrial relations environment witnessed a substantial reduction in disputation during the Hawke-Keating period in government. The number of working days lost through industrial disputes per thousand employees fell from 800 in 1981 to 76 in 1994 (ABS, 1995c).

In 1987, there was a gradual shift away from centralised wage fixing with the Australian Industrial Relations Commission (AIRC) retaining responsibility for coordination and arbitration of industry awards (BIE, 1996). In exchange for negotiated productivity improvements, the AIRC introduced the Restructuring Efficiency Principle (REP). The objective of this initiative was to remove restrictive work practices. The resultant cost savings or 'offsets' constituted the productivity gains basis for wage increases. A second phase followed in 1988 known as the Structural Efficiency Principle (SEP). This modified version attained considerable government support because it addressed...*objectives for improving industry efficiency and providing workers with access to more varied, fulfilling and better paid jobs* (DIR, 1989, p.19).

In 1989, the Industrial Relations Act came into effect. This Act provided a more effective mechanism to achieve industrial relations reform (see, for example, Romeyn, 1994). In addition, the AIRC's 1991 decision on enterprise bargaining opened the way to further decentralisation and productivity improvements. Enterprise bargaining was possible, which in effect allowed for negotiated agreements at an individual enterprise level. In terms of competitiveness, these changes facilitated the opportunity for firms and employees to pursue enterprise agreements consistent with their unique productivity improvement goals. This allowed wage increases based on the actual implementation of efficiency measures designed to effect real gains in productivity. Subsequent amendments to the original Act were introduced through the Industrial Relations Reform Act 1993. According to Short and Buchanan (1995), Australia had created a novel approach to industrial relations and wages policy. Importantly, the process provided an instrument for promoting labour market reform that simultaneously encouraged enterprise efficiency and equity.

From an international perspective, there was little evidence that wage costs were a significant aspect of Porter's (1990a) ten nation study. Any relationship to wage costs was addressed in terms of the overall significance of costs related to factor creation. Porter argued that competitive advantage based purely on labour costs would ultimately be negated by even lower labour costs of competing nations. His studies suggested that lower-order advantages such as low labour costs were not sustainable. Porter (1990a) stressed it is the effectiveness and knowledge intensive nature of labour that is crucial to generating and sustaining competitive advantage.

In summary, the importance of labour efficiency was stressed by Porter. However, his studies did not provide a great deal of labour related data for comparison. As noted, the various studies focused more on the relationship of factor costs and their association with sources of competitive advantage. From an Australian context, it can be argued that labour relations occupied a much more controversial platform. Between 1983 and 1996, while Australia's industrial relations environment was relatively harmonious (Singleton,

1990); its longevity was largely indeterminate. Sloan (1995) observed that the premises of Australia's industrial relations were administratively driven and not a market-based solution. Thus, resolution of labour constraints, and hence, the change to a more productive environment was clearly dependent upon multifaceted agreements. In light of Australia's limited levels of automation and the type of products produced, increased manufacturing productivity only appeared possible through negotiation.

6.6 The Manufacturing Sector's Reluctance to Change

The Labor Government stressed that restructuring was a fundamental aspect of preserving the future viability of Australian industries. A number of commentators argued the manufacturing sector was slow to react to the threat of international competition, and when it did was forced into a catch up situation with other more advanced industrialized nations (Bell, 1993; Fagan and Webber, 1997; Bryan and Rafferty, 1999). Yet, the Government it seemed, was reacting to the momentum of globalization, rather than developing a strategically driven manufacturing industry policy solution.

In addition, it appeared that there was no coherent policy to counteract the threat of imported manufactured products, or to slow the international relocation of manufacturing industries from Australia. The resounding sentiment from government to manufacturers was to 'get competitive'. The irony was, as independent observers had reported, increased competitiveness was only sustainable as part of a comprehensive and nationally focused industry plan (Loveday, 1982; Tsokhas, 1984; Capling and Galligan, 1992; Bell, 1993; Emy, 1993; Bryan and Rafferty, 1999).

Button (1987) argued that protection could not be viewed as a panacea for industrial reconstruction. He advocated a longer term and more coherent national strategy. Similar to Porter's (1990) argument, he was confirmed in his view that the relevance of new and advanced technologies was the way forward for the Australian economy. Button maintained that the dynamics of technology and international trade dictated specialisation and that government should be more selective in the specific areas it supported within its

industry policy. Consequently, a mechanism had to be developed to assist and encourage appropriate industries with global potential. Inevitably this would mean somehow picking 'potential winners', even though this ran counter to the Government's policy dictum.

By advanced economy standards Australia did not produce sufficient amounts of elaborately transformed goods (ETM's). This fact was well documented in studies completed by Pappas Carter, 1990; Emy, 1993; and Sheehan, Pappas and Cheng, 1994. It was also stated in the introductory letter of the Global Challenge Report (1990), a Report commissioned by the Australian Manufacturing Council, that

> *...no modern country of significant size has maintained a vital economy without a strong industrial base that includes at least some tradeable, elaborately transformed manufactures (ETM) industries* (Dix, 1990).

The Report noted that Australia had traditionally concentrated on relatively basic manufacturing that did not demand a great deal of research and development, cost or effort. Pappas Carter (1990) considered this to be the primary reason for the industry's lack-lustre performance. Australian manufacturers did not provide enough 'added value' to the raw material dug up or to the products produced. Moreover, it was stated in the report that *...the extent of this lack of specialisation, both between and within different industries is unique to Australia's manufacturing* (Pappas Carter, 1990, p.25).

According to Pappas Carter, for Australian manufacturers to compete internationally, amongst other things required a focus that integrated its manufacturing activities selectively into global scale industries. These comments were in direct relationship to Australia's pre-disposition to mass produce low value commodity products for the domestic market. Pappas Carter (1990) argued that embracing best practice manufacturing principles would, for all intents and purposes, require Australia to become more involved in high tech, high value added manufacture.

It seems, therefore, the success and growth of Australia's manufacturing sector depended upon its performance in technological development. Bell (1993) noted industries with the

highest growth rates throughout the world were those that spent relatively more on R&D as a proportion of value-added. This will be discussed in detail later. Expenditure on R&D is also an important factor in a nation's export performance especially in the high technology product sector where there is a strong correlation between R&D expenditure and trade performance (Porter, 1990). Complementary to its role in developing innovative products, the application of R&D can assist production processes in order to increase productivity and improve competitiveness (ASTEC, 1985). Thus, manufacturers' reticence to commit to R&D in Australia had serious ramifications for the nation's capacity to become internationally competitive.

The Hawke-Keating Government's approach to improving the manufacturing sector's commitment to R&D, innovation, and increased exports was, however, compatible with other global manufacturing nations (EPAC, 1986). Indeed, in the case of certain high technology and scientific industry sectors the Government introduced more comprehensive assistance than R&D tax concessions. Whereas previously this would have involved the use of tariff and non-tariff protection, industry strategies of the late 1980's relied on non-distorting forms of assistance. Importantly, Senator Button had initiated a number of discrete sectoral plans designed to enhance productivity and Australia's competitiveness. Programs encompassed metal working machines, robots, communications equipment, medical and scientific equipment, biotechnology, space technology, pharmaceutical products, and the information industries (DITAC, 1989).

With reference to Porter's (1990a) Diamond model, the Government's modified industry strategy, at least in theory, addressed each of the four determinants of competitiveness simultaneously. Porter claimed the creation of home-based demand conditions was one of the most important determinants of competitive advantage. What was inferred here was that a 'nation' or as he termed '*home base*' was the most appropriate platform for developing a global strategy based on competitive advantage. Porter (1998a, p.86) argued *...the composition of home demand shapes how firms and industries perceive, interpret, and respond to buyer needs*. He also stressed that internal processes based on innovation and increased levels of productivity unquestionably underpinned these factors.

6.7 Microeconomic Reform

Previous sections of this chapter have touched on the industrial changes occurring as part of the Government's competitiveness agenda. Notably, discussions related to several aspects of microeconomic reform recognised by many as the centrepiece of Labor's industry policy (Bryan and Rafferty, 1999). In his address to the nation in 1986, the Prime Minister stressed that industry reforms to make the economy more flexible and responsive to global market conditions must occur. He stated that:

> *...such long-term problems require long term solutions. The economy needs to diversify, on a competitive basis, to supplement traditional export activities. This will allow a wider range of products to compete on export markets, making us less susceptible to adverse world price movements in a few commodities* (Hawke, 1986, p.953).

The Government's response was to introduce measures to improve the international competitiveness of Australia's industries, in particular manufactured exports. To appease industry concerns, measures were put in place to upgrade the existing infrastructure. Other opportunities for microeconomic reform were secured in the May 1988 Economic Statement by further reducing tariffs. Keating (1988, p.2) argued that *...big cuts to industry protection through tariff reductions...will lower costs and further encourage our manufacturers to look beyond Australia for market opportunities*. He also noted that:

> *...The way forward for Australia is not to be closeted and sheltered, but to be open and dynamic, trading aggressively with the world. Only this kind of economy can provide the employment and rising living standards that Australians aspire to (p.16).*

This initiative signalled an intention to achieve efficiency as well as promote competition for improved performance. In 1989, the IAC was restructured to become the Industries Commission. This was to facilitate greater focus on industry-wide manufacturing improvements (DITAC, 1989).

It had been argued that the microeconomic foundations of productivity rest on two fronts: the sophistication of a nation's operations and the quality of the business environment companies and industries operate within. Thus, a nation's prosperity depends, then, on continually improving its capabilities at the microeconomic level (Porter, 2000). Gruen and Grattan (1993) noted the Government recognised that microeconomic reform had underpinned most OECD sustained improvements in economic performance. Notwithstanding industrial relations improvements made possible through the Accord, the goal of international competitiveness reinforced the Government's direction. The Industry Commission estimated that a thorough going program of microeconomic reform would ...*expand output over the long term by $22 billion a year in 1988-89 dollars* (IC, 1990, p.27).

The two major policy platforms of microeconomic reform promoted by the Labor Government included financial deregulation and tariff reduction. The Government was of the view that floating the Australian dollar and abolishing most of Australia's exchange controls would expose the economy to increased international pressures. In the same way, reductions in protection would play an important role in encouraging more efficient industry structures and competition. Bob Hawke later claimed his Government pioneered microeconomic reform which was seen by industry, rightly, as an essential means towards higher productivity and efficiency. He went on to suggest:

> ...*We are freeing up our transport systems; we have revolutionised our taxation systems; we are creating more efficient workplaces; we are injecting competition where for too long Australian firms and public sector enterprises have been content with the quite life* (Hawke, 1991, p.1.10).

Although his statement was primarily focused on reducing tariffs, other key initiatives were aimed at achieving greater industry efficiency by dismantling all barriers to competitiveness. As noted, this included focus on export markets, particularly for manufacturing firms, but it also allowed the widening of exemptions from sales tax for business inputs, and changes to depreciation provisions (Hawke, 1991).

Processes of microeconomic reform had mixed responses. Bell (1993) noted that for decades microeconomic policy had been the sleeper of Australian economic policy. He maintained the insulated nature of Australian economic activity and lack of oversight of the detailed workings of Australia's economy had allowed massive inefficiencies to flourish in key industries. Bell contended this encompassed road and rail transport, aviation, the waterfront, coastal shipping, electricity generation, postal and telecommunications, commodities handling and marketing, water services and construction. Without reform, the combined effect of these inefficiencies would have been more detrimental to Australia's productivity and the nation's wealth.

In a study of Australian firms, Ergas and Wright (1994) found that involvement in the international economy provided firms with expanded opportunities to learn. Firms associated with the international economy (either through exporting or through direct foreign investment) were more likely than domestically oriented firms to systematically measure themselves against world-best practice. Moreover, these firms focused on improving product quality and customer satisfaction, and successfully learned from customers and suppliers. In essence, this experience fed into productivity gains through the application of competitive strategies.

However, results from a 1996 Productivity Commission study of Australia's automotive industry on the impacts of microeconomic reform showed there can be both positive and negative outcomes to the economy. By way of background, data was compiled from Australia's 4 major automotive manufacturers and from 86 of the 92 component suppliers surveyed. These findings reflected each respondent's perception of the effects of microeconomic reform between 1988 and 1995.

As anticipated, firms in the automotive sector in 1988 held strong negative views about the impact of reduced government assistance on their competitiveness. Each participant reported a substantial increase in the level of competition in the domestic market. This, it was argued, caused a significant decline in their productive activity. A wide range of conditions contributed to these responses. Typically, factors included tariff reductions,

the level of import competition, new market entrants, and improvements in the features of competitor's products. Other aspects included exchange rate variations and changes in technology (PC, 1996).

Data showed the automotive industry had contracted since 1988 in terms of its turnover, value added and employment (PC, 1996). For instance, in 1988 Passenger Motor Vehicles (PMV) manufacturers' employed 30,476 people, and by 1995 this had reduced to 19,754, or by approximately 35 per cent. There had also been a substantial shift in domestic manufacturers' market share. In 1988, automotive vehicle imports accounted for 13 per cent of the domestic PMV market, and by 1995, this share had risen to 31 per cent. Notably, the mix of specialist imported vehicles had also changed. Employment levels within the automotive component supplier sector were similarly impacted. In 1988 some 28,282 people were employed compared to 25,570 in 1995, a reduction of around 9 per cent. This correlated with BIE (1996) data which showed that in 1988, the value of imported automotive components to Australia was $3.3bn this subsequently increased to $6.6bn in 1995, even although vehicle production levels remained similar.

Importantly, the new industrial environment placed increasing importance on improving productivity, and on how manufacturers operated. Three of the four automotive manufacturers and close to 50 per cent of the component suppliers sought out new export markets. Participant response, in general, suggested the majority of firms had increased their levels of productivity. By 1995, PMV manufacturers' labour productivity estimated in terms of vehicles per employee had increased by 47 per cent over 1988 levels. This equated to a rise in vehicles per employee from 10 to 16. Similarly, the top 35 component suppliers stated their labour productivity levels, in terms of sales per employee, had increased by 44 per cent (PC, 1996).

Australia's automotive industry is clearly a significant employer of both capital and labour and accounts for a sizable proportion of manufacturing output. In 1988, labour employed in this industry (covering production of motor vehicles and component parts) accounted for 7 per cent of Australia's manufacturing employment and about 7.5 per cent

of the sector's turnover. Despite this, between 1988 and 1995, there had been a net reduction of 13,434 people employed in the automotive sector (PC, 1996).

Evidence would suggest that the impact of the Government's microeconomic reform agenda had improved productivity performance in the automotive industry sector (BIE, 1996). However, this ran counter to the Government's mandate to reduce the levels of unemployment (Hawke, 1983). In essence, microeconomic reform can be considered a double edged sword; the Government somehow had to contend with contradictory scenarios. Industry policies focused on increased national productivity, directly and indirectly increased unemployment. It can be argued that because there was no significant increase in production volumes, job losses occurred. Indeed, outsourcing resulted in increased levels of imported automotive components. While this improved labour productivity and reduced costs, the corresponding effects contributed to higher unemployment, and to increased levels of imported products.

6.8 Competing in a Global Environment

In terms of global competition, this section briefly addresses some of the key issues faced by Australia's manufacturers. By the late 1980's most of the Hawke Government's market reform policies were in place. However, Senator Button was extremely frustrated by the poor performance of the manufacturing sector. Reflecting this annoyance it was reported in the Sydney Morning Herald on July 15th 1989, that he lashed out at the manufacturing sector, claiming that *...the government had done 'all the right things' to boost industry but had 'grossly overestimated' the response from a narrowly based and somnambulant industry sector.*

His concerns were readily justified based on a survey conducted by the Bureau of Statistics in 1988-9. It found only one third of Australia's manufacturing plants used 'advanced manufacturing technologies' commonly adopted in other countries.

Compounding this was the fact that only a few manufacturers had actually planned to acquire new technologies in the near future (ABS, 1989).[17]

6.8.1 Economic Liberalism

During this period, Walsh (1991) noted that the Labor Government had staged a conscious and deliberate translocation to a more liberalist policy platform. Some of the most extreme views of economic liberalism noted by Bell (1993), Capling and Galligan (1992) and Emy (1993) were embodied in the report to the Government from Professor Ross Garnaut. This Report was commissioned to assess the implications for Australia of economic change in North-East Asia. The Garnaut Report (1989) recommended the complete phasing out of tariffs by the year 2000. Garnaut based his recommendations on the belief that the complete removal of protection would *...cause Australian producers to see themselves as operating in a world market, like those in the small, high wage economies of Europe* (Garnaut, 1989, p.207). He also argued the only appropriate industry policy relevant to Australia was 'free trade'.

Based on trade liberalisation measures recommended by Garnaut, the Government moved to dramatically reduce manufacturing protection by including the Garnaut Report recommendations within its 'Building a Competitive Australia Statement', announced on March 12, 1991. It was reported by Bell (1993, p.191) that Garnaut had proclaimed this was *...the beginnings of industrial transformation in Australia.* Notwithstanding the provisions of the Garnaut Report, the Industries Commission recognised a zero tariff proposal would *...impose undue adjustment pressures on the automotive industry* (IC, 1990, p.xiv). The Government of South Australia, in particular, was highly critical of the Federal Government's tariff stance, as its economy was highly dependent upon the automotive industry, and tariff protection.

Nonetheless, support for Professor Ross Garnaut's thesis was gaining significant momentum, as Australia's current economic performance was nothing short of abysmal.

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[17] The ABS survey referred to was titled Manufacturing Technology Statistics, Australia 30 June 1988, Summary, Commonwealth Government Printer, Canberra, 1989, pp.21-5.

In 1990, for instance, Australia was positioned thirteenth out of twenty-three nations in industrial efficiency and international orientation as ranked by the World Economic Forum 'measures of competitiveness' (DITAC, 1990, pp.12-14).

Recommendations completely rejecting Garnaut's thesis were presented by Pappas Carter (1990). They proposed instead the maintenance of tariffs, albeit at reduced levels. The value of the Automotive Industry to Australia's economy was acknowledged and singled out for special consideration. Even though the emerging consensus was protection had outlived its usefulness, they recommended that the automotive industry tariff be retained at 25 per cent.

This did not deter the Government from its goal of total abolition of tariffs and industry assistance. Treasurer Keating announced in the 'Building a Competitive Australia' statement, a series of economic imperatives that he suggested *...ends forever Australia's sorry association with the tariff as a device for industrial development* (Keating, 1991, p.2.1). The ramifications of this meant that by the end of the year 2000 Australia would have moved from having one of the highest levels of tariff protection amongst OECD countries, to one of the lowest.

6.8.2 The Level Playing Field

Proponents of a free market doctrine in Australia continually criticised the Government's preparedness to support low cost, low value commodity products. Likewise, the pro-protectionist lobby maintained there was no such thing as a 'level playing field' in terms of international competition. Undeniably, protection and targeted assistance by governments had, rightly or wrongly, extended the longevity of inefficient manufacturers. Amongst globalisation issues, reaching a compromise in this newly framed level playing field debate had become central to Australia's industry policy. Also, unfair trading issues between nations remained prominent in World Trade Organisation (WTO) negotiations (Fagan and Webber, 1997).

Fagan and Webber argued that the level playing field theory is based on the proposition of comparative advantage. It is also about reduced government involvement to facilitate free market forces, and about arms length transactions of nationally based companies and countries. Arguably, however, the Australian Government had an implicit responsibility to reflect a policy balance between protection and free trade in light of accelerating globalisation confronting Australia's manufacturing. Yet, amidst the equalisation debate the Government's program of reduced protection was being questioned. Hughes (1989) for example noted that not all countries had been reducing tariffs to the degree Australia had. In defence of the adversaries of the level playing field she argued the same access had not always been available to Australian manufacturers or producers because of the Australian Government's free trade policy preference.[18]

Amongst the revelations of informed debate the Australian Government's stance on the level playing field phenomenon had not been fully resolved at an industry level. A number of policy contradictions still existed. The affects of industry tariff reductions and the consequences of the level playing field argument forced a number of policy reversals. Political lobbying from states such as Victoria and South Australia provided difficulties for the Labor Federal Government and the Coalition Opposition's free market ideology. So much so that during the latter part of the 1980s and early 1990s there had been significant policy divergence from the phased reduction of tariff protection, especially in the automotive industry.

In 1991, consistent with the internationalisation debate, the Prime Minister announced the establishment of the 'Australian Best Practice Demonstration Program'. The purpose of this program was to assist firms make a quantum leap in performance that international best practice could yield. The concept involved the promotion of best practice work methods and approaches for Australian companies (Rimmer, Macneil, Chenhall, Langfield-Smith, and Watts, 1996). These initiatives recognised the fact that to survive in an international market place, Australia's manufacturers had to adopt 'Best Practice'

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[18] Evidence of the extent of available assistance to Australia's overseas trading partners can be found in OECD (1989a, pp.137-40), (1989b) and (1990a, p.146) reports.

techniques and philosophies. This mirrored the theories of Porter (1990), Rugman and D'Cruz (1993) and other commentators. As Porter (1990a) argued, the transformation from traditional manufacturing processes to knowledge-based industries was the 'real challenge' before governments.

Between 1983 and 1986 the Government's policy position was characterized as 'Phase1' of industry policy (Stewart, 1990). The focus was on tariff protection and the use of selective assistance plans. Stewart described this as 'vertical assistance' insofar as firms were assisted to efficiently produce products. Phase 2, however, occurred after 1986 and provided 'horizontal assistance'. This phase concentrated more on commercialization and marketing aspects to encourage exports, research and development and innovation. Conversely, Capling and Galligan (1992) contended that Stewart's thesis imposed logic that did not exist. It can be argued that the Government treaded a fine line between active state assistance and ensuring there was no unwanted government interference. In that respect, Capling and Galligan are correct, as the evidence seems to suggest that neither industry nor the Government were operating from any strategically planned manufacturing stance.

6.9 Industry Policy under Keating

As Keating, the new Prime Minister moved to accelerate Australian industry policy initiatives to a more comprehensive level, it became increasing clear there were distinct similarities with Porter's model of competitiveness. Processes focused on innovation, a greater concentration on exported manufactured products, and the need for increased levels of investment in the manufacturing sector gained significant policy exposure.

Following a series of consultations with state, business and union leaders, Keating launched his comprehensive economic statement 'One Nation' in February 1992. The primary thrust of 'One Nation' was to boost government investment in major infrastructure projects and to encourage private sector investment by measures such as accelerated depreciation allowances (Keating, 1992). To some extent, this contradicted

the Government's previous non-interventionist course of action, but did not change the Government's stance on tariff reduction. It did reflect, however, a specific means to influence Australia's determinants of competitive advantage.

The One Nation statement announced the introduction of a new development allowance. Designed as a tax concession for investment in new plant and equipment, this initiative was intended to benefit Australia's competitiveness in world markets (Keating, 1992). According to INDECS (1995, p.26), Keating had *...returned to expansionism with enthusiasm, turning to a string of fiscal policy measures to boost the recovery.* Commensurate with the focus on competitiveness, the Government also addressed company tax and investment measures in the 1993 Statement to the Parliament titled, 'Investing in the Nation'.

Whilst these initiatives were timely in providing manufacturers with capital assistance measures, it can be argued they did not go far enough in specific areas. There were no policy mechanisms to encourage global scale industries to locate in Australia (Fagan and Webber, 1997). Strategies of this type were used comprehensively by other nations to create employment, and establish new manufacturing plants and supply chain mechanisms. Nor did industry policies provide a safety net for manufacturers producing low value added products with limited export potential. Meanwhile, the Government still faced a dilemma because its interventionist stance was predicated upon a plethora of industry plans and part retention of centralised wage fixing. Although this policy platform retained support from trade unions and some manufacturers, it is extremely important to stress that the Government had realigned its focus to a more open economy (Capling and Galligan, 1992).

Notwithstanding the political clout of certain industries and trade unions, the Government also had to distance itself from narrow group demands. It was in that context the Independent Committee of Inquiry on National Competition Policy (1993) was commissioned by the Keating Government. The subsequent recommendations of the committee became known as the Hilmer Report. As part of the privatisation and

deregulation agenda, this provided the benchmark for the Government's reform process. There was a need to develop universally and uniformly applied rules of conduct for all participants operating in an open and integrated Australian economy.

The inquiry sought structural reform of monopolies and restraint of monopoly pricing, and the encouragement of competitive neutrality when government businesses were competing with private firms (Hilmer, 1993). Two new institutions were proposed as a result of the review. These were a National Competition Council, formed jointly by the Federal and State Governments; and an Australian Competition Council, which would administer conduct rules. It is useful to note the wide ranging extent of the review. In the opening paragraph of the Report, it was stated that

> *...If Australia is to prosper as a nation, and maintain and improve living standards and opportunities for its people, it has no choice but to improve the productivity and international competitiveness of its firms and institutions. Australian organisations, irrespective of their size, location or ownership, must become more efficient, more innovative and more flexible* (Hilmer, 1993, p.1).

Hilmer (1993) reported the greatest benefits to be achieved from opening up the domestic economy to competition would emanate from reducing the excessive regulations, statutory monopolies, occupational and professional licensing and other anti-competitive instances that existed in Australia's layers of government. Hilmer argued that Australia required a level playing field of 'competitive neutrality' and the removal of traditional barriers to trade and unfair competition for its success.[19]

To deal with unemployment and growth, the Government released another significant publication as a White Paper titled 'Working Nation'. This was presented to Parliament by Prime Minister Keating on the 4 May 1994. Working Nation articulated the *...vision, goals, principals and measures that constitute the framework for Australian industry policy in a business climate of minimal protection and globalisation* (Keating, 1994). The

[19] Since its implementation there have been a number of government reports commissioned to assess the consequences of the National Competition Policy (NCP) to Australia in general. Some of these have confirmed the economic benefits forecast by Hilmer. However, there has been a plethora of negative consequences tabled, particularly with respect to the impact on employment and various social issues affected by the Report recommendations.

central focus of this paper was to assist industry growth and to internationalise industry, encourage innovation, and to promote the adoption of best practice techniques. With almost $630m in funding over a four-year period, the Working Nation initiative focused on opportunities for small to medium sized enterprises (SMEs). The Paper enunciated two major themes, which interestingly mirrored several concepts postulated by Porter (1990a). These can be described as follows:

(1) to build competitive firms through business assistance programs aimed at encouraging innovation and the take up of new technology, improving management skills, ensuring access to both debt and equity capital, and encouraging exports;

(2) building a competitive environment by ensuring that Australian firms have the opportunity to compete in global markets, through the continuation of the process of microeconomic and tariff reform, thus securing a strong science base, improved market access by promoting investment and business linkages (Working Nation, 1994).

While the White Paper contained initiatives specific to the improvement of manufacturing competitiveness, its thrust was largely nullified by the oncoming federal elections of 1996. The new Coalition Government rejected the Working Nation Paper as both interventionist and ineffective. In 1997, the Government commissioned the Mortimer Report, a report that advocated similar industry initiatives to the Working Nation Paper (Bryan and Rafferty, 1999). Ironically, the recommendations from the Mortimer Report were largely ignored by the Coalition Government.

The thrust of Working Nation appeared to provide manufacturing with a pragmatic policy solution based on microeconomic reform. It also articulated the Government's commitment to the manufacturing sector. Rather than focus on specific industries, it aimed to create a manufacturing environment conducive to sound macroeconomic policies, and a continuing focus on microeconomic reform. Its objective was to accelerate the internationalisation of the economy, and concentrate on factors critical to Australia's competitive success. This encompassed innovation and the uptake of new technology,

business improvement and exporting. Keating (1994, p.57) stressed *...an open economy leaves no room for subsidies that prop up uncompetitive firms, nor for detailed prescriptions for industry where government directs the flow of resources.*

Within this reform process, however, there was a failure to develop an 'outcomes' strategy to cope with industrial fall-out. The pursuit of high value added production and the growth of elaborately transformed manufactures (ETMs) would not necessarily generate increased employment. Quiggin (1996) suggested inhospitable macroeconomic factors such as high interest rates and budgetary stringency limited the effectiveness of the change process. He also stated that macro and microeconomic policies were working at cross-purposes. Quiggin argued the Government's macroeconomic policies failed because of poor economic forecasting. This, in turn, restricted benefits from microeconomic reform being translated into noticeable growth in manufacturing output and employment (Carman and Quiggin, 1999). Greun and Grattan (1993) went further by suggesting the conventional economic prescriptions used by government were not so much wrong as incomplete. While deregulation and improved competitiveness were necessary, a greater breadth of economic influences needed to be considered.

ETMs had become the fastest growing segment of manufacturing in Australia (Green and Genoff, 1993). Importantly, this supported the Government's innovation and knowledge based industries platform. Nonetheless, while improvements were being realised in the manufacturing sector, they appeared to be disjointed, and were only occurring amongst a lose collection of industry initiatives. No overarching strategic industry policy plan seemed to exist.

Notwithstanding Australia's dependence on multinationals, it can be argued that the industry policy direction pursued, in particular, by the Keating Government was substantially aligned to Porter's model of National Competitiveness. Significant changes to government industry policy since the early 1990's provided substantive proof that the characteristics identified by Porter, especially the focus on innovation and exports had influenced Australia's industry policy direction. Furthermore, Rugman and D'Cruz

(1993, 2000) argued the competitiveness of small manufacturing nations (such as Australia) is supported by large nations through the combination of each nation's determinants in a regional context. Rugman and D'Cruz maintained that multinationals located in a host nation act as flagships to lead, direct and coordinate the manufacturing activities of partner companies involved in host nation clusters. It could be argued that this does occur effectively in Australia. In addition, Rugman and Verbeke (2002) added a new dimension to the 'triad theory' which underpinned their 'double diamond' concept. Whilst not detracting from the previous discussions, Rugman (2000) provided empirical support for the proposition that large MNEs operate on a regional/triad manner rather than a global basis. In an Australian context, it can be argued this proposition reinforced the intrinsic value of Porter's Diamond framework and the essential nature of regional clusters.

6.10 Summary

In this chapter the industry policy challenges confronting the Hawke-Keating Government were reviewed. Initially, the Government's focus was on industry improvement at an enterprise level through the adoption of discrete industry plans. This was successful largely because of the Accord. During this period, Australian manufacturing industry enjoyed a sustained period of industrial harmony, as the push to become internationally competitive impacted on individual enterprises.

The Government's microeconomic reform process became the central part of industry policy. However, by the late 1980s, the momentum of globalization had impacted on the manufacturing sector. Internationalizing of the economy and level playing field dogmas were more pronounced than ever. Nonetheless, the Government's industry policy continued the focus on increased productivity, and greater levels of exports.

On taking office, however, the new Keating Government attempted to increase the momentum of the move towards manufacturing competitiveness. A number of major policy initiatives were introduced. Predominantly these involved industry policy

prescriptions designed to stimulate improved competitiveness and greater levels of investment. Again, these initiatives were underpinned by a focus on productivity, skills upgrade and exports. However, more prominently than before, specific policies were designed to encourage innovation and the take-up of new technology. Increased financial assistance was also provided to generate more research and development activity. Yet, whether through apathy on the part of industry or poor industry policy implementation, little improvement in the competitive culture of Australia's manufacturing sector appeared to exist. Somehow manufacturers failed to respond to the stimulus of the Government's policy initiatives. Commentators such as Carman and Quiggin (1999) attribute the manufacturing sector's poor performance to ineffective macroeconomic policies caused by an imbalance with microeconomic issues. This viewpoint was largely supported by Greun and Grattan (1993).

Lastly, although the Government's industry policy initiatives reflected characteristics identifiable with Porter's methodology, the poor competitiveness dilemma remained. The apparent inaction displayed by manufacturers suggested that a more formal Government-industry policy prescription was warranted. The next chapter will pose certain hypotheses regarding the competitiveness of Australia's manufacturing sector. These will be tested in light of Porter's model and with respect to the measures introduced by the Hawke-Keating Government to lift manufacturing competitiveness.

Chapter 7 Development of Research Hypotheses Relating to the Competitiveness of Australia's Manufacturing Sector

7.1 Introduction

Previous chapters have shown the role of government to be an integral part of the pragmatic and conceptual issues pertinent to increased competitiveness in the manufacturing sector. It has also been discussed how certain key attributes contribute independently and interdependently to the outcomes of effective industry policy, which may or may not stimulate increased manufacturing competitiveness.

To reiterate, the fundamental task of this thesis is to establish whether manufacturing competitiveness improved in Australia during the Hawke-Keating period of government, relative to its performance prior to 1983. As discussed, the time-frame between 1983 and 1996 witnessed some of the most significant changes in the history of Australia's manufacturing sector. Building on this notion, the major focus of this chapter will be to explore ways in which companies and industries can improve competitiveness. Porter (1998) noted that much is known about competitive advantage, however much less is known about the interrelatedness of the specific factors which need to be employed to achieve it. The approach to be taken here will endeavour to isolate the key components of competitive success. By examining the variables which appear to stimulate or influence competitiveness in conjunction with historical performance data, will, in all likelihood, provide evidence to substantiate the need for alternate policy solutions.

7.2 A Sector-Based Approach to Competitiveness

In this chapter and the following, it is important to demonstrate how the key research question posed in this thesis can be adequately examined. Firstly, it should be noted that the review of competitiveness and the direction pursued in this thesis follows a similar process to that used by Porter (1990). As a consequence, the research hypotheses to be developed will be strongly influenced by his work. This will be supplemented by a

comprehensive literature review to encapsulate the interrelated issues that influence manufacturing competitiveness at an enterprise level.

Porter's (1990a) work represented a comprehensive effort to determine the characteristics that sustained a nation's competitiveness. In order to achieve this by simple means, he raised two important questions:

(1) Why are firms based in a particular nation able to create and sustain competitive advantage against the world's best competitors in a particular field?
(2) What national attributes enable an industry to retain international leadership both through export activities and foreign direct investment?

Arguably, these questions provide a logical platform to investigate characteristics intrinsic to Australia's manufacturing competitiveness, and indeed, provide an appropriate course to determine any measure of change.

Chapters 2 and 3 asked the question ...*what is competitiveness and how can it be defined in a manufacturing context*? In essence, previous discussion established there is no single determinant of competitiveness. On that basis, the significance of how can competitiveness be measured in the manufacturing sector underlies the premise of the research question posed. Research has found that largely, a strong interrelatedness exists. For instance, certain factors acting singularly and in combination tended to stimulate improved competitiveness. This would infer that competitiveness cannot be attributed to one specific factor. Basically, it is influenced by the application of a number of different characteristics acting together. Hence, to determine if manufacturing competitiveness improved will necessitate the analysis of key factors associated with competitiveness, and an assessment of their relatedness.

With respect to Porter's (1990) ten-nation study, the unit of analysis included a nation, its industries, and certain unique industry sectors. In this thesis the unit of analysis will be the manufacturing sector in Australia. This is important to emphasize because in his 1990 studies Porter's primary objective was to identify the essential characteristics underpinning a nation's competitiveness. Measures were established from the

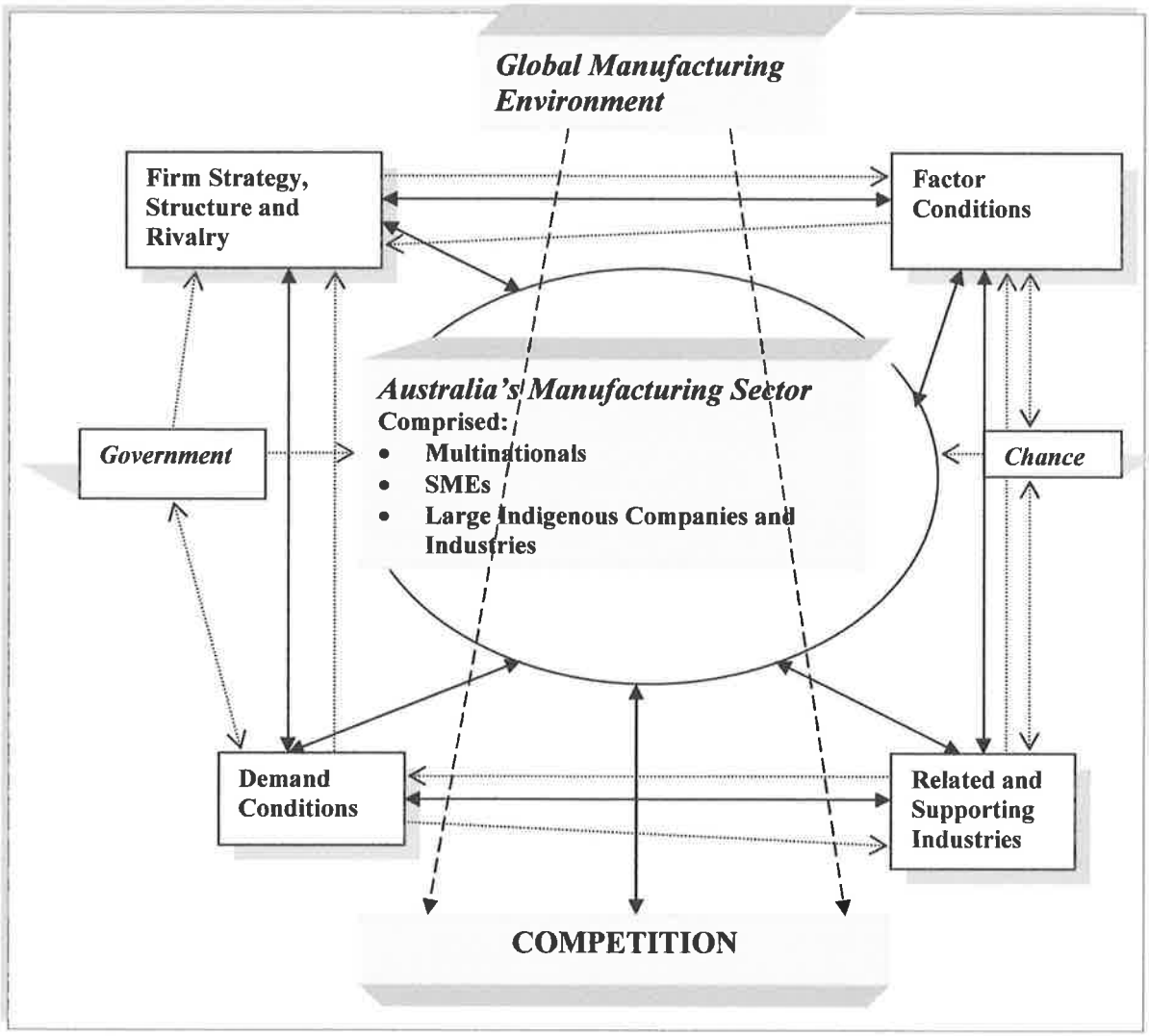
investigation of a nation's performance which allowed meaningful comparison with other competitive nations. At a lower level, analyses was conducted to determine the competitiveness of unique industry sectors using measures such as productivity, exports, and the level of foreign investment. Relative to a nation's most successful industries, Porter (1990a) maintained that competitiveness achieved through these factors represented a nation's skills and reflected the effective use of its assets. Based on this rationale, albeit modified for a single nation and specific sector of an industry, a similar analytical process will be adopted for this thesis.

Porter (1990a) noted that by studying the fundamental forces underlying the competitiveness of a nation he could isolate causal factors from idiosyncratic ones. Commencing at an industry level his theory built up to incorporate the productive activities of a nation as a whole. Founded on the stability of a nation's determinants he sought to illustrate a useful way to identify the unique characteristics of competitive success, and also reasons for poor competitive performance. It is important to stress, however, Porter's (1990a) methodology encompassed an industry-wide approach to assess a nation's competitiveness. Consistent with a single nation and single sector focus the thrust of this thesis will follow a whole of sector approach as demonstrated by Figure 7.1.

Figure 7.1 shows a graphical representation of Porter's model customised to reflect Australia's manufacturing environment. The revised model was developed to highlight the extent of competitiveness in this sector and importantly, the independent and interdependent relationship of the determinants. Similarly, based on the literature review, it is paramount to test the impact of what were shown to be the major drivers of competitiveness at an enterprise level. In the same way, because of the interrelatedness of determinants within the model, this presents a logical basis for developing appropriate hypothesis to test these variables. Hence, the model provides a robust framework to critically examine manufacturing competitiveness. Furthermore, it is argued that assessment of these factors facilitate a greater depth of analysis than in Porter's studies. This is possible because the analysis will be confined to enterprise-based issues,

manageable at a local level. Arguably, this establishes a more informed basis with which to assess the key research question.

Figure 7.1: The Australian Manufacturing Sector Competitiveness Model



The work of Prahalad and Hamel (1990), Jacobs and deJong (1992), Yetton et al. (1992), Rugman and D'Cruz (1993), Clancy and Twomey (1997), Mackinnon (2000), and Enright and Roberts (2001) discussed in previous chapters substantiated Porter's approach. These writers maintained that several common characteristics underpinned superior performing companies and industries. Attributes included: competent management, high levels of productivity, internal efficiency, innovation, research and

development, advanced technology, effective infrastructure, an export focus, and the extent of a company's investment portfolio. Arguably these factors individually and jointly reinforce the competitiveness of Australia's manufacturing sector, and provide a logical basis for developing testable hypothesis.

It is contended that the competitiveness of an industry and nation are secured by the nature of its firms' strategies, institutions, infrastructure, and from the policies of Government that create and enhance the environment in which firms compete (Porter, 1998). Building on Porter's work, for this reason industry policy has a moderating impact on the choice of site locations, infrastructure, factor conditions and aspects of demand that influence individual companies and industries. Porter (1998) argued it was a nation's ability to innovate and remain competitive in the most advanced and profitable industries that sustained global leadership. For Australia, this would require greater focus on industry segments perceived to be competitive and less so on segments not as productive as foreign rivals. The next section will expand this discussion, in particular, to identify the key characteristics that contribute towards the competitive success of Australia's manufacturing sector.

7.3 Research Hypotheses

It is useful to recap on Government industry policy between 1983 and 1996 as outlined in Chapter 6. In response to the manufacturing sector's lack of competitiveness, and the threat of increasing imports, the Hawke-Keating Government introduced a number of key industry policies related to structural change and improvement. The intent of these initiatives was to create an environment conducive to productivity growth, and to address the attitude of manufacturers' which pervaded. As noted, government assistance could no longer be considered 'corporate welfare'. Therefore, this necessitated improved management capability, and the recognition that manufacturers had to become internationally competitive (Bell, 1993).

It appeared the Government had taken responsibility to ensure Australia's perceived determinants of competitive advantage were supported. For instance, Keating (1994, p.56) stated the focus of industry policy of the 1990's was to increase competitive forces, increase investment, and overcome inefficiencies by enhancing ...*productivity through innovation and the adoption of new technology.* Predicated upon incentives for increased exports, R&D, and foreign investment, the Government's policies sought improved competitiveness both domestically and internationally (BIE, 1994).

This leads to the key research question posed in this thesis which is ...*did manufacturing competitiveness improve during the Hawke-Keating period of government relative to its performance in 1983*? In order to investigate this question a number of research hypotheses will be developed and tested. As noted, because of the interrelatedness of factors that impact on competitiveness identified through the literature search, there is a strong argument to suggest that these factors individually or in combination will be crucial components of the manufacturing sector's competitive success. Moreover, the research suggested that the components identified will reflect relatively common characteristics which are measurable and can be managed at an enterprise level.

7.3.1 A Focus on Productivity

As discussed in Chapter 4, Porter (1990a) considered the key to raising productivity to be the least understood aspect of a nation's success using established theory. In his ten-nation study he sought to present a framework to explain how an entire nation advanced in competitive terms. While maintaining ...*the only meaningful concept of competitiveness at the national level is national productivity,* he argued that if a firm increased the intensity of its competitiveness through internal efficiency, it was possible to propel itself ahead of its foreign competitors (Porter, 1998, p.6). In an Australian context, undoubtedly this reflected the collective means available to improve manufacturing productivity and competitiveness.

According to Porter, a number of key elements remained crucial to competitiveness, and importantly fortified the basis of a nation's wealth and success. He argued these aspects are encompassed in the interdependent relationship that exists between:

(1) productivity; and

(2) competitive advantage (Porter, 1998a).

The characteristics of productivity are ubiquitous in nature. In the same way, while industry policy and competitive advantage are independent phenomena they have powerful interdependent relationships. The principle goal of a nation is to produce a high and rising standard of living for its citizens (Porter, 1998a). Yet, the ability to do so is not solely based on the notion of competitiveness but on the productivity with which a nation's resources are employed. Thus, to enhance Australia's manufacturing productivity the environment in which companies and industries operate must be conducive to efficiency, and competitive rivalry.

Central to this notion is the relationship between Porter's theory and Australia's potential to improve manufacturing competitiveness, of which productivity is clearly a key component. It is useful to reflect on Porter's (1990) Diamond model, and on the four major determinants of a nation's competitiveness discussed in Chapter 4. Each determinant acts independently and interdependently to influence productivity which will affect the extent of a nation's competitiveness, they are:

1. Firm strategy, structure, and rivalry
2. Factor conditions
3. Demand conditions
4. Related and supporting industries.

As noted, the Diamond theory is based on the premise that improvements in manufacturing productivity realised from sector-wide efficiencies will assist a nation's competitiveness particularly when underpinned by innovation (Porter, 1998a). Similarly, Australia's manufacturing sector is embraced by multinationals and a plethora of small, medium and large indigenous companies, generally co-located. This close relationship supports the cross-fertilization of ideas, increased potential for R&D, and provides

opportunities for supply chain efficiencies. Therefore, enhanced levels of productivity are possible due to the critical mass created through collaboration, synergy, and the close proximity of commercial expertise. In effect, reflecting the value and stimulus generated by related and supporting industry determinants. Notably this is best represented by Figure 7.1 which depicts the interdependence of each function of Australia's competitive environment.

Porter (1998, p.78) made a number of profound and crucial points relative to increasing competitiveness. For instance, based on the formation of manufacturing clusters, he stated that:

> *...modern competition depends on productivity, not on access to inputs or the scale of individual enterprises. Productivity rests on how companies compete, not on the particular fields they compete in.*

This is extremely important as it indicates the type of environment that Australian manufacturers need to develop. It is also relevant to the Australian Government with respect to the role of appropriately focused industry policy.

It can be argued that the competitive success of Australia's manufacturing sector is largely based on exploiting specific aspects of productivity. Various factors encapsulate the 'know how' and the 'intellectual capacity' that is manifest in company strategies focused on differentiation, innovative concepts, and the efficient utilization of upstream and downstream process linkages. Along similar lines to Porter's approach, this is largely created by exploiting the specific determinants which enhance productivity.

Likewise, in a small manufacturing nation such as Australia, higher productivity may result from strengthening the linkages between manufacturers, government, academia, and research institutes based on fostering national competitiveness. This point reinforces the notion that a nation's competitiveness can be created and sustained through a highly localized process (Porter, 1990a). Consistent with the above discussion, the development of the first null hypothesis to be tested will examine manufacturing productivity to either reject or fail to reject the following:

Hypothesis 1: There was no change in productivity of the manufacturing sector in Australia between the period 1983 and 1996.

7.3.2 Research and Development as a Driver of Competitive Advantage

Earlier chapters noted that innovative processes were a major driver of company and industry competitiveness. As a consequence, innovation consistent with research and development is extremely important to the sustainability of Australian manufacturing. It was stated by the Australian Manufacturing Council (1994, p.iv) that *...research and development underpins technological innovation, which is an essential aspect of business innovation and competitive success.* Porter (1990a) also argued that innovation provided the new basis for competition and sustained growth. In support of this, the AMC (1994) reported that in the early 1990s studies showed what appeared to be emerging was a sense of customer-focused innovation. Similar findings had been noted in Canada, insofar as innovative activities had become the most important determinant of competitive success (Statistics Canada, 1994). Maddock (2000) showed that processes of innovation transcend the whole of an organization's decision making and operational capabilities. He noted this encompassed a company's human resource strategies, manufacturing processes, and its market direction. This suggested that the level of innovation a company generates is a critical determinant of its overall competitiveness (IC, 1997a). Indeed, McKinsey (1993) found that the conventional wisdom about innovation and R&D as strictly the domain of large enterprises was totally misleading in Australia.

Aligned to the above, smallness has traditionally been a disadvantage for Australian manufacturers, however, specialization and smallness underpinned by innovation has significant value added potential (AMC, 1994; DIST, 1998). Arguably, applying processes of innovation throughout the manufacturing sector helps foster creative linkages and supplier-based partnerships to augment Australia's determinants of competitive advantage. As discussed in Chapters 3, 4, and 5, the subsequent wealth

generation derives predominantly from achieving niche market positions that involve the application of R&D to help create positions of competitive strength (Porter, 2003).

It was argued in Porter's (1990) studies that a correlation existed between successful and innovative manufacturing nations that committed significant expenditure to Research and Development (R&D) compared to those nations he termed followers. Expenditure focused on creating high value added products, and the design of discrete processes enabled differentiation from competitors. Porter maintained that nations had to accommodate a steadily rising level of technology underpinned by innovation, and stressed the importance of innovative processes and knowledge-based industries to the development of competitive advantage (Porter, 1990a). He argued that competition is dynamic, and rests on innovation and the pursuit of strategic differences (Porter, 1998). Research also showed there was an inextricable link between a company's innovative capacity and its levels of productivity (see for example, IC, 1997a; Hanna, 1998). Indeed, Maddock (2000) noted that the influence of innovation permeates all aspects of a company's operations, and invariably adds value to inter-industry linkages pertaining to customer related supply chains. For instance, in terms of product innovation, the application of best practice processes in and between companies tends to enhance the speed of product development particularly where companies employ sophisticated methods, and advanced technology (Enright, 2000).

Porter (1990a) contended that government industry policy was vital to exploiting factor creation mechanisms. Notably, this reflected the direction of Government industry policy, especially during Keating's period in office. Button (1990) initially promoted new and innovative technology and knowledge-based processes as the basis of international competitiveness in the manufacturing sector. These aspects were identified as integral to the creation of added value and to the competitiveness of manufacturing in general. Likewise, this philosophy demanded a strong focus on education, human resource development, scientific knowledge, and infrastructure support. In his statement to the Parliament when launching the White Paper *Working Nation* in 1994, Prime Minister Keating argued the Government had introduced these issues. He noted the

Government had provided the capability to stimulate related and supporting entities, as well as assist research institutes through a broad spectrum of industry-wide training and development initiatives (Keating, 1994).

Earlier it was discussed how, prior to the Hawke-Keating period in office, Australia's manufacturing sector had been largely indifferent to the value of research and development. Reasons of culture, poor management skills, and short term profit horizons were cited as the principle causes of this (Capling and Galligan, 1992, Bell, 1993, Bryan and Rafferty, 1999). According to Karpin (1995), it appeared nothing much had changed nearing the end of the Hawke Keating period in government. Notwithstanding levels of assistance and expenditure, it can be argued that research and development cannot be left solely to manufacturers as the benefits to a nation exceed those attributable to any one company due to spill-overs. Hence, technological advances benefit more than an individual company because the rate of innovation multiplies throughout the entire national structure (Porter, 1990a). In Chapter 6, for example, it was discussed how the positive impacts of the Button Plan created both downstream and upstream production efficiencies. Productivity improvements were also achieved as a consequence of standardisation and scale economies. Indeed, it was argued that vastly improved communication systems were realised through the creation of improved company linkages and industry specific networks (Capling and Galligan, 1992).

Processes of innovation have largely become universal (Statistics Canada, 1994). The Australian Manufacturing Council (1994) found that increasingly, intellectual rather than physical inputs have tended to generate the basis of differentiation and competitiveness. Clearly, innovative activity is not solely process related. The research suggested that ideas make up most of the value added in wealth creation in manufacturing (AMC, 1994). It can also be argued that a company's technical sophistication and its level of innovation are inextricably linked to the quality of the environment that encourages competitive intensity. Likewise, competitiveness can be enhanced through the adoption of manufacturing best practice and benchmarking processes. Rimmer et al. (1996) reported that learning from the world's best offered Australia a cost effective solution to accelerate

manufacturing efficiencies throughout the whole sector. Arguably, this correlation fortified the Government's industry policy support for new technology and Industrial Research and Development (IR&D).

Lastly, the national environment which includes universities and research institutes plays a crucial role in supporting opportunities for innovation amongst Australia's manufacturers. Porter (2001) argued that where specialisation is warranted the emphasis should be to form strong links with industry and universities, in this way, commercially relevant technologies can be accelerated. Given the wide-ranging influences inherent in R&D and with respect to its relatedness with manufacturing competitiveness provides the basis for the second null hypothesis to be tested:

> **Hypothesis 2:** The level of Research and Development expenditure remained constant in Australia's manufacturing sector between 1983 and 1996.

7.3.3 Sustaining Competitive Advantage Requires a Global Approach

It was discussed that a company and a nation's manufacturing successes are founded on the basis of competitive advantage (Porter, 1990a). Porter contended that international competitive success demanded companies translate domestic market success into international positions through exporting. He argued that a company employs advantages generated from its home base to penetrate foreign markets. Through a network of relationships, in particular the presence of demanding customers was important for stimulating and sustaining a vibrant export sector. It was suggested that manufactured product successes are developed through differentiation strategies, which are often the act of strategic innovation which unlocks potential for a company to exploit export-based initiatives (Porter, 1990, 1998).

Porter (1990a) determined a nation's competitive success comprised sustained exports and outbound foreign investment. The importance of export production based on high

levels of productivity remained one of his central themes. Predominantly, exports produced by above average productivity industries will raise the production volume of these industries, and the resultant scale economies further increases the nation's average levels of productivity. Exports similarly generate income to finance the importation of goods whose domestic production would occupy capital and labour that could be employed more productively elsewhere. In the same way, the movement of inbound and outbound direct foreign investment (DFI) raises national productivity when it shifts the production of below average productivity industries overseas, and thus enables the investment of repatriated profits to be directed towards high productivity industries (see for example, Van der Linde, 1991). Thus, it can be argued that a nation's competitiveness is reinforced by successfully undertaking both (Porter, 1998).

These notions were largely recognised in two major export related reports published in Australia in the 1980's. They included the Ferris Report (1985) and the Hughes Report (1989). Both were critical, however, of the gross contribution of Australia's manufactured exports. A number of points need to be stated. For example, in 1985 manufacturing provided 20 per cent of Australia's exports and 80 per cent of it imports (Sheehan et. al. 1994). Australia's reliance on mining and primary goods as a basic means of supporting the expansion of the economy was insufficient to compete with the newly developing international economies (Hughes, 1989; Hart and Richardson, 1993; and Anderson, 1995). Moreover, the world was moving towards more knowledge intensive and less resource intensive patterns of output. Ohmae (1990) and Reich (1992) argued that modern industries had to move away from high volume production to that of high value production.

In support of the Government's industry policy, Bryan and Rafferty (1999) noted that during the mid to late 1980s, the impact of globalisation instigated a greater focus by Government on the manufacture and export of elaborately transformed manufactures (ETMs). Indeed, the strong push to increase the level of manufactured exports resulted from the initiatives initially promoted by Senator Button (Bell, 1993). What is more, the AMC (1994) reported that exports had increased, and that ninety per cent of Australia's

emerging exporters were operating in niche markets exploited primarily through differentiation strategies.

It could be argued that export programs were a logical extension of the previous enterprise-based processes that focused on productivity improvement, increased competitiveness, and growth. Government initiatives such as AUSTRADE were given a high priority to assist manufacturing companies increase exports. AUSTRADE provided facilities to access overseas market intelligence through 'target market' assessment reports, and helped coordinate trade enhancement schemes. Financial assistance was also made available to help defray the operational costs incurred in pursuing these markets (Keating 1992). This assistance was recognised as vital to developing trade and for exporters seeking to establish new market opportunities overseas (Bell, 1993).

Interestingly, Porter (1990a) noted that firms could not sustain competitive advantage in international markets in the long run without exploiting and extending their home-based advantages with a global approach to strategy. According to Porter, to succeed firms actively worked to improve their home base by upgrading their national diamond and its constituent parts. He also argued that when firms operated in foreign marketplaces this inspired rising productivity in their home base and strengthened national competitiveness (Porter, 1990a).

The third null hypothesis relative to the competitiveness of the manufacturing sector specifically relates to Australia's export performance:

> **Hypothesis 3:** The value of manufactured exports remained unchanged between 1983 and 1996.

7.3.4 The Changing Pattern of Australian Manufacturing

In his ten-nation study, Porter (1990a) paid little attention to the impact of imported manufactured products on a nation's competitiveness. As part of the overall assessment,

however, researchers did undertake analysis to determine each nation's level of imported products as a percentage of GDP. Yet, discussion on imports was largely ignored. While no specific reason was provided, it can be deduced that imports were perceived to be a normal function of international trade and global integration and as such, their impact was addressed as part of the interactions of a nation's diamond. Notably, however, import data was compiled for each nation studied as part of the demographic and economic characteristics tabled in Porter's (1990a) study.

As discussed previously, from an historical perspective, imported manufactured products have always been problematic for Australia. Manufacturing protection was initially administered to offset the commercial impact of cheaper imported products on manufacturers, and to Australia's domestic markets. Whilst this policy bias has been largely curtailed, the nature of international competitiveness still demands its use in certain circumstances when politically expedient.

It should be noted, however, that since the early 1980s, Australia had been a prominent importer of manufactured goods, especially capital goods. Likewise, imports of high value added goods in general had been increasing at a level five times faster than Australian manufactured exports (Bell, 1997). One school of thought noted by Porter (1990a) was that nations could pursue import substitution. The idea was that freed-up foreign exchange could be used for more advanced purchases, possibly supporting the process of upgrading industrial skills. Porter, however, summarily dismissed the appeal of this by suggesting *...import substitution tends to draw a nation into unattractive industries or industries where it has little prospect of gaining competitive advantage* (p.677). In the context of Australia's manufacturing sector, however, the economic impact of imported manufactured products cannot be neglected, and therefore, constitutes an important aspect to be examined.

Increasing levels of manufactured imports precipitated by the globalisation of markets undoubtedly presented a difficult challenge to Australia's domestic manufacturers. Paradoxically, however, sustaining the viability of some industry segments through

import replacement offered commercial opportunities. It is strongly argued this presented a less onerous task compared to manufacturers attempting to secure export markets. Nonetheless, Porter (1990a) argued that no nation can be competitive in everything and thus, defended the proposition that nation's with ability to export goods produced with high productivity, allowed that nation to import goods involving lower productivity. He maintained this was a more desirable focus because it translated into higher national productivity. To temper this argument, the vast majority of Australia's manufactured imports were tied to factor costs, and hence competed on price. Arguably, advantages based on factor costs have limited options for moving beyond this, mainly because this action can be copied by competitors and with respect to profitability may not be sustainable. Regardless, the balance of modern manufacturing was changing in Australia. The impact of imported manufactured products on Australia's economy was having a deleterious effect (IC, 1990).

Summarising this sentiment, Mahony (1993) and others have argued that the economic wealth generated from mining and primary industry exports of the 1960s and 1970's helped make Australia competitive. However, whilst this played a large part in sustaining almost full employment, it was clear this was no longer relevant. To compete at an international level of competition demanded...*a radical rethink of the central structural issues facing the Australian economy* (Sheehan, Pappas and Cheng, 1994, p.3). Pappas Carter (1990) went further by suggesting that to combat the rise of imported products Australian manufacturers had to reposition themselves. Ascertaining wealth generation and technology benefits warranted the adoption of a fresh conceptualisation of trade theories and a change in Australia's manufacturing paradigm to more knowledge-based levels of competitiveness.

Concerned by the impact of imported manufactures, Prime Minister Hawke (1991, p.12) noted...*we must export more manufactured goods and services and substitute more quality production for imports.* Countries from Asia and South America previously thought of as third world to whom Australia had previously exported, had now reversed this trend and were successfully exporting to Australia. This predicament required a

focus on the design of sophisticated luxury items, and less so on the cost to achieve market differentiation and economies of scale (Emy, 1993).

The forth hypothesis to be tested reflects the interrelatedness of the factors to be examined regarding the competitiveness of manufacturing and to the subsequent impact of imported manufactured products on the sector:

Hypothesis 4: The level of imported manufactured products remained unchanged between 1983 and 1996.

7.3.5 The Importance of Financial Investment to the Manufacturing Sector

Porter (1990a) argued that an integral part of a Government's role was to create an environment conducive to effectively deploying its resources. To achieve increased competitiveness this role must entail mechanisms to stimulate dynamism and upgrading, and by inference, necessitate the willingness of a nation and its firms to invest aggressively. In terms of enhancing a nation's diamond, this should include introducing sophisticated technology as a means of penetrating more advanced segments and entering industries where higher levels of productivity can be achieved.

With respect to competitiveness, it has been shown that Australia's manufacturing history had been dominated by its dependence on tariff protection and lack of capital investment. It must also be conceded, the availability of protection to manufacturers merely encouraged lack lustre competitive performance compared to international standards (BIE, 1996). As a consequence, a failure to maintain adequate investment levels in plant and equipment and new technology, merely exacerbated Australia's manufacturing problems (Capling and Galligan, 1992).

As discussed in Chapter 6, while this predicament was largely addressed through Government industry policy during the Hawke-Keating period, was this level sufficient given the intensity of competition facing manufacturers? Securing high level

manufacturing investment characteristically involved foreign investment procured through investment attraction policies, and domestically funded initiatives generated on the basis of investment incentives (BIE, 1995). It could be argued this focus appeared to be a feature of Government policies, more so during Keating's period as Prime Minister. However, globalisation presented other imponderables. Notably, commentators have argued that increased and ongoing investment in manufacturing is fundamental to achieving international competitive success (Emy, 1991; Bell, 1993, Fagan and Webber, 1997; Bryan and Rafferty, 1999). It was also stated that this obligation was crucial to the growth of manufacturing capabilities, productivity, competitiveness, and to the development and maintenance of an effective world class infrastructure (BIE, 1996).

Chapter 6 briefly touched on investment attraction policies as a key strategy of Australia's global competitor nations (Bryan and Rafferty, 1999). Commentators such as Wade (1990) argued that favourable investment attraction policies underpinned the wealth creation programs of most emerging manufacturing nations. In these countries, Governments played an active role in securing international investment as an integral part of their nation's growth. This secured funding to support a nation's ability to sustain its long-term manufacturing future, and withstand the competitive pressures of globalisation. Governments used a mixture of incentives, controls and mechanisms to procure resources. This achieved investment outcomes more than would otherwise have occurred through free market forces (Wade, 1990).

Building on this, writers such as Gordon (1988), Dicken (1992), Boyer and Drache (1996), Hirst and Thompson (1996) noted processes of globalisation are dominated by multinational investment and the movement of international financial flows. They argued the extent of growth and investment in developing nations is testament to the overarching strategies of transnational manufacturers seeking to consolidate and improve global profitability. Porter (1990a) added that foreign investment is a manifestation of global competition that demanded global strategies. He also noted it was part of the process by which a nation upgrades its competitive performance.

Thus, governments have a role in affecting the supply and cost of capital as well as the markets through which it is allocated. Porter (1990a) argued that a nation's supply of capital is mostly influenced by the personal savings rate, the size of the government surpluses or deficits, and foreign capital. It can be strongly argued that government policy affects all three. Exporters and indeed, emerging exporters need to have access to cost effective capital to fund growth in pursuit of market share and competitiveness. According to Porter (1990a) companies and nations become competitive because of differences, not similarities. Hence, the availability of finance for capital investment can influence a shift in localised niche market competition based on cost, to head to head competition based on securing a dominant international position in key strategic markets founded on capability (Emy, 1993).

Building on this argument, manufacturers were experiencing what became known as a 'global shift'. This meant the direction of manufacturing had moved from a domestic concentration to an international market focus (Bryan and Rafferty, 1999). In the same way, the character of local and foreign investment in which Australia's domestic manufacturing was reliant had changed. Arguably recognition of this predicament was addressed by the Government's 'One Nation' statement. This initiative boosted government investment in major infrastructure projects to encourage private sector investment by measures such as accelerated depreciation allowances (Keating, 1992). Designed as a tax concession for investment in plant and equipment, this policy offered a means to enhance Australia's competitiveness in world markets.

Lastly, if productivity drives competitiveness, and capital investment largely contributes to increased productivity, it follows that if the climate in which investments are made is conducive to acceptable returns on capital employed manufacturing sector investment levels could be improved. Given this sentiment, and consistent with interrelatedness of the research question, Hypothesis 5 will either reject or fail to reject the following:

Hypothesis 5: The level of investment in the manufacturing sector remained unchanged between 1983 and 1996.

7.4 Summary

In this chapter, the development of appropriate research hypotheses was considered. With respect to Australia's manufacturing competitiveness, productivity and competitive advantage were identified as vital factors which independently, and collectively, underpin its competitiveness standing. Based on the key research question posed in this thesis five interrelated hypotheses have been developed. Each individual hypothesis was discussed in detail with respect to its impact on the level of manufacturing competitiveness and with respect to the integral relationship with Porter's determinants of competitive advantage. The next chapter will discuss the research methodology, as well as data collection and analysis processes to be used to test these hypotheses.

Chapter 8 Discussion on the Research Methodology and Data Collection Methods

8.1 Introduction

This chapter will discuss the research methodology adopted for this thesis and also describe the various data collection methods used. As noted in Chapter 7, a modified version of Porter's methodology will be employed to test the hypothesis developed. Building on that discussion, the specific reasons for designing an amended methodology more appropriate to Australian manufacturing will also be addressed. It had been argued the international perspective of Porter's framework was not fully compatible with the objectives established for this thesis. This chapter will explain why a more localised industry specific focus is warranted to investigate the unique characteristics that drive Australia's manufacturing competitiveness. It will also discuss the reasoning behind the nature and compilation of data integral to effectively testing the research hypotheses.

8.2 Discussion of the Preferred Research Methodology

Prior to discussing data format and collection methods, it is necessary to point out the basis for amending Porter's methodology because it impacts on the scope of data collected. When Porter (1990a) developed his original methodology he noted the need for a new theory to determine why firms based in particular industries achieved international success and others did not. His ten-nation study sought to identify the decisive characteristics of a nation that allowed certain firms to create and sustain competitiveness. In the first instance, the generation of macro-level country specific data provided the basis to compare inter-nation economic and demographic performance. At an industry level, the research focus sought to identify the processes involved individually and collectively that underpinned each nation's competitive capability. In this way, a wide range of industries and sectors of industries were able to be assessed. While the latter part of Porter's methodology is appropriate for this work, the compilation of

macroeconomic and demographic data are not critical to the major research question posed, insofar as this thesis is confined to a single sector of an economy.

Thus, it is useful to provide a brief outline of the methodology to be used. Fundamentally, the methodology will assess a series of data sets compiled in tabular form relative to each specific hypotheses developed. These data will be tested to compare their validity, dependence and interdependence with respect to their impact on the competitiveness of the manufacturing sector. Similarly they will be considered against prominent factors that were identified from the literature review as crucial components of manufacturing competitiveness. This will ensure a comprehensive assessment of Australia's manufacturing which will importantly encompass the combined performance of all domestic manufacturers between 1983 and 1996.

According to Porter (1990a), the comprehensive nature of data compilation and analysis processes used to compare the competitive performance of the ten nations studied by him was vital. Purposely, the research criteria focused on successful industries that had already produced a significant share of that nation's exports. Although driven by a different mix of government policies, Korea and Singapore were also included as they were considered part of the newly industrialised countries (NICs), and hence important (Porter, 1990a). Yet, the nations studied demonstrated very different patterns of industry success. As discussed, a competitive profile of each successful country and industry was developed and assessed over three discrete periods, these included: 1971, 1978, and 1985. A longitudinal study approach was adopted to show how patterns of competitiveness had changed within industries and nations over time. Porter (1990a) argued that changes were precipitated by new technology, international trade, and the competitive growth of newly industrialized nations.

Porter (1990a) stressed that most previous studies of competitiveness focused predominantly on single nations and relied on bilateral data comparisons. He argued that findings from bilateral studies often lacked robustness when a third or forth nation was added. While this criticism could be directed at this study, unlike Porter's work which

concentrated primarily on a nation's most successful industries, investigations for this thesis have been confined to a discrete sector of an economy. It is argued that this facilitates a more accurate appreciation of the productive output and competitive nature of successful, less successful, and relatively unproductive manufacturers that existed in Australia. For instance, the nature of competition suggests some manufacturers would adopt certain competitive attributes while others would not. Furthermore, a single nation, single industry sector assessment is not subject to indigenous cultural comparisons, intra-country bias, or potentially flawed by the inherent differences of a nation's work ethic or politics. Notably, these tendencies or limitations were not omitted from Porter's (1990) studies.

The literature suggested Porter's (1990) studies encompassed two separate dimensions. The first was to identify the actual characteristics in which a nation's firms were considered internationally successful based on published data. Indeed, Chapter 4 noted this incorporated the 'major' industry sectors of each unique nation studied. Porter maintained a methodology such as this ensured the commonality of analysis procedures and integrity of the data complied. For the second dimension he argued the best measures of international competitiveness were deemed to be:

(1) the presence of substantial and sustained exports to a wide array of other nations; and

(2) significant outbound foreign investment based on skills and assets created in the home country (Porter, 1998, p.27).

As noted in earlier discussions, the former aspect of data collection examined the history of competition in each nation. This was done principally to understand the dynamic processes by which the 'notion of competitive advantage' was created and sustained.

Chapter 4 summarised the basis for the assessment criteria used by Porter (1990). This chapter also described the differences required to facilitate successful adoption of Porter's methodology in an Australian context. However, five major factors of difference were highlighted. Contrary to Porter's work, the significance of multinational manufacturers to the Australian economy was stressed. The revised model illustrated by Figure 7.1

similarly reflected the broad capability of this structure to facilitate assessment of competitiveness at a sector of an economy level. As previously explained, because the revised model concentrates solely on Australian manufacturing, unlike Porter's methodology, there is no requirement to breakdown a nation's 'Top 50' individual products and their respective industry contributions 'in terms of world export share by nation' (Porter, 1990a, pp.284-6). Given the single nation - single sector focus of this thesis, the need to analyse the macroeconomic factors noted below have been omitted from Porter's (1990a, pp.22-3) framework.

- Population in 1987;
- Land area;
- Population density in 1987;
- Compound Annual Population Growth, 1950-1987;
- Gross Domestic Product (GDP) in 1987 at 1980 prices, 1950-1987;
- GDP per capita in 1987 at 1980 prices;
- Compound Annual Growth in GDP in 1980 prices, 1950-1987;
- Compound Annual Growth in GDP per capita in 1980 prices;
- Compound Annual Growth in industrial production, 1950-1987;
- Compound Annual Workforce Growth (employed persons) 1950-1987;
- Unemployment; and
- Average unemployment comparative data, 1951-1987.

Having discussed the rationale for the major differences to Porter's model, it is appropriate to summarize the key attributes of the preferred methodology being used. Based on the Competitiveness Model (Figure 7.1), the four major determinants encapsulated similar characteristics to Porter's model of National Advantage (Porter 1990, p.72). In contrast to Porter's model, however, notions of competitiveness are confined to the idiosyncratic nature of the manufacturing sector. From a strategic perspective this facilitates the development and enhancement of the sector's determinants and also allows focus on each discrete factor of Australia's 'diamond'. Additionally, since the focus is on manufacturing competitiveness, the research methodology will reflect parameters integral to each hypothesis. Distinct from Porter's work the research will attempt to ascertain the relatedness between identifiable factors. For instance, the compilation of hard data intrinsic to the sector's productivity, R&D, exports, financial investments, and extent of imported manufactured products will be possible. Moreover, the nature of a single nation assessment will not be degraded by the comparative

influences or bias of other nations' wealth, technological superiority, or extent of political interference.

Consistent with Porter's work consideration was given to the assessment of unemployment data relative to Australia's manufacturing sector. However, this view was dismissed because of the inextricable links between employment and productivity and the likely difficulties arising from attempting to isolate the causal impact on employment of study findings. For instance, substitution of capital for labour, new technology, internal efficiency, and changes in employment mix played a significant part of employment trends. Accordingly, for analysis purposes, labour productivity will be included as part of the industry's total productivity. Moreover, in Australia between 1983 and 1996, manufacturing was subjected to the increasing pressures of global competition. This phenomenon, arguably, impacted the vast majority of unqualified and unskilled workers ultimately displaced from the manufacturing sector (Mahony, 1993). Inevitably, they had become vulnerable to retrenchment as a consequence of competition, factory automation, and the restructuring processes taking place nationally in response to the need for improved manufacturing productivity.

From the above it is contended there are 'significant benefits' attributable to a methodological approach such as this. Not the least of which eliminates the need to 'pick and choose' what is an appropriate product, industry, or group of industries to assess from an international perspective. By removing the potential for intra-nation bias, (which could have influenced Porter's choice of nations) the '*real competitiveness*' of a sector of an economy can be examined. This will be possible because there is no requirement to discount certain companies or industries due to performance, personal preference, political reasons, or to ensure focus on *...the most important groups of competitive industries in the economy* (Porter, 1990a, p.26). The next section will expand on the discussion of the preferred methodology to investigate the research hypotheses, and the key research question.

8.3 Methodology to Examine the Key Research Question

Given the intrinsic links with Porter's (1990a) methodology, it is reasonable to suggest that a similar quantitative-based research approach is suitable to investigate the key research question posed in this thesis. As alluded to previously, this methodology is deemed appropriate for a number of reasons:

1. The methodology has been utilized successfully throughout the world by numerous governments as an economic and competitive benchmark to compare the specific policies of each country (Enright, 1993, 2000). With respect to Porter's ten nation case study, his methodology has been applied to a number of cities, metropolitan regions, and in many first and third world countries and industries (Porter, 1998a).
2. Importantly, the nature of Porter's methodology systematically accommodates industry level analysis, and can be adapted for specific industries. This has been demonstrated by Jacobs and de Jong (1992), Yetton et al. (1992), Enright (1993, 2000), Foss (1996), Clancy and Twomey (1997), O'Connel, Egeraat and Enright (1997), O'Gorman, O'Malley and Mooney, (1997), Danson and Whittam (1999) and Mackinnon (2000) amongst others, who have all successfully applied Porter's model. Similarly, the methodological process has the capability to generate unique recommendations to assist an individual sector of an economy's competitiveness, which in combination with other sectors could help increase national level of productivity (Porter, 1990a).
3. The 'Diamond of National Advantage' as a framework incorporates the capacity to influence a nation's determinants of competitive advantage and its inherent macroeconomic and microeconomic conditions. At an industry level the framework can help shape company strategies, industry structure, infrastructure, location, and the effectiveness of supporting industries.
4. It provides the capability to measure competitiveness by identifying the specific parameters that impact an economy at a national level, or alternatively the lack of.

5. The methodology is still relevant. For instance, the Diamond methodology has been used recently in a major United Kingdom study of competitiveness, and is currently being used in other countries (Porter and Ketels, 2003).

It should also be noted that the use of a quantitative research–based approach similar to that used by Porter and others represents a robust methodology widely used in academic inquiry (see for example, Glaser and Struass, 1967; Enright 1991, 1993, 1995, 1998; O'Malley and Egeraat, 2000). Quantitative research methods employ systematic procedures to test, and verify hypotheses (Glaser and Strauss, 1968). In seeking answers, a quantitative approach relies on the use of predetermined response categories by means of standardised data collection instruments so as to enable statistical techniques to be applied in the interpretation of data (Demirbag, 1994). The standardised measurement is intended to enhance the reliability of the analysis, facilitate replication studies, and allow generalisation to a larger population (McClintock et al. 1983). Thus, the processes of data collection, analysis and theory to generate practical outcomes are much more closely linked through quantitative research (Glaser and Struass, 1967; Jorgensen, 1989).

While the preferred methodology follows Porter's, it is important to substantiate the justification for the particular data collection processes to be employed. Mostly, results from his ten nation study were based on historical comparisons of individual nations and their respective industry's performance. It is worth reemphasising that Porter's (1990a) initial analysis concentrated predominantly on the compilation of...*available statistical data, supplementary published sources* (Porter, 1990a, p.24). By replicating this course of action ensures the research question posed in this thesis can be adequately answered from a recognised methodology, similarly based on the use of secondary data. In the context of this thesis, a comprehensive analysis is possible utilising relevant data which has been previously sanctioned by authoritative sources such as the Australian Government, OECD, and the public service and associated bodies.

This point is vital to the credibility of this research because often there is a correlation between variables, however, this does not necessarily lead to a causal explanation

(Kumar, 1997). Wright (1995) argued that complex issues identified as important areas of inquiry in management are not always amenable to neat statistical analysis. Boyacigiller and Adler (1994) also reported there is a lack of fit between some research with its dependence on rigorous quantitative methods and internal validity, and the nature of studies that are dependent on context requiring high levels of external validity. They noted...*research methods are driving knowledge production rather than the problems and needs of managers and policy makers* (p.270). Wright (1995) suggested that in terms of assessment, combining quantitative methods with detailed knowledge gained through literature searches is much more meaningful and has a greater probability of being valid. This avoids the trap articulated by Weick (1989) who maintained that researchers should be less concerned whether their techniques are 'scientific' and more concerned whether the research might lead to more meaningful findings. In addition, however, in accordance with Boyacigiller and Adler (1994) and indeed Weick (1989), it is imperative that data compiled is interpreted intelligently. Arguably, this would reduce the potential for *...processes of theory construction being hemmed in by methodological strictures that favour validation rather than usefulness* (Weick, 1989, p.516).

Equally, identification and detailed examination of the interrelationship of the factors deemed integral to the dynamics of competitiveness are crucial. This will involve consideration of the dependent, independent and any moderating variables pertinent to the research question. While 'competitiveness' for all intents and purposes notionally represents the dependent variable central to the theoretical framework, it is also essential to test the relationships that exist amongst the key factors identified in the detailed literature search. Investigation of these components is vital to establishing the validity of the framework as their influence may independently and jointly impact on the extent of manufacturing competitiveness. Given the variables, it is important to reflect on the relationship between the literature survey and the significance of Porter's (1990) work, and how this relates to the revised framework. Roth (1992) maintained the increasing complexity of modern manufacturing fundamental to developing efficient enterprises is stimulated by the multi-causality of phenomenon. This, in essence, avoids simplistic notions that one variable causes another (Sekaran, 1992). The literature showed that

while each variable or key factor can act independently and can be managed, in terms of competitiveness, key factors interact with varying degrees of intensity (Yetton et al. 1992; Enright, 1993, 2000; Foss, 1996; O'Connel, Egeraat and Enright, 1997; and Danson and Whittam, 1999).

Porter's (1990a) studies employed a causal research design. This approach is also appropriate for this thesis because it delineates the *important dependent and independent variables* associated with the development of competitiveness generated at a sector level. It also allows examination of various factors related to competitiveness more so than relying on cause and effect relationships obtained from a general industry perspective (Billings and Wroten, 1978). By assessing these relationships reliable information regarding their association can be ascertained. Importantly, this will more accurately facilitate testing the hypotheses relevant to the research question. Sekaran (1992, p.16) described this type of approach as the "hypothetico-deductive method". This is a seven step process incorporating: observation, preliminary information gathering, theory formulation, hypothesizing, scientific data collection, data analysis, and deduction.

As noted previously, Porter (1990a) and other researchers used similar approaches to answer research questions analogous to this work. As a consequence, within the context of this thesis there is justification for pursuing a similar process. Moreover, due to the multiplicity of available data on the manufacturing sector there is significant latitude for its independent verification. This approach enables focus on the specific components impacting on competitiveness and allows a more accurate assessment relative to the cause and effect interventions of industry policy. Hence, from a theoretical and practical perspective, a quantitative approach similar to Porter's is suitable for the examining of the research question. The next step is to discuss how this will be undertaken.

8.4 Data Collection Methods

Consistent with the reasons for amending Porter's methodological framework it is necessary to review the specific instrument to be used to garner relevant data for this

thesis. Sekaran (1992) argued that purposeful analysis of research questions demanded the use of quality data acquired from sources pertinent to the nature of the inquiry. Given the constraints associated with the data collection methods discussed in Chapter 7 and again in this chapter, compilation processes have concentrated on the generation of secondary source data accessible from the public domain. Kumar (1997) noted, however, that most data collection methods contain inherent bias. Given the need for substantiation of data, in some cases there may be a requirement to re-interpret data to allow comparisons and statistical correlations to apply.

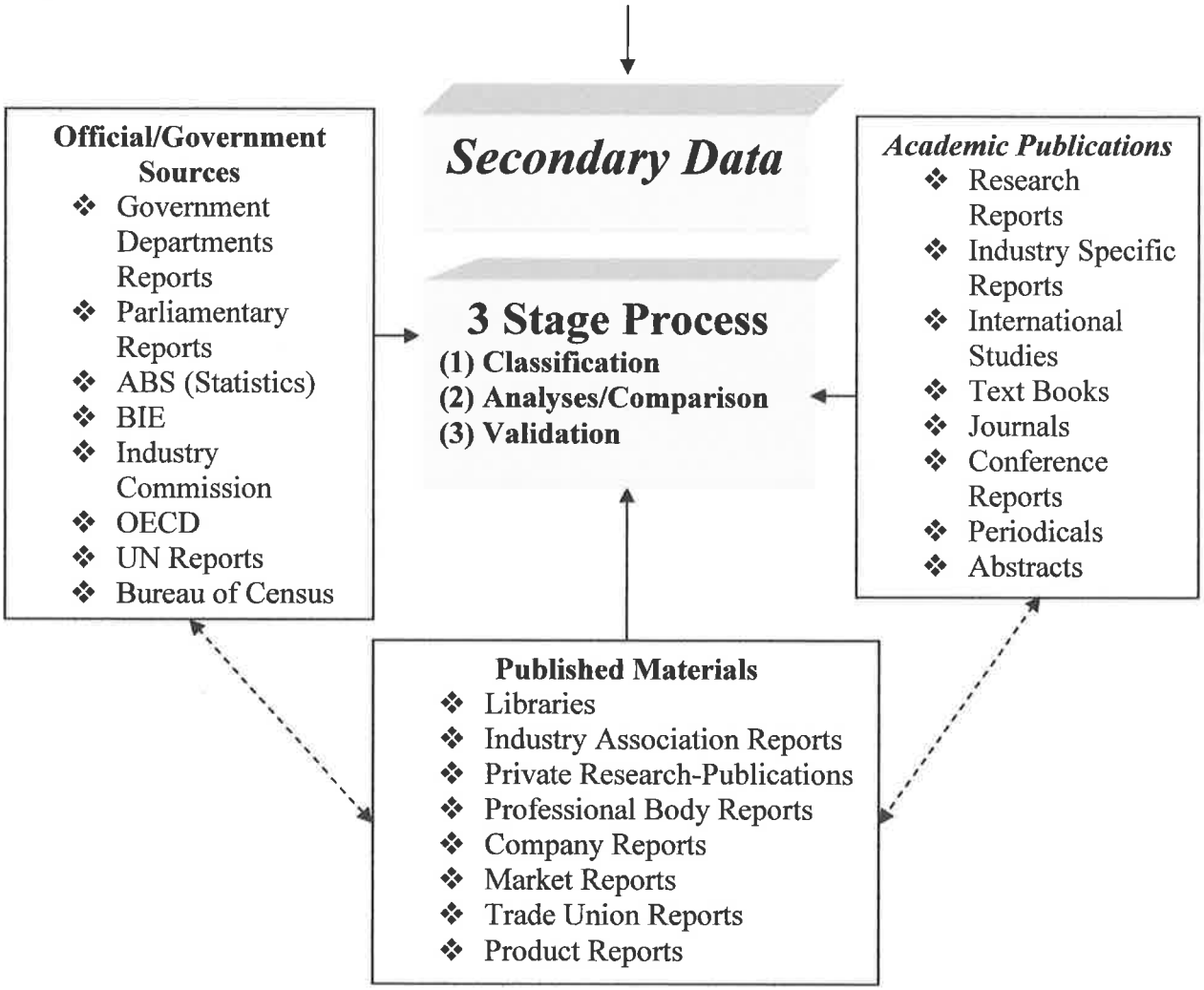
Arguably, collecting data through multi-methods and sources lends rigour to the quality of data and legitimizes the nature of the search. In the context of this thesis secondary data were preferred because of the abundance of Australia–wide 'official' archival sources available. What is more, this enabled access to extensive documentary evidence that has been published on the topics to be investigated. It is argued that for the specific purpose of testing the hypotheses generated in the previous chapter, the use of secondary source data is more appropriate. A detailed representation of the typical secondary data sources used is shown in Figure 8.1.

Figure 8.1 represents the comprehensive nature of available secondary data sources. It also highlights the extent of data interaction that exists between Government and specialist bodies, academia, and the private sector. Using a non-linear approach for data acquisition offers an unobtrusive collection method to help ensure the quality of the information obtained. For instance, extracting data from verifiable records for assessment arguably provides a more precise and reliable information source than gathering data subject to personal opinion.

Consistent with Figure 8.1, most of the data to be analysed in this thesis was complied from 'national' data gathering institutes such as the Australian Bureau of Statistics (ABS), the OECD, the Industry Commission (IC), the Bureau of Industry Economics (BIE), numerous government departments and various specialist industry bodies. Indeed, in order to develop a suitable frame of analysis some six to eight weeks was spent searching

and refining ABS data, and also seeking clarification of certain statistical dimensions. What is more, when collecting the primary set of data, some needed further clarification, notwithstanding cases where there were time series changes and where there was insufficient data available. It should also be stressed that in the context of ascertaining certain national data related to the manufacturing sector, the ABS was commissioned to compile statistical information in a form previously unavailable.

Figure 8.1: A Classification of Secondary Data



Supplementary data were also collated and examined. This included published material compiled from similar competitiveness research findings, statistical records, media reports, and precise information generated from other researchers' experience and documented studies. Given the nature and extent of material it was possible to

undertake detailed analysis, data comparison and corroboration of findings from the multiple sources of evidence compiled from various government, semi-government and independent authorities. To my knowledge, no other researcher has looked at these data from the same perspective or in this specific time frame. Indeed, analysis of this type has not been done consistently in the context of the hypotheses being tested. Furthermore, the integrity of using these data can be substantiated by the fact that the validity and reliability of government and semi-government data has to withstand the scrutiny of bureaucratic processes. By necessity, public service validation processes constantly test data in terms of continuity, format and accuracy prior to publication (AGPS, 1989). In particular, the comprehensive nature of data compiled from the public domain meets the construct validity tests highlighted by Kidder and Judd (1986).

While Porter's studies incorporated face to face interviews, this technique was not considered appropriate for this study, primarily because of the historical nature, logistics and costs associated with this undertaking. Notwithstanding, a series of firm level case studies may have been appropriate for this thesis. However, similar to the reasons detailed above, issues of currency, appropriateness, and the ability to achieve effective comparison negated their use. Furthermore, given the political perspective or issues surrounding this thesis, intentional or even unintentional bias could be generated through interview responses. In particular, preference for support of a particular industry policy perspective could in some cases affect the overall study by creating an unacceptable risk to the validity and accuracy of data and subsequent findings. Unlike Porter's (1990) studies which were essentially comparing national level attributes, the topics addressed here cut across a number of politically sensitive policy areas.

8.5 Analysis of Data

The reference periods utilized in this thesis are significant, not only because they encompass the Hawke-Keating Government's time in office, but they also reflect a significant phase of global change in manufacturing competitiveness. As noted, Porter's (1990) research material was compiled retrospectively from historical sources. Time

series data from industries categorized as representative of the most important group of industries in each nation were evaluated over a fourteen year period to assess appropriate phenomena. Consistent with Porter's quantitative assessment, a similar analysis will be replicated in this study to examine the impact of the variables previously discussed during the 1983 and 1996 period. It is important to note, the use of tabulated data based on historical sources are entirely applicable to the significance of the hypotheses being tested (Grinnell, 1993).

Similar to Porter's (1990) studies, the data compiled for each category will be assessed based on an analytical approach, essentially statistical. This will enable reporting of the results in the context of the hypotheses. Data will be cross-referenced for accuracy, currency, and objectivity. The correct interpretation of these data is critical in order to clarify and isolate specific causes and correlations relative to manufacturing competitiveness. Notwithstanding the strong connection between the topics being assessed both nationally and internationally, they do, however, lend themselves to individual measurement and therefore, comparative statistical processes. In a number of instances data will be used to reflect percentage change in activity, as well as to depict performance trends over certain time periods of interest. However, the changing dimensions and criteria associated with each factor make it extremely difficult to consistently formulate logical correlations and arguments with the use of certain statistical instruments. In the same way, the breadth of topics reviewed and the limited scope to establish commonality with the findings, such as those typically achieved through factor analysis, tests of significance and the like, is difficult with some categories.

However, given the nature of these data, it is important to stress why a quantitative-based research methodological approach is particularly suited to this thesis. Firstly, as Wright (1995) argued, qualitative research based on secondary data allows the generation of better, more durable theories because it is induced from actual data. Secondly, the data compiled are based on similar measures and criteria to that used in Porter's longitudinal studies, albeit in this case limited to the manufacturing sector. Thirdly, the underlying premise of the hypotheses to be tested implies the key to Australia's manufacturing

competitiveness is closely integrated with the interrelationship and collective impact of these various factors. Fourthly, Porter maintained that national productivity and processes of international trade underpinned the basis of a nation's competitive success. In light of this, the nature of the data being assessed with respect to Australia's manufacturing sector has been compiled from performance based activity pertaining to manufacturing productivity, international trade and investment. Thus, analyses of the dependent and interdependent relationships that exist between the hypotheses to be tested may in all likelihood provide justification to accept or refute their validity, with regard to factors inherent in competitive success.

In summary, a process as such is aligned to Kumar (1997) who argued a quantitative research methodology is appropriate to quantify variation in a phenomenon, situation, problem or issue. In the same way, where it is necessary to divorce phenomenon from its context in order to isolate certain variables for control purposes, a quantitative approach is preferred (Yin, 1984). It also meets the design test criteria noted by Kidder and Judd (1986, pp.26-29) in that *...the 'construct validity' used provides testable operational measures for the concepts being studied.* This conforms to 'external validity and reliability tests' deemed necessary by both Yin (1984) and Kumar (1997). It is also of note that causal links in real life interventions are too complex for survey or purely experimental strategies (see Cronbach et al. 1980; Guba and Lincoln, 1981; Patton, 1980; and Yin, 1993). What is more, Barzun and Graff (1985) maintained certain principles remain a mandatory part of developing robust data to maintain a 'chain of evidence' which is based on data continuity. Hence, it can be argued that the reliability of information compiled through secondary data used to test the hypotheses will actually be increased.

8.6 Summary

This chapter discussed the preferred research methodology and identified its fundamental differences from Porter's (1990) original methodology. It then went on to discuss the methodology to be used to examine the key research question posed in this thesis.

Essentially, a quantitative-based approach similar to Porter's was decided upon as a basis with which to examine the interrelationships of the hypotheses being tested.

Data collection methods were then described consistent with the nature of the data being compiled and assessed. In essence, this substantiated the use of secondary source data acquired through multiple sources of evidence from a broad spectrum of institutes and specialist bodies as a suitable frame of analysis. The processes adopted to undertake the analyses of data were also briefly described. It was important to emphasize the comprehensive nature and validity of the available data. The next chapter will test the validity of each hypothesis in terms of its relationship and influence on the competitiveness of Australia's manufacturing sector.

Chapter 9 Data Testing, Results and Analysis

9.1 Introduction

In this chapter the hypotheses developed previously will be tested in the context of the data collection process used as part of the preferred research methodology described in Chapter 8. The objective of this analysis will be to provide evidence to confirm or refute whether or not competitiveness in Australia's manufacturing sector improved during the Hawke-Keating period in government.

9.2 Investigation of the Research Hypothesis

The main purpose of this section will be to test the research hypotheses generated in Chapter 7. Focused at the enterprise level each hypothesis will be considered in terms of its influence on manufacturing performance. From a detailed analysis of data generated, the hypotheses will be either rejected or fail to be rejected. With respect to competitiveness, data will be presented in a series of cross-data tabulations reflecting each specific factor being assessed. This will allow comparisons to be made on the performances of Australian manufacturers from 1983-1996, and then against OECD nations across pertinent time frames. Findings may provide an alternative industry policy perspective based on the specific factors which may or may not directly influence Australia's manufacturing competitiveness.

9.2.1 Investigation of Hypothesis 1

Hypothesis 1 suggested there was no change in Australia's manufacturing productivity over the period 1983-1996. The validity of this could have serious ramifications for the sustainability of manufacturing given the relationship that exists between the need to improve productivity and Australia's resource capability. Yet, as previously discussed, there is no single source of competitiveness. According to Porter (1990a) the determinants of a nation's competitiveness operate in isolation but their combined

influence acts as a powerful mutually reinforcing system. Ergas and Wright (1994), and Sheehan et al. (1994) argued that the key to sustaining manufacturing competitiveness at an international level is based on improving productivity. This would imply that competitiveness in manufacturing is achieved by exploiting the discrete characteristics which individually and jointly impact on productivity. In an Australian context determinants are manifest in government industry policy, industry infrastructure, manufacturing strategy, expertise of labour, and the presence and application of resources. Accordingly, these factors need to be constantly upgraded to facilitate competitiveness and sustained growth (Porter, 1990a).

Consistent with testing the first hypothesis it is important to discuss the measurement processes adopted for this thesis. In simplistic terms, productivity is the ratio of input to output and, relative to inputs this largely includes human resource efforts. As mentioned previously, employment issues will be considered as part of overall productivity. Notably, however, the Labour Government's election mandate promoted a reduction in unemployment consistent with the Accord and its subsequent tripartite agreements (Hawke, 1983).

In recent decades, developed economies have relied less on input growth and focused more on aspects of 'productivity' as an effective measure of increased output. It is argued that the best way to test the validity of Hypothesis 1 is to assess multifactor productivity (MFP) from both a national and international perspective. The OECD (1989a) noted that multifactor productivity indicators are the preferred means to measure manufacturing efficiency. Accordingly, it is important to explain the term 'multifactor productivity' in the context of this thesis. Labour productivity and capital productivity are only partial indicators of multifactor productivity, so from an overall efficiency perspective they need to be explained. (also, refer to Appendix 2, Productivity determinants).

In the first instance, the output concept used for calculation purposes is based on 'value added' in production. This is measured by subtracting from gross output an estimate of intermediate material inputs and activities used in production. Thus, an industry's output

is measured as the industry's value added. This is the market value of goods and services produced by that industry after deducting the cost of goods and services expended by the industry in production (ABS, 1995). In general, this allows changes in output to be decomposed into changes arising from inputs and growth, reflecting factors such as productivity-induced growth. Productivity growth is calculated by subtracting the contributions attributable to growth in inputs from output growth. So, the efficiency of labour and capital, arguably, major factors of productivity, are directly related to creating value added. Defined in this way, productivity is referred to as multifactor productivity (MFP). Similarly, at a national level, these indicators correlate with gross domestic product (GDP). Thus for clarity, the approximate relationships between growth in labour productivity (*lp*), growth in capital productivity (*c*), growth in capital–labour productivity ratio (*k*) and growth in (MFP) can be seen from the following:

$$lp = ak + m$$
$$c = (a\text{-}l)\ k + m$$

Where (*a*) is the capital share in total factor income.

Therefore, an increase in the capital–labour ratio (capital deepening) raises labour productivity (each unit of labour has more capital on average with which to produce output) but correspondingly, reduces capital productivity (each unit of capital has less labour on average to produce output) (PC, 1996).

Consistent with Australia's industry policy focus, it is important to show how improved 'multifactor productivity' impacts on for example, manufacturing sector employment. To demonstrate the full effect of (MFP) on employment during the Hawke-Keating period, it is necessary to illustrate the preceding trends (reference Table 9.1). By way of explanation, factors which contribute to labour productivity and the lower input requirements per unit of output dominate the output effects, causing overall employment in manufacturing to decline. The main factors leading to lower labour requirements are associated with additional capital per unit of labour input which arguably underpins improvements in multifactor productivity. Likewise, the relocation of labour to more capital-intensive activities would infer that rather than accumulate additional capital with diminishing returns to promote growth, capital will be utilised more effectively to

generate greater output. Therefore, it is necessary to simultaneously increase both labour and capital productivity to improve multifactor productivity. In the same way it is reasoned that through industry policy designed to increase capital investment, improved work-practices and specialisation, competitiveness can be stimulated by the effective use of Australia's resources.

Table 9.1: Decomposition of Changes to Manufacturing Employment Levels: 1968-69 to 1994-95 (000)

Total Manufacturing Employment 1968-69		**1265**
Employment Level Changes due to:		
Output growth (employment)		**550**
Employment Level Changes due to:		
Input growth and usage		
• Growth in labour input per person	-174	
• Relocation of labour	-11	
• Growth in capital per unit of labour input	-341	
• Relocation of capital	-20	
• Growth in multifactor productivity	-336	
• Other	-9	
Sub Total		**-891**
Net Changes in Employment (Outputs and Inputs)		**-341**
Total Manufacturing Employment 1994-95		**924**

Source: Based on ABS and Industry Commission Estimates

Table 9.1 demonstrates the decomposition of changes in manufacturing employment between 1968 and 1995 and highlights the consequences of output growth on these employment changes. It is vital to emphasise the real impact of multifactor productivity on manufacturing sector employment. For instance, the short-term affects of increased productivity shown in Table 9.1 arguably reflects negatively on jobs. In the absence of counter policy measures, reduced employment would in all likelihood prove to be problematic for Trade Unions and workers in general (see, for example, Jackson, 1975; Crawford, 1979). The positive outcomes, however, appear to indicate substantially

improved operating performance due to the increased productivity levels realised throughout the sector.

The consequences of output growth on employment changes are also highlighted. These data have been generated from ABS and Industry Commission estimates. Each section represents the specific details of the decomposition of labour which occurred during the specified period. In 1968-69, for instance, employment in the manufacturing sector stood at 1.27 million. Second level data shows that between 1968 and 1995 employment growth equivalent to 550,000 employees occurred in the manufacturing sector. In level 3, six factors have been identified as unique features and measures of corresponding input growth and usage. Evidence from Table 9.1 suggests that major growth in labour input per person and the effect of increased capital expenditure per unit of labour input had substantially contributed to productivity improvements over the reference period.

Indeed, as Table 9.1 shows, multifactor productivity in general appeared to have the most prolific impact on employment levels. These findings also suggest that increased competitiveness was forcing domestic manufacturers to improve productivity, and as a consequence, this efficiency justified the need for less labour. Thus, between 1968 and 1995 manufacturing performance appeared to have improved through the adoption of various productivity measures. However, whilst Table 9.1 represents changes in employment during the Hawke-Keating period in office, these data do not fully reflect manufacturing performance, particularly by sector. To achieve some indication of this it is necessary to provide a more comprehensive assessment.

Importantly, a number of points need to be clarified from the above:

(1) Hypothesis 1 stated there was no change in productivity between 1983 and 1996. Data shows that output growth appears to have improved, as a consequence of reduced labour levels contributing largely to increased multifactor productivity. To confirm or refute this additional analysis is necessary.

(2) The previous section discussed the various components of multifactor productivity. To maintain continuity, data assessed in the rest of this section reflects changes in multifactor productivity at national and international levels.

(3) As noted earlier, OECD estimates of multifactor productivity reflects the performance of all industry sectors. To facilitate an accurate comparison with Australia this will be replicated. However, Australia's productivity performance will also be assessed on purely manufacturing sector data.

Table 9.2: Average Annual Growth in Real Output by Manufacturing Segment 1983 to 1996 (per cent)

Manufacturing Sector	1983 to 1991	1992 to 1996	1983-96 Average Growth
Food, beverage and tobacco	2.0	4.3	2.7
Textiles, clothing, footwear and leather	0.9	-4.7	-1.0
Wood and paper products	1.3	1.9	1.5
Printing, publishing and recorded media	3.3	5.5	4.0
Petroleum, coal, chemical and associated products	2.8	3.0	2.8
Non-metallic mineral products	2.1	9.9	4.7
Metal products	3.8	2.5	3.4
Machinery and equipment	1.9	6.9	3.6
Other manufacturing	2.3	8.1	4.2
All Manufacturing	**2.3**	**4.2**	**2.9**

Note: Transport and Equipment is included in Machinery and Equipment
Source: Based on ABS Cat.No.5206.0 and Industry Commission data (various years).

Table 9.2 demonstrates the average annual growth in percentage terms of real manufacturing output. Based on ABS statistical estimates these data describe manufacturing output by segment between 1983 and 1996. Importantly, data illustrates the impact of productivity related policies, in particular, those that encompassed the 'manufacturing improvement plans' promoted by Senator Button. They also reflect the impact of macroeconomic policies, tariff reduction, devaluation, and laterally the stimulative effects of the Government's investment incentives. Average annual growth in real output in percentage terms achieved by each manufacturing segment is also shown.

In line with industry policy changes in the performance of key segments of Australian manufacturing are presented across two discrete periods. A third column has been included to demonstrate the average growth that had occurred over the Hawke-Keating period. In column 1, between 1983 and 1991 consistent with the various productivity initiatives introduced, data shows that average annual growth performance had increased by 2.3 per cent on base figures. The 'metal products' sector stands out showing 3.8 per cent annual growth. It could be argued that in general this reflected the specific emphasis placed on manufacturing improvement, particularly the need for increased international competitiveness. The performance of 'other manufacturing and petroleum, coal, chemical and associated products, printing, publishing and recorded media' also increased.

The slower growth in TCF and machinery and equipment segments, however, appears to reflect the impact of tariff reductions. In the second period from 1992 to 1996, the real impact of the tariff reduction programs which commenced from around the mid 1980's can be seen. In column 1, the textiles, clothing and footwear and leather sector shows an average increase of 0.9 per cent from 1983-84 to 1990-91. But in column 2, this industry segment experienced an overall decline of 4.7 per cent in the period between 1992 and 1996. Arguably, this contributed substantially to increased levels of unemployment (DIST, 1996). Moreover, the Industry Commission (1997a) later noted that the impact of tariff reductions, results of industry restructuring and the shift to offshore manufacturing was apparently more prevalent in this sector.

With the exception of the TCF industries, manufacturing growth in real output increased to 4.2 per cent on average. The contribution of non-metallic mineral products, other manufacturing, and machinery and equipment in column 2 warrants comment. These data show an increase of 9.9 per cent, 8.1 per cent and 6.9 per cent respectively following the recession of 1991-92, and the start of the new Keating Government. Also, the real output of the food, beverage and tobacco segments more than doubled. This suggests improved productivity and value added occurred in processes attributable to the efficient use of Australia's primary products, and substantiated the effective use of upstream and downstream capabilities contributing to the sector's growth (Keating, 1996). Column 3

represents the average growth of all sectors which was running at 2.9 per cent between 1983 and 1996.

Notwithstanding the performance of non-metallic mineral products, other manufacturing, and printing and publishing up to 1996, findings suggest that a change in market focus had occurred. A large part of this increase represents ETMs which supports the argument that Australia's manufacturers should focus on the production of high value added goods (IC, 1996b). It is not unreasonable to suggest that the policies introduced by the Government helped stimulate domestic and export opportunities in the face of greater competition from global markets. Results also confirmed, however, that low value products synonymous with the textile, clothing, and footwear industry, were not likely to be part of Australia's long-term manufacturing focus. Gretton and Fisher (1997) confirmed the rate of multifactor productivity growth in the manufacturing sector averaged around 1.8 per cent between 1983 and 1995/6. Productivity improvements in manufacturing similarly made a strong contribution to output growth (IC, 1997a).

Building on the above discussion, the need to improve productivity faster than other nations was considered the key to increasing international competitiveness and promoting national prosperity (Porter, 1990a). Moreover, a number of writers have stated that international comparisons of productivity serve as an indicator of national competitiveness (Ergas and Wright, 1994; Sheehan et al. 1994; Bryan and Rafferty, 1999). While evidence has been presented to show that Australia's manufacturing productivity improved during 1983-1996, did it improve relative to that of the manufacturing sectors of Australia's competitor nations?

Appendix 3 provides the source data for this, and shows the multifactor productivity (MFP) performances of twelve OECD countries including Australia summarised for the period 1983 to 1996. Data have been compiled from the OECD Productivity Database (various years), and used as the basis for testing Hypothesis 1. These data reflect the accepted standard classification of (MFP) defined by the OECD (1989a).

To determine Australia's performance against other OECD countries a 'Fixed-Effect Panel Regression' (Model) serves as the particular econometric model applied to the data. This model performs linear regression analysis by using the least squares method. The model approximates how the dependent variable (multifactor productivity) is affected by variables related to the performance of each country, and across time. Thus the correlation coefficient percentage values can be determined in conjunction with the error variable. Whilst only limited data have been used, nonetheless, panel data modelling can explicitly account for within country variability across time, (see, for example, Islam (1995), and Folster and Henrekson (2001) which is an important factor for this particular data set.

Table 9.3 Fixed-Effects Panel Regression Model

Based on Selected OECD Countries – Average MFP Growth

Method: Pooled Least Squares – Sample Data: 1983-1996

Coefficient	Std Error	t-Statistic	R-squared	F-Statistic	Prob (F-Stat)
1.036	**0.097**	**10.636**	**0.204**	**2.912**	**0.002**

Adjusted R-Squared	SE of Regression	Sum Squared Residual	Mean Dependent Var
0.134	**1.139**	**162.39**	**1.036**

Fixed Effects			
Country	Coefficient	Country	Coefficient
Australia	-0.094	Germany	0.284
Belgium	0.148	Italy	0.130
Canada	-1.11	Japan	0.939
Denmark	-0.502	Sweden	-0.586
Finland	0.772	United Kingdom	0.119
France	0.247	United States	0.056

The empirical results presented follow a standard panel specification given as... $y_{i,t} = C + V_{i,t}$, $i = 1,...N$; $t = 1, ...,T$, where y is the dependent variable, Country, and *C(MFP)* being a set of explanatory variables over time, t, and between countries, i. The term $V_{i,t}$ captures the stochastic component of the data with V_i, $t = C = u_{i,t}$ where C represents the country effect for which $\alpha_i \sim (0,\sigma^2/\alpha)$ and u_{it} is a stochastic disturbance such that $u_{it} \sim (0,\sigma^2/\alpha)$. The model is estimated using generalised least squares. Given the

restrictive nature of the data (in terms of degrees of freedom), only results obtained from the 'fixed-effects model' are presented. In order to reject or fail to reject Hypothesis 1 the following analysis has been conducted. For each independent variable, we will test:

$Ho: \beta_1 = 0$ Australia's MFP remained constant between 1983 and 1996

$H_A: \beta_1 \neq 0$ Australia's MFP did not remain constant between 1983 and 1996.

MFP = constant + errors

Results from the model show that the intercept $\beta_0 = 1.036$ and represents the value of y when $x_1 \ldots = 0$. Based on 12 observations (137 pooled) the coefficient (MFP) representing all country data is 1.036%, with a standard error of 0.097% and a *t*-statistic value of 10.636. Notably, the *t* statistic is the coefficient divided by the standard error, given that the standard error is an estimate of the standard deviation of the coefficient, and shows there is a good linear relationship between x_1 and y, given the probability 0.000. The coefficient of determination denoted R^2, = 0.204 or 20.4% signifies the variability. Whilst this is fairly low, this can be explained due to the extent of intra-country variation of the variables. In the analysis of variance, another key factor includes the F-statistic = 2.912 which is the sum of the squares of the variables. This is higher consistent with the data. According to the model, this result has statistically significant predictive capability. The fixed effects model shows that the coefficient of growth relative to Australia's MFP performance (-0.094), Canada (-1.111), Denmark (-0.502) and Sweden (-0.586) are less than the pooled coefficient 1.036% calculated by means of the model. In terms of the level of significance the value of the *t* statistic 10.636 and the F-statistic 2.912 show statistically significant predictive capability, at 95% confidence level. The other countries which make up the rest of the table demonstrate significantly higher levels of MFP. In particular, Japan and Finland appear more productive.

Test of β_1

Significance level:	$\alpha = 0.05$
Decision rule:	Reject *Ho* if $t = \alpha/2 = t_{0.025, 12} = 2.179$,
Value of test statistic	$t = 10.636$
Conclusion:	As $t = 10.636 > 2.179$, reject *Ho*

These results confirm that Australia has not performed as well as some OECD nations nonetheless, in conjunction with the source data (Appendix 3) this analysis confirms that Australia's MFP performance increased, thus Hypothesis 1 is rejected.

9.2.2 Investigation of Hypothesis 2

It has been argued that R&D and increased productivity are fundamental determinants of a nation's technological progress and success (Porter, 1990a). Indeed, according to new economic theories in terms of productivity and long term R&D growth, these factors are considered symptomatic of a nation's competitiveness and essential to the infrastructure that drives innovation (Clark et al. 1996; Daniels 1997). What is more, support for Australia's science, technology, research and development policy similarly remained a legacy of past administrative arrangements. For all intents and purposes, it appeared to be built around public sector R&D which in the absence of a more strategic plan reflected the nation's cobbled contribution (James, 1997).

The second hypothesis to be tested reflects a criticism of Australia's manufacturers; that is, insufficient funds had been invested in research and development activity. As previously discussed, a number of observers contended this had actually retarded manufacturing growth and the production of high value, knowledge intensive products, and constrained Australia's global competitiveness. Mortimer (1997) also reported there was a strong correlation between the wealth of nations in terms of GDP per capita, and R&D intensity (R&D/GDP).

In order to test the validity of Hypothesis 2, the majority of statistical data have been sourced from the ABS, OECD, and BIE publications and summaries which have been previously generated through probabilistic analyses. Data from other industry bodies and official government sources have also been used to complement these. It should be noted that business expenditure on research and development (BERD) had become prominent as the universal standard for assessing Australia's R&D performance. For this thesis, it is important to qualify this position. BERD expenditure on R&D encompasses the total of all manufacturing sector research and development activities. Its use has been adopted by agencies such as ABS, the Industry Commission, and intermittently by the OECD.

BERD is also frequently utilized by academics and others for statistical validity and reporting in Australia.

The BIE (1995) stated there is greater accuracy in recording BERD because of the technology spill-overs, syndication, overseas R&D, and importantly for tax concessions. It was also reported in the Science and Technology Budget Statement 1995-96, that to enable international comparison of business expenditure on R&D common ratios are necessary due to the complications inherent in data compilation.[20] Banks (2000) maintained the links between multifactor productivity, Business R&D and tax concessions by their very nature incorporate broader influences of research. Commenting on a paper by Maddock (2000) assessing the effectiveness of BERD, Banks suggested that while 'phantom R&D' will invariably exist on the basis of tax concessions and the like...*the econometric evidence, while complicated by difficult measurement, interpretation and specification issues suggests that some of the best performers in manufacturing have been those with high or rising intensity* (Banks, 2000, pp.4-8).

Given the impetus of R&D in terms of innovation and the improvement of manufacturing competitiveness, it follows there is a need to exploit the opportunities it creates. Several commentators have argued that the functions of R&D are fundamental to the creation of new and improved product design, production processes, and the acquisition of new technology and other forms of innovation (see for example, Maddock, 2000; Guellec and van Pottelsberghe, 2001). As a consequence, there is justification to attain a greater commitment within Australia in order to exploit the nation's intellectual capabilities. Indeed, in a series of ongoing reports, innovation was noted by various bodies as the dominant factor in economic growth and patterns of world trade (MIST, 1996; DIST, 1995a). To reiterate, Hypothesis 2 stated that the level of Research and Development expenditure remained constant in Australia's manufacturing sector between 1983 and 1996. Accordingly, this proposition needs to be tested against the level of R&D expenditure which took place.

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[20] See OECD (1996) *Technology and Industry Performance*, which demonstrates that more than half of all OECD R&D expenditures are financed by industry and two thirds of all R&D investment is performed in the business sector.

Table 9.4 represents the level of BERD expenditure from around the start of the Hawke-Keating period in government.

Table 9.4: Business Enterprise R&D Expenditure 1984-85 to 1995-96

Period	Real BERD Expenditure ($m)	Annual Increase/Decrease %	Ratio of Real BERD to GDP (%)
1984-85	731	0	0.34
1985-86	948	29.6	0.39
1986-87	1,29	36.0	0.48
1987-88	1,46	13.1	0.48
1988-89	1,79	23.3	0.52
1989-90	1,99	10.7	0.53
1990-91	2,08	4.6	0.54
1991-92	2,32	11.4	0.59
1992-93	2,79	20.2	0.67
1993-94	2,95	5.9	0.72
1994-95	3,38	14.6	0.74
1995-96	3,99	18.2	0.88
(Ave) 1984-96	**2,15**	**17.05**	**0.57**

Based on ABS, Cat. No. 8104.0 and 8114.0.

The columns denote the specific time period, the real expenditure in $m, the annual increase/decrease, and the actual ratio of BERD to GDP in percentage terms. These data have been generated from ABS data catalogues. It can be seen from the above, BERD expenditure significantly increased in each period. Almost a five fold increase was achieved over this eleven year time horizon proving, categorically, that R&D expenditure had substantially increased. The largest year-on-year increases in real BERD occurred in 1986-87 and 1987-88, and again in 1991-92 and 1994-95. There is a clear correlation with government industry policy during these periods. For instance, 1985-86 reflected the first two years of the 150 per cent R&D tax concession, a more broadly based

program than before. Prior to this the Australian Industrial Research and Development Incentives Scheme (AIRDIS) had operated.

It can be argued that the marked increase recorded during the mid-1980's closely correlated with the stimuli created by Government industry plans, in particular tax-based incentives for R&D. This pattern plateaued in the latter part of the 1980's and early 1990's in line with the recession. Data appears consistent with the Government's policy statement on science and technology announced in May 1989. Following the recession of 1991-92 and synonymous with the thrust of the One Nation (1992) policy and other stimulative measures, R&D investment significantly increased. In 1995-96 the ratio of real BERD equated to 0.88 per cent of GDP, the highest recorded level.[21] Accordingly, on the basis of accepted national and international interpretations of manufacturing sector research and development expenditure by nations (OECD, 1996); there is strong evidence to suggest that R&D increased over the period. However, there are a number of factors which must similarly be considered prior to drawing policy conclusions from these data.

As discussed, productivity is measured on the basis of multifactor productivity (MFP). In the same way, this reflects the spill-over effects of R&D. It is strongly argued this underpinned the importance of technological change and potential for improved competitiveness based on knowledge-based processes. However, while data showed that BERD appeared to increase substantially throughout the Hawke-Keating period, this needs to be considered against the rate of increase achieved by Australia's international counterparts. In terms of data compilation, BERD is comprised of research data specific to nine ANZSIC statistical categories (accounting for approximately 60-65 per cent of BERD). BERD also includes some data relative to the mining sector and certain manufacturing service segments of the economy.[22] Thus, interpretation of these data must be treated with some caution, even though the data compilation method is applied internationally.

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[21] Notably, by 1999-2000 this ratio had steadily decreased to 0.64 percent of GDP under the new Liberal Government administration.

[22] ANZSIC, refers to the Australian and New Zealand Standard Industry Classification. This process provides a tiered statistical breakdown of industry specific categories and classifications.

It is useful to reflect on findings published by the OECD on the correlation between R&D and increased productivity (Porter and Ketels, 2003). One particular report studied the impact of R&D and productivity growth in 16 OECD countries over the period between 1980 and 1998. Guellec and van Pottelsberghe (2001) reported that an increase of 1.0 per cent in business R&D generated 0.13 per cent in productivity growth. They noted the effect was larger in countries dominant in R&D, and in countries where the share of defence related government funding was lower. It can be argued this is because the purpose of defence related R&D is not necessarily to improve productivity. Similarly, a 1.0 per cent increase from foreign R&D sources generated 0.44 per cent in productivity growth, with the effect being larger in countries intensive in business R&D. Also, an additional 1.0 per cent increase in public R&D could generate 0.17 per cent in productivity growth. In terms of manufacturing, Guellec and van Pottelsberghe (2001) also noted that business R&D had a positive impact on multifactor productivity, indicating that as well as boosting economic growth, it enhanced the sector's ability to absorb new technology from overseas and from government and university-based research.

Empirical evidence also suggested that Australian firms undertaking R&D had in some cases become more innovative. In its research report *R&D Innovation and Competitiveness* (1993), the BIE concluded that the 150 per cent R&D Tax Concession had contributed substantially to increased innovation, facilitated 17 per cent extra R&D, and had helped change managements' perception of the value of R&D. In another paper, *Beyond the Innovator: Spillovers from Australian Industrial R&D* (1994), the BIE highlighted the additional benefits to other companies, consumers, and society in general as a direct consequence of more enterprises undertaking R&D. Importantly, 'business innovation' combined the notion of newness and the notion of creating commercial value. Innovation is contained within aspects of new products and processes, new services, and new ways of doing business. For this reason the relationship between Australia's manufacturing success and innovation is critical.

Observers have argued that technological innovation is central to R&D as it supplied the 'newness' element fundamental to sustained competitiveness. Almost 40 per cent of all emerging exporters attributed their success to technology, 28 per cent to unique products, and 25 per cent to product design (BIE, 1994a). According to the BIE, exporters receiving the 150 per cent R&D tax concession were amongst those achieving the highest growth rates and had become the most technologically innovative. In addition, findings from a BIE (1993) survey which included 832 respondents comprising 546 small and 286 large manufacturers identified the important factors that influenced R&D decisions. This information is presented in Table 9.5.

Table 9.5: Factors Influencing Manufacturing R&D Expenditure

Factor	Small <100 employees	Large 100> employees	All companies
Create a competitive advantage	84.3	87.8	85.3
Exploit technological strengths	75.5	76.6	75.3
Changes in market opportunities	72.0	76.9	73.4
Changes in technological opportunities	63.6	68.9	65.0
Tax concession for R&D	66.8	58.7	63.1
Keep up with competitors' products	58.1	73.4	62.8
Cash flow position	70.2	46.2	61.7
After-tax cost of R&D	49.3	46.5	47.9
Retained profits	50.6	42.7	47.4
Pre-tax cost of R&D	48.0	41.6	45.5
Maintain a given ratio of R&D to sales	17.6	7.7	14.0
Level of competitors' R&D	10.8	10.8	10.8

Source: BIE 1993c.

Data in Table 9.5 shows factors categorized as 'important' and 'very important' in relation to decisions to commit R&D expenditure. This information has been compiled from the BIE. Of the twelve response categories, 'creating competitive advantage' is crucial to this thesis. Technological leadership and market opportunities also ranked highly. Importantly, tax benefits attributable to R&D expenditure appeared to be fundamental to the increased levels of R&D. Data also shows that constraints pertaining to the cost of R&D expenditure had to be closely managed, particularly regarding the cash

flow position of small companies. Interestingly, only 7.7 per cent of large companies indicated that maintaining a prescribed ratio of R&D to sales was a high priority. Yet, for small companies this was identified as 17.6 percent of the total.

While evidence suggests there had been an improvement in manufacturing related R&D, the number of manufacturers conducting R&D was extremely limited. It was argued that the financial contribution from Australia's private sector was well below that of its international counterparts (Maddock, 2000; Capling and Galligan, 1992). Lewis et al. (1996) reported some of the reasons for this were Australian industries had been slow to adopt innovative technologies and processes, products and services, and maintained only limited supplier relationships. They also argued Australia had restrictive product and labour market regulations which further inhibited its international development against its overseas counterparts.

What is more, from a policy perspective, if R&D is considered the cornerstone of leading edge technology, insofar as it underpins improved competitiveness, it must by inference reflect the challenges facing Australian manufacturers. Failure to maintain increasing levels of investment in innovation, new technology, and international best practice to at least international standards confines Australian manufacturers to a second rate existence. So how does Australia's commitment to R&D rank in comparison to its international counterparts?

Appendix 4 provides a summary of OECD country R&D expenditure as a percentage of GDP during the Hawke-Keating period. This has been used as the source data for analysis. These data reflect OECD accepted standard classifications of international R&D expenditure related to GDP and, arguably, demonstrate Australia's R&D competitiveness. Data have been complied from OECD Factbook publications reflecting various years. The same twelve countries used to previously assess MFP form the basis for determining the average R&D expenditure relative each nation's GDP.

Consistent with the nature of data, a 'fixed-effect panel regression' analysis will be conducted to facilitate interpretation.[23] Accordingly, based on a pooled least squares method the extent to which the dependent variable (R&D) is affected by the values of the independent variables will be assessed. Importantly, the correlation coefficient percentage values reflecting each country can be determined. The analysis also defines each of the 'effects specifications' which are also summarised in Table 9.3., page 203. In order to reject or fail to reject the premise of Hypothesis 2, the following analysis has been conducted.

Table 9.6 Fixed-Effects Panel Regression Model
Selected OECD Countries – Total R&D–Percentage of GDP

Method: Pooled Least Squares – Sample Data: 1983-1996

Coefficient	Std Error	t-Statistic	R-squared	F-Statistic	Prob (F-Stat)
1.999	**0.049**	**40.183**	**0.013**	**0.142**	**0.999**
Adjusted R-Squared		SE of Regression	Sum Squared Residual		Mean Dependent Var
-0.076		**0.578**	**41.127**		**1.999**

Fixed Effects			
Country	Coefficient	Country	Coefficient
Australia	-0.067	Germany	0.047
Belgium	-0.115	Italy	0.015
Canada	-0.012	Japan	0.085
Denmark	-0.092	Sweden	-0.014
Finland	0.015	United Kingdom	0.093
France	0.014	United States	0.017

For each independent variable, we will test:

Ho: $\beta_1 = 0$ - Australia's R&D expenditure remained constant as a % of GDP

HA: $\beta_1 \neq 0$ - Australia's R&D expenditure did not remain constant as a % of GDP

Thus, R&D = constant + errors

Results from the model show that the intercept $\beta_0 = 1.999$ and represents the value of y when $x_1 \ldots = 0$. Based on 12 observations (135 pooled) the coefficient (R&D expenditure) of all country data is 1.999 with a standard error of 0.097% and a t-statistic

[23] Refer to Figure 9.1 with regard to explanatory notes on Fixed-Effect Panel Regression Models.

value of 40.183. The coefficient of determination denoted R^2, = 0.013 or 1.3% variability. This is extremely low, but highlights the extreme variability of intra-nation variation of the variables. Other factors include the F-statistic = 0.142, however, the sum of the squares is high at 41.17 and provides significant predictive capability. The probability (F-statistic) = 0.999 is also significant.

The fixed effects model shows the coefficient of growth for R&D expenditure in Australia is -0.067. Other countries with negative levels to the coefficient are Belgium (-0.115), Canada (-0.012), Denmark (-0.092) and Sweden (-0.013). The United Kingdom (0.093), and Japan at (0.085) rate the highest based on the model calculations.

Test of β_1

Significance level:	$\alpha = 0.05$
Decision rule:	Reject *Ho* if $t = \alpha/2 = t_{0.025, 12} = 2.179$,
Value of test statistic	$t = 40.183$
Conclusion:	As $t = 40.183 > 2.179$, reject *Ho*

Similar to MFP, Australia is well behind some OECD nations. However, on a positive note, data in Appendix 4 shows there had been a positive upward trend in R&D expenditure within Australia during the Hawke-Keating period. Thus, results confirm that while Australia was well behind some OECD nations in terms of R&D expenditure relative to GDP, as a nation, R&D expenditure has increased. Therefore Hypothesis 2 is rejected.

9.2.3 Investigation of Hypothesis 3

Porter (1990, p.683) argued the central focus of national agendas should be...*to upgrade so that firms achieve more sophisticated competitive advantages and higher productivity.* He went on to note that raising productivity in industries is contingent upon advancing technology, innovation, and through penetration of foreign markets. Moreover, measures of manufacturing competitiveness amongst others are based on international comparisons of productivity, quality, efficiency, exports and imported product (BIE, 1990a). This is in sharp contrast to Australia's... *lagging economic performance which is closely linked to its poor export growth* (Hughes, 1989, p.xix). Amidst this international outlook,

however, and consistent with the first two hypotheses, the essence of the third hypothesis encapsulates Australia's manufacturing future in terms of achieving increased export performance against global market competition.

Table 9.7 represents data sourced from ABS upon request and shows the extent of manufactured exports produced during 1983-1996. These data portray export value, export propensity, industry turnover, imports, and show their respective growth patterns. In simple terms, export propensity refers to the level of exports as a percentage of total manufactured products. Industry turnover reflects the total value of manufactured production in $m.

Table 9.7: Real Manufactured Exports from 1983-84 to 1995-96

Year	Export Value (Real-$bn)	Growth %	Export Propensity [24] %	Industry Turnover (Real-$bn)	Growth %	Imports Real ($bn)
1983-84	12,41		14.0	88,64		21,19
1984-85	13,58	9.4	15.1	98,21	10.8	26,45
1985-86	15,45	13.8	15.4	100,31	2.1	31,80
1986-87	18,96	22.7	15.9	119,25	18.9	33,66
1987-88	22,71	19.8	16.8	135,55	13.7	36,69
1988-89	24,54	8.0	16.0	153,15	13.0	43,92
1989-90	28,12	14.6	16.8	167,79	9.6	48,46
1990-91	31,27	11.2	18.3	171,25	2.1	46,26
1991-92	32,85	5.0	19.6	168,02	(1.8)	48,47
1992-93	37,55	14.3	21.6	173,64	3.3	56,31
1993-94	41,48	10.5	22.6	183,85	5.9	61,10
1994-95	43,79	5.6	22.4	195,20	6.2	70,73
1995-96	48,79	11.4	24.2	201,76	3.4	73,55

Source: ABS, 2001 International trade interrogation system (original data). Manufacturing Industry (8210.0 & 8221.0) National Accounts (5204.0), International Merchandise Trade (5422.0) and Inventories & Sales (5629.0), Note: re-exports are included.

[24] Export Propensity data are compiled from various sources and are indicative over the periods noted.

In line with Porter's (1990a) focus the results show that the manufacturing sector experienced a fourfold real increase in exports over the period, rising from $12.4bn in 1983-84 to $48.8bn in 1995-96 shown in column 2. The pace at which Australia had become integrated into global economies appears to have accelerated considerably, especially from the mid 1980's. Of note, manufactured exports increased substantially from around 1986-87. This result appears to correspond with positive Government policy initiatives. Assistance programs typically included Export Market Development Grant (EMDG) incentives, assistance through the Export Finance Insurance Corporation (EFIC), the Investment Promotion Program 1987, and the 1991 Export Facilitation Scheme (EFS). Other specialist programs also existed, as well as State Government assistance initiatives which complemented the above. Between 1983-84 and 1995-96 manufactured exports grew around 12 per cent per annum in real values (ABS, 2001).

Other information from Table 9.7 suggests that manufactured exports in 1990-91 shown in column 4 contributed to 18 per cent of industry turnover. This ratio had increased to over 24 per cent by 1995-96. Yet, as detailed in column 6 in 1991-92, reflecting Australia's recession, manufacturing industry performance showed negative growth of 1.8 per cent. Manufactured imports have been included in column 7 primarily for comparative purposes. Imports will be discussed more fully in the next section. Following the 1991-92 recession there is clear evidence of productivity improvement, and stronger export demand. The impact of export investment incentives also appears to have stimulated the value of manufactured exports and growth. It could be argued that the extent of increased exports echoed the thrust of the One Nation (1992) and Working Nation (1994) plans. Notably, these plans were designed to promote plant efficiency, improved manufacturing performance, and the adoption of best practice management techniques to increase manufactured exports.

From the data described in Table 9.7 it is necessary to assess the relationship between the dependent and independent variable(s) with respect to the correlation between industry turnover, export value, export growth, and manufactured imports. For instance, manufacturing industry turnover could increase on an annual bases, yet be independent of

any increase in manufactured exports. Similarly, export growth could increase or decrease on an annual basis and not impact on the level of manufactured imports. To determine the overall affect on manufactured exports a regression analysis and tests for correlation will be conducted. Due to the quantitative nature of the data the use of regression analysis will be able to analyse the relationship among variables. Accordingly, this process will utilize the method of least squares along with the estimation and test procedures associated with it. In order to reject or fail to reject Hypothesis 3 the following analysis has been conducted.

The model is represented by $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \epsilon$

Where y (dependent variable) = x independent variable(s)

So y is Industry turnover = f (export value, export growth AND import value), x_1, x_2 x_3. The statistical output is as follows:

Regression Statistics	
Multiple R	0.97
R Square	0.93
Adjusted R Square	0.91
Standard Error	11348.7
Observations	13

ANOVA

	df	*SS*	*MS*	*F*	*Sig F*
Regression	3	1.64	5.48	42.55	1.22
Residual	9	1.16	1.29		
Total	12	1.76			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*95% Conf limit*
Intercept	54570.74	13479.45	4.05	0.003	24078.11
X Variable 1	2.34	1.45	1.61	0.14	-0.95
X Variable 2	243.43	542.33	0.45	0.66	-983.39
X Variable 3	0.58	1.08	0.53	0.61	-1.86

The correlation coefficient of the dependent variable (industry turnover) to the independent variables (export value, export growth and import value) equates to 54570.4. Thus, the regression line is $y = 54570.4 + 2.34\ x_1 + 243.43\ x_2 + 0.58\ x_3$. Accordingly, the relationship between x_1 and y is measured by $\beta_1 = 2.34$.

The coefficient of determination (R^2) equates to 93%. This shows there is little variation in the data suggesting that only 7% cannot be explained by the values of the independent

variables. This is a very high correlation and thus supports the validity of the model. The *t* statistic is the coefficient divided by its standard error, given that the standard error is an estimate of the standard deviation of the coefficient. This provides a good measure of the precision with which the coefficient is measured. The F-value at 42.55 is highly significant relative to the sum of squares and the variables. This would infer that the model has significant predictive capability in the presence of other variables. The P value or the observed significance levels for the *t* statistics also show the variables have statistically significant predictive capability. Test statistic:

$Ho: \beta_1 = 0$	Industry turnover is not useful for predicting Export value
$H_A: \beta_1 \neq 0$	Industry Turnover is useful for predicting Export value
Test of β_1:	Significance level: $\alpha = .05$
Decision rule:	Reject *Ho* if $t = \alpha/2 = t.025, 9 = 2.262$,
Value of test statistic	$t(X_1) = 1.61$
Conclusion:	As $t = 1.61 < 2.262$, do not reject *Ho*

Whilst the sample size is small, there is not enough evidence to suggest that a linear relationship exists between Industry turnover and Export value. The p value of 0.14 infers that the null hypothesis can only be rejected at a significance level above 14.0%. Test Statistic: Test of β_2

$Ho: \beta_2 = 0$	Industry turnover is not useful for predicting Export growth
$H_A: \beta_2 \neq 0$	Industry Turnover is useful for predicting Export growth
Test of β_2:	Significance level: $\alpha = .05$
Decision rule:	Reject *Ho* if $t = \alpha/2 = t.025, 9 = 2.262$,
Value of test statistic	$t(X_2) = 0.45$
Conclusion:	As $t = 0.45 < 2.262$, do not reject *Ho*

Consistent with the above, there is not enough evidence to suggest that a linear relationship exists between Industry turnover and Export growth. The p value of 0.66 corresponding to this test states that the null hypothesis can only be rejected at a significance level above 66%. Test statistic: Test of β_3

$Ho: \beta_3 = 0$	Industry turnover is not useful for predicting Import value
$H_A: \beta_3 \neq 0$	Industry Turnover is useful for predicting Import value
Test of β_3:	Significance level: $\alpha = .05$
Decision rule:	Reject *Ho* if $t = \alpha/2 = t.025, 9 = 2.262$,
Value of test statistic	$t(X_3) = 0.53$

Conclusion: As $t = 0.53 < 2.262$, do not reject *Ho*

There is not enough evidence to suggest that a linear relationship exists between Industry turnover and Import value. The p value of 0.61 corresponding to this test states that the null hypothesis can only be rejected at a significance level above 61%. However, there is evidence to show that exports increased, albeit independent of the values of imported manufactures and industry turnover. Thus Hypothesis 4 is rejected, as the value of exports between 1983 and 1996 had changed.

Unequivocally, Australia's manufacturing sector experienced considerable export growth between 1983 and 1996. To a greater or lesser extent this could be attributable to the effectiveness of industry policy. Evidence suggests the steady increase in exports was associated with growth in the manufacture of components and sub-assemblies from the motor vehicle industries, and from specialist manufacturers operating in highly differentiated markets (IC, 1997a). Moreover, it appeared that greater global trade integration by Australian manufacturing had been partly facilitated by reductions in protection, increased competitiveness, and from a concentration on the production of ETMs. Earlier it was suggested that no single factor constitutes competitiveness, nonetheless, it is logical to suggest there is a strong correlation between productivity, innovation, R&D and increased ETM exports.

In summary, the Government's Export Facilitation Scheme (EFS) was particularly useful to Australian vehicle manufacturers, their component suppliers, and to manufacturers in general. The scheme provided participating manufacturers with financial incentives in return for automotive exports, and to use this credit to offset the duty incurred on imports. Assistance was also provided to multinationals located in Australia to encourage increased export production. The total duty foregone under the scheme was around $160 million per annum (IC, 1997b, p.221). In addition, imported inputs used in the production of vehicle and component exports were allowed duty free entry. Arguably, these programs underpinned the extent of ETM growth, and represent some of the most positive initiatives introduced during the Hawke-Keating period. To reiterate, the level of

manufactured exports were considered a crucial indicator of Australia's competitive performance (Porter, 1990; Gretton and Fisher, 1997).

Yet, while achievement of increased ETMs exports was consistent with the Government's policy thrust, nonetheless, the extent of manufactured imports further highlighted the challenge to be overcome.

9.2.4 Investigation of Hypothesis 4

Hypothesis 4 relates to the impact of imported manufactured products on Australia. The hypothesis inferred that the value and level of imported manufactured products remained unchanged during the Hawke-Keating period. Yet as trade barriers declined over the 1980s and 1990s, the Australian market clearly became more attractive to overseas competitors. Simply put, if Australian manufacturers were less competitive, market share would be lost to overseas producers. The corollary is, of course, international competitive pressure should have encouraged Australian manufacturers to become more competitive by improving the productivity of their operations. Accordingly, Hypothesis 4 will be tested consistent with the level of imported manufactured products entering Australia between 1983 and 1996.

Prior to this undertaking it is important to clarify some details. Earlier it was stated the legitimacy of testing this hypothesis was because of the inextricable links to issues which could be countered by manufacturers. This point underlies the relatedness inherent in the variables associated with manufacturing competitiveness. For example, in most cases the quantity and type of finished manufactured goods imported to Australia cannot be controlled by the manufacturing sector. However, contrary to Porter's thesis, rather than arbitrarily dismiss the impact of manufactured imports on Australia's economy, it is argued that their existence provides a strategic manufacturing opportunity to be exploited.

Firstly, however, did imports actually increase in real terms, and how can this be substantiated? Economists refer to the measure of imported goods as 'import

penetration'. In the case of manufactured products this is the share of total manufactured products supplied to the domestic market through imports. By the same token, given the finite market for manufactured, part finished goods or components entering Australia, countering the level of imports through domestic rivalry offers significant opportunities. It can be argued that based on the capability to access discrete information on domestic market sales patterns, Australian manufacturers could opportunistically exploit import replacement. Whilst this opportunity presently occurs on some levels, what is being postulated here is that on the basis of accurate knowledge, strategic decisions could be formulated by astute manufacturers to 'cherry-pick' real commercial manufacturing opportunity.

Table 9.8: Real Manufactured Imports to Australia between 1983-1996

Year	Imports ($bn)	Imports % Change	Manfg Ind Turnover (Real-$bn)	Import % of Manfg Turnover	Exports ($bn)	Diff % Exports-Imports
1983-84	21,19		88,64	23.9	12,41	58.5
1984-85	26,45	19.9	98,21	26.9	13,58	51.3
1985-86	31,80	16.8	100,31	31.7	15,45	48.6
1986-87	33,66	5.5	119,25	28.2	18,96	56.3
1987-88	36,69	8.3	135,55	27.1	22,713	62.0
1988-89	43,92	16.3	153,15	28.7	24,54	55.9
1989-90	48,46	9.6	167,79	28.9	28,12	58.0
1990-91	46,26	(4.5)	171,25	27.0	31,27	67.6
1991-92	48,47	4.5	168,02	28.8	32,85	67.8
1992-93	56,31	13.9	173,64	32.4	37,55	66.7
1993-94	61,10	7.8	183,85	33.2	41,48	67.9
1994-95	70,73	13.6	195,20	36.2	43,79	61.9
1995-96	73,55	3.8	201,76	36.5	48,79	66.3
Ave 1983-96	**46,05**	**9.63**	**150,51**	**29.9**	**28,58**	**60.7**

Source: ABS, 2001 International trade interrogation system (original data). ABS, Cat 8221.0

Table 9.8 provides a year on year summary of manufactured imports in real terms and highlights the percentage change by year. These data have been compiled by the ABS upon request and show the extent of manufactured imports that occurred between 1983

and 1996. By using real values as opposed to nominal data, a more accurate appreciation of the impact on trade is possible.

Data reported in column 2 reflects the total value of manufactured imports, while column 3 denotes the percentage change since 1983-84. Column 4 details annualised manufacturing turnover during the Hawke-Keating period with column 5 highlighting the respective percentage of imports. The data in column 6 has been shown previously in Table 9.7, and has been included for analysis purposes. Column 7 represents the percentage difference per annum between manufactured imports and Australian manufactured exports. Data shows the value of real imported manufactured products had increased substantially on an annual basis. Indeed, this equates to an average increase in manufactured imports of 348 percent over the 13 year period or a weighted average growth of 9.6 per cent per annum. Column 5 shows this value had increased from around 24 per cent in 1983 to 36.5 per cent of total manufacturing industry turnover in 1996. It should be noted, the differential between imported manufactured goods and Australian exported manufactures was maintained at around 61 per cent.

Consistent with the quantitative nature of the data provided in Table 9.8, regression analysis will be conducted to analyse the relationship among variables. This process will utilize the method of least squares along with the estimation and test procedures associated with the process. In order to reject or fail to reject Hypothesis 4 the following analysis has been conducted.

The model is represented by $y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$

Where y (dependent variable) = x independent variable(s)

So y is import value = f (export value AND industry turnover), x_1, x_2

The statistical output is as follows:

Regression Statistics	
Multiple R	0.98
R Square	0.97
Adjusted R Square	0.96
Standard Error	3280.84
Observations	13

ANOVA

	df	*SS*	*MS*	*F*	*Sig. F*
Regression	2	2998682099	1499341049	139.29	4.99
Residual	10	107639110.4	10763911.04		
Total	12	3106321209			
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*95% Conf level*
Intercept	4564.1	6316.23	0.72	0.48	-9509.36
X Variable 1	1.15	0.29	3.83	0.003	0.48
X Variable 2	0.06	0.09	0.59	0.56	-0.15

The correlation coefficient of the dependent variable (Import value) to the independent variables (Export value and Industry turnover) equates to 4564.1. Thus, the regression line is y = 4564 1+ 1.15 X_1 + 0.06 X_2. The relationship between x_1, and y = 4564.1. This indicated that, in this model, export value will increase by 1.15 when Import value goes up by one, increase by 4564.1 when import value goes up by one, and is predicted to increase 0.59 when both Import value and Industry turnover are zero. Clearly, this shows the differential between export and import manufactured product value is maintained. The coefficient of determination (R^2) equates to 0.97. This demonstrates that 97% of the variation is explained by the two variables, and shows that only 3% cannot be explained by the values of the independent variables. This is a very high correlation and supports the validity of the model. Also, the *t* statistic is the coefficient divided by the standard error, given that the standard error is an estimate of the standard deviation of the coefficient. Analysis confirms that variable 1 (export value) is statistically significant, while variable 2 (industry turnover) is less so. This would add weight to the previous comment that industry turnover could increase as a result of domestic output. The F-value equates to 139.3 which is reasonably high relative to the sum of the squares of the variables. This suggests the model has statistical significant predictive capability. The P value reflects the significant predictive capability in the presence of other variables. For each independent variable, we test:

Ho: $\beta_1 = 0$ Export value is not useful for predicting Import value

H_A: $\beta_1 \neq 0$ Export value is useful for predicting Import value

Test of β_1: Significance level: $\alpha = .05$
Decision rule: Reject *Ho* if $t = \alpha/2 = t.025, 9 = 2.262$,
Value of test statistic $t\ (X_1) = 3.83$
Conclusion: As $t = 3.83 > 2.262$, reject *Ho*

While the sample is limited, there is sufficient evidence to suggest that a linear relationship exists between Import value and Export value. The p value of 0.003 substantiates this test. Test statistic: Test of β_2

Ho: $\beta_2 = 0$	Import value is not useful for predicting Industry turnover
H_A: $\beta_2 \neq 0$	Import value is useful for predicting Industry turnover
Test of β_2:	Significance level: $\alpha = .05$
Decision rule:	Reject *Ho* if $t = \alpha/2 = t.025, 9 = 2.262$,
Value of test statistic	$t\ (X_2) = 0.59$
Conclusion:	As $t = 0.59 < 2.262$, do not reject *Ho*

There is not enough evidence to suggest that a linear relationship exists between Import value and Industry turnover. The p value of 0.56 corresponding to this test states that the null hypothesis can only be rejected at a significance level above 56%. However, there is sufficient evidence to show that imports increased. Thus Hypothesis 4 is rejected.

As discussed, while Australia's total market had grown, this was not purely generic growth; growth was being increasingly taken up by imported manufactured products. The Industry Commission (1995) reported that during the Hawke-Keating period the ratio of manufactured goods (share of exports) increased by an average of 10 per cent. However, over the same period, the ratio of imported manufactured products increased on average by around 30 per cent. It should be noted, however, that while some of these imports represented components of manufactured exports, the level and type of manufactured imports warrants concern. Manufactured (finished) goods comprised the largest proportion of growth in imports between 1983 and 1995/6 rising to $70.7bn in current prices (PC, 1996, p.38).

Evidence suggests that in conjunction with a lack of competitiveness and corrective action in policy terms, reductions in barrier protection had stimulated increased imports, particularly in ETM categories, hence, placing greater pressures on domestic manufacturers. The dilemma confronting manufacturers appears to be that the rate of import penetration was growing faster than the export of manufactured products. Whilst export incentives and targeted assistance arguably provided short term improvements, it is suggested that a more sustainable approach was necessary. Largely substantiated by

Porter (1990a), the extent of imported manufactured products can only be effectively countered through productivity and increased competitiveness generated at national level.

9.2.5 Investigation of Hypothesis 5

Porter (1990a) and others have reported that a key aspect of the growth and success of competitiveness is dependent to a large extent on securing ongoing capital investment. Thus it could be argued that the role of Government is to provide a manufacturing environment conducive to increasing domestic level expenditure, and correspondingly, stimulate manufacturing investment through industry attraction policies. The last hypothesis encompasses the extent of Australia's manufacturing sector investment and stated that this level had remained unchanged between 1983 and 1996.

Despite a relatively long period of foreign investment in Australia, there are limited data available on its nature and extent (DIST, 1998). Moreover, international investment data is generally compiled in macro level form. This constraint caused problems in isolating purely manufacturing sector related data from broad industry-based investment information. The nationality of capital can also be ambiguous and presented difficulties in acquiring the precise details of investment by segment, as data tended to be anecdotal and lacked continuity. Further complications existed when discussing the various forms of investment. For instance, the definition of Australian Direct Investment Abroad (ADIA) used by the ABS is different from the definition used by the United Nations Conference on Trade and Development (UNCTAD), and FDI data and ADIA data cannot be readily compared.[25]

The OECD (1992) argued that there are three main reasons why manufacturing firms invest and produce in foreign markets, they are as follows:

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[25] The ABS defines ADIA as net capital investments made by Australian residents in foreign enterprises in which they have at least 10 per cent equity interest (ABS, 1998b). This includes various investments where the investor has a controlling interest and those where the investment falls short of full control, but is still regarded as significant (DIST, 1998).

1. The existence of market imperfections in the form of barriers to trade or disparities in the development stage or economic conditions of countries.
2. The combination of strong domestic capital accumulation and insufficient domestic opportunities.
3. The ability of multinationals and transnational corporations (TNCs) to 'internalise' international transactions, reduce transaction costs and maximise their returns from specific assets such as technology and innovation.

With respect to Australia's manufacturing sector, the BIE (1995) reported that while FDI is often undertaken in response to a perceived competitive advantage, there are other factors which influence the timing of decisions such as:

- changes to taxation guidelines which may alter the relative profitability of domestic versus foreign firms;
- changes to corporate borrowing capacity and the availability to access internal funds;
- me too! responses to the actions of other firms entering global markets; and,
- exchange rate movements - the depreciation of a nation's currency may increase the attractiveness of local assets to foreign companies.

Several observers have argued that Australia's investment climate for domestic and foreign capital had been exacerbated somewhat by the short-term nature of government industry policy (Capling and Calligan, 1992; Bell, 1993; Fagan and Webber, 1997). In turn, this uncertainty and lack of vision had been detrimental to long-term stability, insofar as it fostered a domestically focused low-risk climate consistent with quick-fix solutions (Bryan and Rafferty, 1999). Rather, as argued by Porter (1998), industry policy should encourage the development of strategically driven initiatives that focus on an international market presence and longer-term opportunities. Likewise, a prerequisite of restructuring relative to the manufacturing sector is more than procuring adequate levels of aggregate investment. In order to create value adding and growth, it should include a shift in composition towards outlays on knowledge–based processes supported by appropriate Government policies which facilitate adjustment.

As noted, the exploitation of Australia's determinants of competitive advantage is crucial to its sustainable success. Accordingly, the extent of technological advances which can be secured through capital investment in plant and equipment and new technology will arguably stimulate large scale productivity benefits (De Long and Summers, 1992). Fundamentally, De Long and Summers claimed the spill-over affects to other segments of manufacturing are critical to improving the industry's competitiveness.

Table 9.9: Manufacturing Sector - Gross Fixed Capital Formation 1983-1996, and Average Effective Rate of Assistance

Year of Investment	GFCF ($bn)	Manfg (%) GFCF	Manfg Expend ($bn)	Average ERA (%)
1983-84	31.6	11.1	3.5	22.7
1984-85	35.9	11.9	4.3	23.4
1985-86	41.3	11.9	4.9	21.0
1986-87	45.4	13.9	6.3	20.1
1987-88	54.9	13.1	7.2	20.0
1988-89	67.2	11.4	7.7	17.9
1989-90	67.8	12.6	8.6	16.7
1990-91	60.5	11.9	7.2	15.6
1991-92	56.8	12.2	6.9	13.8
1992-93	62.4	12.6	7.8	12.6
1993-94	70.1	11.7	8.2	10.8
1994-95	77.1	12.4	9.5	9.4
1995-96	78.7	11.9	9.3	8.1

Source: ABS, National Income, Expenditure and Product, ABS Catalogue 5204.0, New Capital Expenditure, Aust Cat. No 5626.0, Industry Commission, Annual Report, 1996-97.

Table 9.9 contains a summary of the extent of gross fixed capital formation expended during 1983-1996. These data have been compiled from various ABS data catalogues, and from the Industry Commission. Data shows total industry investment, manufacturing's share of investment in percentage and financial terms and the associated average effective rate of assistance (ERA) which was in place during the reference period. In order to test the significance of these data with respect to Hypothesis 5 a number of

statistical tests have been used to assess the relationship of the variables that exist. Using 1983-84 as the base year, the gross fixed capital formation (GFCF) time series data refers to the aggregate level of net new investments in the domestic economy.

The five columns reading from the left show the year of investment, the actual level of capital expended, the manufacturing percentage, the financial commitment, and the average effective rate of assistance. By way of explanation, GFCF provides an economic indicator of business activity in the manufacturing sector. As a flow value it reflects the total value of additions to fixed assets which includes domestic manufacturers less various disposals plus additions to the value of non-produced assets. A 'gross' measure is used because there is no adjustment made for the depreciation of assets (UNCTAD, 1997a). During this period, as detailed in column 2 the total investment in all industries increased from around $31bn to approximately $79bn in real terms (ABS, 1998b). As shown in column 3 investments remained fairly constant at around 12 per cent per annum. It could be argued the increased level of investment from $3.5bn to around $9.3bn described in column 4 was symptomatic of improved productivity and reflected the impact of government investment incentives. Yet, while investment in the manufacturing sector more than doubled during the Hawke-Keating period, it failed to keep pace with total investment in other industries (IC, 1997).

It is also worth commenting on the declining levels of Government assistance detailed in column 5. For example, Drysdale and Lu (1996) concluded that industry specific policies were decisive in the turnaround of manufacturing performance. Their analysis suggested that as a consequence of reduced tariff protection, this actually stimulated manufacturing efficiency and exports. This assertion can largely be supported by Table 9.9 which shows as the ERA declined manufacturing capital expenditure increased. Arguably, this was in response to the need for improved competitiveness. Between 1985-86 and 1986-87 there was a significant increase in gross fixed capital formation. By analysing total investment more closely, however, suggested that the majority of investment had moved to the service sector (Bryan and Rafferty, 1999). Put in perspective, during the 1960s manufacturing investment levels regularly reached 22-23 per cent of total industry

investment (ABS, 1998b). Even though manufacturing sector investment remained fairly constant in percentage terms at around 12%, total industry investment within Australia increased threefold.

Using Table 9.9 data it is possible to test the relationship between the dependent and independent variables using regression analysis and tests for correlation. Given the quantitative nature of the data, the method of least squares along with the estimation and test procedures associated with regression analysis will be used. In order to reject or fail to reject Hypothesis 5 the following analysis applies.

The model is represented by $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon$

Where y (dependent variable) = x independent variable(s)

So y is (manufacturing expenditure) = f (GFCF% and ERA%), x_1, x_2

The statistical outputs are as follows:

Regression Statistics	
Multiple R	0.89
R Square	0.80
Adjusted R Square	0.76
Standard Error	0.91
Observations	13

ANOVA

	df	*SS*	*MS*	*F*	
Regression	2	32.9	16.48	20.05	
Residual	10	8.22	0.82		
Total	12	41.19			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*95% Confidence level*
Intercept	4.62	4.41	1.05	0.31	-5.0
X Variable 1	0.62	0.36	1.74	0.11	-0.17
X Variable 2	-0.31	0.05	-6.11	0.00	-0.43

The correlation coefficient of the dependent variable (manufacturing expenditure) to the independent variables (percentage GFCF and Average ERA percentage) equates to 4.619. Accordingly, the regression line is $y = 4.62 + 0.62\, x_1 + -0.31\, x_2$

The relationship between x_1 and y is measured by $\beta_1 = 0.62$. This indicated that, in this model, for each additional percentage GFCF expended, manufacturing investment would

increase on average by 0.62 percent. The coefficient β_2 = -0.31 specifies that on average ERA could effectively reduce by 0.3 percent as long as other variables do not change. In addition, the coefficient of determination (R^2) equates to 0.8, and shows that 80% of the variation is explained by the two variables and 20% remains unexplained. This is a relatively high correlation supporting the validity of the model. The *t* statistic 1.05 is the coefficient divided by the standard error, given that the standard error is an estimate of the standard deviation of the coefficient. Analysis suggests there is a linear relationship between GFCF% variable x_1 and manufacturing expenditure *y*. The F-value is 20.05 which is highly significant relative to the sum of the squares of the variables, and indicates that most of the variation of *y* is explained by the regression model. Finally, the observed significance level (P value) reflects the significant predictive capability in the presence of other variables.

Test statistic:

Ho: $\beta_1 = 0$	Manufacturing expenditure is not useful for predicting GFCF%
H_A: $\beta_1 \neq 0$	Manufacturing expenditure is useful for predicting GFCF%
Test of β_1:	Significance level: α =. 05
Decision rule:	Reject *Ho* if $t = \alpha/2 = t.025, 9 = 2.262$,
Value of test statistic	t (X_1) = 1.74
Conclusion:	As t = 1.74 < 2.262, fail to reject *Ho*

There is not enough evidence to suggest that a linear relationship exists between manufacturing investment and GFCF%. The p value of 0.11 corresponding to this test states that the null hypothesis can only be rejected at a significance level above 11%.

Test statistic:

Ho: $\beta_2 = 0$	Manufacturing investment is not useful for predicting ERA%
H_A: $\beta_2 \neq 0$	Manufacturing investment is useful for predicting ERA%
Test of β_2:	Significance level: α =. 05
Decision rule:	Reject *Ho* if $t = \alpha/2 = t.025, 9 = 2.262$,
Value of test statistic	t (X_2) = -6.11
Conclusion:	As t = -6.11 > -2.262, reject *Ho*

Whilst the sample is small, there is sufficient evidence to suggest that a linear relationship exists between Manufacturing investment and ERA%. The p value of 0.00 substantiates

this test. Accordingly, consistent with the above analysis, given manufacturing investment increased, Hypothesis 5 is rejected.

Meanwhile the internationalisation of manufacturing was occurring, Australian direct investment abroad (ADIA) had increased by nearly $40bn (IC, 1996), of which, 46 per cent was attributed to service sector investments and 43 per cent to the manufacturing sector. This level equated to around $17.2bn which was arguably, detrimental to manufacturing in general. Interestingly, however, a BIE (1995) study found that outbound overseas foreign investment had either 'no effect 'or a 'limited effect' on domestic production and employment. It could be argued the reasons for overseas investment was to optimise low cost labour, or indeed, in response to available incentives from foreign governments. The free market protagonists would, however, maintain the 'negative impact' is a consequence of trade distortions, not necessarily the actual foreign investment. Yet, in the same way, overseas taxation-inducements and financial incentives could be better matched by reciprocal inducements for Australian manufacturers. Because of the largely nomadic nature of capital investment, it is argued this would facilitate a higher priority and focus for domestic level manufacturing investment (see for example, Mortimer, 1997).

9.3 The Need for Broad-based Industry Policies for the Manufacturing Sector

As discussed, data suggests that investment levels had increased in the manufacturing sector. There is also sufficient evidence from the literature that government industry policy influences the decisions and locations of investment (Wade, 1990; Capling and Galligan, 1992; Yetton et al., 1992; Bell, 1993; Emy, 1993; Yoffie, 1993; Bora, 1995; EIU, 1996; Goldsworthy, 1997; Bryan and Rafferty, 1999). Notwithstanding, is there a specific role for Government in assisting manufacturers compete more effectively? Moreover, how effective was industry policy during the period assessed? Returning to the hypotheses tested, the examination arguably showed a strong interrelationship, and thus, an inextricable link to competitiveness. Thus, based on findings, what are the implications for government industry policy?

Notably the key elements of Porter's (1990) model have been applied in this thesis. Their adoption subsequently led to the development of each hypothesis. Indeed, the elements identified enabled a detailed analysis of their specific characteristics which appeared to impact positively on competitiveness. What is more, results showed that competitiveness cannot be attributed to one single factor; it is usually generated from the combined influence of several factors acting simultaneously. These factors include innovation, research and development, increased productivity and greater workplace efficiency to achieve higher levels of domestic sales and exports. Accordingly, it is strongly argued that to improve competitiveness demands the exploitation of resource capabilities similar to those articulated by the hypotheses. These factors have been shown to act independently and interdependently and operate effectively in an environment conducive to increased productivity and supportive industry policy. By inference, this provides compelling evidence to suggest that through broad-based industry policies the Government has a definitive role in assisting the competitiveness of the manufacturing sector.

Yet, amongst this, did the performance of Australian manufacturing improve internationally? Whilst testing the hypotheses comparisons were made with OECD countries which in general confirmed Australia had increased the performance of certain determinants. Nonetheless, it cannot be assumed that Australia's overall 'international competitiveness' improved. For instance, Australia's competitor nations could have improved at a faster rate, and necessitates further clarification.

Porter and others were undoubtedly confronted by the same dilemma whilst assessing the competitiveness of single nations in isolation. In single nation studies researchers appear to have adopted broad-based comparisons to determine national performance, based typically on OECD data and Global Competitiveness Reports (GCR). These data comprised the use of industry-wide statistical information compiled at a national/macro level. GCR data are categorised across 3 economic sectors namely: agriculture, industry, and services. For all intents and purposes, the use of these data appeared adequate for

research needs. More specifically, evidence suggests that aggregate statistical data compiled from international sources had been used extensively for comparing competitiveness in the United Kingdom, Japan, USA, New Zealand, and in other studies of European nations (Porter, 1998a; Porter, 1999; Porter and Bond, 1999; Porter, Takeuchi and Sakakibara, 2000; Porter and Ketels, 2003).

Unlike Porter's (1990) methodology, however, the use of broad-based industry-wide data had to be narrowed sufficiently for the level of detail required in this thesis. As noted, the focus of this work was purposely confined to a single nation and single sector of an economy. Furthermore, the research suggests that industry policy is a key contributor towards the effective management of a nation's determinants. Undoubtedly industry policy plays a large part in sustaining competitiveness and clearly impacts on how we manufacture products and how we strategise the future of the manufacturing sector. The next chapter will demonstrate the powerful links that exist between the hypotheses and the revised model of competitiveness.

9.4 Summary

This chapter has tested the validity of five unique but interdependent hypotheses crucial to the viability of Australia's manufacturing future. In turn, each hypothesis was tested with a view to either rejecting or failing to reject its proposition. Indeed, based on Porter's work the hypotheses were designed to establish whether competitiveness in Australia's manufacturing sector improved. The purpose was also to investigate the relationship between productivity, research and development, exports, imports and investment, as well as manufacturing competitiveness.

Results showed that with respect to productivity, the performance of the manufacturing sector had improved during the Hawke-Keating period. Relative to the components of multifactor productivity results showed there was a strong link between the characteristics of the hypotheses being examined and improved competitiveness. For example, it was argued that Australia's increased levels of ETM production were closely associated with

improved research and development expenditure during 1983 and 1996. Similarly, powerful relationships appeared to exist between increased R&D expenditure, innovation, and improved manufactured exports. At an international level, however, expenditure committed by Australia's manufacturers was well below the majority of the 'key nations' used for comparison. In terms of BERD expenditure, Australia ranked eighteenth out of twenty-four countries. What is encouraging however, Australia's measure of BERD increased during the 1990s at a faster rate than most OECD competitors.

Research also confirmed that manufactured exports had improved, albeit from comparatively low levels. In terms of value added, the sector's share of ETMs increased. However, it was found that imported manufactured products were increasing at an accelerating rate, and continue to do so. Arguably, the real dichotomy stemmed from the fact that the level of ETM imports was increasing at a faster rate than Australia's ETM exports. The last hypothesis reviewed the extent of Australia's manufacturing sector investments. In general, results showed that between 1983 and 1996 increased investment had occurred. The Government's role in industry policy development regarding investment attraction and incentives was found to be crucial to the long-term success of manufacturing. In the same way, given the important contribution of manufacturing to the economy, it is naïve to leave this dilemma to market forces.

Chapter 10 Implications for Industry Policy

10.1 Introduction

Results of the hypotheses tested in Chapter 9 show that between 1983 and 1996, with the exception of imported manufactured products, each hypothesis allied to competitiveness improved. The strong correlation between government industry policy and the viability of the manufacturing sector was also shown to be critical. In this chapter the ramifications of these results as a means of developing a more cohesive industry policy solution will be discussed.

10.2 Implications of the Empirical Results

With respect to the hypotheses tested in Chapter 9 results have shown categorically (with the exception of imported manufactured products) that Australia's manufacturing performance improved during the Hawke-Keating period in government. However, the analysis showed that while increased levels of performance could be identified, there was significant evidence to suggest that a number of Australia's international counterparts improved at a faster rate.[26] Accordingly, what are the long term implications for Australia's manufacturing sector given these results.

Findings from this thesis suggest that competitiveness evolves from the adoption of a number of related factors which act simultaneously in fostering a competitive environment. As a consequence, firms gain advantage over their rivals because they can develop a better means of applying certain strategies more effectively than their competitors. Thus, their business is driven by a competitive focus based on exploiting the multitude of resources available. In other words, there is no simple remedy to resolve the dilemmas confronting Australia's manufacturing sector in terms of competitiveness. Moreover, it is naïve for the Government and manufacturers to assume there is a global panacea for competitive success.

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[26] It is appreciated that the performance levels of certain nations could be stimulated by external factors.

A number of salient points emerge from the data analysis. It is clear from the results that there is a common relationship across several of the competitive variables. For instance, it was shown that manufacturing productivity improved; however, some countries demonstrated a higher level of improvement. The same thing occurred with R&D, and with manufactured exports. It is useful and, indeed, relevant to ask if the performance of Australia's manufacturing sector could have been better relative to other countries if there was a different set of industry policies in place? Hence, the key factor to be considered relates to the issue of whether the industry policy mix was appropriate between 1983 and 1996. Prior to addressing this some brief comments relative to Chapter 9 will be discussed.

Understandably, the Government developed policy initiatives based on apparent industry needs, and in response to the nation's economic performance (IC, 1997a). Following this line of argument, one of the most notable contributions of the Labor Government during its period in office was to introduce the Accord. The merits of this tri-partite agreement were discussed in Chapter 6. However, consistent with the successive iterations and amendments, it could be argued that the fundamental premiss of the Accord handicapped real manufacturing productivity. One consideration might be that 'bargaining' productivity performance is not sustainable, especially on what could be considered as soft options. Evidence from this research suggests that increased productivity evolves predominantly from the culmination of inter-related factors acting concurrently. Typically these factors are founded on innovation and an holistic suite of strategies that generally encompass competitiveness and growth.

Moreover, several issues tended to cloud policy effectiveness at this time, which in turn, arguably impacted on its success. For example, could more have been done to further the overall competitive process? Previously, it was reported that Australia's reluctance to fund research in manufacturing was indicative of its poor management capability. Yet, data suggested that BERD had increased. The same argument could be directed towards manufactured exports and capital expenditure. Earlier in Chapter 6, for instance, it was

reported that the major stimulus for increased manufacturing expenditure was tax concessions and direct financial assistance. Notwithstanding the motivation of manufacturers, data shows there is a strong correlation between increased participation in each of the above initiatives and the introduction of new manufacturing incentives. Consequently, the real reasons for program take-up are inconclusive. This has clear implications for the effectiveness of industry policy.

The next section will develop this theme further, for the present it seems appropriate to note that the historical reliance upon protection and high levels of government assistance seemed to have merit in the case of manufacturers. Indeed, it has been stated that manufacturing's contribution to economic growth and employment was often cited as a means of gaining preferential treatment from the Government even though, in the late 1980's and early 1990's manufacturing employment levels significantly reduced, which arguably precipitated the manufacturing sector's fall from political favour. With regard to protection and the need for improved competitiveness, the Government moved to reduce this level of assistance. It could be argued that if left unchecked, the sector's reliance upon protection would have remained. Ironically, when the 'crutch of protection' was substantially removed, manufacturing productivity levels appeared to improve.

The design and administration of industry policy related to manufactured imports similarly demands comment. Chapter 9 highlighted the significant increase in manufactured imports to Australia between 1983 and 1996. Notwithstanding the consequences to manufacturers, there seemed to be no evidence to suggest the Government was doing anything constructive in a policy sense to abate these increasing levels. For all and intents and purposes, the Government seemed oblivious to the real impact of globalisation, preferring instead to assume that significantly increased levels of imported manufactured products were symptomatic of global trends. There appeared to be no policy imperatives pursued by the Government to counter this phenomenon.

So what can be concluded from these comments? The set of industry policies progressively developed and implemented over the Hawke-Keating years appears to have

increased the competitiveness of manufacturing, but not to the extent necessary to ensure that the sector had a sustainable future.

In terms of the industry policy mix what could have been a superior position? It could be argued that during the Hawke-Keating years industry policy reflected a 'catch all' facility with apparent difficulties in monitoring and program management. Likewise, the application of more rigour may well have negated the piecemeal approach used. However, in order to address the comprehensive nature of competitiveness, what was required was a more strategic approach, attuned to corporate needs. Given the relatedness of the competitive variables, it is argued that the nature of industry policy should reflect this. As discussed previously, manufacturing expertise should be harnessed through clusters and centres of excellence, and managed on a national basis. Based on specialisation, it is crucial that industry policy encompasses the manufacturing sector's total capabilities. Furthermore, the evidence suggested that program take-up was enhanced through incentives. Therefore, to avoid misuse, it is logical to suggest that all incentives should be outcomes-based and integral to a company's performance. Clearly, properly managed programs would help increase competitiveness, and at the same time facilitate a nationally focused effort that integrates the full extent of Australia's industrial and research capabilities.

Suggestions for improvement in the coordination of the industry policy will be addressed later in the chapter.

10.3 The Need to Increase the Effectiveness of Industry Policy

With particular reference to the findings presented in Chapter 9, and building on Porter's work, it is contended that in order to capitalize on the wealth generating potential of manufacturing, a broad based strategy that encapsulates the industry's national capabilities is warranted.

It is argued that this is necessary because the dissipation of resources has been a particularly ineffective aspect of Australia's manufacturing culture. Given the nation's limited resources to create wealth and combat imported manufactured products, there is some justification for moving towards more specialised manufacturing on a national basis, rather than each company and state pursuing its own competitiveness agenda. This problem is largely exacerbated by Australia's limited population and geographically dispersed industries which have invariably forced states to remain somewhat autonomous.

It is further argued that globalisation has changed the competitive landscape. Because of resource limitations it is suggested that, through industry policy, efforts to build critical mass based on specialisation should be pursued. Indeed, the concentration of industries situated in certain locations to maximise capabilities is crucial to achieving efficiency and increased competitiveness (Porter, 1990; Enright and Roberts, 2001). In this way, Australia could effectively exploit economies of scale and scope by the adoption of highly focused competitive strategies.

Australia's national source of expertise is derived from multinationals, SMEs and large indigenous companies. In conjunction with its research facilities and academic input, these resources collectively meet the competitive needs of manufacturing. To position itself more competitively, it is suggested that Australia narrows its field of manufacturing expertise by focussing on specific industries where it is perceived to have competitive advantage. In the same way, it should extricate itself from industries where it appears to have no apparent advantage. Furthermore, consistent with the increasing nature of global competition, it is argued that the basis of Australia's manufacturing future, in all likelihood, will be in highly specialised areas of manufacturing that demands sophisticated knowledge-based processes.

By encouraging specialisation through 'centres of excellence' this should provide the capability to effectively pursue commercial opportunities on a global basis consistent with focused networks. Similarly, it is economically prudent to ensure that Australia's national source of expertise is relatively self-sufficient in knowledge-based capabilities.

This demands that industry policy of the future needs to have greater integration with academia and industry direction. At the same time, supplier-based opportunities will inevitably arise, and because of increased levels of competitiveness, these opportunities will invariably be met through Australia's domestic market capability. Likewise, Australia could make better use of its multinational linkages, in particular through collaborative agreements that necessitate the utilisation of the resources that multinationals can access. The rationale for this proposition is detailed below, and also encompassed within the thrust of the competitiveness model represented by Figure 10.1.

First, domestic rivalry promotes upgrading the competitiveness of an entire system (refer to Figure 10.1). Second, geographic concentration and thus, the creation of clusters are crucial to any analysis because this elevates and magnifies the interactions between Australia's competitive characteristics. Third, by upgrading the discrete expertise of cluster participants in terms of their strategic capabilities as well as specialist functions provides opportunities for both scale and specialisation. By any measure of competitiveness this would facilitate the emergence of highly competitive and nationally focused centres of excellence. Fourth, and most importantly, harnessing the capability of Australia's manufacturing resources on a national basis would dramatically reduce duplication and cost, maximise knowledge and expertise, and potentially eliminate the counter-productive practices of inter-state rivalry.

Arguably, the creation of 'national centres of excellence' underpins this competitiveness agenda. Due to the inter-relatedness of competitive factors, achieving increased manufacturing competitiveness and value added processes logically emanates from exploiting clusters. Yet, whilst predominantly involving knowledge-based high value added manufacturing, this proposition has the flexibility to encompass traditional resource-based low value commodities. The benefits achieved through industry clusters invariably enhances the independent and interdependent relationship of companies operating in this market. What is more, the level of advanced factor conditions underpinning each specialist centre offers the ability to attract the best calibre labour,

complementary industries, and investment from domestic and global sources. The next section will review the implications for industry policy.

10.4 The Implications for Industry Policy

Given the findings from Chapter 9, and from discussions undertaken in this chapter, to help achieve the sustainability of Australia's manufacturing future there is a need to refocus the direction of industry policy. This last section will address this point with a view to obtaining a more purposeful industry policy solution.

Discussions have shown that the industry policy mix was not entirely appropriate for the industrial climate that existed during the Hawke-Keating years. Given the existing and ongoing pressures of global competition, this research has also shown that there is justification for a more comprehensive blend of industry policies. Assessment of factors such as productivity, R&D, exports and capital investment show that individually and collectively they contribute to increasing levels of manufacturing competitiveness. Accordingly, it is vital that industry policy can be directed towards these areas in a coordinated and holistic manner. Notwithstanding, however, there is a fundamental requirement for a closer bond between government and industry.

In order to stimulate improved competitiveness, the Government's role is crucial. Essentially, its role must be to ensure an efficient microeconomic and macroeconomic environment in which manufacturers can operate. Thus, industry policy needs to stimulate dynamism and upgrading within industries. Its aim should be to create an environment in which companies can improve their competitiveness within established industries. In the same way, it should support the capability to develop new initiatives where higher levels of productivity can be achieved.

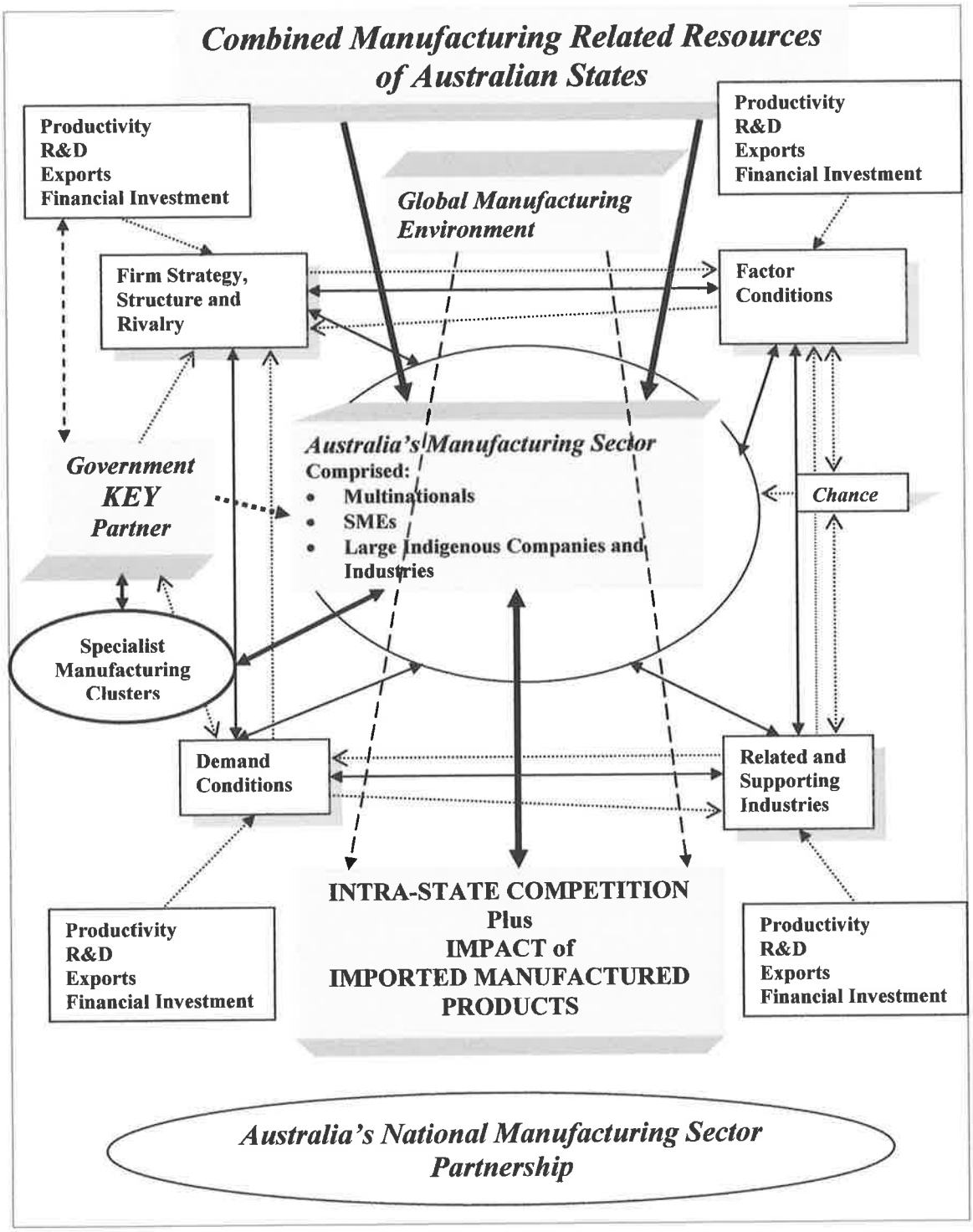
The sustainability of the manufacturing sector cannot be left to chance, but as noted, must be supported through the adoption of a unique blend of competitive strategies. Hence, the effectiveness of industry policy can be considered key to the future of Australia's

international competitive success. Importantly, however, competitiveness at a national level will demand substantial change from both industry and the Government. For this reason the 'revised competitiveness' model shown in figure 10.1 which will be discussed later in this section reflects a system in which the influence of Australia's determinants cannot be viewed in isolation.

Extending this argument, the Government's role should be that of a 'partner to manufacturers' and to the related and supporting industries and resources it supports. Thus, industry policy should be based on sustaining an 'investor friendly and technologically driven' environment, and one that is conducive to innovatively exploiting Australia's capabilities. As noted, architects of industry policy need to adopt a new paradigm which is not based on protectionist philosophies, but one that reinforces Australia's natural advantages and demonstrates a global focus. It is in this arena that industry policy becomes a key ingredient of Australia's competitive success. As argued, this can only be effectively accomplished through a whole of sector approach consistent with the holistic nature of the competitiveness model described in Chapter 7, and further refined in Figure 10.1.

Similarly, the impact of imported manufactured products cannot be ignored. This assertion is supported in view of the Government's tacit acceptance of increasing levels of imported products, arguably, with little or no industry policy response. It is recognised, however, that the manufacturing sector needs to import a wide-range of products, components, and specialist technology due to its size and limited capability. However, there is justification to apply a strategic focus to certain high value imported products that could constitute the sustainability of specialised manufacturing processes in Australia. Indeed, it is envisaged that the characteristics synonymous with globalisation, such as innovation and new technology, can be engineered to Australia's benefit.

Figure 10.1: The Competitiveness Model – Interaction



Source: Based on Porter (1990, p.72).

Figure 10.1 reflects the causative interactions which occur in Australia's competitive manufacturing environment. Predominantly, the model reflects an Australian national manufacturing sector partnership. The model is intended to show the interaction of the combined manufacturing related resources that operate within Australia. These elements comprise a blend of multinationals, SMEs and large indigenous companies and industries. Notably, Porter's four aspects of 'factor creation' are fundamental to the effectiveness of the model. However, these factors have been enhanced substantially by the influences of the parameters reflected in the hypotheses tested. Also, the function of Government as a key partner provides a significant deviation from Porter's original concept. The reason for this is to help engender positive policy prescriptions consistent with the interaction of market demands. Moreover, central to the model's effectiveness, is that all competitive and positive interactions are contained within the composition of this environment. Notably, the structure of Australia's manufacturing sector is arguably determined by the strategies of its firms. Thus, ways of doing business will vary according to the context in which firms are created, organised and managed, and from their unique goals and strategies.

In the same way, competitiveness at a national level will demand substantial change from both industry and the Government. In accordance with this goal the bureaucratic mechanisms which drive industry policy need to be closer to industry. Arguably, this will necessitate more effective collaboration between the various functions of government in Australia, and with its linkages overseas. It is not unreasonable to suggest that information and timing will underpin the basis of Australia's knowledge-based manufacturing.

Porter (1990a) maintained that geographic concentration is vitally important to the genesis of competitiveness as it amplifies the forces that upgrade and sustain it. This suggests a close affinity with government, industry policy and industry. Accordingly, this notion has been integrated with the competitiveness model. As noted, industries and industry clusters are generally concentrated in certain regions for political reasons, such

as in Australia. The formation of these locations usually demands a prominent role for government on which the basis for competitive advantage is often intensely local. Moreover, in these regions, the synergy that exists through cluster formation evolves through a blend of indigenous companies and flagship multinationals.

In order to cope with increasing competitiveness from overseas manufacturers, governments and associated peak industry bodies need to consider the lessons that have emerged from the study of competitiveness during the Hawke-Keating years when industry policy underwent considerable change in direction. Essentially, the Government has to move away from politically expedient policies to a more strategic stance. Also, in terms of policy continuity and the strategic nature of investments, the time between compulsory federal elections is not conducive to long-term industry policy outcomes. Yet, given the importance of wealth creation mechanisms, it appears the real problem stems from the fact that Australian manufacturing is devoid of strategic direction.

Accordingly, policies need to build on the positive aspects of increased competitiveness. Not because of some impassioned plea to support the manufacturing sector, but the results of this thesis categorically show that in terms of wealth generation, each sector of Australia's economy is interdependent and subject to similar global competitive forces.

To complete this chapter, there are a number of key lessons that emerge from this research. These are as follows:

1. Globalisation and the threat from international competition did not appear to be considered as 'important' as it should have been to Australian manufacturers.
2. As a means of facilitating improved international competitiveness, Australia's manufacturing capabilities and resources need to be considered on a national basis, in order to achieve the necessary capabilities to compete more effectively.
3. Australia's manufacturing should no longer operate in state by state isolation. This point is exacerbated by the counter-productive nature and cost of political manoeuvring precipitated through intra-state rivalry.

4. The need to continuously increase productivity should be the fundamental dictum of Australian manufacturers, and be promoted through the aims of industry policy.
5. Australian manufacturing should move towards specialisation and competitive advantage, and away from highly commoditized industry sectors.
6. There should be greater focus on import replacement as a competitive manufacturing strategy to exploit the production of high value products.
7. Industry assistance linked to industry policy should not be accessible on a piecemeal basis, but must be part of a larger strategic framework.
8. The role of the Government must be more prominent, and that of a 'partner to industry' and to the nation's collective resources.
9. Industry policy should integrate the operations of multinationals more effectively to help enhance Australia's competitiveness goals.
10. There is justification to introduce a specialist body to oversee the coordination of nationally focused clusters and centres of excellence.

10.5 Summary

In the context of improved competitiveness, this chapter has discussed the implications for industry policy. Discussion initially centred on the implications of the empirical results determined in Chapter 9. The question of how could the government have performed better in terms of industry policy during the Hawke-Keating years, was posed. From this, certain elements crucial to the sustainability of Australian's manufacturing sector were determined. It was also shown that the implications of the results determined from this thesis were closely linked to improving Australia's competitiveness.

Amongst this, the need to increase the effectiveness of industry policy was then discussed. It was suggested that globalisation had changed the competitive landscape and that alternative policies to cope with increased levels of competitiveness had to be adopted. Discussion also focused on clusters and the creation of centres of excellence, based on the need to encourage specialisation as a basis for increased national competitiveness.

The last section reviewed the implications of industry policy that existed between 1983 and 1996. It was determined that this was no longer sufficient to cope with the levels of competitiveness that are currently being experienced from overseas. Also, it was suggested that there should be greater participation between the Government and industry, and that the Government should play a more prominent role in the constructs of industry policy. Moreover, it was argued that what was necessary was a broad-based approach to industry policy that utilized a wider cross section of inputs. In essence, this demanded the development of a uniquely 'Australian competitiveness model'.

Exploiting the synergies that exist between indigenous manufacturers and the domestic manufacturing operations of multinationals was also considered integral to the development of a more effective global manufacturing approach. These initiatives could provide insulation against the extent of 'imported' products and thus, create a pragmatic and realistic means to enhance Australia's manufacturing competitiveness and wealth.

To complete this chapter, and to highlight the lessons to be learned from this study, ten-points were summarised as a basis to help improve the effectiveness of industry policy.

The last chapter will summarise the key findings of this research.

Chapter 11 Summary and Conclusions

11.1 Introduction

During the Hawke-Keating period in government Australian manufacturing witnessed unprecedented transformation. Given the Government's mandate to improve the competitiveness of the manufacturing sector, the Government introduced major changes to the macro and microeconomic policy environment. The pursuit of new technology, productivity improvements and stimulus for increased efficiency and manufactured exports followed. As a measure of this success, Australia's manufacturing sector in 1994-95 produced around one seventh of the nation's gross domestic product (GDP) and employed over one million people (IC, 1997a).

In this last chapter, the major findings of the preceding chapters will be briefly reviewed. The general lessons to be learned from the research undertaken regarding the competitiveness of Australia's manufacturing sector and the implications for its survival will be considered.

11.2 Summary of Discussion

The major objective of this thesis has been to investigate whether competitiveness in Australia's manufacturing sector improved during the Hawke-Keating period of Government. In order to ascertain this certain key characteristics were identified from analysis of the competitiveness literature. These factors formed the basis of the hypotheses tested in Chapter 9. Prior to forming conclusions, however, it is useful to reflect on these discussions.

In Chapter 2 a review of competitiveness was undertaken. The question of 'what is competitiveness' was discussed. It was found in general, that there is no single determinant insofar as competitiveness cannot be attributed to one specific aspect but is, in fact, influenced by a number of factors acting simultaneously. Hence, to determine the

extent of competitiveness necessitated the analysis of several key characteristics related to competitiveness which function both independently and interdependently. Contributions to the development of the concept of competitiveness were also discussed. The roots of competitiveness were largely traced back to the doctrine of 'competitive advantage'. Indeed, it was shown that the early stage growth patterns of international trade were based on a nation's comparative advantages. However, much of this traditional thinking was inevitably surpassed when the correlation between competitiveness and strategy was better understood.

Chapter 3 focused predominantly on establishing a suitable framework for analysis of competitiveness in manufacturing. Firstly, it was argued that comparative advantage was an incomplete explanation for trade advantage, inasmuch as competition was dynamic and evolving and that processes had moved to more knowledge based and capital intensive forms of production. The significance of Michael Porter's work was also examined relative to competitiveness. This touched on his generic strategies model, the five forces model, the value chain concept, and importantly, introduced the diamond of competitiveness framework. As indicated, each of these concepts contributed substantially to the existing body of knowledge pertaining to the competitive advantage of companies, industries, and to determining the competitiveness of nations.

Porter's Diamond model was used in Chapter 4 to examine the relationship between government industry policy and the competitiveness of the manufacturing sector. This was accomplished by conducting a brief review of his methodology and the characteristics employed to assess competitiveness in his ten nations study (Porter, 1990a). Consistent with role of Government, the impact of the determinants of competitive advantage were assessed. A brief analysis was carried out on a few selected nations. Results were ranked according to the strength of each determinant for two nations in particular, and in broad terms, for the ten nations studied by Porter.

To substantiate the holistic nature of the model, the work of other researchers' was examined with a view to the appropriateness of the model for use in different countries

and competitive circumstances. The influences that underpinned competitiveness were then discussed. Notably, behind the 'Diamond framework' was an implicit theoretical construct. The core concept supporting the methodology was deemed to be the 'centrality of innovation'.

A review of evolving manufacturing competitiveness prior to the advent of the Hawke-Keating Government was conducted in Chapter 5. Discussion initially focused on Australia as a trading nation and covered aspects of European settlement and colonial development. Recognition of Australia's growing wealth rapidly attracted competition to the fledgling industries from overseas manufacturers. It was observed how Australia's early industrial history became dominated by protectionist policies. Reasons of geographical isolation and lack of resources were often cited. This led to a brief examination of tariff protection. While establishing Australia's manufacturing sector, successive Governments used tariffs extremely effectively to control competition, as a tacit revenue generator, and for sustaining employment and high wage jobs.

During the 1960's and 1970's the pressure to become internationally competitive gained prominence. It was largely the outcomes of the Jackson and Crawford Committee Reports that set the agenda for genuine industrial reform in the manufacturing sector albeit founded on a new interventionist approach. However, results of successive policy machinations did little! This ultimately became the challenge for the new Labor Government in 1983.

It was argued in Chapter 6 that the Labor Government substantially changed the industry policy landscape during the 1980's and 1990's. Primarily this was achieved through the collective strength of its tripartite mechanism involving industry, unions, and government. The impact of a globalising economy and the imperative for manufacturers to become world competitive underpinned the Government's industry policy thrust. It was demonstrated how the positive aspects of government intervention played a large part in encouraging cooperative mechanisms to achieve improved productivity. In addition, considerable success was reached in lowering tariffs and moving towards a free trade

market. What is more, the Government orchestrated significant changes to the manufacturing sector through its focus on improved competitiveness. Amongst this, the Accord remained prominent by facilitating a means of centralised wage fixing, industrial harmony, and through increased productivity in a number of industries.

DITAC was formed in 1984 as a result of an amalgamation of three existing federal government departments headed by Senator John L. Button. A brief review of the National Industry Extension Service (NIES) followed. This initiative became known as the 'flagship program' for enterprise level assistance. Although reputed to be grossly under-funded, NIES was largely successful in its broad aims of assisting manufacturers become more internationally competitive.

Evidence also suggested, however, that the Government had a crucial role to play in developing an industrial climate conducive to both domestic and international competitiveness. It was concluded that to contend with the internationalisation of the economy, different industry policy approaches were necessary, particularly the need for clearly defined infrastructure support mechanisms to assist manufacturers.

Microeconomic reform came onto the political agenda. This was undoubtedly the centrepiece of industry policy during the Hawke-Keating period. However, amongst the positive industrial and economic change that took place, the Government had still not achieved an acceptable compromise to conclusively terminate the tariff debate, in deference to a free market alternative. Indeed, even as a consequence of industrial peace, and increased productivity underpinned by the Accord, Australian manufacturing failed to grasp the consequences of globalisation and the imperatives of international competitiveness.

This led to a discussion of Keating's influence on the development of industry policy. It was demonstrated how the Government sought to transform manufacturing from low value production to a focus on high value added ETMs through policies supporting innovation and increased exports. It was also identified that Australia's investment

climate was not conducive to attracting major funding to the manufacturing sector. The need to address this concern was considered fundamental to the sector's growth and success, especially where investment could be synchronised with areas of existing competitive advantage. Based on the need to improve manufacturing competitiveness, specific policies were designed to encourage innovation and the take up of new technology. Increased financial assistance was also made available to help generate more research and development activity.

In light of this discussion, Chapter 7 concentrated on the development of a number of key hypotheses to be tested within the context of this thesis. It was reasoned there were a number of independent and interdependent forces acting within various constructs of government industry policy related to competitiveness that interacted as part of a cause and effect relationship. This led to the development of five hypotheses deemed to be crucial and intrinsically linked to Australia's ability to improve manufacturing competitiveness. In turn, each hypothesis was tested with a view to either rejecting or failing to reject its proposition. Factors examined included manufacturing productivity, research and development, exports, imports, and financial investment.

An amended model of Porter's Diamond of National Advantage was developed. It was argued this revised model was more appropriate to contend with the nuances of Australia's manufacturing. As noted, manufacturing was highly dependent upon overseas multinationals. Importantly, they served to stimulate indigenous capabilities and provide an appropriate vehicle to promote networks or clusters of specialist expertise. Moreover, the effective co-ordination of indigenous and multinational capabilities offered a strategic solution to help sustain the viability of manufacturing.

Chapter 8 discussed the research methodology and data collection methods. Prior to reviewing the preferred methodology, however, it was necessary to comment on the basis for amending Porter's model because this impacted on the scope of the data collected. Distinct from Porter's work, it was possible to ascertain a direct correlation between the effective coordination of the variables tested and the improvement of manufacturing

competitiveness. In addition, significant benefits were attributable to a revised methodological approach because of the single industry, single nation character of this thesis. Not the least of which negated the need to choose between an appropriate product, industry, or group of industries for analysis as in Porter's case. Nonetheless, a similar quantitative-based research approach to Porter's was shown to be justifiable. However, it was necessary to validate the approach to be used to ensure the research question posed could be adequately tested based on a recognised and robust research methodology.

The data collection methods were then discussed. Fundamentally, secondary data was preferred for use because of its suitability to the focus of this thesis, and with respect to the abundance of Australia-wide 'official' archival sources available. A graphical representation of typical data sources was presented. This highlighted the extent of data interaction that existed between Government, specialist bodies, academia, and the private sector. The analysis of data formed the latter part of this chapter. Notwithstanding the nature of data compiled it was necessary to describe the analytical approach to be applied. Importantly, this was to ensure the data used was reliable and could adequately test each of the hypotheses under consideration.

In Chapter 9 investigation of the research hypotheses was undertaken. With respect to productivity, analysis showed that Australian levels had improved during the Hawke-Keating period in government. Research and development (R&D) and associated expenditure had similarly increased. However, it must be stated that the relative improvement in performance was still less than a large number of Australia's competitor nations. Research also confirmed that manufactured exports had increased, albeit from a relatively low base. Notably, the increased levels of ETMs contributed significantly to an improvement in export intensity. A more disturbing feature, however, stemmed from the fact that during this period, Australia witnessed wide-ranging increases of imported manufactured goods, arguably denuding the benefits of its improved performance.

The concluding part of Chapter 9 investigated the extent of manufacturing investment in Australia. In general, results showed that investment levels between 1983 and 1996 had

increased stemming largely from the fact that there appeared to be a strong correlation between increased manufacturing investment and productivity growth (De Long and Summers, 1992; IC, 1997a).

Chapter 10 went on to review the implications for industry policy. Initially, this centred on the implications of the empirical results found in Chapter 9. The question of how could the Government have done better in terms of industry policy was then posed. A number of elements crucial to the sustainability of the manufacturing sector were subsequently determined. In general, it was found that the influence of each variable was strongly linked to improving competitiveness, thus adding weight to the notion of their interdependence. The need to increase the effectiveness of industry policy was then discussed. From this, it was determined that globalisation had changed the competitive landscape and that more appropriately focused industry policies were necessary.

The suitability of specialist clusters was supported as a basis for maximising resources. Based on centres of excellence, the importance of a nationally focused competitive strategy offered a means with which to effectively exploit manufacturing capabilities. The remaining part of the chapter discussed the implications of industry policy and the role of government. Discussion was based predominantly on whether the Government's industry policy was sufficient to address the needs of the manufacturing sector. It was suggested that a more broad-based approach to industry policy was appropriate.

Lastly, this led to discussion of the revised competitiveness model. This showed that the crucial interactions which occurred regarding the sustainability of Australian manufacturing justified the need for the Government to be a 'key partner' in supporting the 'collective nature' of Australia's national capabilities.

11.3 Conclusions

Consistent with the objectives stated in Chapter 1, this last section will consider whether or not the aims have been achieved in terms of the justification for this study. The

primary goal was to investigate if manufacturing competitiveness improved in Australia during the Hawke–Keating period of government. As argued, this demanded assessment of a number of interrelated factors which appeared to operate both independently and interdependently within Australia's manufacturing landscape. It was also stated in Chapter 1 that structural change and a move to alternative economic tenets could not be achieved through existing paradigms. This assertion was widely based on a belief that improving competitiveness in the manufacturing sector demanded a more holistic policy solution. Indeed, one which necessitated a whole of sector approach. Accordingly, these issues provided the basis for the subsequent direction of this research.

Given the purpose of this thesis each of the stipulated tasks described in Chapter 1 have been accomplished. The major findings suggested that manufacturing competitiveness appeared to improve during the Hawke-Keating years. However, it is not possible to isolate the exact drivers of competitiveness. Although, it can be defensively concluded that within the policy jurisdiction investigated, the relatedness of each variable tested in Chapter 9 played a significant part in increasing the competitive performance of the manufacturing sector.

Consistent with the research undertaken, it can also be concluded that the Government faced an immutable dilemma, insofar as the political platform on which it won office was founded on increased employment and economic wealth creation. Globalisation and the pursuit of international competitiveness had made this task extremely difficult to achieve. Moreover, industry policy or more correctly, the dichotomy of microeconomic reform and the diverse characteristics of macroeconomic policy appeared too difficult to manage simultaneously.

Furthermore, from the mid 1980s onward, it was clear the Government adopted a 'hands off' persuasion preferring instead to allow market forces to prevail. Amongst this momentum and lack of leadership, the manufacturing sector lurched from crisis to crises. Indeed, as a broad–based indicator of the so called free market dogma, manufactured imports significantly increased. This point is exemplified by what appeared to be tacit

acceptance of high unemployment as a consequence of increased competition and globalisation. Also, given the absence of any incisive industry policy, the inevitable retrenchments that occurred as part of tariff reduction and other microeconomic reform processes appeared to be badly managed.

It is also questionable to what extent Australia had participated in the globalisation debate relative to competitiveness. It can be argued that the Government merely paraphrased the globalisation rhetoric and failed to develop any unique strategies to assist manufacturers. The net affect would undoubtedly assign Australia's manufacturers to a second best mentality reliant upon the competitive initiatives of other nations.

Relative to the future of Australian manufacturing, evidence showed that improved competitiveness was related to several factors acting simultaneously. By the same token, to stimulate increased manufacturing competitiveness, it was determined that industry policy must be directed towards these specific aspects. It was also found that the demands of globalization and the necessity to compete at an international level required more sophisticated strategies and more incisive industry policy. This subsequently led to the consideration of the merits of manufacturing centres of excellence, as a means to exploit Australia's limited resources and capabilities.

Fundamental to this proposition was the fact that there is no single remedy to improve Australia's manufacturing competitiveness. Competitiveness is an attribute of companies, insofar as it is generated from enterprise productivity. While Government's can assist the mechanism they cannot create competitive industries. Accordingly, there is a need for a more strategic model which would in effect combine the attributes of competitiveness with appropriate industry policies.

It is in this area that the culmination of national competitiveness can be achieved. To accommodate the changing nature of manufacturing, industry policy considerations must be founded on a 'whole of industry' approach. Based on a national agenda of sector-wide productivity, the contributions of multinationals and indigenous companies can then be

effectively exploited through the proposed centres of excellence. Indeed, there is justification for a government-industry partnership; one based on the support of differentiation and manufacturing specialisation. Accordingly, the centrality of this notion fosters a more cooperative federal and state government approach based on a nationally focused competitiveness agenda.

With regard to Australia's international competitiveness standing, to reiterate, the role of Government is crucial to the sustainability of manufacturing. As a 'participating partner' this would clearly enhance the goal to marshal specialisation, and improve manufacturing competitiveness at a national level. As argued, it is no longer feasible for Australia's manufacturing sector to persist in the manufacture of low value products. Consistent with the growing levels of sophistication from international competition, Australia needs to adopt a new manufacturing paradigm. As a matter of urgency, the manufacturing sector must differentiate itself and seek to occupy narrow fields of specialised expertise. Based on creating competitive advantage, undoubtedly this will mean focusing of knowledge-based industries that demand extremely high skill levels and complimentary research expertise. In the same way, a move away from what has been considered traditional manufacturing will inevitably cause disruption. However, the longer term benefits will ensure the sustainability of Australia's manufacturing future.

Overall, the results of this thesis add to the body of knowledge of competitiveness theory. It has been shown there is a pragmatic link between the factors which influence competitiveness, and industry policy as the basis for manufacturing direction and sustainability. These results also contribute to the understanding of the underlying importance of adopting a collective approach to the development of industry policy. Whilst more research is clearly needed, findings from this thesis regarding the competitiveness of Australia's manufacturing sector provide architects of industry policy with an alternative solution.

Appendix 1

Summary of Labor Government Policy Initiatives and Programs 1983-96.

- Extensions to Research and Development schemes such as 150 percent tax concession for industrial R&D.
- Grants for Industrial Research and Development (GIRD) scheme.
- Continuation of the Export Market Development Grants (EMDG) scheme.
- The formation of AUSTRADE, a specialist export assistance body.
- Increased flexibility for the Australian Industry Development Corporation (AIDC).
- The formation of the Management Investment Companies Program (MIC) (1984-91).
- The National Industry Extension Scheme (NIES), a program designed to coordinate, rationalise and upgrade State and Federal industry consultancy services into one high profile non-bureaucratic body. It was also established to encourage the formulation and introduction of modern manufacturing management techniques and production systems.
- Heavy Engineering Adjustment and Development Program.
- Shipbuilding Policy embodied in the Bounty (Ships) Act 1980 and 1989.
- The Partnership for Development program (Information Technology Industry).
- The National Teaching Company Scheme, a University/Industry linkage program.
- Aerospace Industry Development Strategy.
- Information Industries Strategy.
- Food Processing Industry Strategy.
- Raw Materials Processing Strategy.
- Medical and Scientific Equipment Strategy.
- Space Technology Strategy.
- The National Procurement Development Program (1987-90) to boost research, and develop and trial products within government departments and agencies.
- The Vendor Qualification Scheme.

- The Revised Offsets Program (Wide coverage, eg aerospace, biotechnology).
- The Factor F Pharmaceutical Program.
- Advanced manufacturing Technology Program (AMT).
- Significant enhancement to the Export Finance and Insurance Corporation (EFIC).
- Enterprise Improvement Process (EIP).
- Introduction of Cooperative Research Centres (CRC's).
- The International Trade Enhancement Scheme (ITES).
- Metal Based Engineering Program (MBEP).
- Initiatives such as the Pooled Development Fund to provide equity for small businesses.
- AusIndustry's Technology Access program (TAP).
- The Network Brokers and Business Networks program.
- The Intelligent Manufacturing Systems (IMS) program.
- The Department of Industrial Relations Best Practice Demonstration program.

Each of the above program initiatives was discretely funded. Applicants received financial support on a case-by-case basis. However, the financial limits were invariably set by agreement between the state and federal governments. Applicants could access a number of programs simultaneously depending upon their specific strategic planning needs.

Appendix 2

Productivity Determinants

Productivity determinants identified in the literature can be identified by three characteristics. These include:

- immediate causes;
- underlying factors; and
- fundamental influences (Industry Commission, 1995).

(1) Immediate causes are specifically determinants that have close and tangible links to input/output relationships in production systems. For example, aspects such as technological advances are crucial to productivity growth. Innovation, invention and the diffusion of technologies are also major determinants of productivity. Similarly, knowledge based systems have been emphasized in the literature as a key component of technological advances. Other aspects include: the accumulation of human and physical capital, research and development, economies of scale and scope, and notwithstanding, specialization, management practices, workplace culture and organizational structures.

(2) Underlying factors related to productivity include competition, particularly, the ramifications to manufacturers competing in both domestic and overseas markets. Other aspects relate to openness, with respect to trade and investment especially for mechanisms such as investment attraction, intra-industry trade and the development of export markets. Supply and demand also has a pervasive effect on productivity determinants. Opportunities can similarly be realised through scale economies, network clusters and in particular, the collectivity of manufacturing capabilities as previously argued, and;

(3) Fundamental influences that affect productivity are to a large extent governed by factors that impact the productive potential of individual companies, industries, and nations. Research suggests there are also some interrelated aspects that create the difference between competitors, and accordingly, provide a means to differentiate the levels of competition.

Appendix 3

Selected OECD Countries - Average Annual Growth in Multifactor Productivity (MFP)

Country	Ave 1983-84	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total	Industry Sector %
Australia	0.6	1	0.3	1.7	-0.9	0.4	-0.4	1.1	3.3	0.8	0.4	1.3	2.3	11.9	15
Belgium	1.7	0.1	0.8	0.4	2.5	2	1.6	1.1	0.5	0.9	2.9	1.2	0.2	15.9	27
Canada	0.6	0.4	-1.4	-0.1	0.2	-0.6	-1.1	-1.2	0.7	0.4	1.6	0.7	-0.5	-0.3	22
Denmark	1	0.1	0.6	-0.7	-1.1	0.9	1.3	1.1	-0.6	2.1	-0.1	2.5	0.3	7.4	24
Finland	2.4	2.4	2.5	2.6	2.4	2.9	0.2	-2.6	0.3	2.7	4	1.7	2.6	24.1	28
France	1.9	2.4	1.7	0.8	2.5	2.2	0.7	0.3	1.4	-0.2	1.5	2.1	0	17.3	27
Germany	1.5			-		-	-	-	1.5	0.3	2	1.6	1.2	8.1	37
Italy	1.6	1.9	1.3	2	1.3	1.5	-0.3	-0.6	0.9	1.1	3.4	1.8	-0.3	15.6	28
Japan	2.2	3.8	1.1	2.2	4.4	3.3	3.7	1.4	-0.1	1	0.2	1.3	1.4	25.9	30
Sweden	1	0	1.3	1.1	-0.6	0.3	-0.8	-0.4	0.4	0.2	2.1	1.4	0.4	6.4	28
United Kingdom	1	0.3	2.9	2	-1.4	-0.5	-0.2	-0.4	2	2.2	2.2	0.9	1	12	26
United States	0.9	1.6	1.2	0.4	1.5	0.8	0.7	0.3	2	0.6	1.5	0.5	2	14	21
OECD Country Totals	**16.4**	**14**	**12**	**10.7**	**11.7**	**12.8**	**5.8**	**-1**	**9**	**11.3**	**21.3**	**15.7**	**8.3**	**158.3**	
Ave/year Totals	**1.37**	**1.27**	**1.12**	**1.13**	**0.98**	**1.20**	**0.49**	**0.01**	**1.03**	**1.01**	**1.81**	**1.42**	**0.88**	**13.71**	**1.05**

Source: OECD Productivity Data Base various years

Appendix 4

Selected OECD Countries – Total Research and Development - Percentage of GDP

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Ave
Australia	**0.86**	**1.07**	**1.12**	**1.24**	**1.19**	**1.22**	**1.26**	**1.31**	**1.42**	**1.52**	**1.6**	**1.59**	**1.61**	**1.67**	**1.33**
Belgium	1.56	1.57	1.62	1.63	1.64	1.59	1.65	n/a	1.62	n/a	1.7	1.69	1.72	1.8	1.65
Canada	1.36	1.4	1.44	1.48	1.43	1.4	1.47	1.53	1.6	1.64	1.7	1.76	1.72	1.68	1.54
Denmark	1.13	1.16	1.19	1.26	1.35	1.43	1.48	1.56	1.61	1.64	1.72	n/a	1.82	1.84	1.48
Finland	1.32	1.46	1.54	1.64	1.72	1.75	1.79	1.86	2.02	2.11	2.14	2.26	2.26	2.52	1.89
France	2.01	2.1	2.15	2.14	2.18	2.18	2.23	2.33	2.33	2.33	2.37	2.32	2.29	2.27	2.23
Germany	2.5	2.5	2.68	2.7	2.8	2.79	2.79	2.67	2.47	2.35	2.28	2.18	2.19	2.19	2.51
Italy	0.95	1.01	1.12	1.13	1.19	1.22	1.24	1.29	1.23	1.18	1.13	1.05	1	1.01	1.13
Japan	2.34	2.43	2.56	2.53	2.6	2.62	2.71	2.79	2.76	2.71	2.63	2.58	2.69	2.78	2.62
Sweden	2.47	n/a	2.78	n/a	2.86	n/a	2.8	n/a	2.72	n/a	3.17	n/a	3.35	n/a	2.88
United Kingdom	2.2	n/a	2.24	2.26	2.2	2.14	2.15	2.15	2.07	2.03	2.06	2.01	1.95	1.88	2.10
United States	2.58	2.64	2.75	2.72	2.69	2.65	2.61	2.65	2.71	2.64	2.52	2.42	2.51	2.55	2.62

Source: OECD Factbook various years

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