Working Together: Innovation and Export Links within Highly Developed and Embryonic Wine Clusters

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Abstract

This paper examines innovation and export linkages within two distinct levels of wine cluster development. The aim of the paper, using empirical data from the Australian wine industry, is to demonstrate that the association between innovation and export activity intensifies as the cluster develops.

The paper uses selected core indicators of innovation and export activity to explore levels of integration within highly developed and embryonic models (In this context, 'embryonic' does not relate to the age of the cluster, but rather, its level of sophistication and development). This integration is examined in the context of Porter's theory of 'competitive advantage', with potential lessons for New and Old World wine clusters.

Keywords: Innovation; Exporting; Industry Clusters; Wine Industry; Linkages

Introduction

Over the past decade the potential for industrial clusters to create 'competitive advantage' has become an issue of growing discussion. In consequence, the body of research literature has developed to an extent where 'cluster analysis' is now a recognised component of innovation theory.

As Michael Porter recently described them, clusters are:

> "…networks of companies, suppliers, service firms, academic institutions and organizations in related industries that, together, bring new products or services to market." (Porter, 2004)

It is the interaction between these public and private sector 'actors' that can be so effective in generating an environment of concentrated innovation. As the environment becomes more interactive, additional actors are attracted from an increasing range of related industry sectors. The level of value-adding continues to grow, both competition and cooperation within the cluster are further elevated and a self-sustaining momentum is often created (Porter et al, 2004). In terms of innovation system theory, Mytelka points out that the intense interaction within such a cluster becomes itself a measure of innovation. Firms learn their innovative behaviour from their environment (Mytelka & Goertzen, 2003).

Wine Industry Clusters

Wine is one of the world's oldest commodities. However, the systemic organization, infrastructure, packaging and marketing of this commodity is far more recent. Only within the past two decades has it been referred to as an 'industry'. Now, however, particularly with the emergence of high growth New World wine industries, the sector is attracting intense interest. Importantly, New World wine industries are also attracting interest because of their natural tendency towards cluster formations, or what Porter refers to as ' pre-existing local circumstances' (Porter, 2004).

The desire to export has been a key factor in the evolution of these clusters. While historically, wine firms have always emerged and grouped around existing and new wine growing regions, it was the desire to export, to expand markets, that triggered systemic organization. In catering to international markets, New World firms quickly realized that the only way to compete effectively with their Old World counterparts was to produce and market a consistently high quality product, at a reasonable price, to the world. This required a coordinated approach to research and development

(R&D), a well-developed supply chain, sustainable alliances between growers and producers, significant public and private sector infrastructure and a unified marketing strategy. To a very large extent, the strategy has worked, and, clusters have evolved.

These clusters have, without exception, followed the model of geographic proximity emphasized by Redman and, to some extent, that of Rosenfeld. Unlike IT, communication or the electronics industry, the wine sector is a natural resource-based industry that, as Mytelka and Goertzen (2003) put it, is focused around 'site-specific characteristics'. Wine clusters will vary in development, intensity, connectedness and therefore effectiveness. At the lower end of the range are the embryonic clusters with a loosely knit group of firms, some associated suppliers, perhaps local industry associations, some related agricultural firms, technical education providers and growers. At the other end of the scale is the highly evolved, intense cluster, which displays a significantly different business and organizational culture. There is a cohesive integration of suppliers, wine makers, growers, marketers, a raft of related industries, and the national research, funding, regulatory, education and infrastructure bodies that help provide the framework within which these firms compete and cooperate so effectively (Porter, 1998).

Porter and Bond (2004) have devoted considerable attention to what they call the California wine cluster. In other works, Mytelka and Goertzen (2003) have focused on the Niagara wine cluster and Visser & Langen (2003) have chosen the Chilean wine cluster for examination. These clusters are at quite different stages of evolution. California is far more developed than either of its newer rivals, Niagara or Chile. It has the associated fertilizer, grape harvesting, irrigation, barrel, cork, bottle and wine-making equipment firms. It has strong linkages with state government agencies,

regulatory bodies, marketing agencies and research institutes, and it has the associated tourism and food clusters (Porter, 2004). As with wine clusters in South Africa, New Zealand (with the exception of Malborough) and Argentina, Chile and Niagara are far less developed and could only be classified as 'embryonic'.

Aims of the Study

This paper aims to build on the current knowledge of wine clusters by:

- Relating the cluster models summarized above to the Australian wine industry
- Through empirical research, demonstrating the effectiveness of innovation and export linkages within a highly developed wine cluster.
- Contrasting these linkages with those evident in embryonic wine clusters within Australia's major wine regions
- Providing potential lessons for other New and Old World wine industries

Research Methods

This paper is based on empirical data, with a survey designed around selected innovation and export measures. The study did not attempt to include a comprehensive set of measures but rather, focused on what an extensive literature search found to be a number of 'core' measures.

In terms of export activity, respondents were asked a series of questions relating to length of time in the export market, their methods of entering the export market, their firm's export intensity (exports as a % of sales), absolute changes in export sales, number of export markets (time series analysis), and whether they believed exporting had made their firm more innovative.

In terms of innovation activity, respondents were asked about their use of the industry's research and analytical services, new product development and production processes, extension of product range, sources of competitive advantage, collaboration with other firms, relative marketing costs, training levels of employees and methods of training.

The survey was conducted in the form of individual phone interviews. One hundred interviews were conducted in total. A stratified, randomised method was used. The survey included 50 respondents from a highly developed cluster (the South Australian wine industry), and 50 respondents, equally divided between two significantly less developed, embryonic clusters, but still within major wine regions (NSW and Victoria). Respondents were also chosen to provide relatively equal representation across category of firm size within the micro/Small to Medium Enterprise (SME) band. Only micro firms and SMEs were surveyed, as large firms within the Australian wine industry account for a significantly disproportionate share of resources, innovation and export activity. Size of firm in the wine industry is usually determined by tonnes crushed and this was the measure used for this study.

The Australian Context

The Australian wine industry, like most New World wine industries had somewhat inauspicious beginnings. Wine grapes were introduced to the new colony under Governor Phillip in the 1790s, with first plantations just west of Sydney, and by 1795 the first vineyard had produced 410 litres of wine (Beeston, 1994). For the next half-century plantings were sporadic and usually short-lived, until a new immigrant, James Busby, undertook substantial plantings in the Hunter Valley, NSW. Plantings in Victoria (1830s), South Australia (1840s) and Western Australia (1860s) were soon to

follow and the Australian wine industry began its slow and often troubled evolution. In the latter half of the 19th century the industry was beset by a number of major problems, the main one being the lack of a significant domestic market. Compounding this was an apparent inability by large and small firms alike to access international markets due to Australia's reputation as a 'backwater colony' (Walsh, 1979). It was not until federation in 1901 that Australian wine-makers looked forward with any degree of optimism. With this federation came the removal of the debilitating trade barriers between states. At last, wine appeared to be a viable commodity. Until the early 1980s, however, Australia was still seen by the rest of the world as a bulk wine supplier, with little sophistication and only bland products to offer. The proliferation of vineyards in the 1980s and 1990s and the renewed focus on international markets and the need for quality at last brought fundamental changes to the way wine was grown, made and marketed (Beeston, 1994).

The Australian wine industry today, is at the forefront of a changing international wine landscape. It is one of the 'upstart' New World participants that have ushered in a new paradigm of innovation and growth. As a result, it has transformed itself from a cottage industry to a leading exporter, ranked 4th internationally in 2003/04, with sales of $2.39 billion (Winetitles, 2004). The industry also boasts approximately 1800 wineries, has 157,000 hectares under vine, and crushes 1.86 million tonnes a year (Winetitles, 2004 & WFA 2004). The growth is almost unmatched.

Such figures, however, tend to mask the less than even distribution of resources, research infrastructure and wine output throughout the industry. Of those 1800 wineries, the twelve largest account for over 90% of production, with the top four accounting for 66%. Almost 70% of wineries crush less than 100 tonnes annually. In

terms of exports, the top 20 exporters account for approximately 94% (Winetitles, 2004).

[INSERT TABLE 1 ABOUT HERE]

In addition, every one of the 14 national industry associations, including regulators, national supplier groups, export councils, federations and research bodies, is located in the South Australian wine cluster. The GWRDC, which is the industry's intermediary agency, responsible for R&D funding, priority setting and coordination, is also located in this cluster, as are the national training and education bodies. While South Australia is home to only 24% of the country's wineries, it accounts for 49% of production and 60% of the nation's exports (Winetitles, 2004 & South Australia bizfacts, 2004). More than this, however, the South Australian cluster epitomizes the highly developed model. It has successfully integrated core ingredients of viticulture, oenology and the organizational and marketing requirements into a highly evolved mix of innovation and export activity. This is what sets it apart. The apparent two-way articulation between innovation and export is refined to a degree that one appears to feed into the other (Aylward & Turpin, 2003 & 03 & Harcourt, 2003).

Saimee, Walters and DuBois' (1993) capture the significance of this two-way articulation in their article 'Exporting as an innovative behaviour: An empirical investigation'. The authors draw attention to the intimate relationship between innovation and export activity among leading-edge firms and argue that this relationship is so interdependent that firm-initiated exporting must be viewed as a core innovative measure.

It is the intention of this paper to demonstrate a clear disparity between the highly developed cluster of South Australia (SA) and the embryonic clusters of Victoria and New South Wales by assessing and comparing core export and innovation indicators.

Below are diagrams representing the author's impression of these two different cluster models. Figure 1 represents the highly developed cluster of South Australia which, as the diagram shows, is very inclusive, has numerous actors at a national and state level, has a high degree of integration and draws heavily upon the industry's research bodies. As a result, both inputs and outputs are closely interdependent and occur at high levels.

[INSERT FIGURE 1 ABOUT HERE]

Figure 2 represents the embryonic clusters of Victoria and NSW. While the diagram illustrates the same type of activity occurring, it is less intense, less integrated, involves fewer actors and is not as inclusive. National industry associations have only limited, external influence on the cluster and accordingly, their impact is much

reduced. As a result of the above factors, inputs and outputs are also occurring at a lower level.

[INSERT FIGURE 2 ABOUT HERE]

Findings

In the 2003/04 year approximately 50% of Australian wine firms exported. Furthermore, in the period 1993/4 to 2003/04 there was a 402% increase in the number of firms exporting. This compared with an increase of only 143% in the actual number of firms established (Aylward 2004 & Winetitles, 2004). Over the past decade the value of Australia's wine exports have increased by approximately 1200% from $259 million to $2.391 billion.

These figures place the wine industry substantially ahead of any other Australian industry sector in terms of export activity (Australian Bureau of Statistics, 2000). They also appear to place the industry well ahead of the majority of its New and Old World wine competitors. For example, Old World producers such as France, Italy and Spain have all recorded falls in the value of wine exports since the 1980s, with France's decline being quite substantial (10 percentage points) (Anderson, 2001). While New Zealand and Chile's exports have increased at a slightly more rapid rate than Australia's, they have come off much smaller bases. Other New World producers such as California, Canada, and Argentina have had significantly slower export growth than Australia. In terms of export intensity, France exports 28.3% of its total wine production, Italy exports 30%, Spain exports 32% and Germany exports 27.2%. Among New World industries Canada exports less than 10%, the USA exports 14.7% and South Africa exports 27%. Australia exports a significant 37% of its production (Winetitles, 2004 p.27 & Madill, Riding & Haines, 2001).

Table?: National Exports as a Percentage of Total Wine Production

Country	% of Production Exported
France	28.3%
Italy	30%
Spain	32%
Canada	<10%
USA	14.7%
South Africa	27.3%
Australia	**37%**

In terms of export intensity within wine clusters, Canada boasts that one or two of its firms export more than 10% of their product (Madill, Riding & Haines 2001). Within the Californian cluster firms such as E&J Gallo exports 13% of product and Mondavi, the most intense Californian exporter, exports approximately 20% of product (Silverman, Castaldi, Baak & Sorlien, 2002). By comparison, this study indicates that in Australia's highly developed cluster firms *averaged* 41% of product going to export, while some firms claim between 80% and 90% of product for export. What makes these Australian figures even more impressive by comparison, is that they represent the activities of micro and SME firms only – traditionally the least export intensive of firms.

As stated previously, however, the Australian activity is by no means evenly distributed. If we look at the percentage of firms exporting by state over a ten-year period in Table 2, we see a rather different picture.

Export Activity

[INSERT TABLE 2 ABOUT HERE]

Within the study's three sample states – South Australia (SA), Victoria and NSW. there is also a marked difference. While Victoria and NSW show approximately the same levels of export activity, with 40.3% and 45.3% of firms exporting, our

'innovative' SA cluster has 77.3% of its firms involved in exporting. The differences are reinforced when we look at *export intensity* (exports as % of sales) - a core criterion of an entrenched export culture (Hodgkinson, et al, 2003). Respondents in Victoria and NSW claimed that exports averaged 27% of total sales for 2003 while in SA exports of the sampled respondents represented 41% of total sales.

While all industry sectors, including the wine industry, suffer from one-off or sporadic export activity, this does not appear to be the case within our highly developed cluster. Of those surveyed, an average 50% of embryonic cluster firms claimed that exports had increased as a percentage of total sales over the past 3 years. This compared with more than 66% of respondents within the SA cluster. Only 32% of Victorian/NSW firms claimed that absolute exports had risen in this period compared to 78% of SA firms. Even more significant, of the firms whose exports did increase, embryonic cluster firms claimed their exports had risen by 44% over the three years. For the highly developed cluster respondents, this figure was an astounding 96.4%, or more than double the growth of those in the embryonic clusters. These figures help to demonstrate the apparent ability of firms within both these cluster types to increase exports over time. But they also reflect the higher levels of export sustainability within the South Australian cluster.

Growth and sustainability of exports within a highly developed wine cluster is certainly not confined to larger firms. The survey was conducted only among micro and SME firms. Additional data from the Australian and New Zealand Wine Industry Directory (2004) also highlights the fact that by far the highest growth (646%) in firm establishment within SA over the past decade was within the micro firm category (Aylward, 2004). This is traditionally the least export-intensive sector, yet in South

Australia, this is not the case. As data from the author's previous research shows, while the national average (excluding SA) of exporters within the micro firm category is 12%, in SA's cluster it is 42%, or 3.5 times the average (Aylward, 2003).

Another key indicator of a firm's export drive and sustainability is the extensiveness of its export market. Firms were asked about the number of international markets they exported to in 2003. Again those firms in the embryonic clusters of Victoria/NSW trailed those in South Australia, with an average of 5.5 markets per firm compared to 7.96 markets per firm. Wine industry directory data reinforce this trend. Looking at all firms in the decade 1993/4 to 2003/04, South Australian firms increased their number of export markets by 132%, from an average of 3.3 markets per firm in to an average of 7.66. By contrast, Victoria/NSW increased their export markets by 68.5% from a combined average of 3.05 markets to 5.15 markets in 2003/04 (Winetitles, 1993, 2004 & Aylward, 2004).

[INSERT TABLE 3 ABOUT HERE]

Table 4 provides a quick summary of the export indicators surveyed for each cluster type.

[INSERT TABLE 4 ABOUT HERE]

The export and innovation link

The above data clearly show that firms within South Australia's highly developed cluster are substantially ahead of their Victorian and NSW counterparts in each of the export indicators. The firms export more, have more markets to which they export, are increasing their exports at a faster rate and are more export intensive. In the words of Tim Harcourt, Chief Economist at the Australian Trade Commission, "exports and innovation are linked…innovation creates exports, which in turn assists innovation"

(Harcourt, 2003). Or, as Roper and Love (2002) state, 'Product innovation, however measured, has a strong effect on the probability and propensity to export…being innovative is positively linked to export probability".

Such statements are substantiated by the study's survey respondents. When asked if they believed exporting made their firm more innovative, an average 41.6% of embryonic cluster firms replied that it did. This compared with 66% of South Australian firms. The reasons behind these responses were just as interesting and included: Marketing exposure, packaging, production flexibility, product quality, branding, labeling, varietal experimentation & development, market specific designs, efficiency documentation, collaboration and quality testing.

Core Innovation Indicators

Respondents were asked a series of questions focused around a selected number of core innovation indicators that may be correlated with those for export. Firstly, respondents were asked about their use of the wine industry's research and analytical services. Specifically, this included the Australian Wine Research Institute (AWRI), the Cooperative Research Centre for Viticulture (CRCV) and, to some extent, the Grape and Wine Research and Development Corporation (GWRDC) for more generic information. The AWRI carries out the vast majority of research within the industry. It also provides specialist contract services to all firms across the full range of oenological, viticulture and knowledge transfer requirements. Within the wine industry, use of the industry's research services is strongly encouraged, made readily available and considered a central indicator of innovative activity.

Industry Research Services

Responses to the use of research services proved interesting. Indicatively, more than twice as many SA firms use industry research services than do embryonic cluster firms (68% versus 32%). Given that the AWRI, the CRCV and the GWRDC are all located within the SA cluster, it is understandable that firms in this cluster have much higher levels of research opportunity and participation than their Victorian and NSW counterparts. As the author has argued previously, these three research bodies, together with their attendant education and training bodies, have created an R&D 'epicentre'. Although having a mandate to disseminate knowledge industry-wide, inevitably, intense servicing of wine firms tends to be restricted to geographic co-location (Aylward, 2002 & Aylward and Turpin 2003). Firms operating outside the SA cluster, and particularly SMEs, can only access the industry's research base through limited and sometimes sporadic regional extension programs.

Collaboration

Reinforcing this 'cultural divide' between clusters were responses to another core indicator of innovation. When interviewees were questioned about their collaboration with other wine firms for the purposes of marketing, research or other 'innovative activities', 44% of Victorian/NSW firms responded that they had been involved in such collaboration over the past three years. This compared with 64% from within SA's cluster. Apparently, firms within the highly developed cluster not only utilise the industry's research services more, but also more often partner other firms in the use of that research. This, of course, is part of a highly developed cluster's self-sustaining momentum. Borrowing from Dobkins (1996), such 'spill-over' between co-located firms involved in collaborative activities also leads to improved export performance.

It appears that the more concentrated the co-location and innovation 'spill-over', the higher the export activity and intensity (Aylward, 2002; 2003).

Related Indicators

The study then looked at a grouping of related innovation measures, comprising 'new product development', 'improvement to production processes', 'education levels' and 'training methods'. 'New product development' primarily involved new bottled products, a new variety or blend but also included clone development. 'Improvement to production processes' is a broad indicator and drew varied responses from those interviewed. These ranged from soft-equipment improvements, to temperature controls, testing mechanisms, climate controls, harvesting, packaging, vertical integration, canopy management, irrigation and rootstock development. An interesting example of this indicator was the 'virgin wine' procedure of a South Australian firm, where no pressing was involved. The 'pressing' process simply relied on the grapes' own weight, involving large quantities of grape for little quantity, but high quality juice.

Indicators of education differentiated between 'no education', 'technical institution education' and 'tertiary (university) education'. For 'training', respondents were asked a series of questions relating to 'in-house training', 'external provision of training' and 'employment of skilled workers'. Again firms within the highly developed cluster led in all these indicators, although the degree of leadership varied. Disparity between SA and Victorian/NSW firms ranged between only 4% (negligible) on 'new product development' through to approximately 20% on some of the training indicators, including in-house training and the contracting of skilled employees.

It is difficult to assess this variation at face value, as a number of the indicators are multi-faceted and involve innovation at different levels and stages and in different ways. For example, 'production process improvements' were interpreted by the majority of SA firms as improvements to the actual wine making process, which involves new machinery, upgraded temperature and hygiene controls, crushers, destemers and maceration procedures. In a large proportion of embryonic cluster firms, however, the indicator was interpreted more broadly. For example, many included testing procedures, replacement of barrels and vineyard software management. Such indicators may be considered peripheral to those cited by SA firms.

Competitive Advantage

Respondents were asked to cite what they believed were their firm's key sources of 'competitive advantage' outside export. As shown in Table 5, 'product differentiation' was the most highly cited factor and was equally cited by both the highly developed cluster firms (SA) and those in the Victorian/NSW cluster. 'Branding' was the next key indicator cited. 40% of SA cluster firms believed it provided a critical edge to their competitive advantage, as opposed to an average 32% from Victoria and NSW. 'Marketing innovation' provided a significant disparity, with 34% of SA firms believing it increased their competitiveness compared with just 18% of Victorian/NSW firms. Probably the most critical indicator cited was that of 'technical innovation'. Only 8% of Victorian/NSW firms believed this was key to their 'competitive advantage', compared with 22% of firms within the SA cluster.

[INSERT TABLE 5 ABOUT HERE]

Cluster Performance

While not an exact science, as a 'package' the above group of indicators serves to confirm the clear leadership shown by SA firms in the indicators of 'collaboration' and 'participation in industry research services'. Additionally, when respondents were asked about their products' domestic market share over the past two years, 76% of SA firms stated that it had increased. This compared with 58% of Victorian/NSW respondents citing an increase. Reasons provided for this increase also varied between cluster types. In the SA cluster, prime reasons ranged between marketing, new initiatives, labelling & packaging, targeting specific markets, upgrading product quality and increasing varieties. The majority of these link in with the core indicators selected for the survey and are focused around product and process quality. In the embryonic clusters, while firms also focused on marketing and branding to increase their market share, the majority attributed their success to new distributors and tourism-oriented activities. These are indeed innovative mechanisms, but not the core innovations preferred within the SA cluster. Again, the science is not exact, but it *is* strongly indicative of the 'cultures' within the different clusters.

The figures above suggest that growth within the highly developed cluster is not confined to either export or domestic markets. One is not being sacrificed in favour of the other, but rather, growth is occurring within both these markets simultaneously and at a more rapid rate than within the embryonic clusters. Historical data suggest that it is also a more sustainable growth. This is probably one of the more important findings, as it helps to illustrate tangible outcomes from the collection of indicators surveyed. In addition, it helps to demonstrate that firm growth and development are key aspects of wine clusters and the more developed a cluster is, the more sustainable

this growth becomes. Innovation and export activities appear to be not only more closely aligned within developed wine clusters, but also underpin market advancement on the domestic front.

As Siamee, et al (1993) point out, exporting *is* an innovative behaviour, but so it appears, is operating within highly developed wine clusters. Porter tells us that clusters tend to 'drive the direction and pace of innovation'. As clusters mature and develop, this pace increases (Porter, 1998). The innovative climate within the cluster becomes increasingly entrenched and translates more effectively into retailing in general, exporting in particular and above all, 'competitive advantage'.

Concluding Remarks

As if to confirm the above argument, the latest news from Britain highlights the fact that in a list of the top100 Australian wines compiled by leading European wine writer, Matthew Jukes, South Australian brands account for half (*The Advertiser*, 2004).

By no means, however, should the Victorian and NSW wine clusters be undervalued. In terms of the Australian wine industry, wine clusters within Victoria and NSW, as well as Western Australia must be regarded as significant and on growth trajectories. Each of these clusters has demonstrated substantial growth and concentration over the past two decades. Furthermore, and particularly in the case of Western Australia, each cluster appears to be progressing towards higher levels of public and private sector integration. Industry programs and local industry associations are complementing growers, producers, suppliers, and marketers in the value-adding process. Education

and training are also commanding greater attention and occupying a more central role within each cluster. Export intensity is increasing and regional recognition is rising. The GWRDC has played a critical role in this development and each of these clusters now has the potential to evolve into the highly developed model.

An aim of the paper was to compare the two-way articulation between export and innovation within this embryonic cluster type and that of the South Australian cluster. Indicative results highlighted throughout the paper indeed reflect the apparent advantages of co-location. The more intense that co-location and the more highly evolved the integration of supply chains, advisory and regulatory bodies, education, training and research bodies and the growers and wine-makers themselves, the more visible the advantages.

Since the GWRDC was established in 1991, one of its critical roles was to ensure that research and development underpinned a viable and growth-oriented export market (GWRDC, 2002). South Australia's highly developed cluster is their template and the industry's benchmark. Other wine clusters have yet to fully embrace this template, but as the Australian wine industry continues to target the export market, demand will require higher levels of integration within these clusters.

Finally, the paper has attempted to demonstrate Porter's theory of 'competitive advantage'. By drawing on these distinct wine cluster types, the author was able to underline differences in cluster activity and integration, showing the association between cluster intensity and export/innovation performance.

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Table 1: Number of wine producers by tonnes crushed, by state

Tonnes	NSW/ACT	VIC	QLD	SA	WA	TAS	TOTAL
<20	101	204	46	112	66	53	582
20-99	157	195	42	143	114	21	667
100-449	79	76	11	88	57	6	317
500-999	17	11	0	29	14	1	72
1000-2499	9	9	1	12	12	2	42
2500-4999	10	12	0	14	4	0	40
5000-9999	5	5	0	14	0	0	22
>10000	14	9	0	19	1	0	43
Unknown	4	0	1	1	1	0	7
TOTAL	**392**	**521**	**101**	**432**	**269**	**83**	**1798**

Table 2: Percentage of each state's firms that export 1993/4 – 2003/04

Year	ACT	NSW	VIC	QLD	SA	WA	TAS
1993	0%	20.2%	21.5%	4.7%	36.5%	22.8%	26.4%
1998	20%	31.3%	27.8%	13.1%	57%	31.2%	12.5%
2004	0%	40.3%	45.3%	11.9%	77.3%	56.1%	33.7%

Note: ACT's figures are based on very small numbers and so are not statistically relevant.
Source: Wintetiles, Directory 2004 and Aylward

Table3: Growth in the average number of export markets per firm, by state

Year	ACT	NSW	VIC	QLD	SA	WA	TAS
1993	0	3.2	2.9	1	3.3	3	1.3
2004	0	5.44	4.86	2.25	7.66	5.93	1.43
% Growth	0%	70%	67%	125%	132%	97%	10%

Table 4: Summary of Export Indicators for the Two Cluster Types

Cluster Type	% firms that export	Exports as % of sales	Firms with increase in exports	No. with increase in absolute exports	Av. % by which exports have risen	Av. Number export markets	% increase in No. of export markets
SA	77.3	41	66	78	96.4	7.96	132
VIC/NSW	42.8	27	50	32	44	5.5	68.5

Table 5: Responses to Competitiveness Indicators

Indicator	**SA firms**	**VIC/NSW firms**
Technical innovation	22%	8%
Product differentiation	54%	54%
Marketing innovation	34%	18%
Price Competitiveness	32%	32%
Branding	40%	32%

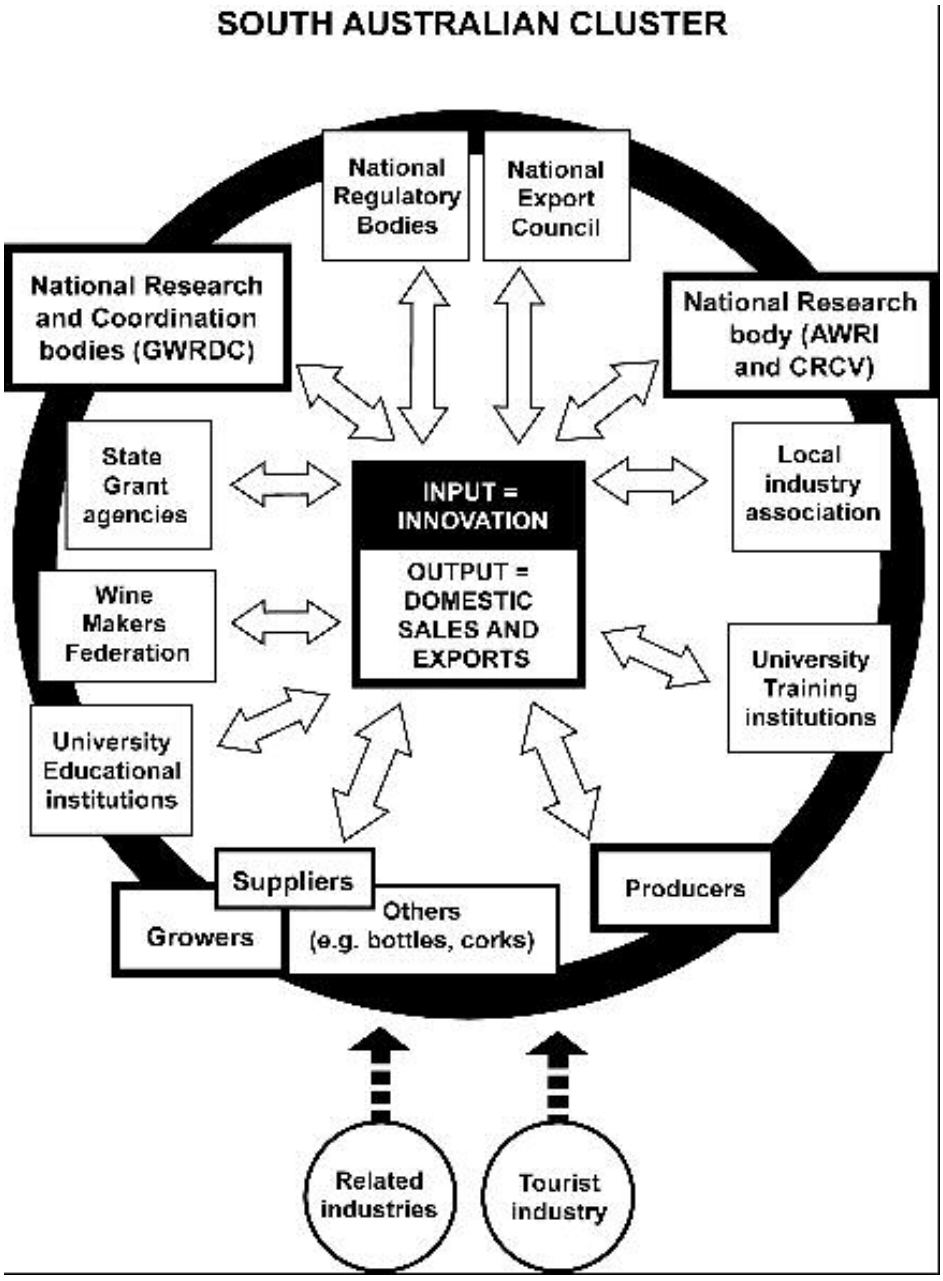

Figure 1: The South Australian 'innovative' wine cluster

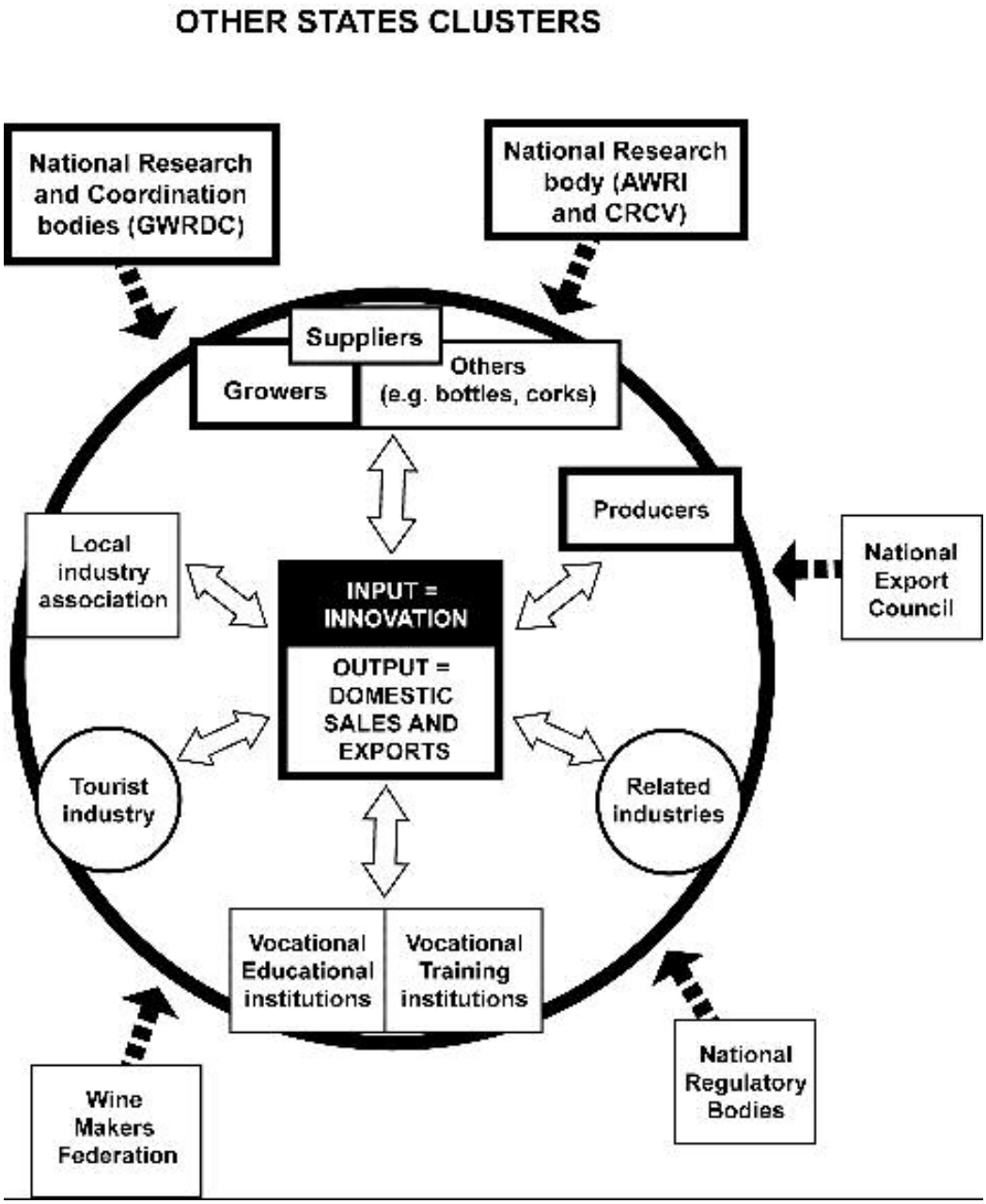

Figure 2: The 'organised' wine clusters of Victoria and NSW