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Deriving a conceptual model from the case study of Yalumba

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Introduction

Industrial clusters are geographic concentrations of interconnected companies and institutions in a particular field (Porter, 1990). In recent decades, researchers have paid much attention to the important role played by industrial clusters in inspiring regional entrepreneurship, economic competitiveness and productivity. In the field of entrepreneurship research, sources of opportunity and the entrepreneurial behaviours to exploit these opportunities are considered as two main research areas (Shane & Venkataraman, 2000). Judging from the success of some industrial clusters in various parts of the world and existing research outcomes, industrial clusters and entrepreneurship are closely related phenomena (Rutherford & Holmes, 2007; Wennberg & Lindqvist, 2010). However, most of the research on the impacts of industrial clusters on entrepreneurship focuses on innovation, firm creation or firm growth effects of clusters at the regional level. Limited research has been found in the literature to explore the interaction between industrial clusters and entrepreneurial processes systematically at the firm level.

This chapter attempts to address the above research limitation by deriving a conceptual model articulating the integrated components of industrial clusters, entrepreneurial behaviours in established firms and types of entrepreneurial opportunities. In doing so, we illustrate two fundamental entrepreneurship research questions. What are the sources of entrepreneurial opportunities in clusters? And what are the entrepreneurial behaviours that established firms use to exploit the entrepreneurial opportunities? To respond to these questions we conduct a review of the literature and test it against a case study.

There are six sections in this chapter. In the following section we analyse eight components of industrial clusters. In the section after that we discuss the entrepreneurial process: entrepreneurial opportunities and entrepreneurial management behaviours of established firms. In the next section we present a conceptual model of the entrepreneurial process within industrial clusters and provide propositions about their dynamic interactions. On this basis, in the next section, we conduct an analysis on the case study of Yalumba in the Barossa wine region of South Australia which shows that the entrepreneurial process is active and evident in clusters and that the research in this area is worthwhile. We discuss research limitations and future research directions in the final two sections of the chapter.

Identifying eight components of industrial clusters at the firm level

Industrial clusters are viewed as regional innovative systems, market organisations (Maskell & Lorenzen, 2004), social market constructions (Bagnasco, 1999), contexts of territorial production (Ratti, Bramanti, & Gordon, 1997) and socio-economic environments that support vibrant innovative and transactional activities. The research on industrial clusters has yielded a long list of factors that contribute to the competitiveness of firms within clusters (Aleksandar, Koh, & Leslie, 2007) and to regional economic growth (Cooke, 2001). These key factors include geographic agglomeration (Porter, 1996), economies of scale and scope (Gordon & McCann, 2000), knowledge spillover (Iammarino & McCann, 2006), shared resources (Molina-Morales & Martínez-Fernández, 2008), networking between clustered firms (Karlsson, Johansson, & Stough, 2005), and interaction between firms and supporting organisations (Romero-Martínez & Montoro-Sánchez, 2008). Besides this, industrial clusters involve a sense of belonging, co-operation culture, transportation and transaction cost savings (McCann, Arita, & Gordon, 2002). These factors also

include affluent social and venture capital (Cooke, Clifton, & Oleaga, 2005), skilled/ semi-skilled labour pools, abundant opportunities, advanced technologies, innovative environment, localised and specialised suppliers and buyers (Porter, 1998), increased legitimacy (Klyver, Hindle, & Meyer, 2008), regional identity, decreased 'newness' and the proliferation of entrepreneurial examples (Romero-Martínez & Montoro-Sánchez, 2008).

Though there is much literature describing various factors, especially on a theoretical level contributing to cluster advantages, the existing literature shows inconsistent research results. This is due to the following reasons: firstly, there is no consistent view about what we mean when we talk about industrial clusters and hence conflicting results from cluster research can occur depending upon the perspective taken — for instance, a pure agglomeration or a complex system perspective. Secondly, the empirical research examines the advantages that clusters bring mostly from a pure agglomeration perspective (Folta, Cooper, & Baik, 2006). The arguments supporting cluster development from this research perspective are often criticised for imitation and homogeneous behaviours (Rocha, 2002) and for mimetic isomorphism (Pouder & St John, 1996) as it occurs in clusters, particularly from a life cycle viewpoint of clusters. Thirdly and most importantly, the analysis of clusters at the firm level lacks an integrating theoretical framework exploring the principal components of clusters to set up a general analysis framework. Given the above research limitations and needs, we attempt, from a review of the literature, to develop an integrating framework of industrial clusters. This framework could help cluster researchers identify and recognise the principal factors as well as the relationships among them to advance the quality of further conceptual and empirical research.

For decades, the advantages brought by geographic proximity — such as agglomeration economies (Marshall, 1890), transportation cost savings (Weber, 1909), external scale economies (Krugman, 1991) and local markets (Porter, 1990) — have been the centre of industrial cluster research. However, the knowledge spillover effects, learning effects, collective efficiency and embeddedness cannot be explained just by applying geographic proximity. Granovetter (1985) has pointed out that economic action is embedded in structures of social relations. In a case such as clusters, social relations become so prominent that it is impossible to ignore them. The classic approach to research on industrial clusters, especially in empirical research, is a focus on the regional or national level, without giving consideration to the micro

dynamism of cluster firms. Therefore, this chapter points out the social relations of firms within clusters. Sternberg and Litzenberger (2004) identify three key factors of clusters: spatial concentration of firms, co-operation between firms and co-operation between firms and institutions. Other scholars also point out that clustered firms' external networks are crucial in overcoming cluster-specific generated weaknesses such as lock-in effects and path dependence. Therefore, based on the studies of the above scholars and other existing literature, this chapter identifies four key factors of clusters and their associated key effects.

The first key factor of industrial clusters is geographical proximity. Geographical concentration is the key element in defining a cluster and is mostly common among quantitative research on clusters (Baptista & Swann, 1998). Geographic proximity promises the sharing of infrastructure, social institutions, accessing of crucial resources and enjoyment of collective government promotion and programs for the region (McDonald, Tsagdis, & Huang, 2006). Moreover, geographical proximity facilitates the spread of tacit, codified knowledge (Cooke, 2007), offers innovative advantages (Jaffe, Trajtenberg, & Henderson, 1993), saves innovation costs (Cooke, 2007), builds trust relationships, and increases imitation innovations (Romero-Martínez & Montoro-Sánchez, 2008). Geographical proximity is the basic element defining clusters and the basis of other key factors of clusters. In the clusters literature, geographic proximity of firms is simply geographic agglomeration (Sternberg & Litzenberger, 2004), including Marshallian industrial districts and industrial complexes.

The second key factor is inter-firm networks. A prominent feature of geographical clusters is the extensive network of inter-firm linkages supporting knowledge trading and collaborative innovation (McEvily & Zaheer, 1999). Inter-firm networks refer to both formal, market-based transactions and informal, untraded relationships between firms located in the cluster (Storper, 1997). Inter-firm networks provide access to key resources, tacit knowledge and norms, standards or conventions of behaviours and advanced information and technology (Aldrich & Zimmer, 1986) to ensure business success (Dubini & Aldrich, 1991). Furthermore, inter-firm networks reduce environment uncertainty and ambiguity, stimulate initiatives and innovations (Julien, 2007) and contribute to the learning process and entrepreneurial process (Parker, 2010). Based on these characteristics and effects contributed by inter-

firm networks, the region where clusters are located becomes a regional innovative network (Camagni, 1991).

The third key factor is institutional networks between clustered firms, research institutions, financial institutions, governments and other supporting agencies (Saxenian, 1996). Research has found that knowledge is not evenly diffused in the cluster but only flows to firms in certain network positions (Giuliani & Bell, 2005); and that firms especially in the position of a structure hole (as a bridging role between clustered firms and other supporting bodies) easily catch opportunities (Burt, 2000). The institutional network concept is also used to refer to social capital (Coleman, 1990) and institutional embeddedness (Van de Ven, 1993). After examination of the metropolitan high-tech cluster in Rome, Pirolo and Presutti (2007) argue that social capital within clusters ensures the acquisition of knowledge. Similarly, Gordon and McCann (2000, p. 720) argue that

> firms within the social network are willing to undertake risky co-operative and joint-ventures without fear of opportunism, willing to reorganise their relationship without fear of reprisals, and are willing to act as a group in support of common mutually beneficial goals.

In this context, all the clustered entities co-ordinate collectively to enhance a cluster's development and then help to build regional identity. Consequently, the cluster becomes an innovative system (Cooke, Gomez Uranga, & Etxebarria, 1997).

The fourth key factor is the external networks of clustered entities. External networks refer to the relationships between clustered bodies and the organisations located outside of the cluster. There are abundant studies that argue that as clusters evolve, the closeness of regional networks will ultimately become an obstacle to cluster development (DiMaggio & Powell, 1983; Menzel & Fornahl, 2007; Pouder & St John, 1996; Tushman & Romanelli, 1985). In contrast, external networks of clusters expose clustered firms to new ideas and visions (Parker, 2010), and stimulate cluster transformation (Tappi, 2005) and entrepreneurial activities (Rocha & Sternberg, 2005). Because of globalisation and the location of multinational corporation branches worldwide, the involvement of industrial clusters in global value chains is the precondition to ensure cluster upgrade and sustainable development. Furthermore, involvement in global value chains creates opportunities for clustered firms (Humphrey & Schmitz, 2002) in the forms of new information, technology

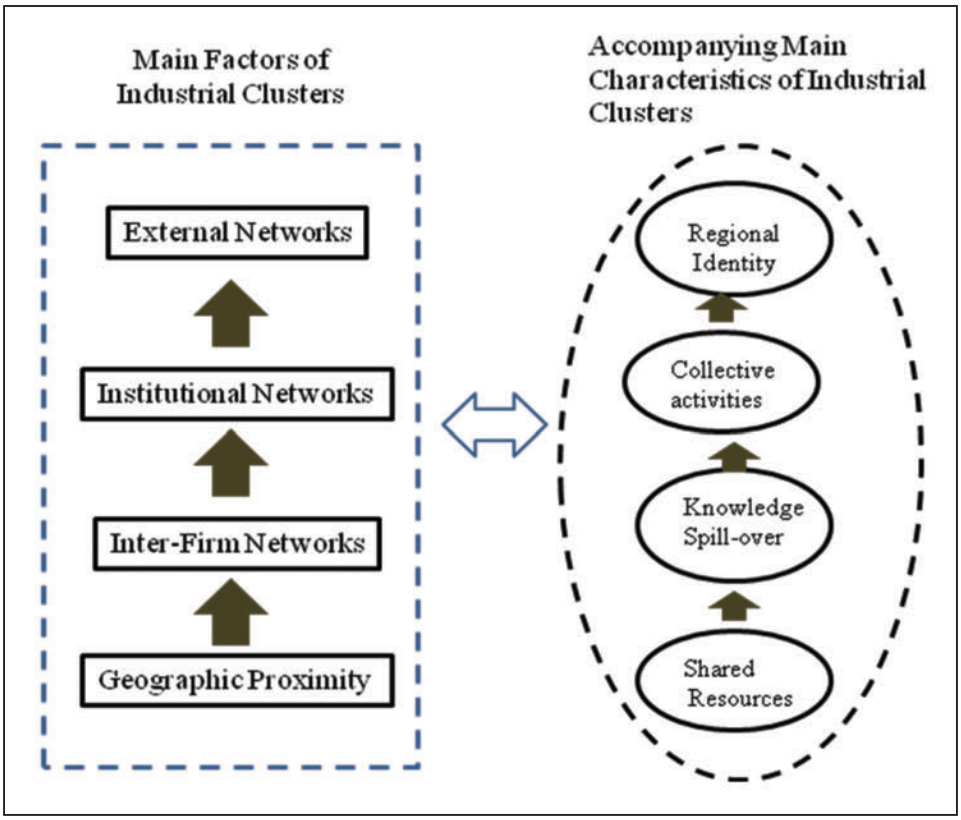

Figure 5.1: The eight components of which clusters are composed.
Source: Courtesy of the authors.

innovation, market expansion and so forth. Thus the networks of clusters are no longer contained within regional or clustered boundaries but are linked to global scope, referred to as an open innovation system (Cooke, 2005).

Prominent effects often accompany the above four key factors of industrial clusters, as shown in Figure 5.1. Firstly, shared public infrastructures and services are often viewed as a basic cluster element. Secondly, the inter-firm networks and institutional networks facilitate codified and tacit knowledge spillover among the clustered firms. Thirdly, the inter-firm and institutional networks promote collective activities and help clustered firms link to organisations outside of clusters. Finally, successful industrial clusters often have a common reputation among the clustered

firms such that if one clustered organisation behaves badly or unethically, it will directly or indirectly ruin the reputation of other firms in the same cluster, and vice versa. The collective promotion activities help to build regional identity in domestic or international markets, saving market investment as well as management cost. The above four cluster factors interact with the accompanying characteristics to promote collectively the dynamism of industrial clusters.

An overview of the entrepreneurial process

The entrepreneurial process is the process through which managers employ entrepreneurial methods, practices and decision-making styles to behave entrepreneurially and seize entrepreneurial opportunities. Thus the key point here is how firms can behave entrepreneurially and what types of opportunities are entrepreneurial opportunities. Below, we clarify the dimensions of firm entrepreneurial behaviours and entrepreneurial opportunities.

Entrepreneurial management: A review of the concept and main concerns

Researchers and governments have actively sought entrepreneurship, carried on in the pursuit of business opportunities (Lumpkin & Dess, 1996), as one of the major engines for economic development, innovation, job creation, new start-ups and existing business growth. The research perspectives of entrepreneurship vary between individual, organisation and environment, and are accompanied by definitions of entrepreneurship including new material combinations (Schumpeter, 1934), new entry (Lumpkin & Dess, 1996), creation of organisations (Gartner, 1988) and the process of pursuing opportunities (Shane & Venkataraman, 2000; Stevenson & Jarillo, 1990). In the recent decade, the research focus of entrepreneurship has gradually shifted from psychological characteristics of self-employed individuals to firm-level entrepreneurial management/orientation.

Some useful work has been done to conceptualise and 'practitionalise' firm level entrepreneurship. Based on Miller's (1983) original work on firm-level entrepreneurship, Covin and Slevin (1989) developed a nine-item scale to measure the entrepreneurial posture of firms: innovation, proactiveness and risk-taking. Drawing from strategic management literature, Lumpkin and Dess (1996) proposed a framework of entrepreneurial orientation [EO] for investigating firm-

level entrepreneurship: autonomy, innovativeness, risk-taking, proactiveness and competitive aggressiveness. Lumpkin and Dess's research of EO is analogous to Stevenson and Jarillo's (1990) concept of entrepreneurial management [EM], since both reflect the entrepreneurial process of firm.

Stevenson and Jarillo (1990a; 1986) differentiate the opportunity-based entrepreneurial management [EM] from traditional management, which reflects the pursuit of opportunity without regard to the resources currently controlled. The entrepreneurial management practices are reflected in the strategic orientation, resource orientation, management structure, reward philosophy, growth orientation and entrepreneurial culture of a firm (Brown, Davidsson, & Wiklund, 2001; Stevenson & Gumpert, 1985; Stevenson & Jarillo, 1990; Stevenson & Jarrillo-Mossi, 1986). The conceptualisation of opportunity-based EM is consistent with the contemporary opportunity-based definition of entrepreneurship (Eckhardt & Shane, 2003; Shane & Venkataraman, 2000; Venkataraman, 1997) and reflects classical entrepreneurship domains such as Kirzner's (1973) 'opportunity alertness'. After three decades of theoretical and empirical inquiry, EM is widely recognised as an efficient tool to evaluate or measure entrepreneurship in existing organisations and to further our understanding of the entrepreneurial behaviours pursued by existing organisations. Below we discuss six key attributes of EM.

Strategic orientation

Strategy creation is driven by perceived opportunities in the environment, not by the resources required to pursue these opportunities in entrepreneurial management practice. In opportunity-driven strategy, opportunities are the first consideration of managers. Once managers identify opportunities as real, they will marshall the required resources to exploit these opportunities. Almost any opportunity is relevant to the firm (Brown, Davidsson, & Wiklund, 2001) because managers are inclined to create a new business (organisation), instigate renewal or encourage innovation (Sharma & Chrisman, 1999). At the other extreme, the pure trustee's strategy is to utilise the resources controlled by the firm and make use of these resources efficiently. Managers will consider their resources before exploiting any opportunities. In other words, the firm exploits only opportunities requiring the resources under the firm's control.

Resource orientation

Stevenson (as cited in Brown, Davidsson, & Wiklund, 2001) has firstly described dimensions of commitment of resources and control of resources in resource orientation, and Brown, Davidsson, and Wiklund (2001) have then developed this. At one end of the resource commitment continuum, an entrepreneurial firm's resource orientation is to maximise value creation generated by exploiting opportunities while minimising the firm's resources committed. Under the situation of resource orientation, the acquisition and commitment of resources is done in a flexible and multi-step manner (McGrath, 1999), which allows the entrepreneurial firm to adopt new or improved strategies according to the opportunities status without necessarily owning the resources. To maintain this manner of committing resources may be difficult because of pressures created by the accumulation of resources within an organisation (Brown, Davidsson, & Wiklund, 2001), such as capital allocation systems, formal planning systems and certain incentive systems.

At the other end of this continuum are the firms that are considered less entrepreneurial because the commitment of resources is characterised by favouring ownership and control of resources and a thorough analysis in advance before mostly irreversible investments are made. An entrepreneurial firm reduces the resources it uses or owns as much as possible and favours resources (for example, financial capital, intellectual capital, skills and competencies) which are borrowed or rented from others. Such an entrepreneurial resources orientation provides flexibility, which allows SMEs to manage uncertainty by pursuing multiple opportunities (Bradley, Wiklund, & Shepherd, 2011). However, a firm's growth together with the accumulation of resources makes it increasingly difficult to adopt this kind of resource management behaviour.

Management structure

Burns and Stalker (1961) introduced the idea of an organic versus a mechanistic organisational structure. Organic firms are decentralised and informal, emphasising lateral interactions and an equal distribution of knowledge and information throughout the organisation (Lumpkin & Dess, 1996). Meanwhile, mechanistic firms are highly centralised and formal, with a clearly defined hierarchy, authority, responsibility

and clearly defined systems to ensure efficiency. An organic organisational structure enables an entrepreneurial firm to manage its rented or borrowed resources flexibly when pursuing opportunities influenced by uncertain environments. Furthermore, to achieve growth from the addition of new products/services or new markets, organic firms are flexible and open to change (Stevenson & Gumpert, 1985).

Reward philosophy

The reward philosophy of an entrepreneurially managed firm reflects interest in creating and harvesting wealth (value) and thus is oriented toward compensations based on how individuals contribute to value creation in pursuing opportunities. The entrepreneurial management structure makes it possible to reward or evaluate employees based on their own individual performance and accountability. Under an entrepreneurial reward philosophy, employees are encouraged to explore potential opportunities, thus developing higher levels of commitment and trust within the firm (Bradley, Wiklund & Shepherd, 2011). In contrast, under a less entrepreneurial reward philosophy, rewards are based on the amount of resources under the individual's control, on hierarchy, and on seniority. Such a reward philosophy will undermine the pursuit of opportunities, since the individuals who control resources tend to limit the usage of these resources to pursue any opportunities under uncertainty.

Growth orientation

Managers in entrepreneurial firms prefer rapid growth to the steady growth that is often the choice of managers in a traditional administrative firm. An entrepreneurial firm is characterised as proactive and competitively aggressive (Covin & Slevin, 1991), utilising all kinds of opportunities and resources to achieve high growth. A traditional administrative firm, in contrast, focuses on resources under its control, tending to avoid rapid growth, which requires more and new resources. The reward philosophy in less entrepreneurial firms decides that it seeks a growth rate which does not jeopardise accumulated resources or create fluctuations in the management track record (Stevenson & Gumpert, 1985). In contrast, high growth often indicates high value creation, thus in entrepreneurially managed firms, managers are inclined to seek high growth rates.

Entrepreneurial culture

Entrepreneurial culture describes the culture of a firm that encourages a broad range of ideas, experimentation, and creativity. An entrepreneurially managed firm regards opportunity as the starting point to conduct business, whereas a traditional administrative firm takes resources under its control as the starting point. Therefore, a firm with an entrepreneurial culture is full of ideas, experimentation and creativity, while there can be a lack of ideas or ideas that just match the owned resources within traditional and more administratively focused firms. An entrepreneurial culture is beneficial to firm growth since growth can be generated from a broad range of opportunities. However, firms that lack an entrepreneurial culture typically generate sales from a more proven and narrow set of opportunities, and this is associated with slower growth rates than entrepreneurial firms (Covin, Green, & Slevin, 2006).

Entrepreneurial opportunity: A review of the concept and main concerns

The concept of opportunities has its roots in Austrian economics and the roles of entrepreneurs have been divided between arbitrageurs (Hayek, 1945; Kirzner, 1973) and innovators (Schumpeter, 1934). One of the fundamental questions of entrepreneurship research, raised by Shane and Venkataraman (2000), is why, when and how opportunities for the creation of goods and services come into existence. This question draws much research attention to the attributes, forms, origins and life cycles of the entrepreneurial opportunity. However, the research on entrepreneurial opportunity is in its infancy and has been characterised by scattered descriptions (Gaglio & Katz, 2001) from a variety of theoretical perspectives. Researchers have viewed an entrepreneurial opportunity as an idea (Davidsson, Hunter, & Klofsten, 2006), an entrepreneurial envisioning or a new means-ends framework (Sarason, Dean, & Dillard, 2006), a project (Casson & Wadeson, 2007) or more commonly as introducing novelty to the market at a profit (Alsos & Kaikkonen, 2004; Companys & McMullen, 2007; DeTienne & Chandler, 2007). The high fragmentation of entrepreneurial opportunity literature has presented a serious obstacle to its theory building.

Casson (1982) defines an entrepreneurial opportunity as a situation in which new goods, services, raw materials and organising methods can be introduced and sold at greater than their cost of production. Following on from Casson's definition,

Venkataraman (1997) defines an entrepreneurial opportunity as a set of ideas, beliefs and actions that enable the creation of future goods and services in the absence of a current market for them. In order to differentiate entrepreneurial opportunities and all other profit opportunities, Shane and Eckhardt (2003) define an entrepreneurial opportunity as a situation in which new goods, services, raw materials, markets and organising methods can be introduced through the formation of new means, ends or means-ends relationships.

However, Plummer, Haynie, and Godesiabois (2007) used the example of Dell Computer's origin to illustrate that even Shane and Eckhardt's (2003) new means-ends framework could confound the idea of an entrepreneurial opportunity, and they appealed for differentiation between objectively new and underexploited opportunities. From the aspect of underexploited opportunities, Singh (2001, p. 11) defined an entrepreneurial opportunity as 'a feasible, profit-seeking potential venture that provides an innovative new product or service to the market, improves on an existing product/service, or imitates a profitable product/service in a less-than-saturated market'. In response to Singh's comments on their definition of an entrepreneurial opportunity, Shane and Venkataraman (2001) rebutted Singh's definition of an entrepreneurial opportunity. According to Shane and Venkataraman (p. 15), firstly, an entrepreneurial opportunity does not have to be exploited by a new venture. It can be exploited by an existing organisation or it can be sold to other organisations or individuals. Secondly, entrepreneurial opportunities do not have to take the form of new products or services. They can also include new organising methods, new raw materials and new geographical markets. Thirdly, an entrepreneurial opportunity should include any market inefficiency due to information asymmetry.

Smith, Matthews, and Schenkel (2009), drawing upon the exchange between Singh and Shane and Venkataraman, define an entrepreneurial opportunity as 'a feasible profit-seeking situation to exploit a market inefficiency that provides an innovative, improved or imitated product, service, raw material, or organising method in a less-than-saturated market' (p. 41). This definition creates more confusion, however, by expanding the entrepreneurial opportunities domain and also blurring the differentiation between entrepreneurial opportunities and all other profit opportunities.

The above statements illustrate the complexity and challenge of establishing a consensus definition of an entrepreneurial opportunity. The basic precondition of

an entrepreneurial opportunity is a profitable gap existing in the market (Casson, 1982; Singh, 2000; Smith, Matthews, & Schenkl, 2009), and the exploitation of the profitable gap is often accompanied by innovative application (Casson, 1982; Shane & Eckhardt, 2003; Singh, 2001), whether in products or process. A default position in entrepreneurship research is that entrepreneurial opportunities are not evident, but need entrepreneurial alertness (Gaglio & Katz, 2001; Kirzner, 1973) or entrepreneurial vision (Sadler-Smith, Hampson, Chaston, & Badger (2003). In addition, entrepreneurial opportunities should be feasible by taking legal actions (i.e. actions within the law), using achievable technologies and accessible materials. Besides this, entrepreneurial opportunities cannot be exploited by an existing means-ends framework (Shane & Eckhardt, 2003).

Following the extant works of previous theorists, we define an entrepreneurial opportunity in this research as a feasible profit-seeking situation that influences market balance by providing a new product/service, new raw material, new production methods and new distribution/marketing methods, and by entering new geographical or demographical markets.

The contribution of clustering to entrepreneurial dynamics

A review of the literature reveals that there exist only a few studies analysing the relationship between key components of an industrial cluster and the entrepreneurial behaviours happening in the cluster. However, in the past few years there is a growing tendency toward connecting entrepreneurship and industrial clusters. The majority of the research, on the one hand, oversimplifies entrepreneurship by adopting the number of businesses (Pickles & O'Farrell, 1987), new start-ups (Amit, Muller, & Cockburn, 1995; Giannetti & Simonov, 2004; Pickles & O'Farrell, 1987; Stuart & Sorenson, 2003) or the level of private sector economy (Acs & Armington, 2004) to measure entrepreneurship. On the other hand, most of the existing empirical research on clusters only examines the spatial concentration perspective without considering other crucial factors of clusters. As Romero-Martínez and Montoro-Sánchez (2008) argue, the research on the effects of the cluster key factors are not analysed explicitly or sufficiently.

The main body of existing literature examining cluster benefits on firms usually compares firms within clusters and outside of clusters. It is widely acknowledged that industrial clusters bring opportunities, which require that clustered firms be active,

innovative and risk-taking to be able to recognise and exploit these opportunities. In this case, entrepreneurship becomes the essential element for a firm to be able to survive and grow in clusters. The existing research on the relationship between clusters and entrepreneurship mostly centres on the start-up effects of emerging or immature clusters. It is argued theoretically that as clusters mature, innovative inertia arises, where the imitation and homogeneous behaviours of managers (Rocha, 2002), the homogeneous macro culture (Pouder & St John, 1996) and the network closeness (Westlund & Bolton, 2003) will prohibit the development of established firms and the entry of new firms. This argument is inherent in the work of Pouder and St John (1996), who argue that in the convergence phase of industrial clusters, managers within geographic proximate regions are more likely to develop similar models of competition with managers in the same region than with managers outside the clustering region. They further argue that the cognitive homogeneity of managers in clustering regions will cause cognitive bias of competition, innovation inertia and dysfunctional macro culture. However, they do not mention the role of entrepreneurs in the clustering process.

In conclusion, most of the existing arguments regarding the relationship between industrial clusters and entrepreneurship are based on either theoretical assumptions or imprecise empirical analyses. To date, research on the impact that key cluster factors and characteristics have on the entrepreneurial behaviours of established firms, and the entrepreneurial opportunities of clustered regions, is rare. Moreover, research has not arrived at a consensus regarding the interaction between entrepreneurship and industrial clusters. More qualitative research is needed to design the framework for entrepreneurship that occurs in regions and its interactions with regional contexts. Quantitative research should be encouraged using first-hand data to understand the regional entrepreneurship phenomenon. This chapter responds to the research gap by outlining a conceptual model interpreting the relationship between industrial clusters and entrepreneurial process as illustrated in Figure 5.2.

The conceptual model illustrates the general framework of the impacts of key factors and main characteristics of industrial clusters on entrepreneurial behaviours and entrepreneurial opportunities. It also interprets the close relationship between industrial clusters and regional competitiveness, as well as the entrepreneurial process and performance.

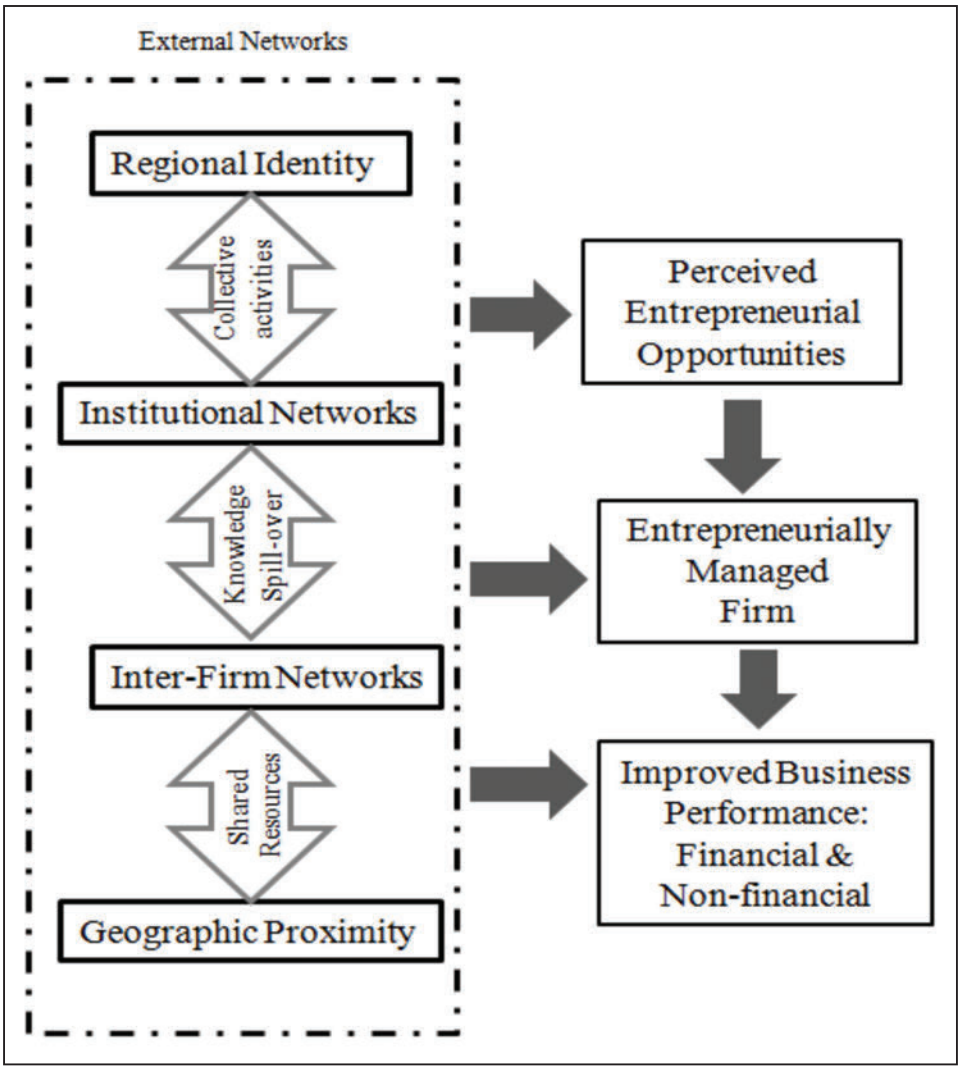

Figure 5.2: The dynamic mechanism between cluster involvement and entrepreneurial process.
Source: Courtesy of the authors.

Industrial clusters are regarded as network-based systems (James, 2005; Keui-Hsien, 2010). James (2005) regards geographical proximity as regional agglomeration, in which the clustered members can access the public infrastructures, services and information. Actors in network-based systems have greater access to each

other to learn from and integrate each other's knowledge (Keui-Hsien, 2010), and this, in turn, enhances regional innovation and growth, often referred to as regional innovative networks. At the level of institutional networks, Cooke et al. (1997) link learning to a certain institutional network, and clustered firms can benefit from governmental collective promotions and programs, both of which create learning economies and finally a regional innovative network. The external networks of one cluster decreases the clustered blindness and exposes the cluster to new ideas and visions (Parker, 2010), which is of crucial importance to the cluster's transformation (Tappi, 2005) and upgrade.

Entrepreneurial behaviours and entrepreneurial opportunities are interdependent and interrelated. Entrepreneurial opportunities have been seen as objective, existing independently of entrepreneurial consciousness (Sarasvathy, Dew, Velamuri, & Venkataraman, 2005; Shane & Eckhardt, 2003; Smith, Matthews, & Schenkl, 2009), since they are characterised by generalisability, accuracy and timelessness (McMullen, Plummer, & Acs, 2007). However, there are counter-studies showing that entrepreneurial opportunities are subjective, influenced by an entrepreneur's personal interpretation of a certain situation (Sarason, Dean, & Dillard, 2006). From structuration theory, entrepreneurial opportunities are not an objective existence but are idiosyncratic to the entrepreneur, and entrepreneurs and opportunities are interdependent as a duality (Sarason, Dean, & Dillard, 2006). In this chapter, opportunities are themselves objective but shaped by subjective, idiosyncratic factors. These subjective and idiosyncratic factors condition the creation of new opportunities for the established firms and the firms' ability and willingness to pursue them (Buenstorf, 2007).

Identification of an entrepreneurial opportunity requires entrepreneurial alertness (Kirzner, 1973). Once an entrepreneurial opportunity has been found, the evaluation of whether one particular entrepreneurial opportunity is worth pursuing or not is related closely to a firm's experience and strategies as well as to its abilities. In the exploitation stage of entrepreneurial opportunity, different entrepreneurial opportunities require specific entrepreneurial behaviours to fully exploit them (Eckhardt & Shane, 2003). An entrepreneurial opportunity of new products/services and new production methods should require entrepreneurial behaviours that emphasise innovativeness; an entrepreneurial opportunity of a new market entry and new distribution/marketing methods should require entrepreneurial behaviours that

emphasise risk-taking and proactiveness. Individuals are more likely to identify an entrepreneurial opportunity, but the exploitation of an entrepreneurial opportunity is often through a firm, and thus the supporting context of firms is crucial in the exploitation stage.

Main propositions of the conceptual model

Industrial clusters and entrepreneurship are closely related phenomena; however, research on the entrepreneurial dynamic mechanism of industrial clusters is quite rare. In this section we present three propositions that extend from the conceptual framework. The majority of existing research connecting entrepreneurship and industrial clusters focuses on the start-up effects of industrial clusters or the effect of entrepreneurship to promote the formation of industrial clusters. This research addresses the research gap by constructing a conceptual model that links the different networks existing in an industrial cluster, as well as the accompanied characteristics of different networks, to the entrepreneurial process defined by the interaction between entrepreneurial behaviours and entrepreneurial opportunities.

The argument that entrepreneurship involves networking activity supports the claim that the entrepreneur is embedded in a social network that plays a critical role in the entrepreneurial process (Hoang & Antoncic, 2003). Some entrepreneurs choose to start their firms where their family members, relatives and friends have already had firms — in other words, where they have close ties (Klyver, Hindle, & Meyer, 2008). Network theory suggests that networks benefit entrepreneurs through providing them with access to knowledge, capital, information, advice and other exclusive resources. In addition, networks help entrepreneurs build reputation and social legitimacy (Klyver, Hindle, & Meyer, 2008). Social networks facilitate the access of information (Sorenson, 2003). In sum, these arguments ground Propositions 1a and 1b (below), which suggest a relationship between entrepreneurial opportunities and entrepreneurial management with respect to the depth of industrial cluster involvement by firms.

> Proposition 1a: A firm's depth of involvement in an industrial cluster is closely related to the number of entrepreneurial opportunities that are perceived by the firm.
>
> Proposition 1b: A firm's depth of involvement in an industrial cluster is closely related to its level of entrepreneurial management behaviours.

Both the geographical concentration of firms as well as the internal and external networks of clusters enable the sharing of resources and infrastructure, strengthen supply to local markets, facilitate information exchange, stimulate co-operation and build regional identity. Wixted (2009) argues that knowledge has a strong tendency to be localised within certain regions. Both codified and tacit knowledge is more easily shared and distributed among localised firms. One basic promise of clusters is to increase opportunities (Rosenfeld, 2003), since clusters are sites of localised positive externalities in labour market pooling, input-output linkages and knowledge spillover (Potter, 2009). Audretsch (1998) argues that innovative ideas based on tacit knowledge cannot be easily transferred across distance, which is why firms always choose to locate in close geographical proximity. Baptista and Swann (1999) believe that information exchange is the prominent feature of geographic concentration and is of foremost importance for technology innovation. Proposition 2 therefore addresses the issues of business performance in relation to industrial clusters.

> Proposition 2: A firm's involvement in an industrial cluster and its business performance are closely related.

Opportunity exploitation requires innovation in resources and the combination of resources (Shane, 2012). Entrepreneurial management relates closely to opportunity identification and exploitation (Dimitratos, Voudouris, Plakoyiannaki, & Nakos, 2012; Runyan, Droge, & Swinney, 2008). Entrepreneurially managed firms are more innovative than traditionally managed firms and are more likely to seize entrepreneurial opportunities (Chaston & Scott, 2012). Entrepreneurially managed firms can take first-move advantage and control market entry, dominate distribution channels and set up industry standards (Wiklund, 2006). Entrepreneurially managed firms anticipate and act on future business situations (Venkatraman, 1989). Entrepreneurial behaviours of firms will shape and reshape the entrepreneurial opportunities to fit their pursuit framework, which in turn will affect firm performance. In this process, entrepreneurial behaviours also create certain entrepreneurial opportunities intentionally or inadvertently. Entrepreneurial management encourages an organisation's flexibility and enhances performance (Brown, Davidsson, & Wiklund, 2001; Hughes & Morgan, 2007; Stevenson & Jarillo, 1990). It facilitates knowledge transfer and sharing, helps generate new ideas and is beneficial to organisational culture (Lumpkin, Cogliser, & Schneider, 2009). Propositions 3a and 3b therefore address the issues of business performance in relation to entrepreneurial management.

Proposition 3a: A firm's entrepreneurial management practices and its business performance are closely related.

Proposition 3b: A firm's entrepreneurial management practices and the opportunities that can be perceived by the firm are closely related.

The case study of Yalumba

For many decades, South Australia has been the largest grape grower, wine producer and wine exporter of Australia. The wine industry is integral to the state's economy, society and identity. Wine exports are the third-largest export earner for the state (Chandler, 2010) and the wine industry contributes to employment in many other realms, such as manufacturing, research and tourism. There are seven wine zones and eighteen wine regions in South Australia. Fourteen national industry associations — including regulators, national supplier groups, export councils, federations and research bodies — are located in the South Australian wine cluster (Aylward, 2007). Furthermore, substantial education and training, research, funding and intermediary bodies and various wine industry associations are also located in South Australia. From the industrial cluster perspective, the South Australian wine industry has demonstrated strong cluster characteristics (Roberts & Enright, 2004) and the South Australian wine industry cluster epitomises the innovative model (Aylward, 2007).

Yalumba is Australia's oldest family-owned winery, located in Eden Valley, South Australia. Eden Valley is in the Barossa wine zone, which comprises Barossa Valley and Eden Valley. The foundation history of Yalumba is the story of risk-taking, proactiveness, innovation and alertness to opportunity. Yalumba was founded in 1849 by Samuel Smith, who initially brought thirty acres of vineyard with his first saving. The Yalumba of today is still an extremely progressive organisation, building its innovative reputation on ongoing winemaking and viticultural trials.

In order to improve the competitiveness of the wine industry, in 2009, The Government of South Australia and Adelaide Thinkers in Residence jointly published a report, 'Sustainable value chain analysis: A case study of South Australia wine' (Fearne et al., 2009). The report examined the Oxford Landing/Tesco [OLT] value chain as an example case study. Yalumba owns Oxford Landing Estate, which is based in South Australia. Tesco is the largest supermarket customer for Australian wine in the UK. Below, we test the propositions of our research against the published case to find evidence of whether the four factors (geographic proximity, inter-firm networks, institutional networks and external networks) and the four main characteristics (shared resources, knowledge spillover, collective activities and regional identity) of industrial clusters and the entrepreneurial process are closely related phenomena.

We coded and analysed the text in our report, 'Sustainable value chain analysis: A case study of South Australia wine', using a qualitative analysis software tool, NVivo 9.0. We used this because Computer-Aided Text Analysis [CATA] has higher reliability than human coding, as well as lower cost and greater speed (Neuendorf, 2002), and has been used by other scholars in entrepreneurial orientation analysis (Short, Broberg, Cogliser, & Brigham, 2010). Firstly, we analysed the text for word usage (Morris, 1994) by using the Word Frequency Query to enhance construct validity (Short, Ketchen, Shook, & Ireland, 2010). The result of the Word Frequency Query shows that the article content is closely relevant to the research topic of the chapter. Secondly, we coded the whole article under the interacting factors of the model in the chapter, such as knowledge spillover, institutional networks and entrepreneurial opportunity, to confirm that the key concepts proposed by the conceptual model could be identified within the text. Table 5.1 lists the coded findings. Thirdly, we ran a cluster analysis to check the similarity and relatedness of the concepts used in the chapter and codes,

and to verify whether the propositions had validity for further study. The nodes coded show that the factors of the model we propose in this chapter, appearing in one specific region, are interdependent in creating value for consumers.

Table 5.1 demonstrates clearly that Yalumba exhibits industrial cluster involvement characteristics. Yalumba shows strong relationships with internal and external bodies, regional embeddedness and a common reputation with clustered members. The case shows that industrial cluster involvement enables Yalumba to access premium grapes, updated winemaking technology and information, and opportunities related to wine-marketing. Furthermore, industrial cluster involvement appears to continuously encourage the company's management practices to be more outgoing, sustainable and innovative.

The management practices of Yalumba — such as informal relationships, innovative company culture, cutting red tape and easy information exchange — are typical entrepreneurial behaviours (codes 3a to 3q), which may help build the opportunity alertness at Yalumba and facilitate the subsequent opportunity exploration. The entrepreneurial atmosphere of Yalumba creates an environment for the employees to work together to challenge the status quo, and it puts Yalumba in the leading position in innovation in the South Australian wine industrial cluster. The case supports this, as it reveals aspects of positive financial and non-financial performance (codes 2a and 2b).

Figure 5.3 shows that the connections among the concepts of industrial clusters, entrepreneurial behaviours, entrepreneurial opportunities and firm business performance proposed in the model are readily observed when running a word similarity cluster analysis with

Table 5.1 (overleaf): Industrial Cluster and Entrepreneurial Process.
Source: Fearne et al., 2009, page numbers in this table refer to the source document, *Sustainable value chain analysis: A case study of South Australia wine*.

Item ref.	Name	References (%)	Text Sample	Source
1	**Industrial cluster**	**99 (59%)**	**Including collective activities, shared resources, geographic proximity, institutional networks, regional identity, external networks, knowledge spill over, inter-firm networks**	**Various**
1a	Collective activities	4 (2%)	There are also efforts made to educate growers through workshops, seminars and social activities organised.	Page 33
1b			There are opportunities created for growers to get together and form collaborative relationships (e.g. annual barbeques, educational tours overseas and regular workshops and seminars).	Page 37
1c	Shared resources	2 (1%)	Yalumba, Amcor and Tarac Technologies are all partners in the 14th Adelaide Thinker in Residence program.	Page 18
1d	Geographic proximity	3 (2%)	Grape growers in the Riverland, South Australia. This region produces half of South Australia's grapes and a quarter of Australia's wine, the bulk of which is exported. There are over 1300 registered wine growers in the area.	Page 17
1e	Institutional networks	14 (8%)	The logistics management must also interface with the Australian Wine and Brandy Corporation (AWBC) to obtain, manage and report on export approval for wine batches.	Page 25
1f			This analysis suggests that government R&D funding may be required and justified to investigate how best to reduce the related emissions since there is no commercial driver for firms and chains to do so.	Page 28
1g	Regional identity	6 (4%)	UK consumers who purchase wine from a supermarket regard Australian wines as reliable ('it will never let you down'), good quality and good value. However, Australian wines are rarely on the radar screen when they are looking for something special.	Page 3

1h	External networks	25 (15%)	The understanding of the customer (Tesco) needs and consumer wants (value) is distinctly limited upstream, particularly amongst input suppliers and growers.	Page 4
1j			Tesco UK, is the world's fourth largest supermarket and responsible for 25% of all UK wine sales, making it the single largest overseas buyer of Australian wine and the largest customer for Oxford Landing.	Page 17
1k	Knowledge spill over	17 (10%)	There are also efforts made to educate growers through workshops, seminars and social activities organised.	Page 33
1m			There are some growers who collaborate but generally, the various groups of growers have more scope for interaction and information sharing.	Page 31
1n			Yalumba provides a lot of information and advice to their growers through grower liaison officers, winemakers, viticulturists and vineyard managers on maximising their opportunities and efficiencies	Page 33
1p	Inter-firm networks	28 (17%)	The relationships between Yalumba and the three divisions of Amcor are generally strong but there is scope to exploit the strong relationships to allow for more innovative designs and improvements to packaging to meet Tesco's needs.	Page 39
1q			Collotype produces all labels for the Oxford Landing wine. There is a strong two-way information flow between both organisations.	Page 31
1r			The information flow in the OLT value chain was assessed with respect to different functional activities (e.g. quality control, sales, and distribution) and at different levels (e.g. operational or strategic), with the aim of improving efficiency and effectiveness.	Page 34
2	**Business performance**	**10 (6%)**	**Including financial performance and non-financial performance**	**Various**

2a	Financial performance	2 (1%)	Yalumba is Australia's oldest family-owned winery and one of the country's largest exporters of wine.	Page 17
2b	Nonfinancial performance	8(5%)	It was also highlighted that Yalumba has made extra efforts to support the community, local businesses and employ local people from the region.	Page 39
3	**Entrepreneurial behaviours**	**32(19%)**	**Including strategic orientation, reward philosophy, resource orientation, management structure, growth orientation, entrepreneurial culture**	**Various**
3a	Strategic orientation	7(4%)	They have developed as a team, overcoming operational as well as strategic challenges together.	Page 42
3b			Strategically develop an innovative value chain through focusing on the willingness to work with suppliers and customers for cooperative improvement.	Page 33
3c	Reward philosophy	1(1%)	There are many long term employees at all levels, with most senior managers having had experience at operational level.	Page 37
3d	Resource orientation	3(2%)	Strategically develop an innovative value chain through focusing on the willingness to work with suppliers and customers for co-operative improvement.	Page 42
3e	Management structure	11(7%)	Yalumba adopts an informal management style, reflecting the personality of senior management and extent of synergies. They have developed as a team, overcoming operational as well as strategic challenges together.	Page 33
3f			It was highlighted that the personnel from Yalumba are flexible and willing to adjust their systems to suit their operations.	Page 39
3g			There were examples of Yalumba staff being commended for being highly approachable, 'natural innovators' and collaborative with a long-term vision and growth strategy.	Page 39

3h	Growth orientation	2(1%)		There were examples of Yalumba staff being commended for being highly approachable, 'natural innovators' and collaborative with a long-term vision and growth strategy.	Page 39
3j	Entrepreneurial culture	8(5%)		They have developed as a team, overcoming operational as well as strategic challenges together.	Page 33
3k				Senior managers are deemed approachable, involved and enthusiastic.	Page 37
3m	Entrepreneurial opportunity	28(17%)		In-depth market intelligence (including consumer research) would enable Yalumba to break out of the commodity trap and more effectively reach the distinct market segments, targeting their differential preferences with specific attributes when feasible.	Page 43
3n				The relationships between Yalumba and the three divisions of Amcor are generally strong but there is scope to exploit the strong relationships to allow for more innovative designs and improvements to packaging to meet Tesco's needs.	Page 39
3p	Product-market	20(12%)		The greatest opportunity for improvement lies in leveraging already strong relationships, to improve the flow of information (strategic and operational) and enable more effective forecasting of supply and demand.	Page 4
3q	Technology	8(5%)		… working closely with Yalumba on the design and production of lighter weight bottles.	Page 17

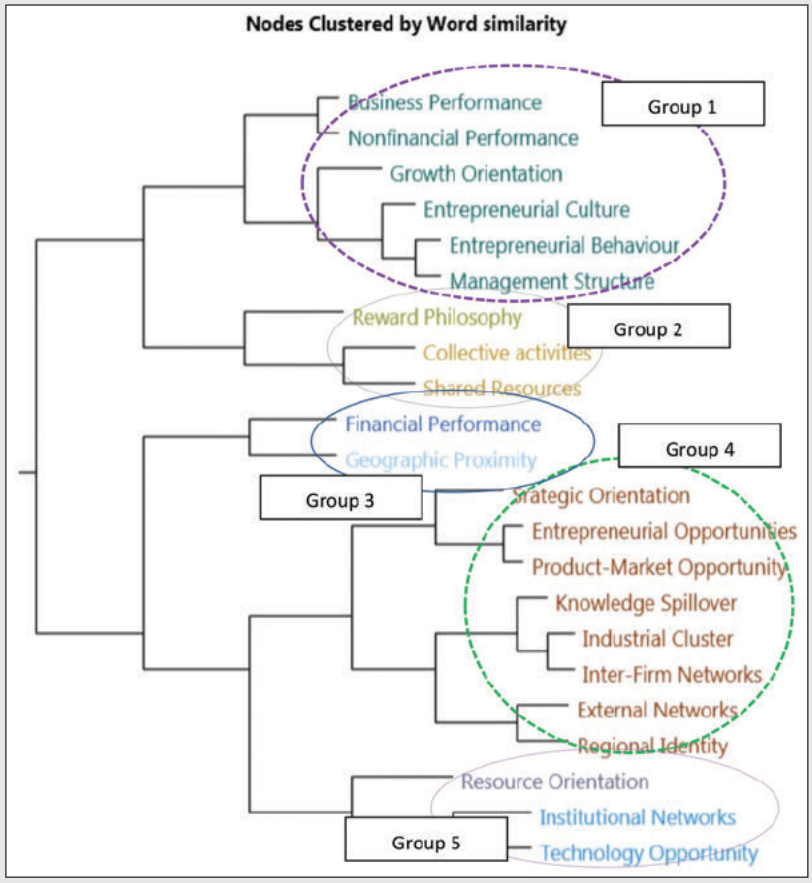

Figure 5.3: Nodes clustered by word similarity.
Source: Courtesy of the authors.

NVivo 9.0. Word similarity cluster analysis means that nodes that have a higher degree of similarity based on the occurrence and frequency of words are shown clustered together, indicating a higher level of relatedness. Sources or nodes that have a lower degree of similarity based on the occurrence and frequency of words are displayed further apart (NVivo9.0, 2012), suggesting low levels of relatedness.

Using this approach we can check the research propositions. In the first instance we can observe in Group 4 of Figure 5.3 that there are many indicators of depth of cluster involvement grouped in close proximity with entrepreneurial opportunities, particularly market-based opportunities. This supports our Proposition 1a, which suggests that a firm's depth of involvement in a cluster is closely related to the number of entrepreneurial opportunities. However, there are also some differences observed with Proposition 1b, which is not so well-supported, due to the distance between the concepts for depth of cluster involvement (Group 4) and those that indicate entrepreneurial management (Group 1). This suggests that the two concepts are more independent, suggesting that involvement in industrial clusters is not necessarily related to entrepreneurial management, and that entrepreneurial management may occur without the presence of an industrial cluster.

We also find that Proposition 2 proves to be unreliable, given that non-financial performance occupies the same grouping as entrepreneurial management and shows less relatedness to the cluster involvement concepts in Group 4. To further confound the propositions, it can be observed that financial performance (Group 3) raised in Proposition 3a, is in close proximity, although not grouped with key entrepreneurial management concepts (in Groups 1 and 2), while Proposition 3b reveals even less relatedness between entrepreneurial management and opportunities.

Discussion

Overall, our analysis reveals that the depth of industrial cluster involvement is closely related to market-based opportunities, and that these two factors may be difficult to distinguish, due to a close correlation. However, the relative failure of Propositions 1b, 2, 3a and 3b suggests that each of the pairs of concepts are likely

to be distinguishable factors and therefore may be isolated independently from each other. The extent to which these combined factors leverage the dependent variables of financial and non-financial performance remains unclear, though — as does whether these performances can be improved with the coexistence of factors underpinned by involvement in an industrial cluster.

There are other observations that we may draw from this analysis. For example, geographic proximity is parallel with shared resources and collective activity. This suggests that institutional networks may not provide the necessary condition to generate collective activity as the model suggests but are mostly associated with shared resources and geographic proximity. Another difference worthy of further study is that firm business performance is closely associated with institutional networks.

A study of clusters cannot ignore its commodity/value chain analysis, especially when researching its dynamics (Schmitz, 1995). The case study based on the commodity/value chain of Yalumba illustrates that Yalumba is highly involved in its regional community based on demonstrated clustered development characteristics, while Yalumba's management and marketing practices also express entrepreneurial behaviours and entrepreneurial opportunities. A deeper analysis of the project supports the argument that industrial clusters and entrepreneurship, although independent, are potentially strongly connected phenomena, and research that seeks to further explain the interactive dynamics of the two is necessary.

Conclusion

This chapter identifies gaps regarding research on the relationship between industrial clusters and entrepreneurship. In contrast with prior research, this chapter firstly identifies eight components of industrial clusters, and then describes how the above factors and characteristics contribute to the entrepreneurial process within identified clusters. Rather than focusing on the promoting role of entrepreneurship on the formation of clusters or on the creation role of clusters on start-up enterprises, we focus on the effect of industrial clusters on the established firms located within them. We outline a conceptual model to investigate the interaction between clusters, entrepreneurial behaviours and entrepreneurial opportunities, and this model provides another perspective to address the dynamic mechanism of clusters.

In addition, this chapter provides new perspectives to investigate the complex phenomena of entrepreneurial behaviours and entrepreneurial opportunities. It defines

entrepreneurial behaviours as those that are risk-taking, proactive and innovative behaviours aimed at discovering, evaluating, exploiting and creating entrepreneurial opportunities while also constructing a supportive context for entrepreneurial opportunities. This chapter defines an entrepreneurial opportunity as a feasible profit-seeking situation to influence market balance by providing a new product/service, new raw material, new production methods, new distribution/marketing methods and new geographical markets. This chapter adds valuable arguments to the controversial entrepreneurship research regarding the nature of entrepreneurial opportunity and its relationship with entrepreneurial behaviour. It also suggests ways to measure entrepreneurial behaviours and entrepreneurial opportunities in order to add novel and valuable research outcomes in this area.

Results from descriptive analyses have shown that industrial clusters and entrepreneurial process are closely related phenomena. Given the influences of key factors and main characteristics of industrial clusters on entrepreneurship, we believe it is reasonable to suggest policy strategies to promote entrepreneurship through promoting the development of clusters, especially by stimulating the decisive elements of clusters. It is also reasonable for government strategies to provide more opportunities by stimulating entrepreneurial behaviours in the region.

However, the project also shows a lack of interaction with consumers, which may cause Yalumba to waste some of its investment and opportunity. Our research suggests that Yalumba should not only collaborate and interact with supporting bodies, but should also develop an interactive strategy with consumers both locally and internationally to better understand the markets and stay alert to consumer preferences in order to exploit opportunities.

Future research

It is widely believed that industrial clusters and entrepreneurship are beneficial to individual business performance, regional development and even national competitiveness. In this chapter we have sought to identify the key factors and characteristics of industrial clusters, and to ascertain whether a relationship with the entrepreneurial process could be substantiated. This chapter contributes to a greater understanding of the dynamic interaction between industrial clusters and entrepreneurship. However, more research, both qualitative and quantitative,

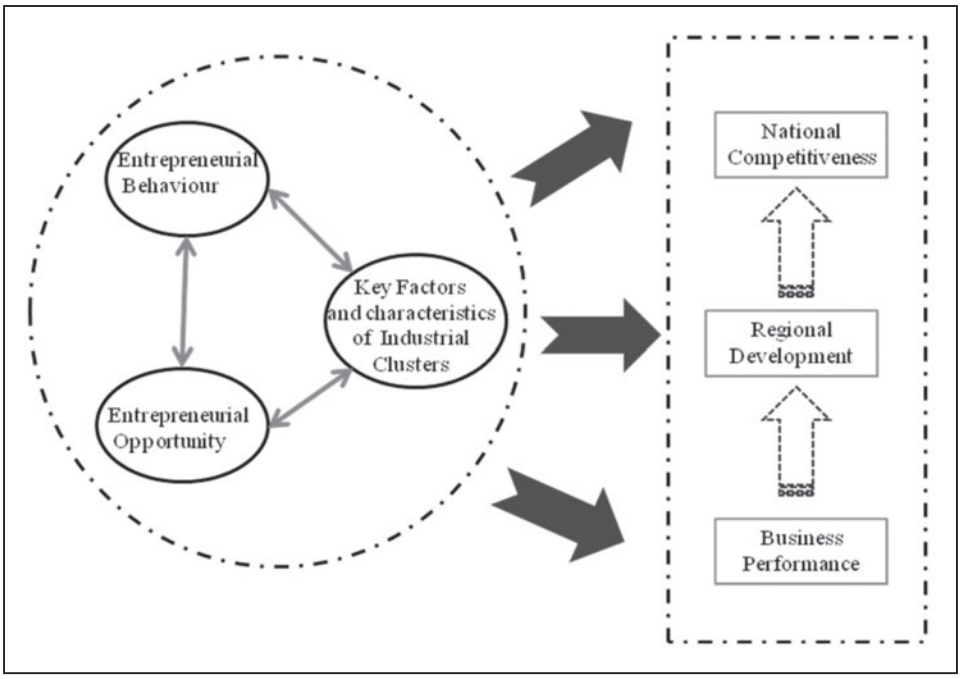

Figure 5.4: Conceptual model for future research.
Source: Courtesy of the authors.

is needed to explore the complex, multidisciplinary and universal phenomena of entrepreneurship and industrial clusters, as well as the interactions between them.

Figure 5.4 shows a future research conceptual model. We propose that future research could focus on how the interactions between industrial clusters, entrepreneurial behaviours and entrepreneurial opportunities influence firm performance, regional development and national competitiveness. Critical future research areas include identifying direct and indirect influential factors of industrial clusters, and identifying the impact pathway of how these key factors and characteristics enhance business performance, regional development and national competitiveness through entrepreneurial behaviours and entrepreneurial opportunities. Further research, both conceptual and empirical, is necessary given the existing and emerging focus and emphasis on policy and practice to develop industrial clusters worldwide.

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