

Industrial clustering in regional Australia: The role of chance, entrepreneurs and government in the Tasmanian Light Ships Industry

Mark Wickham

Dallas Hanson

University of Tasmania

Abstract

Australia has had unfortunate experience in industrial cluster development, and despite widespread government action remains below OECD averages in terms of cluster contribution to economic wealth. We use Porter's cluster theory to examine the contrary case: the highly successful Tasmanian Light Ships Cluster, to determine the roles of government, chance and local culture in cluster success. We conclude that cluster development is a dynamic process. Governments should only provide infrastructure support and only this for new ideas that fall within the scope of local knowledge, and existing chance related entrepreneurial activity.

Introduction

Since the 1980s, globalisation of Australia's markets and associated reforms to the economy presented significant economic challenges for the country's federal and state governments. Of particular concern to legislators was (and remains) the question as to how to make a nation previously protected by a 'fortress' of tariffs and subsidies, more productive and competitive on world markets (Brown, 2000). One concept that was adopted as a prominent economic development model by Australian governments in the 1990s was Porter's (1990) theory of 'industrial clustering' (Ivarsson, 1999). It was generally accepted by Australian governments that the conditions leading to the formation of internationally recognised 'clusters' of industry (such as Silicon Valley in the United States) could be replicated to help foster the growth of new industries, and to re-engineer older industries to world standards (Ivarsson, 1999; Lloyd & Dicken, 1990).

This belief was manifest in the Australian Manufacturing Report (Pappas, Carter, Evens, Koop & Telesis, 1990) which introduced the Porterian concept of 'industrial cluster development' into governmental policy development by proposing regional industry partnerships to strengthen networks, encourage innovation and development, and technology transfer. In particular, the notions of 'networking and innovation' emerged as important platforms of public policy to integrate Australian industries more into global business structures (Australian Manufacturing Council, 1994; Bureau of Industry Economics, 1991). Further to this, in 1993, a federal government taskforce on regional development investigated the development potential of regions within Australia (Kelty, 1993). This was followed by the McKinsey Report "Lead Local, Compete Global" (McKinsey & Company, 1994) which was the first report to explicitly suggest clustering as a basis of industry and economic development. Working Nation (Keating, 1994) policies and other initiatives by state and federal governments led to investigations and the implementation of policies to facilitate the development of clustering as a means of stimulating regional industry and economic development in Australia.

Industrial Cluster Development: The Australian experience

Of particular note in the economic literature however, is the fact that despite the widespread adoption of industrial cluster policy by the federal and state governments, Australia remains below the OECD average in terms of its clusters' economic contributions to real wealth creation (Brown, 2000; Enright & Roberts, 2001). This 'below average' performance has been largely attributed to a lack of awareness and in-depth understanding regarding the different cluster processes and typologies that exist in the literature, the benefits available from them, and how government policy development impacts on other economic initiatives (Enright & Roberts, 2001; OECD, 1998). Indeed, Brown (2000) goes so far as to suggest that

Australia's below average performance is largely predicated on the inexperience of legislators, the spatial effects of the country's vast landmass and relatively low population, and the "very confused role of government" (Brown, 2000: 13).

To further compound Australian efforts to implement the 'lessons' of Porter's (1990) ICT were several scholarly advances which suggested that the theory was not specifically able to advance national development, but rather only 'firm development' (Yetton, Craig, Davis & Hilmer, 1992). Additionally, authors such as Brown (2000) and Enright & Roberts (2001) suggested that the theory was largely retrospective in nature, and unable to aid the post-hoc development of national economies. Porter's (1990) theory has been updated to account for these observations (see Porter, 1998a; 1998b; 2001a; 2001b) but there still seems to be further work required to apply its tenets to regional economies, such as the majority of those in Australia (Enright & Roberts, 2001). Given this opportunity there appears to be three main theoretical issues that arise from the Australian 'industrial cluster development' experience. The first issue surrounds the question as to what the appropriate governmental role in industrial cluster development actually is, and indeed what it is that constitutes the 'government' as an actor. The second issue relates to the government's role in supporting the regional economy's pool of entrepreneurs. The third issue surrounds the notion of 'chance events', and whether chance events can be incorporated into a government's cluster development policies.

In order to improve our understanding of the clustering process and its value in regional economic development in Australia, this paper will undertake an examination of one of Australia's most successful industry clusters, that of the Tasmanian Light Ship Industry (TLSI). The TLSI comprises of five 'core' firms – International Catamarans (Incat), Colbeck and Gunton, Skeels and Perkins, Liferaft Systems, and Riley Industrial and Marine Sales, along with five other 'peripheral' or 'support' organisations (Industry Audit, 1998). The value of the TLSI to the regional Tasmanian economy (and indeed to the Australian economy as a whole) is without question. During the period 1979 to 1999, the TLSI has grown substantially, generating an annual turnover of some AUD\$250 million, directly employing approximately 1 500 people (about 80% of the state industry's total), and indirectly employing approximately 1 000 others. Indeed, the TLSI boasts the world's leading manufacturer of high-speed ferries, Incat, which has managed to capture approximately 40 percent of the world's passenger ferry market (Hanson et.al. 2002). This particular industry is useful because it has proved to be one of the world's best performing industrial clusters in terms of market share gained relative to the nation's average. It also emphasises the role that chance plays in cluster development, and illustrates the significance to cluster development of 'cultural understanding' and government infrastructure provisions after the entrepreneur has initiated their business strategy.

A brief discussion of Porter's (1990) Industrial Cluster Theory (ITC)

In his book *The Competitive Advantage of Nations* (1990), Porter develops the notion of industrial clusters as part of a framework known as the 'diamond of national competitive advantage', which attempts to define the set of interrelated factors that result in the competitive success of national industries (eg. Silicon Valley in the USA). Porter's ICT suggests that a nation's industry will be internationally successful if a synergistic interrelationship exists between four important variables: 'factor conditions', 'local demand conditions', 'related and supporting industries', and 'firm strategy, structure and rivalry' (see Figure 1).

Factor conditions refer to any primary inputs required by the firm, that is, the basic factors of production such as land, labour and capital, human resources, and infrastructure, which are necessary conditions to compete in an industry (Porter, 1990). Local demand conditions can influence the development of a competitive industry by ensuring that clustered firms focus on differing and increasingly more sophisticated consumer preferences, be it at the government, firm or individual level (Porter, 1990). As the diamond model is based upon the success of a nation's produce in international markets, only those

products that have performed well in their own domestic markets can provide a nation with a competitive advantage. Sophisticated and discerning consumers are considered particularly important, as they drive the need for quality and high standards of innovation along with the development of new products, leading to enhanced market competitiveness. The public sector has an equally important role to play, both as a demanding customer itself, and an establisher of rigid standards concerning a firm's safety, its product quality, and its environmental impact (Porter, 1990).

Related and supporting industries refer to those industries within an economy that share common technologies, factor inputs, distribution channels, customers, activities and/or provide products that are complementary in nature (Porter, 1990). Linkages between industries constitute the nexus around which Porter's (1990) notion of 'industrial clusters' are formed. The more 'effective' the related and supporting industries are in an economy, the greater the value of the technologies, ideas and human capital development that may ensue within the economy, and the better able industries are in benefiting from these positive externalities (Porter, 1990). Firm strategy, structure and rivalry also fosters the growth of national industries, and are seen as an impetus for increased competitiveness as they create pressure for firms to improve their local competitiveness and innovativeness (Porter, 1990). According to Porter's (1990) model, rigorous domestic competition helps ensure a precondition for success in international markets, as it forces firms to innovate and prevents them from relying merely on an abundance of natural resources, or protection via government intervention policies.

Of the four factors, Porter (1990) suggests that two in particular, the 'intensity of domestic rivalry' and the nature of its 'related and supporting industries', are considered of utmost importance in the development of industry clusters that are internationally competitive, and therefore able to generate real economic growth. Porter (1990) theorised that a nation will be particularly competitive in those industries where 'clusters' of related and supporting industries are geographically concentrated, allowing their interactions to be more complementary and far more dynamic than they might be otherwise. Simultaneously, the intensity of the domestic rivalry between firms promotes the upgrading of the entire 'cluster system', while geographical concentration increases the intensity of interactions within that system (Baptista, 1996). A cluster of firms that draws on common specialised inputs and infrastructure should upgrade local factor quality and increase its supply. In a similar fashion, intense rivalry and geographical concentration should also have positive effects on the composition and size of local demand, and also on the existence and development of related and supporting industries, particularly specialised suppliers and users (Porter, 1990). Geographical concentration is of foremost importance for organisational improvement and technological innovation. Universities and other research centres, customers and suppliers that are close together are best placed to exchange ideas and co-operate in industry research (Porter, 1990). As such, the Porterian Clusters are often characterised as agglomerations of similar firms that together are able to achieve synergies in their operations; therefore the greater the rivalry (and indeed support) inherent to the cluster relationships, the greater the expected relative quality, quantity, and profitability of the cluster's output.

In addition, Porter's (1990) model incorporates the moderating roles of 'historical precedence', 'chance events' and 'government' in determining the success (or otherwise) of a nation's industrial clusters, and therefore, its competitive advantage. Chance events can play a major role in the creation (and indeed destruction) of industrial clusters. Chance occurrences can lead to a chain of events that trigger the growth of an industry cluster, for example, the partial destruction of Hobart's Tasman Bridge in 1975 resulted in the 'exponential growth' of a local marine transportation industry, which, in turn, helped establish Australia's currently successful shipbuilding industry. Porter (1990) suggests that the second moderating variable, the 'role of government' is of equally significant importance to the development and maintenance of a nation's competitive advantage. Porter argues that the government's actions and policy directions have a direct (and/or indirect) influence on each the four 'diamond factors'. Governments, according to Porter (1990) are able, and therefore required, to provide the appropriate economic

conditions that allow an industry cluster to realise the agglomeration benefits that may be available to it, and in doing so present 'economic challenges' to the cluster to generate growth through continued innovation. To do more than this is to render the cluster weak and open to decay.

The Tasmanian Light Ship Industry – A Porterian analysis

Historical Precedence and the 'Diamond Factors':

Tasmania has a long history of building both boats and ships.. Aboriginal inhabitants were sufficiently skilled in boat building for their craft to navigate the treacherous seas around Maatsuyker Island where different tribes met each summer. craft, self-built, using twisted bark as The first trading vessel recorded as being launched on the Derwent was the Henrietta Packett in 1812, a 40 tonne schooner. More regular building began in the 1820s with the construction of thirty to one hundred tonne vessels for the coastal trade. Four main centres of activity developed: at Launceston, at Hobart, on the Huon, and at the penal settlements, first Macquarie Harbour and later at Port Arthur. 1836 saw the beginning of an expansion in both the number and size of vessels being built. The colonial builders began to construct vessels large enough to take their place on the Australia-England route. Between 1838 and 1848, 107 vessels were built. During this time, Hobart was producing more ships than the remaining Australian colonies combined. Shipbuilding costs were lower in Tasmania than on the mainland and the availability and excellence of the native timber allowed the industry to boom. The advent of steel-hulled sailing vessels on the major international sailing routes saw the industry decline in Tasmania during the second half of the 19th century. During the early decades of the twentieth century, employment in ship building in Tasmania averaged 65 persons. During the 1930s this had slipped to an average of 35 with most ships servicing the State having been constructed overseas.

World War II saw the resurgence of shipbuilding in both the private shipyards and in the newly established government yard at Prince of Wales Bay. The government yard constructed wooden-hulled cargo vessels to 600 tonnes and at its peak employed more than 600 men. Private yards at Battery Point and on the Tamar built shallow-draft hospital vessels and harbour defence motor launches. After the surge of activity associated with the war effort, the industry again declined and stabilised at a level commensurate with servicing the local demand for fishing vessels and other craft. The 1980s saw the emergence of companies successfully concentrating their activities on innovative designs and export markets. These pioneering developments culminated during the 1990s in the attainment of world leadership in the design and manufacture of a new generation of fast passenger ferries.

Tasmania's Light Ship Industry and the 'Role of Chance':

During the early 1970's, there had been some talk of a reintroduction of a 'Trans-Derwent' ferry service, one that would predominantly serve Tasmania's tourist population. As had happened with the sinking of a rival's vessel some four years earlier, Robert Clifford, an experienced fisherman, sensed an opportunity to employ his entrepreneurial skill and capture a new market. In 1972 he and his father formed the Sullivan's Cove Ferry Company on the Derwent River. (this and subsequent Incat material is from Wickham and Hanson 2002) .So keen had Clifford been that simultaneously, he also approached the Marine Construction Company (a boat building venture in Rokeby, Hobart) with some preliminary design plans for his proposed 'Derwent River ferry'. As with the boats the two had previously built, Clifford was keen to have production underway nearly immediately, and in fact, the details of the ferry's design was 'worked out by the builder and Clifford as construction progressed'. By mid 1972, construction of Clifford's first ferry, the 20-metre steel-hulled 'Matthew Brady' was completed. Armed with a suitable vessel to handle a ferry service across the Derwent River, all that the Sullivan's Cove Ferry Company had to accomplish was a successful bid for the rights to service the market. The father and son combination was eventually successful in their bid, and began operations late in 1972.

Business proved to be good in the early stages of the newly formed ferry service, with both tourists and locals taking advantage of this novel attraction. In order for Clifford to generate sales growth, and indeed

protect his source of income, he prudently decided to build a second ferry in case the Matthew Brady was unable to sail. A second ferry was designed, commissioned and built in 1973. Technologies had improved since the construction of the Matthew Brady, and as such the new ferry was actually somewhat faster and more comfortable than the mother ship. On the 5th January, 1975 at 9:27 p.m., the bulk ore carrier 'Lake Illawarra' crashed into the 19th pier of the Tasman Bridge, claiming twelve lives, and severing the Eastern Shore's link with Hobart by knocking out an 80 metre section of the bridge. Many tens of thousands of motorists and cyclists were now unable to travel easily to their required destinations, be it for work or pleasure. Bob Clifford found himself in the enviable position of 'being in the right place at the right time'.

The Role of the Entrepreneur in Regional Economic Development:

In response to the increased demand for transport, which resulted from the Tasman Bridge tragedy, Clifford hurriedly built a third ferry, the 'Martin Cash'. Such was the priority of the project that "records were broken in the rush to get the crafty into service quickly". The construction process was aided somewhat by the fact that the new ferry was a sister ship to the original Matthew Brady, and therefore no new designs or alterations were required.

Although the ferry service now boasted three boats, demand still exceeded supply, and in late 1975 a fourth ferry was commissioned. Given the urgency of demand in the market, the latest ferry, the 'Lawrence Kavanagh' was constructed in record time.

The ferries transported nine million passengers and provided Clifford with significant revenues, but not the entire fortune came from the sale of transport tickets alone. Indeed, after finding a loophole in the Tasmanian Licensing Laws, Clifford was able to serve both counter meals and alcoholic beverages on his ferry rides, even though he did not possess what the law required – a dedicated dining area. It would appear that the lawmakers of the day had not considered the possibility that a ferry service would undertake such additional services. At its zenith, Clifford's 'bushranger fleet' was the largest licensee in Australia, averaging sales of 3800 litres of beer per week; the sales from beer and food were so great that they accounted for more than 50% of the entire revenues generated by the business.

In order to improve customer service and increase the business' revenues, Clifford hired a new British-built 'fast ferry', the 'Michael Howe'. The Howe was twice as fast and twice as comfortable as the 'bushranger fleet' owned by Clifford, and was an instant success with the general public. Unfortunately, the Michael Howe was also a maintenance intensive investment, with 75 percent of all company maintenance expenditure spent on the new 'hired hand'. Clifford was understandably unimpressed with the boat's design and maintenance requirements, despite the public's obvious delight with the faster service. The flaws that Clifford observed in the boat's design and structure (ie. the mechanics were far too complicated and labour intensive to be viable in the long-term) once again re-ignited his innovative flair: "If the English can sell 34 heaps of rubbish like this [around the world], how many properly engineered fast ships could we sell from Tasmania?" And with this marketing opportunity well in his grasp, the Clifford business began its initial foray into the fast-ferry industry.

The question for Clifford now concerned how to develop a boat with the speed and the passenger appeal of a fast-moving vessel (eg. a hovercraft), yet maintain the basic economies of a conventional ferry. Clifford studied the merits of numerous low-resistance hovercrafts, and the catamaran-style 'sidewall' hovercraft was chosen as the best available design template. Clifford utilised this hovercraft design, but altered it to include twin-hulls (somewhat wider than the norm for catamarans at the time) and to exclude the 'air-lift equipment' standard to the hovercraft altogether. The newly designed boat was described as 'thought provoking' by naval engineering experts, and indeed, the prototype model was not sanctioned by the maritime authorities as a 'legal means for general public transportation'. This rejection was primarily due to a recent change in maritime law in Tasmania.

Under new legislation, Clifford (and every other boat manufacturer) was forced to seek the services of a qualified naval architect to endorse any new design – a time consuming and rather expensive task given that no such professional practiced in the state at the time. In order to get the required endorsement, Clifford had to travel to New South Wales, to meet a certified naval architect, Phil Hercus, who resided in Sydney. The plans were then approved. The ‘Jeremiah Ryan’ was built in a Tasmanian government owned ‘wharf shed’ at Prince of Wales Bay in September 1977, and according to Clifford, it could only have been described as ‘ugly as sin’. Construction was undertaken by collaboration between Clifford employees and a number of contracted ‘expert’ tradesmen. Although not as pretty as Clifford may have liked, the steel catamaran was a considered a major breakthrough, achieving some 26 knots in initial speed trials, considerably more than the 18 originally hoped for in the design stage. After this success of Clifford and Hercus entered into a partnership to form International Catamarans Pty Ltd of Australia (Incat).

Incat, buoyed by the success of their original catamaran design and construction, continued to employ innovative design and construction processes. To achieve this end, the company restructured its management team, which now ‘professionally employed’ the functional services of an ‘offshore project manager’ (Mr. Graeme Freeman) and the strategic services of three ‘company directors’ (Mr. R. Clifford, Mr. P. Hercus and Mr. K. Sturme).

By 1979, in an effort to reduce the weight of their boats, the company ‘did away’ with the traditional steel-based catamaran designs in favour of an experiment with aluminium super-structures. The first steel-aluminium catamaran to be sold by Incat was the ‘James Kelly’ in June of 1979, and served to ferry passengers across Macquarie Harbour. The project was considered ‘highly important’, as it was the initial foray into new shipbuilding technologies and processes, the most important of which is arguably the ‘perfection of aluminium-based welding’. However radical the design and building processes were, the end result was that the operators found the ferry to be much faster and cheaper to run than traditional ferry designs. Consequently, the operators considered the James Kelly a great success. The commercial success of the James Kelly soon became the talk of the maritime industry, and resulted in the first orders for ‘all aluminium’ catamarans.

In keeping with the innovative nature of the business to date, Clifford was only too happy to attempt this new ‘all-aluminium’ catamaran. The lighter and more aesthetically pleasing vessel also proved to be a great success for the purchasers, and very popular with their customers. Clifford comments that with this first effort (eventually named the ‘Fitzroy’) “We had overcome our fear of the unknown and built an excellent aluminium vessel at our first try”. Clifford also learnt an important marketing lesson: A fast ship must look fast! In an effort to impress Incat’s customer, the delivery voyage was used as an opportunity to show off the tremendous speed the boat had to offer. So impressed were the customers by the speed at which their new boat arrived that they immediately ordered five more similar vessels on the spot. Positive word of mouth soon followed, as did orders from all over Australia and from around the world.

Clifford was effective because he worked from existing knowledge deeply embedded in the Tasmanian culture. He took advantage of chance events and created a successful firm that set cluster development going. The shipping emphasis meant that a workforce with basic understanding of the challenges of the industry was available and that basic foreshore infrastructure could readily be created.

Analysis - The Roles of Regional Government and Culture

The theoretical role of any government, be it state or federal, is to provide an economic climate that supports the evolution and growth of the Porterian Diamond Factors (Porter, 1998). In essence, this suggests that governments are required to support the growth of each of the four diamond factors outlined above. As noted in the Nixon Report (Foster & Nixon, 1998) however, regional governments are far less

able to influence the development of all the factors inherent to the diamond model than are federal governments, or those in major economic centres (such as Melbourne, Sydney or Brisbane). Of particular concern to regional governments is their lack of international business expertise; the low taxation base from which they draw revenue; the fact that federal policies aimed at controlling the major economic centres have a greater impact at the regional level (Foster & Nixon, 1998). In addition to these issues, the regional government of Tasmania has some specific concerns of its own, and includes a highly decentralised and declining population; and its distance from Australian markets, let alone international ones.

Theoretically, the regional government has to attempt to achieve the same regional outcomes (in terms of supporting the diamond factors) as do federal and major economic centre government, but with far less resources and less expertise. In terms of the TLSI, the state government's major contributions to the cluster's development were in terms of identifying skills shortages and providing a training centre (TAFE) focused on aluminium welding courses. The government also lobbied the federal government to continue the Shipbuilding Bounty throughout the 1990s, which at various times had been threatened under an international convention. The TLSI members were also provided with land such that they could physically cluster in a close geographical location, and were given tax breaks and grants for training and research and development. Most recently, the Tasmanian government went so far as to purchase equity in a new shipbuilding precinct in the state's south (valued at some \$800K) and 'loan' the Incat company some \$30 million in order to overcome what was called a short-term 'cash flow crisis'.

The Tasmanian government was successful in providing training and other basic but expensive infrastructure after the industry had started. This was not a government led cluster but one led by a culturally appropriate idea and entrepreneur. Much other Australian experience of cluster development has been unfortunate because of failure to follow the TLSI path, for example the 'multi function polis' of the 1990's was a famous failure, amongst other reasons, because the government role was overplayed. Government is most successful when it stays at a distance, but is willing to provide expensive infrastructure within the scope of 'chance', the ideas of the entrepreneur who takes advantage of chance events and the 'culture' of the region.

In the case of the TLSI, cultural understanding provided the boundaries that scope internationally successful regional clusters. This idea of scope encompasses the appropriate role for government and the use of chance events. In the TLSI it was the specific knowledge of Tasmania's shipbuilding culture possessed by Clifford and his network of contacts that helped to drive the 'new' industry toward international success. The chance event was significant because it initiated responses that fell within the scope of the state's shipbuilding knowledge. The TLSI example suggests that not all 'chance events' are significant only those that fit within cultural understandings contingent on time and place.

Conclusion

Industry clustering is a dynamic process that must be learned and cultivated by both federal and state governments, although there is still much to be learned about the nature, means and benefits of clustering in supporting regional and local economic development (Enright & Roberts, 2001). It appears important that regional economic policymakers learn how to identify and build the national and regional strategic architecture to support the development of industry clusters. The challenge facing Australia is how to apply the lessons learned from this brief exploration of industry clustering in setting future strategic directions and initiatives that will strengthen the capacity of entrepreneurs, their firms, and indeed industries in regions to develop and compete for new business, trade, investment and employment opportunities. The new role for the regional government may be that it should not attempt to merely 'bankroll' new ideas when developing policies for economic growth. Instead it should provide money for that infrastructure which promotes new ideas that fall within a region's 'cultural knowledge' and that have entrepreneurs that are already pursuing the opportunity in the region. It is important then, that the

adoption of new technologies and policies should be undertaken through the lens of the existing cultural knowledge and capabilities.

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