

## **EXPLORING THE NATURE OF LINKAGES AS A MEANS OF EXAMINING THE POTENTIAL FOR BUSINESS COLLABORATION WITHIN A QUEENSLAND REGION**

**Yvonne Brunetto**

School of Management, Griffith University, Logan Campus, University Drive, Meadowbrook 4131. Qld, Australia.

**John Campbell**

School of Management, Griffith University, Nathan Campus, Nathan, Qld 4111, Australia.

**Rod Farr-Wharton**

Technology and Innovation Management Centre, University of Queensland, St Lucia, Qld 4072, Australia.

**Anita Greenhill**

School of Management, Griffith University, Nathan Campus, Nathan, Qld 4111, Australia.

**ABSTRACT:** Exploring the nature of linkages as a means of examining the potential for business collaboration within a Queensland region, this paper uses the existing business linkages as a means of analysing the potential of a region to foster greater collaboration amongst small and medium enterprises. Past research suggests that when firms within individual industries collaborate, higher economic growth and development for both the region and the economy at large are possible. Historically the Australian business environment has been characterised by low levels of supply and value chain collaboration. The findings from this study suggest that the region under examination meets only some of the conditions identified in other regions as necessary for successful industry clustering. The evidence from this research also suggests that businesses in the Logan region of South East Queensland demonstrate a relatively insular inwards-focused approach to business decision-making. Furthermore, it seems likely that if this approach is to change, there will need to be a strategy involving a significant support role by government/business organisations to assist businesses to change the way they think about doing business.

### **1. INTRODUCTION**

For the greater part of Australia's western history, business prosperity has been based on the primary sectors of agriculture and minerals. In more recent times, the secondary and tertiary sectors have emerged supported by a relatively insular and protected trade environment. With the advent of globalisation and the resulting emphasis on knowledge-based business, the Australian government has begun to recognise the need for business to change focus and address the

inherent structural problems presently hindering economic growth and development (Enright and Roberts, 2001). Moreover, some other western economies have experienced similar structural problems and in turn, their governments have responded by developing policies aimed at promoting collaboration as one strategy aimed at encouraging businesses to compete more effectively within the global arena (Benneworth and Charles, 2001).

The Australian business environment has historically been characterised by low levels of collaborative activities (Enright and Roberts, 2001). In addition, to date, Australian policy makers have been slow to embrace the need for policies that specifically promote different types of networks and clusters of business activities in a comprehensive manner (Marceau, 1999). For example, in the past decade, there have been only a few specific policies promoting regional clustering initiatives [such as Working Nation (Keating, 1994)]. More recently, federal government held a Regional Summit (DTRD, 2000) which intends to fund a number of regional clusters. In contrast, some OECD governments have become proactive in developing business policies that promote collaboration via networking programs such as industry clustering and the integration of intra-organisational supply chain activities (Marceau, 1999).

In some regions within countries such as northern Italy and the United States of America, businesses have taken the initiative to cluster together in order to gain a competitive advantage. An industry cluster is defined as “*geographic concentrations of competing, complementary, or interdependent firms and industries that do business with each other and / or have common needs for talent, technology and infrastructure*” (Munnich, et al., 1999, p. 4). Members within the cluster may compete directly with other members or may provide inputs or buy outputs from other members. The idea is that members build linkages and interdependencies between themselves within a value chain. According to Porter (1998) a region can develop a competitive advantage as long as the firms within it continue to innovate and businesses cluster together for mutual advantage. The cluster could incorporate a lead organisation that can act in various coordinating and facilitating roles. For example, a special cluster could involve many small specialist businesses linked through a supplier relationship to a lead organisation. According to Department of the Environment, Transport and the Regions (DETR, 2000, p. 25); “... *the idea that cluster-based policies can be beneficial to economic development has arisen from practical observations of the inter-firm networking and institutional support in regions such as Silicon Valley, (USA), Baden-Wurtenburg, (Germany), and the industrial districts of Central and North Italy.*”

According to Porter (2000, p. 16) the size of a functional geographic region varies according to the comparative distances over which “informational, transactional, incentive and other efficiencies” are achieved. Hence, an effective regional industry cluster can be as small as a discreet region or as large as a single city or state. The linkages between the firms themselves determine the size of an industry cluster. However, governments can also influence the development of industry clusters in the way they fund projects (DOTARS, 2002). According to Waits (2000) the way economic policies are implemented

and funded in turn affects the way linkages develop because it can determine the type of infrastructure (universities and research facilities, training centres, telecommunication services) and supporting industries that sustain the network of firms. For example, in the case of the Logan region, the regional officers of State Government and the local Economic Development Unit (EDU) in conjunction with the Area Consultative Committee (ACC) applied for, and were granted funding from the federal Department of Transport and Regional Services (DOTARS) to run a series of information sessions for firms belonging to three industry types in the region. These information sessions were expected to facilitate the development of three industry specific clusters. Hence, within the Logan region, there is evidence of government activity in fostering the linkages between firms (Brunetto and Farr-Wharton, 2003).

There is no standard size or formula in facilitating a functional industry cluster, rather the borders and factors facilitating it appear to vary from example to example (Porter, 1998, 2000; Waits, 2000; DOTARS, 2002). According to Porter (2000, p. 17) the boundaries of a cluster region are somewhat arbitrary and to determine a functional region, it is necessary to be “informed by understanding the linkages and complementarities across industries” within a region. He argues that it is the development of close linkages with buyers, suppliers and other institutions that facilitates the competition necessary amongst firms in the cluster that in turn, promotes innovation. Hence, this study involves an exploratory investigation of selected industry networks within the Logan region of South Eastern Queensland, Australia. The paper is in three parts. The first part provides a brief review of relevant literature. The second part details an input-output analysis of business activity within the region. The final section examines the characteristics of the region in terms of its potential to foster greater industry collaboration.

The remainder of the paper examines the Australian business cluster environment generally, and the linkages evident amongst selected Logan firms in particular. The primary research question is:

*What is the potential for fostering collaborative activities amongst firm within the Logan region?*

In order to address this question, two secondary research questions emerge:

- What are the linkages demonstrated by specific industry types in the region under study?
- What is the potential for fostering collaborative activities amongst firm within the Logan region based on existing theories and past practices?

### **1.1 Background**

Some clusters form naturally without any government intervention. According to Hill and Brennan (2000), successful cluster development begins with building on the existing business base. Historically, the geographic reasons for the success of naturally forming regional clusters included the “*presence of unique natural resources, economies of scale in production, proximity to markets, labour pooling, the presence of local input or equipment supplies, shared infrastructure, reduced transaction costs, and other localised*

*externalities.*” (Enright and Roberts, 2001, p. 68). The localised externalities result because when firms that normally engage in face-to-face interactions locate close to their suppliers and buyers, the cost of engaging in the acts of negotiating and monitoring contracts increases with distance. In some regions, such as within the textile areas of Italy and Japan, clusters of businesses have developed standardised contracts and mechanisms for negotiations. According to Enright and Roberts (2001, p. 69) the closeness of physical proximity also deters short-term opportunistic activities in favour of longer-term relationship-based business practices. The advantage of successful regional clusters is that over time they provide an appropriate environment for facilitating innovative activities amongst firms. This is because when similar firms locate in close proximity, “knowledge cumulates, skills are handed down from person to person, and industry-specific knowledge becomes common knowledge within the cluster” (Enright and Roberts, 2001, p. 70). Moreover, when similar firms locate in close proximity, it is easier for investors, researchers, government and private sector infrastructure (such as training institutions) and new firms to access. In addition, the emerging business climate within a thriving business cluster is instrumental in promoting innovative spin-offs.

Innovative processes are encouraged when firms engaged in making the same or similar products for user clients interact and/or when firms positioned on a similar supply chain interact. Debresson (1996, p. 346) refers to these as backward and forward innovation linkages. Other authors suggest alternative ways of achieving potential gains from innovation. For example, Croom (2001) infers that there are a number of factors that affect supply chain formation, although information channel innovation is likely to lead to greater innovation in procurement processes and outsourcing. In addition, according to Johannessen *et al.* (1999, p. 117) innovative activity can result from improved mastery of processes simply by different producers discussing the ways they presently engage in processes. In turn, clients may come to demand more innovative products simply from having experienced the initial products of isolated examples of innovation (Debresson, 1996, p. 346). As a result, this activity may become an inducement of more innovative activities in related industries.

The theory of innovation and its implications is still in its infancy although the link between industry clustering and innovative performance has received some research attention (Craig, 1993; Debresson, 1996; Enright, 1998). At one level, Debresson (1996) explains the interrelationship as being a product of entrepreneurial activities. He argues that as businesses become more interdependent, the social division of labour increases, and in turn, innovative activities are likely to follow. However, Debresson (1996, pp. 13 and 28) cautions that innovation “*is never due to one sole event, but to an accumulation of improvements, complements, and adaptations*”. In addition, he argues the importance of timing in establishing “*innovative agents*” and “*innovative actors*” as prerequisite for innovation activity.” Some innovative agents such as government policy and resources may take time to achieve their goals. This is because the first step in any such change is to initiate a new way of thinking about business. Until entrepreneurs understand the potential gains possible from

business clustering, it is likely that there would be significant resistance. Businesses need time to trust the new information especially when it challenges traditional beliefs about how business should be conducted (Child, 2001).

According to Enright and Roberts (2001, p. 69) innovation performance is “*a function of innovative investment, technological opportunities, and the effectiveness, direction, and degree of focus of innovative activity*”. Their perspective of innovation differs from that of Debresson (1996) in that rather than just focusing on the economic factors fuelling innovation, Enright and Roberts include political and sociological factors that might impact on innovation environment. They argue that investment in innovative activity is dependent on two factors - the level and type of incentives and knowledge about the potential benefits possible from innovative activity. These incentives and knowledge may originate exclusively from within an industry cluster or there may be political agents supporting the process from the sideline.

One indicator traditionally used to detect the potential of a region for collaborative and/or innovative activity is an examination of the presence of key ingredients necessary for cluster activity/innovation within input-output tables (indicating domestic, import flows). Debresson (1996) argues that by measuring inputs and outputs one can make assumptions about past collaborative/innovative activity. Using such a method, he found in an examination of innovative clusters in Italy that two separate sub-systems of innovation existed - one was an agglomeration around consumer goods and the other was a non-standard alliance in producer goods.

### **1.2 Australian Business Environment**

Australian industry is presently characterised by relatively few large businesses, foreign ownership and remoteness from large markets (DISR, 1999). Many multinational corporations have established subsidiaries in Australia as sales and marketing offices or production capability to address local market opportunities. In total, there were approximately 400,000 businesses operating in the Australian business sector in 1998, of which 94 percent had less than 20 employees and only 6 percent had 20 or more employees. The 20 largest enterprises accounted for 19 percent of total employment.

In addition, in the Australian economy there is a direct relationship between business size and propensity to undertake research and development. About 9 percent of all Australian businesses undertake some form of research and development. DISR (1999) argues that innovation is a proven and decisive ingredient in the competitiveness of firms and of nations. However, industry self-funded research and development remains relatively low. Most Australian firms are small except for mining industries, and they do not presently have a culture that promotes research and development. In addition, the Australian experience has been that foreign owned firms are less innovative and export orientated than Australian-owned firms undertaking research and development. Of businesses with 100 or more employees, about 26 percent undertake some form of research and development; of businesses with less than 20 employees, 12 percent undertake some form of research and development. Also, in small businesses,

less than 2 percent derive income from export business. For example, research and development expenditure in Australia is estimated to be 0.79 percent of GDP which compares negatively with the 2.08 percent estimated for the United States, 1.57 percent for Germany and 1.22 percent for the United Kingdom (ARC, 2001). According to Marceau (1999), the lack of research and development and the lack of non-income derived from export are reasons given as to why business clustering has failed to eventuate in Australia except in a few cases.

The role of government policy in fostering industry clustering is at best ambiguous. According to Enright and Roberts (2001) the reason is that there is still a philosophical debate occurring within Australian governments (both at state and federal levels) that question the role of government in fostering business clustering. These questions have already been answered in the UK and most other OECD countries, which they have opted for varying degrees of government involvement. In contrast, the focus of the Australian government has been to develop business policies that have been directed towards achieving import replacement and a collaborative relationship between government and business. Hence, the business environment lacks a supportive framework that is conducive to collaborative relationship between businesses. Moreover, taxation policies aimed at promoting research and development are directed at the individual exclusively, thereby discouraging collaboration (Marceau, 1999, Brown, 1999). Hence, in summary, the impact of these business environment characteristics has been to make industry cluster formation difficult generally within Australia.

### **1.3 Factors Identified as Enhancing Industry Cluster Development**

In theory, Porter argues that clustering enhance economic development in three ways (Miller, *et al.*, 2001). Firstly, clusters increase productivity by improving access to relevant information and organisations (both public and private). Secondly, clustering activities provides the impetus for the development of more firms. Finally, clustering activities enhance innovative activities. Past research suggests that the formation of functional industry clusters is a prerequisite for innovative and leading-edge business activity. For example, the OECD has suggested “clusters with links to local and regional innovation networks have been associated with accelerated diffusion of technology and know-how” (OECD, 1997). Hence in theory, clustering promotes economic development.

According to Porter (1999) a nation’s competitiveness is dependent on the availability of certain factor conditions – a common innovation infrastructure, the supportiveness of cluster-specific conditions and the strength of linkages between interconnected industries. In turn, the cluster-specific conditions comprise four determinants, the first of which relates to positive factor input conditions. Such conditions depend on whether there is a supply of high quality skilled human resources, basic research infrastructures such as universities, a high quality information infrastructure and capital resources for investment purposes. According to Murray (1999) one of the key factors affecting the development of a plastics industry in North Central Massachusetts was the lack

of skilled labour that is compounded by a poor vocational education system. As such, Murray argues that without more assistance by government to address the lack of skilled labour, the industry will not grow.

Porter's (1999) second determinant refers to the context for the firm's strategy and rivalry. This is affected by whether investment in innovation is encouraged and whether competition between locally based rivals is vigorous. In addition, the macroeconomic policies of a government are instrumental in either facilitating or hindering business clustering (Porter, 2000). However, according to Waits (2000) there is minimal past evidence that can assist governments to understand which policies and programs will support businesses and which won't. Waits (2000, p. 49) argues that "*there is no formula for determining the right combination of policy tools and strategies appropriate for all states at all times*". Hence, the same government program implemented to assist firms within the same industry within two regions may result in two different outcomes because the dynamics of each industry network may be different.

Porter's third determinant is the demand conditions. He argued that when the local customers were demanding, that this forced firms to be innovative and proactive in anticipating future demand. According to Waits (2000) when a critical mass of customers emerges, there is more incentive for firms in a cluster to be responsive (usually with the help of public agencies and private consultants). Finally, Porter's (1999) fourth determinant is the state of the related and supporting industries. He argues that industry clusters rather than individual firms as well as vertically and horizontally integrated business had a competitive advantage. According to Porter (2000, p.20) it is the role of related industries that gives rise to demand-side advantages.

However, Porter's approach to examining characteristics that affect competitiveness may not be appropriate when examining Australian regions. According to Miller *et al.* (2001, p. 4) the whole concept of clustering as argued by Porter is "*somewhat vague and elastic, and [causes] problems of theoretical and empirical definition, as well as methodological investigation.*" Of greater significance to this paper is that it is rarely acknowledged that "*clusters undergo a 'life-cycle', for example from embryonic to emergent ....*" (Miller *et al.*, 2001, p. 5). Miller *et al.* posits that researchers and government alike need to recognise the requirement for different policies and resource levels depending on the stage of development of the clusters. Hence, some conditions evident in established regions with mature clusters may display significantly different characteristics compared with regions forming clusters.

In addition, a perceived disadvantage of the way a network structure develops is that it infers that the business participants should provide a driving force for the cluster to be successful. This is probably because historically, in many OECD countries, the driving force has originated from within the network. Examples from within the Northern Italian and USA perspective are often quoted (Porter, 1998). In contrast, such ideal models have largely failed to eventuate in clustering ventures within some other OECD countries and the role of the government has become crucial in supporting and nurturing collaborative activities amongst businesses. According to Waits (2000) the role of government

in supporting collaboration amongst firms may be more than originally anticipated by Porter (1998). Porter argued that the role of government was to remove structural obstacles compromising competitiveness and to ensure that the economic infrastructure (education, research, telecommunications etc) of a region facilitated the growth of firms (Porter, 1998, 1999, 2000). Waits (2000) infers that the degree to which government is involved depends on the circumstances of the firms within a region. Hence, it may be that in some regions/countries, the government may have to play an even greater role than in the past.

Moreover, according to DETR (2000), public policy can also affect the development of clusters by affecting the location of infrastructure investment, research and development expenditure and public sector procurement, and laws relating to zoning. Evaluation of six cluster developments in UK against 10 factors found that although factor importance varies in each case, public sector support was important in building on existing strengths and removing barriers (DETR, 2000, p. 31). In addition, the findings from DETR suggest that Porter's characteristics may vary in importance. For example, whilst Porter argued that proximity to market was an important locational factor, DETR (2000, p. 32) found that the importance of market was dependent on the "*nature of a company's business and its location within the cluster chain*". DETR argued that market proximity became important at the lower part of the cluster supply chain. Two of the emerging critical factors identified as important in the six case studies evaluated by DETR (2000) were the importance of having a supply of skilled labour and being located close to other companies. Similarly, Porter has comparable factors.

One of the main differences in the evidence presented by DETR and Porter focuses on the degree of government involvement. The role of public policy in the UK in promoting clustering has been strong at a regional level (DETR, 2000). The government's role has been to identify and reinforce clusters not to develop them. The 1998 Competitiveness White Paper stated that the government's role was to encourage clusters "*to help British business compete*". It later became a main component of the government's competitiveness policies and an essential part of regional policy. Clusters are seen as highly individualistic –different factors enhance it each time. As a rough guide, DETR (2000, p. 31) found that "*locational and spatial factors are critical in the early formation of the cluster; economic and vertical factors (eg, supply chain) consolidate the cluster; and social and cultural factors (labour mobility etc) form the glue which makes the cluster operational*". Institutional factors, in particular a supportive policy environment, were important in every UK case. However, public policy varied from region to region. Government support can be provided in a variety of different forms such as grants, economic development packages, land releases, pro-active planning policies, and infrastructure improvements. The UK perspective empowered regional policymakers to tailor different approaches to individual regional circumstances.

In contrast, within the USA, according to Munnich *et al.* (1999, p. 8), State and regional authorities provided more indirect assistance. They were



responsible for providing education, research, transport and telecommunication infrastructure. Munnich *et al.* (1999, p. 8) argue that the reasons that the Minnesota Clusters succeeded were that they were industry driven, there was strong government and industry leadership and that all clusters that met a set of criteria were assisted – not just ones identified by the government. The process required was firstly to promote awareness and interest in clustering and secondly, to provide strong leadership in coordinating government, education and research efforts and finally to develop strong productive relationships with industries. The main role of leaders was to “*sell the idea to other businesses, ensuring good turnout at meetings, and generating support for the implementation of action plans*” Munnich *et al.* (1999, p. 16). However, Poole, et al. (1999) argue that state support has played a large indirect part in cluster development. A 1998 survey of 940 state-funded programs found about 40% used tax credits, exceptions, abatements or deferrals. In addition, an additional \$6.3 billions in state funding was allocated in 1998 to non-tax incentives including loans, grants and guarantees provided directly to business or indirectly to communities. Hence, whilst cluster development may be industry driven in the US, it is also strongly government supported. The situation in Australia contrasts sharply with the US examples in a number of ways that will be explored via the case study analysis of the Logan region of Queensland, Australia.

## 2. METHODOLOGY

This study adopts a modified version of the methodology used by Marceau, (1999). Marceau looked at the changing nature of transactions between economic sectors within Australia to identify dependencies that could support the existence of national clusters. In contrast, this research examined business clustering activity at a regional level using input-output data from the database developed by the Logan Office of Economic Development (LOED). LOED database consists of responses to a survey conducted in 2001 of business activity and contains input, output and employment data on more than 5,500 businesses in the Logan region. While the general focus of this analysis is manufacturing, four manufacturing sub-groupings have been identified as strategic for regional economic development. These groupings are (1) Food, Beverage and Tobacco Manufacturing (FBTM); (2) Metal Product Manufacturing (MPM); (3) Machinery and Equipment Manufacturing (MEM); and (4) Other Manufacturing (OM).

The rationale used is that those areas identified as reporting high levels of exchange-based transactions are also likely to engage in co-operative links (the sorts of links likely to lead to business networking and possibly business clustering). The limitation of using the input-output approach is that whilst the outcomes can identify areas of concentration of specific economic activity, it cannot indicate the type of and extent of collaborative relationships within the specified area. This is because the linkages examined in an input-output study are only those that are typically exchange-based transactions. In addition, because this is a preliminary study, it does not attempt to examine linkages between firms. This is clearly a limitation of the study that must be addressed in

future studies.

### **3. LOGAN REGION DEMOGRAPHICS**

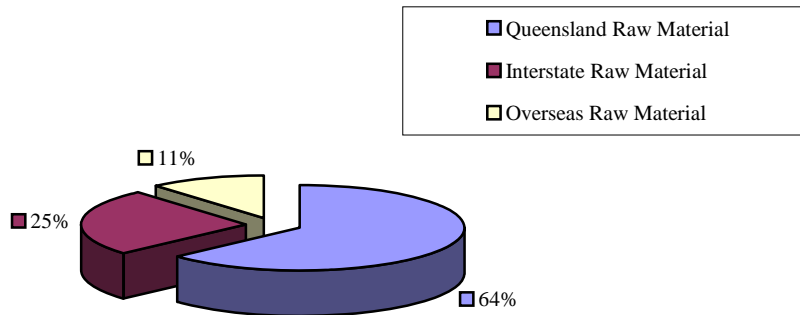
The Logan Region is situated between Brisbane City and the Gold Coast close to the Queensland coastline. It contains a well-developed transport system providing Logan with extensive intra-state, inter-state and international transport links. Logan, unlike any other Australian competitive region, has been the recent recipient of a high-grade telecommunications initiative with the installation of fibre optic cable. The population of the region is 166,770, comprising 18.9 percent of the Greater Brisbane resident population. The population growth per annum is 2.12 percent, with the labour force comprising 83,155 employees.. Approximately, 46 percent of the workforce is under 35 years of age and 9 percent are aged between 15-19. There are over 5,700 businesses in the Logan region of which 360 (or 16 percent) export internationally.

Logan businesses are primarily engaged in services, retail and manufacturing. Within the region, 16.1 percent of the workforce is involved in manufacturing and about 25.1 percent in wholesale/retailing. Approximately 55 percent of firms employ less than five employees, 36 percent employee less than 20, 8 percent employ less than 100 and 1 percent employ 100 or more employees. In terms of the annual business turnover, 66 percent have an annual income less than \$500,000, 14 percent have an annual income between \$500,000-\$1,000,000, 8 percent have an annual income between \$1,000,000 - \$5,000,000 and 4 percent have an annual income over \$5,000,000.

In 1986 the Logan City Council established an independent instrumentality - Logan Office of Economic Development (the LOED)- with the task of encouraging businesses to the region and assisting existing businesses. Within the past year, the LOED has added a further goal of encouraging business clustering and networking with the aim of increasing business activity generally within the region. A number of regions within Australia have developed similar initiatives, however, the difference between this and neighbouring instrumentalities appears to be the level of funding. Presently, the LOED receives significantly fewer resources to achieve similar goals.

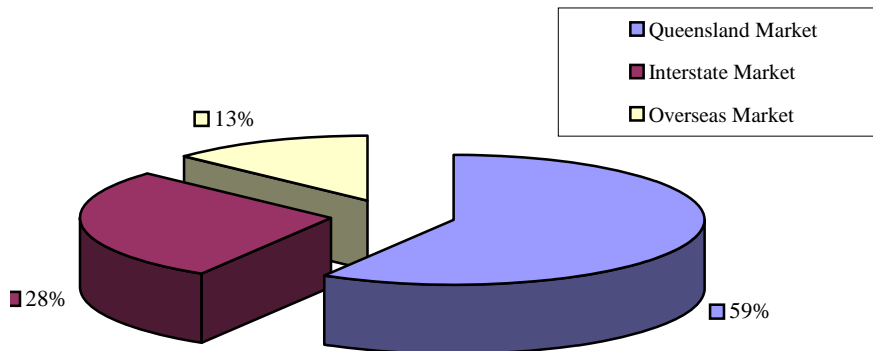
### **4. RESULTS**

Figure 1a displays input data for all 681 manufacturing companies listed in the LOED database. Sixty-four percent of all manufacturing companies use raw materials from within the state, 25 percent from interstate, and 11 percent from overseas. Overall the figures suggest a high reliance on raw materials from local sources. Figure 1b illustrates the markets targeted by manufacturers. Fifty-nine percent of all manufacturers sell into local Queensland markets, 28 percent sell interstate and 13 percent export overseas. Raw materials tend to be sourced locally while product markets tend to be located relatively further afield. In relation to sales, the data shows a markedly poor result in interstate markets in



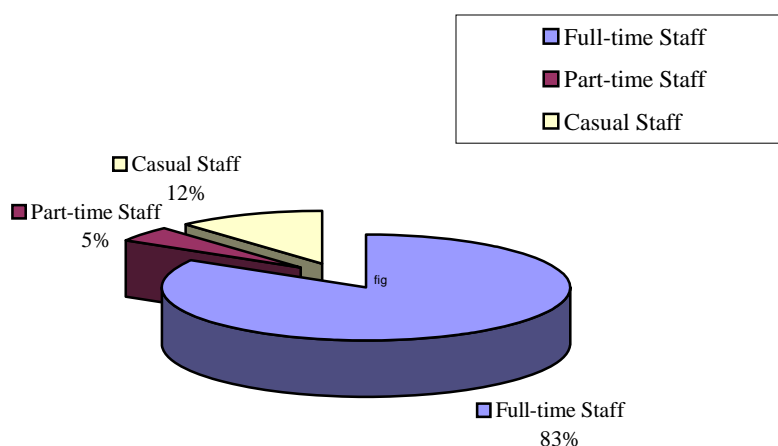
**Figure 1a.** Source of Raw Materials used by Manufacturers in the Logan Region.

**Note:** The information contained in this figure is not indicative of actual dollar values. The above ratios represent the proportion of manufactures that source raw materials locally, interstate and from overseas.



**Figure 1b.** Markets Targetted by Manufacturers in the Logan Region.

**Note:** The information contained in this figure is not indicative of actual dollar values. The above ratios represent the proportion of manufactures that sell into local, interstate and overseas markets.



**Figure 1c.** Employment Profile for Manufacturers in the Logan Region.

general and overseas markets in particular. Figure 1c shows the employment categories and statistics for all manufacturers. The predominant employment category is full-time which accounts for 83 percent of employees. Part-time employment is very low at five percent while 12 percent of the workforce is employed on a casual basis. On balance, manufacturers tend to rely on a full-time workforce. This reliance on a full-time workforce may in part reflect the need for a higher workforce skill base than can be provided by part-time and casual employees.

As mentioned above, four manufacturing sub-groupings within the LOED database were identified as having strategic potential for clustering in the region and were therefore subjected to further analysis. These groupings and the associated number of business entries in the LOED database are: Food, Beverage and Tobacco Manufacturing (FBTM) – 27 business entries; Metal Product Manufacturing (MPM) – 134 business entries; Machinery and Equipment Manufacturing (MEM) – 125 business entries; and Other Manufacturing (OM) – 132 business entries.

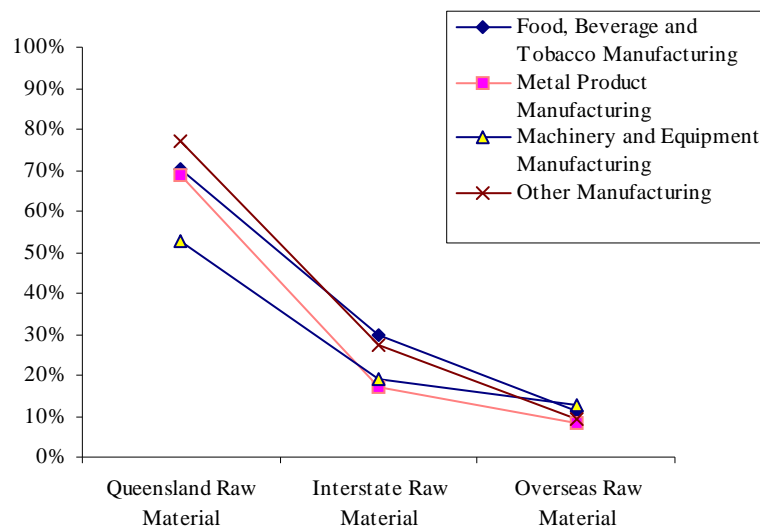
Figures 2a, 2b and 2c show the input, output and employment data for each of these categories. The FBTM group source 70 percent of their raw materials locally, 30 percent from interstate and 11 percent from overseas. All businesses within this category sell into the local market, 70 percent sell into interstate markets and 19 percent export finished goods. Employment within the FBTM group is strongly biased towards casual positions. Full-time employment accounts for 49 percent of all positions, part-time five percent and casual employment a disproportionately large 46 percent.

The MPM group sources 69 percent of raw material inputs locally, 17 percent

from interstate and 18 percent from overseas. All businesses within this category also sell into the local market, 43 percent sell into interstate markets and 22 percent into export markets. Employment within the MPM group consists of 88 percent full-time positions, two percent part-time and 10 percent casual employment.

The MEM group has a high service based component in their core business activities. They source only 53 percent of raw material inputs locally, 19 percent from interstate and 13 percent from overseas. Ninety-eight percent of businesses within this category sell into the local market, 62 percent sell into interstate markets and 26 percent into export markets. Employment within the MEM group consists of 92 percent full-time positions, and four-percent each for part-time and casual employment.

The OM group sources 77 percent of raw material inputs locally, 27 percent from interstate and 9 percent from overseas. Ninety-eight percent of all businesses within this category also sell into the local market, 36 percent sell into interstate markets and 15 percent export their product. Employment within the MPM group consists of 91 percent full-time positions, three-percent part-time and six-percent casual employment.



**Figure 2a.** Source of Raw Materials used by Selected Manufacturer Groups.

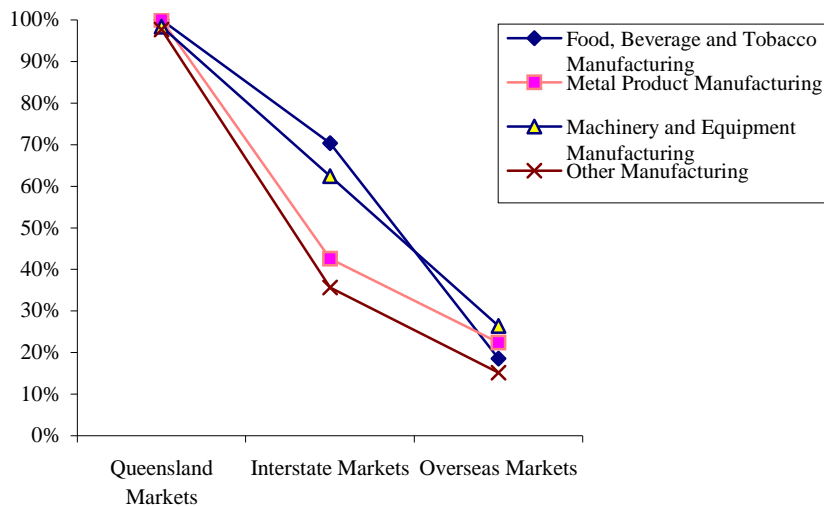


Figure 2b. Markets Targeted Selected Manufacturer Groups.

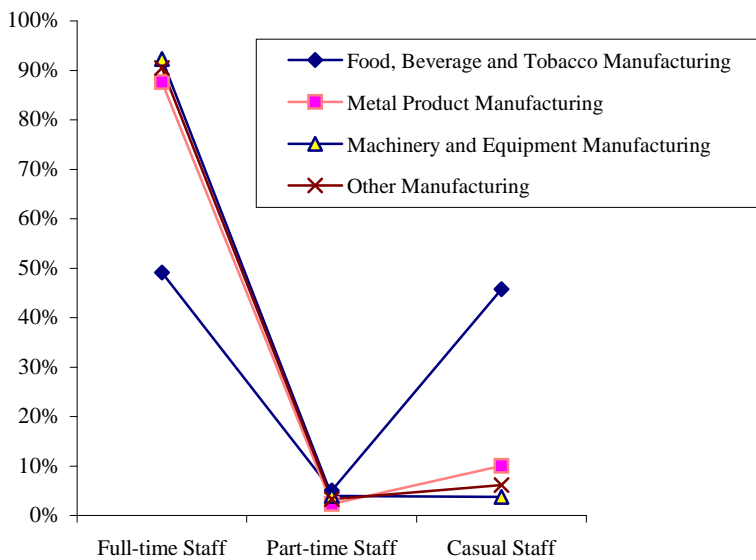


Figure 2c. Employment Profile for Selected Manufacturers in the Logan Region.

Overall the FBTM, MPM and OM groups are more reliant on locally based raw materials than the average for all 681 manufacturers in the Logan database.

However, there is little difference between these groups and the average for raw materials sourced from interstate or overseas. All four strategic manufacturing groups report an above average penetration in all three markets – local, interstate and export. For example, the average proportion of manufacturing businesses targeting the local market is 59 percent whereas the target rate for each of the four strategic groups studied here is around 100 percent.

The MPM and OM groups employ an above average proportion of full-time staff in comparison to all manufacturers. However, the FBTM group demonstrates the most conspicuous employment profile. Clearly, this group has a unique mix of employment characterised with high levels of casual employment and low levels of full-time positions. These figures suggest future investment in food manufacturing cluster development must consider the potential socioeconomic impact that excessive casualisation of employment might have on a regional workforce and the wider population base.

## **5. DISCUSSION**

This paper has attempted a preliminary investigation of the linkages associated with selected firms and an examination of the region in terms of theories and practices identified in the literature. In response to the first secondary research question regarding the linkages demonstrated by the manufacturing industry types within the Logan region, the findings suggest that Logan businesses presently demonstrate a relatively insular inwards-focused approach to business decision-making. The prevailing theory suggests that regions that comprise firms with high levels of exchange-based transactions are also likely to engage in co-operative links (the sorts of links likely to lead to business networking and possibly business clustering). Based on the theory, the findings for the Logan region suggest that firms are less likely to engage in co-operative links. Another interpretation is that the region examined did not reflect the real boundaries of the linkages associated with the selected firms under examination.

In response to the second secondary research question regarding the potential of the region to foster collaborative activities based on the existing theories and past practices the findings are relatively mixed. There are a number of ways that the characteristics of Logan region can be analysed according to different theories and the experiences in different countries. However, some of these perspectives may be less meaningful than others in assessing the capability of this region to foster business collaborative activities. For example, it may be inadequate to analyse Australia's potential for achieving greater competitiveness via industry clustering using only Porter's determinants because the Australian business conditions generally are so different from that of most other OECD countries (eg small population, dominated by a few large multinational and many small businesses). In terms of Porter's criteria, the evidence suggests that there is a balance of factors promoting and factors hindering successful cluster development, however, the factors appear incidental rather than instrumental in affecting business clustering. For example, whilst research infrastructure exists within the region, no specific research facilities have been set up by private or

public sector sources to research innovation in any one of the clusters in formation within Logan to date, although one is being discussed by government presently. It may be that the Australian government needs to examine the degree of assistance given by specific policies and programs (Waits, 2000, Murray, 1999, DETR, 2002) in ensuring that infrastructure investment supports the growth of firms.

On the other hand, Australia as a whole has a high level of information literacy compared with other OECD countries, although it is unclear how accessible relevant information is to smaller businesses. Similarly, in terms of the context for strategy and rivalry, the factors enhancing Australia's competitive position in general, and that of firms within Logan in particular, are limited. As stated earlier, Australia's business policies, including taxation policies, are based on individual firms making individual decisions – hardly a situation conducive to collaboration. In addition, research and development is limited in Australian firms because they tend to be subsidiaries of multinationals that undertake research in their parent country (Marceau, 1999). It is unclear whether investment in innovation is encouraged within local firms and it is also unclear whether competition between locally based rivals is evident at all. However, if having a web presence is indicative of the openness of businesses to innovate, then the findings from this study are a concern because there was a general lack of innovation involving the use of information and communication technology. Specifically, very few businesses in the data set had an Internet presence. Finally, Australian businesses generally lack a culture that promotes the use of private sector risk capital. Hence, in terms of Porter's factor conditions, the conditions within Logan appear not to be favourable towards business collaboration. In addition, in terms of the level of government financial assistance (either directly or indirectly via tax policies) the conditions in Australia generally and Logan in particular, appear in deep contrast to the level of indirect government assistance and research activity undertaken in the USA and UK.

In addition, in terms of demand conditions, Logan is again not necessarily conducive for fostering cluster formation in terms of Porter's criteria. The limited and isolated market size has always been a hindrance for Australian businesses; probably resulting in the strong local market focus demonstrated in the input/output studies. Finally, in terms of the presence of related and supporting industries, the situation is unclear as to whether more vertically and horizontally integrated business are either moving to the regions or are emerging because of any perceived level of unmet demand. In summary, when the future of the Logan region is considered in terms of Porter's four determinants, it is unclear whether the region has the support of a critical mass of required infrastructure and conditions to succeed and his criteria appears irrelevant at the micro level in determining the potential for clustering within the regional Australian context.

When the Logan experience is compared with that of the United Kingdom, further understanding of the real position of the Logan region is possible. As stated previously, DETR (2000, p. 31) found that locational and spatial factors



were important in the formation stage along with positive institutional factors – particularly a supportive policy environment. In terms of workforce input factors, the Logan region has a reasonable supply of quality skilled employees, as well as the necessary research infrastructure, such as a university and technical colleges, located within the area. However, other input condition factors such as the high level of casual employment and low levels of full-time positions within some industry clusters (as evident in the input/output studies) may limit the formation of a viable cluster. Enright and Roberts (2001) argued that when firms located with close proximity, knowledge and expertise expanded over time and employees passed on valuable information. It seems likely that a possible limitation of this argument is when industries are highly casualised, thereby limiting the ability of employees to build up and use their tacit knowledge. Moreover, high casual employment levels may also compromise training options for employees and in turn, limit the potential for industry expansion and its associated innovative activity. This is because employers are less likely to invest training resources (funding/time) in temporary staff.

On the other hand, when the infrastructure of the Logan region is compared with that of the UK regions where clustering has been promoted with strong support from government, the potential capability of Logan businesses to collaborate successfully appears promising. Logan is well serviced with a high quality information infrastructure, particularly because of its reasonably close locality wedged between two cities. Similarly, in terms of transport routes, if firms do decide to import or export more, there are likely to be minimal physical restrictions. However, it is likely that businesses in the Logan region are similar to the rest of Australia in terms of their access to capital resources for investment purposes. Although businesses are geographically very close to one another, access to less tangible resources such as capital remains problematic. These restrictions have a historical context that will not easily be addressed without conscious effort by government to re-educate businesses about the potential benefits likely to accrue from such activities.

One important similarity between the experience of the Logan region and the UK experiences involves the important role of government and its agencies in identifying and reinforcing cluster formation. In the case studies that were examined by DETR (2000), a supportive policy environment was perceived as essential to success. Similarly, although the supportive role of the Logan Office of Economic Development as well as the state government has been extensive, the strategy is barely two years old. Government activities have been an effective catalyst in the early stages of the formation of clusters providing information, identifying industry champions and developing strong relationship-based networks across businesses within industry.

However, in contrast with the UK or US or European examples, the level of funding support (from federal or state governments) for business clustering generally or within Logan specifically appears to be significantly less. Support is provided in kind, although it is clear that at a local and state government level, business clustering is treated as a priority. Impinging on this positive government initiative is the fact that government involvement in business and industry

clustering is relatively new within the state. Therefore it is not surprising that policy vacuums may exist in some policy areas related to business clustering.

Another factor that was identified by DETR (2000) as important for achieving successful industry clusters in three of their six case studies was the proximity to close markets. In contrast, the findings from the input-output study are the predominance of domestic destinations for Logan outputs. At present, Logan business appears very insular in focus and direction. However this may simply reflect past business practices. The situation could simply indicate that the impact of government in informing and assisting businesses to consider export possibilities is still in its infancy.

In total, the information obtained in response to each of the two secondary research questions provides a means of addressing the primary research question which was to examine the potential for fostering collaborative activities amongst firms within the Logan region. The findings of this preliminary study suggest that the selective firms in Logan are unlikely to engage in collaborative activities naturally. It is therefore likely that similarly to the UK experience, intervention of supportive policies and programs will be required.

## 6. CONCLUSION

Whilst it may appear that the Logan region has a number of significant barriers hindering business clustering, there are a number of factors that require consideration. The findings from this preliminary study suggest a fairly insular group of firms displaying few signs of wanting to embrace the idea of collaborating with other firms. In addition, the conditions for fostering collaboration are in place, however, it is probably unlikely to occur without significant government assistance and support. British examples of successful business clustering suggest that government assistance and timing are important factors in establishing the necessary contextual environment for promoting productive interactions. This is probably the case for Australian examples in general and Logan in particular. The one benefit Australia has is the experience and knowledge already available overseas. The challenge for Australia generally and Logan in particular is to effectively integrate the existing experience and knowledge within the Australian environment. Furthermore, it seems likely that there will need to be a significant support role played by government/business organisations to assist businesses to change the way they think about doing business.

## REFERENCES

- ARC (Australian Research Council) (2001) *Mapping The Nature And Extent Of Business-University Interaction In Australia*. Australian Government Publishing Service (AGPS): Canberra.
- Benneworth, P. and Charles, D. (2001) Bridging cluster theory and practice: learning from the cluster policy cycle. In P. den Hertog, E.M. Bergman, and D. Charles (eds), *Innovative Clusters, Drivers of National Innovation Systems*. OECD: Paris, pp. 389-404.

- Brown, R. (1999) The Competitive Institute, a Network of Cluster Practitioners. 2<sup>nd</sup> Annual Conference, Varese, Italy, 10-12 November. [http://www.regional.org.au/articles/development/tci\\_italy.htm](http://www.regional.org.au/articles/development/tci_italy.htm), accessed 15 July 2003.
- Brunetto, Y. and Farr-Wharton, R. (2003) The impact of government policies and practices on Australian SMEs. *European Academy of Management Proceedings*, Milan.
- Child, J. (2001) Trust. The fundamental bond in global collaboration. *Organizational Dynamics*, 29(4), pp. 274-288.
- Craig, J. (1993) *Transforming the Tortoise: A Breakthrough to Improving Australia's Place in the Economic Race*. Prosperity Press: Brisbane.
- Croom, S. (2001) Restructuring supply chains through information channel innovation. *International Journal of Operations and Production Management*, 21(4), pp. 504-515.
- Debresson, C. (1996) *Economic Interdependence and Innovative Activity An Input-Output Analysis*. Edward Elgar: Cheltenham.
- DETR (Department of the Environment, Transport and the Regions) (2000) *Planning for Clusters A Research Report*. Her Majesty's Stationery Office: London.
- DISR (Department of Industry Sciences Resources) (1999) *Shaping Australia's Future Innovation Framework Paper*. Australian Government Publishing Service (AGPS): Canberra.
- DOTARS (Department of Transport and Regional Services) (2002) *Regional Business Development Literature Review*. SGS Economic & Planning: Melbourne.
- DTRD (Department of Transport and Regional Development) (2000), Regional Australia Summit Steering Committee Final Report, AGPS: Canberra, Vol. 31.
- Enright, M. (1998) Regional clusters and firm strategy. In A.D. Chandler, P. Hagström, and Ö. Sölvell (eds), *The Dynamic Firm: The Role of Technology, Strategy, Organization, and Regions*. Oxford University Press: Oxford, pp. 315-342.
- Enright, M. and Roberts, B. (2001) Regional clustering in Australia. *Australian Journal of Management*, 26, pp. 66-85.
- Hill, E.W. and Brennan, J. (2000) A methodology for identifying the drivers of industrial clusters: The foundation of regional competitive advantage. *Economic Development Quarterly*, 14(1), pp. 65-96.
- Johannessen, J., Olaisen, J. and Olsen, B. (1999) Managing and organizing innovation in the knowledge economy *European Journal of Innovation Management*. 2 (3) pp. 16-128.
- Keating, P. (1994) Working Nation: the White Paper on Employment and Growth. Australian Government Publishing Service (AGPS): Canberra.
- Marceau, J. (1999) The disappearing trick: Clusters in the Australian economy. In: *OECD Boosting Innovation: The Cluster Approach*. OECD Paris Ch. 6.
- Miller, P., Botham, R., Martin, R.L., and Moore, B. (2001) Business Clusters in the UK: A First Assessment. Department of Trade and Industry: London.

- Munnich, L; Love, P; Clark, J; Warner, J; Templin, E; Rosemeier, D; Imsland, D and Lenhard, N. (1999) *Industry Clusters An Economic Development Strategy for Minnesota*. Preliminary Report, University of Minnesota: Minnesota.
- Murray, E (1999) Cluster-based development strategies: Lessons from the plastics industry in North Central Massachusetts. *Economic Development Quarterly*, 13(3), pp. 266-280.
- OECD (Organisation for Economic Cooperation and Development) (1997) *National Innovation Systems*. OECD: Paris.
- Poole, K; Erickcek, G; Iannone, D; McCrea, N and Salem, P. (1999) *Evaluating Business Development Incentives*. National Association of State Development Agencies: Washington.
- Porter, M.E (2000) Location, competition, and economic development: local clusters in a global economy. *Economic Development Quarterly*, 14 (1) pp. 15-34.
- Porter, M.E. (1999) *The New Challenge to America's Prosperity: Findings from the Innovation Index*. Council on Competitiveness, Washington.
- Porter, M.E (1998) Clusters and the new economics of competition. *Harvard Business Review* 76(6), November-December, pp. 77-90.
- Waits, M.J. (2000) The added value of the industry cluster approach to economic analysis, strategy development and service delivery. *Economic Development Quarterly*, 14(1), pp. 35-50.