A resource-based taxonomy of manufacturing MSMEs

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Abstract

Purpose – The purpose of this paper is to develop a contemporary resource-based taxonomy of manufacturing micro, small, and medium-sized enterprises (MSMEs) and to relate the findings to other small to medium-sized enterprise (SME) taxonomies and to resource-based theory.

Design/methodology/approach – Cluster analysis of 186 Swedish manufacturing MSMEs. The cluster analysis is based on resources and capabilities. The cluster variables were identified through case studies and a literature review of contemporary studies in resource-based theory.

Findings – The cluster analysis resulted in identification of six different clusters: Ikeas, conservatives, technocrats, marketeers, craftsmen, and nomads. The results are related to other SME taxonomies and the usefulness of going beyond the one-dimensional scale of entrepreneurs and non-entrepreneurs is discussed.

Originality/value – Classifications of firms, for example the Miles and Snow typology, have been used successfully in numerous studies. Also, the resource-based view of the firm has had a great impact on business research and there has been increasing interest in MSMEs. However, there are very few contemporary resource-based taxonomies of MSMEs.

Keywords Resource-based theory, Small to medium-sized enterprises, Cluster analysis, Taxonomy, Micro, small, and medium-sized enterprises, Entrepreneurial orientation

Paper type Research paper

1. Introduction

The concept of micro-, small-, and medium-sized enterprises (MSMEs) has become established in small business research. In addition, the importance of MSMEs for growth and employment has been established in numerous studies (e.g. Gibb and Li, 2003; Tether and Storey, 1998). In order to achieve a better understanding of this group of companies, we need to improve our understanding of the kinds of MSMEs that actually exist. One way of doing this is to develop MSME configurations. Previously identified classifications in terms of, for example, organizational types (Miles and Snow, 1978) or generic strategies (Porter, 1980) have been applied successfully in numerous studies. SMEs are often divided into entrepreneurial and non-entrepreneurial firms (often labeled conservative or managerial-oriented firms). Entrepreneurial-oriented firms are defined as being more proactive, innovative, risk-taking, and aggressive towards their competitors than their more conservative and/or managerial-oriented counterparts (Lumpkin and Dess, 1996). The distinction between entrepreneurial firms and managerial firms has been useful, and it has illustrated the circumstances under which more entrepreneurial strategies are most likely to succeed. Entrepreneurial firms are, for example, often more successful in uncertain environments (Covin and Slevin, 1989) and entrepreneurial orientation is generally more efficient if used in combination with a high level of network capabilities

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(Walter *et al.*, 2006) or organizational knowledge (Wiklund and Shepherd, 2003). However, the distinction between entrepreneurial companies and conservative companies can also be regarded as a one-dimensional classification of firms.

Configurations can be divided into conceptually developed typologies or empirically developed taxonomies (Miller, 1996). Although all typologies and taxonomies are simplifications of reality, the entrepreneurial-conservative typology might sometimes oversimplify the actual conditions too much. In addition to the distinction between entrepreneurs and managers, the typologies developed by Miles and Snow (1978) and Porter (1980) have probably received most interest in business research. The Miles and Snow typology of prospectors, reactors, defenders, and analyzers has been applied successfully in numerous studies (e.g. Kabanoff and Brown, 2008; McCann *et al.*, 2001). Porter's distinction between firms adopting a differentiation strategy, a cost leadership strategy, or a focus strategy has also had a great impact on strategy and marketing research (Porter, 2008). The effect these typologies have had on marketing, strategic management, and small business research illustrates the usefulness of analyzing configurations of firms. However, although later validated by empirical studies (e.g. Dess and Davis, 1984; Hambrick, 2003; Miller and Friesen, 1986), none of these frequently referred-to classifications were empirically derived. Also, they were not developed for small businesses specifically, and were developed before the shift in strategic management research from market strategy to internal resources and capabilities. The latter notion, i.e. the resource-based view (RBV) (Barney, 1986, 1991; Peteraf, 1993; Wernerfelt, 1984), is a vital argument for the present study.

The original RBV publications generally focused on single resources and their impact on firm performance. However, more recent contributions have shown, or argued, that it is the combination of several resources or resource bundles (Vicente-Lorente, 2001) that often generates the competitive advantage (Miller and Shamsie, 1996; Song *et al.*, 2005). Resources also have to fit into the system of other resources (Black and Boal, 1994; Sanchez and Heene, 1997) and are dependent of existing organizational processes (Grant, 1991). Thus, competitive advantages are often the result of how bundles of resources are combined into different resource interactions (Smith *et al.*, 1996) and how resources are organized (Barney and Hesterly, 2008). A better understanding of the resource configurations of firms is essential in order to understand why certain companies outperform their competitors.

In most empirical RBV studies, the accuracy of the classical RBV literature (Barney, 1991; Wernerfelt, 1984) has been analyzed by examining the importance of specific resources and/or capabilities (Newbert, 2007). These studies, however, do not say anything about the complete resource configuration of companies. When the relationship between differential resource configurations and firm performance has been analyzed, the level of possession of different resources and/or capabilities has often been used as an indicator of more aggregated resource concepts, for example, by measuring the possession of tangible resources, intangible resources and capabilities (Galbreath and Galvin, 2008) or the overall level of knowledge (Wiklund and Shepherd, 2003). Other studies (Hitt *et al.*, 2000; Song *et al.*, 2005) have applied more holistic approaches, and have analyzed the relationship between performance and several resources or resource configurations.

In accordance with RBV logic, the studies described have mainly focused on the identification of strategic resources and the correlation between these resources and the

performance of a firm. These studies are interesting and important. They have all contributed to our understanding of the relationship between different strategic resources and sustainable competitive advantages. However, due to the heterogenic distribution of strategic and non-strategic resources among firms, different firms are most likely to have different possibilities of making the best use of strategic resources (Sanchez and Heene, 1997). But does the heterogeneous distribution of resources between firms (Barney, 1991) also imply that the resource configurations differ between all firms, or is it possible to identify similarities between companies, based on their resources? Or, to use some industrial organization terminology, is it meaningful to identify resource-based strategic groups? From a RBV, firm taxonomies can have several implications for the development of a resource-based theory. If the competitive advantages of firms can be explained by differences in resource bundles, it is obviously important to have some knowledge about the structures of such bundles. Identification of resource-based strategic groups can provide insights into the existence of common ways to organize resources, and how different firms choose to emphasize different resources rather than others. Another argument for the development of resource-based strategic groups is based on the notion that the value of a resource is dependent on the firm's ability to utilize the resource (Barney and Hesterly, 2008; Penrose, 1959; Sanchez and Heene, 1997). This ability is restricted by the resources the firm possesses; thus, the existing resource configuration of a company plays a key role in its ability to make use of potential strategic resources. Also, firms with different resources might differ in their capabilities of acquiring strategic resources (Andersén, 2007).

Thus, a taxonomy based on resources and capabilities could constitute an important contribution to resource-based theory. Also, it could provide a richer taxonomy of MSMEs than the traditional entrepreneur-manager scale or typologies based on external variables. Even so, the body of knowledge that exists regarding differences in the configuration of resources and/or capabilities among MSMEs is limited. Also, the resource taxonomy developed by Borch *et al.* (1999) used a traditional classification of resources by analyzing, for example, human and organizational resources. In more recent RBV contributions, scholars have argued for the importance of resource utilization (and not only the possession of resources) and have shown that capabilities generally explain performance differences better than broadly defined resources (Newbert, 2007). Rangone's (1999) identification of capabilities in SMEs can, for example, be more useful as cluster variables than meta resources. Consequently, the aim of this article is to develop a contemporary resource-based taxonomy of MSMEs and to relate the findings to other SME taxonomies in order to contribute to our understanding of how different MSMEs organize their resources and capabilities. By relating the results to the RBV, the study also aims to contribute to the development of a resource-based theory.

The study is limited to manufacturing MSMEs for three reasons. By limiting the study to a specific industry (albeit broadly defined), it is possible to exclude cross-industry differences. Secondly, the Swedish manufacturing industry is vital for the Swedish extremely export-dependent economy (export constitute more than 50 percent of Sweden's GDP), but it has been in decline during the last decades – at least in terms of the number of people employed. This makes it important to improve our knowledge of this sector. Thirdly, previous studies (e.g. Rangone, 1999) have

identified key capabilities for manufacturing SMEs. This makes it possible to build the present study upon those results.

2. Literature review

Non-SME taxonomies and their applicability to MSMEs

The typology developed by Miles and Snow (1978) of prospectors, reactors, defenders, and analyzers is still the predominant approach to classification of firms, and it has been applied successfully in several studies (Hambrick, 2003). The classification is mainly a development and refinement of Ansoff's (1965) division of firms into entrepreneurs, reactors, and planners, and although originally developed for larger firms, the classification has also been applied successfully to SMEs (e.g. Aragon-Sanchez and Sánchez-Marín, 2005; Citrin *et al.*, 2007; Ghosh *et al.*, 2001; McCann *et al.*, 2001). Another established classification of firms that has been applied to SMEs (e.g. Leitner and Güldenberg, 2010) is Porter's (1980) generic strategy types; that is, a classification based on whether a company adopts a cost leadership strategy, a differentiation strategy, or a focus strategy. With few exceptions, other typologies or taxonomies of firms have not gained as much attention. However, the taxonomy of large manufacturing firms developed by Miller and Roth (1994) has been cited frequently. In that study, the authors identified three clusters: caretakers, marketeers, and innovators. The taxonomy has mainly been used in operations management research (see for example, Frohlich and Dixon, 2001) and its application to SMEs has also been discussed (Kathuria, 2000).

Thus, these established classifications have been applied successfully to SMEs. They are, however, mainly based on an external view of the firm. Although some internal elements are included in the typology developed by Miles and Snow (1978), the main emphasis in the categorizations is on market strategies (Porter, 1980) and perceptions of environmental uncertainty (Miles and Snow, 1978). Also, categorization of SMEs – and especially MSMEs – in the same manner as large corporations is perhaps not ideal. Numerous scholars (Beaver, 2003; Donaldson, 2005; Knight, 1989; Wagner and Hansen, 2005; Zahra and George, 1999) have argued that large and small companies generally face different challenges and different strategies are usually required, depending on the size of the firm. However, new taxonomies can obviously benefit from being compared to these more established classifications.

MSME- and SME-specific taxonomies

Other than applying and testing existing taxonomies on SMEs, a number of studies have been explorative, the aim being to develop taxonomies for SMEs specifically. As previously described, in entrepreneurship research firms can often be divided into entrepreneurial and conservative/managerial firms. However, when using the concept of entrepreneurship, contemporary studies have usually taken the degree of entrepreneurship as the point of departure. Entrepreneurship is often operationalized by using the concept of entrepreneurial orientation (EO). Thus, companies are placed on a scale ranging from managerial to entrepreneurial depending on their level of entrepreneurship, which is often measured in terms of the level of risk-taking, innovativeness, and proactiveness (Lumpkin and Dess, 1996). This construct has been applied to SMEs in several studies (e.g. Keh *et al.*, 2007; Wiklund and Shepherd, 2003).

Besides EO classifications of SMEs, taxonomies based on various other variables have been developed for SMEs. A number of these studies are listed in Table I.

Some of these studies illustrate the usefulness of the duality approach often adopted in research in entrepreneurship. Explorative cluster analysis has, for example, resulted in an identification of two cluster solutions in terms of active entrepreneurs and passive entrepreneurs (Avlonitis and Salavou, 2007), or alternatively, technology leaders and technology followers (Galbraith *et al.*, 2008). Other studies have examined more precise taxonomies, based on some narrow and specific variables. For example, Westhead and Howorth (2007) identified different types of family firms based on the company objectives, management structure, and ownership. McMahon (2001) clustered SMEs based on different growth pathways. McMahon's (2001) identification of high-, moderate-, and low-growth pathways of SMEs can also be regarded as a one-dimensional classification. Also, De Jong and Marsili (2006) developed the taxonomy of innovative firms identified by Pavitt (1984), by developing a classification of supplier-dominated firms, specialized suppliers, science-based firms, and resource-intensive firms.

There have been a limited number of taxonomies based on strategic management practices and/or resources of SMEs. Bantel (1998) identified six clusters of high-technology SMEs based on their competitive techniques whereas a cluster analysis by Borch *et al.* (1999), based on resources, resulted in a four-cluster solution. Although they used different cluster variables, there are several similarities between the studies conducted by Bantel (1998) and Borch *et al.* (1999). For example, both studies identified clusters that could be characterized as being technology-oriented, clusters consisting of companies that were aggressive in their marketing efforts, and clusters of companies without any strategic direction or with a lack of resources. Also, they argued that their taxonomies were to a certain extent validations of the Miles and Snow typology. The analysis of Sum *et al.* (2004) resulted in three clusters, based on operational variables such as cost, efficiency, delivery, and quality. Their sample only consisted of high-performing SMEs, however, and therefore did not represent all SMEs. Greene and Brown (1997) discussed the typology developed by Kirchhoff (1994), based on growth rate and innovation rate, by analyzing the resource needs for each group of companies. For example, glamorous firms (high-growth and innovatory firms) in Kirchhoff's typology have a high need of several resources (i.e. human, physical, financial, and organizational), but they are not as dependent on family resources as other firms (Greene and Brown, 1997). Thus, identification of clusters of SMEs based on resources can validate (or falsify) the findings of Greene and Brown (1997).

A resource-based taxonomy

Ever since the seminal contributions on RBV (Barney, 1991; Peteraf, 1993; Rumelt, 1984; Wernerfelt, 1984), the RBV has become a predominant approach in strategic management research. The basic assumption of the RBV is that resources are not perfectly mobile (nor easy to imitate) and are heterogeneously distributed among firms (Barney, 1991). Thus, firm resources that are valuable and immobile are the key explanatory mechanism for sustainable competitive advantages. The RBV does not contradict Porter's generic strategy classification of cost leadership or differentiation strategies. However, by analyzing resources, RBV scholars seek to explain how some firms are able to implement such strategies. The most important notion of the RBV is

Author(s)	Taxonomy (or other classification)	Sample	Variables
Avlonitis and Salavou (2007)	Active entrepreneurs Passive entrepreneurs	149 Greece SMEs	Entrepreneurial orientation, product innovativeness, product performance
Bantel (1998)	1: Focus on narrow niche of specialized, infrequently purchased, large investment products; direct sales and support 2: "Spin-offs" reliant on contracts with original employers 3: Marketing and sales expertise targeted at narrow market 4: Technology leaders with a high degree of specialization, quality, and service 5: Lacking in a clear strategic profile 6: Broad and aggressive product/market reach with relatively high quality and service	162 US technology-based SMEs	25 competitive techniques
Borch *et al.* (1999)	Managerial firms Technological firms Traditional firms Impoverished firms	660 small and micro Swedish firms	Strategic posture, resources
De Jong and Marsili (2006)	Science based Specialized suppliers Supplier dominated Resource intensive	1,234 Dutch micro and small firms	Several different innovation variables
Galbraith *et al.* (2008)	Technology leader Technology follower	44 Scottish high-tech SMEs	R&D focus, technology strategy
Greene and Brown (1997) and Kirchhoff (1994)	Resource constrained Glamorous Economic core Ambitious	Conceptual	Resources (human, social, physical, organizational, financial)
McMahon (2001)	Low-growth pathway High-growth pathway Moderate-growth pathway	2,413 Australian manufacturing SMEs	Age, size, growth rate
Sum *et al.* (2004)	All-rounders Efficient innovators Differentiators	43 high-performing Singaporean SMEs	Cost, quality, delivery, flexibility
Westhead and Howorth (2007)	Cousin consortium family firms Large open family firms Entrenched average family firms Multi-generation open family firms Professional family firms Average family firms Multi-generation family firms	237 UK family firms	Company ownership, management structure, company objectives

Table I.
SME classifications

that resources are heterogeneously distributed between firms (Barney, 1991). As previously discussed, it can then be regarded as a paradox to analyze similarities between companies. Sanchez and Heene (1997) do, for example, claim that each organization is a unique entity with specific resources and competences. That said, there can still be companies with similar resource configurations. For example, Mehra (1996) and Borch *et al.* (1999) identified clusters of companies based on their resources.

In the core RBV literature, capabilities are generally included in the strategic resource concept (e.g. Barney, 1991; Miller and Shamsie, 1996; Peteraf, 1993; Wernerfelt, 1984). Thus, the distinction between a resource and a capability is at most imprecise, and following the core RBV definitions, non-existent. Even so, when resources and capabilities are treated as separate concepts, capabilities are generally regarded as more dynamic and knowledge-based than resources. Also, resources are usually regarded as being further back in the value-creating process of a company. Human resources and organizational resources can, for example, be the basis of different capabilities, such as innovation capability, marketing management capability, and production capability (Andersén, 2007; Rangone, 1999). In Newbert's (2007) review of the RBV literature, he concluded that the correlation between capabilities and performance is much stronger than the correlation between resources and performance (71 percent of the capability-performance hypotheses were supported, as opposed to 53 percent of the hypotheses testing the resource-performance relationship). Although the study conducted by Newbert can be criticized for the lack of coherence of definitions of capabilities and resources, it is useful in its identification of the stronger correlation between capabilities and performance. It illustrates the problems of tracing performance back to meta-resources, such as human resources or overall organizational knowledge (e.g. Wiklund and Shepherd, 2003). Thus, pinpointing and measuring specific capabilities seems more appropriate than analyzing meta-resources such as human resources or total knowledge. For MSMEs, the owner/manager of the firm is most likely to be the most important (human) resource, and in order to grasp the importance of this person, analysis of the capabilities of the company would seem appropriate. For micro-firms, these capabilities are often possessed by the owner/manager himself/herself.

3. Method

Identification of resources and capabilities in manufacturing SMEs

When conducting cluster analysis, the most important step is the selection of variables (Ketchen and Shook, 1996). Thus, a great deal of care must be taken to identify relevant variables. The first step is to identify relevant resources for the population under analysis. In the present study, this identification was conducted by means of a literature review combined with case studies of 14 Swedish manufacturing MSMEs. Five of the companies could be classified as micro firms. The owner/manager of each company was interviewed for one to two hours and the questions concerned the importance of different resources and capabilities for their businesses. The case studies also involved financial analysis of the companies for a period of up to 25 years (depending on when the company was founded). The case studies were part of a larger study concerning strategic resources in manufacturing MSMEs (see Andersén, 2005).

As recently discussed, analysis of specific firm capabilities is most likely a suitable approach when analyzing firm resources. The distinction between capabilities and

resources is not always apparent, and capabilities have been regarded as resources by several prominent scholars (e.g. Barney, 1991; Wernerfelt, 1984). Rangone (1999) identified three main capabilities in manufacturing SMEs: production capability, marketing management capability, and innovation capability. The applicability of the study conducted by Rangone was to some extent validated through the case studies conducted. The case studies did, however, indicate that the concept of production capabilities might be too broad. By dividing the production capability into an ability to produce low-cost products and an ability to produce complex products, the capabilities become more in accordance with more established literature on competitive advantages (i.e. a low cost capability is the same thing as cost leadership, whereas a complex product capability can result in a differentiation strategy). Complex products refer to products that are complex to produce (but not necessarily complex to use) – for example, products of superior quality.

Resources are, however, a broader concept than internal capabilities. Miller and Shamsie (1996) make a distinction between property-based resources and knowledge-based resources. Property-based resources in manufacturing companies mainly include different physical resources in terms of tools, machinery or production systems. These resources can generate temporary competitive advantages, but due to the tangible characteristics of such resources they can be imitated more easily by competitors and are not likely to be sustainable. However, these resources can be an important prerequisite for other resources to function and thus constitute an important resource (Barney, 1991). The importance of advanced production systems and machinery was also emphasized by the owner/managers of the more profitable SMEs in the case studies. Thus, it makes sense to include physical resources, defined as production facilities and machinery, when conducting cluster analysis of manufacturing companies. External resources are also generally included in the resource concept. Corporate reputation has, for example, been found to be a potential strategic resource (Roberts and Dowling, 2002). For SMEs, customer relations are an established key factor for success, which has been identified in numerous studies (Payne and Frow, 2005; Verhoef, 2003), and the importance of this factor was validated by the 14 case studies. Thus, customer relations are also included as a resource.

By using these definitions of resources, six resources and capabilities can be identified: ability to produce low-cost products, ability to produce complex products, marketing capability, innovation capability, physical resources and relational resources. Some of these resources require more precise definitions. Innovation capability is defined as the ability to develop new products and/or to improve existing products. Physical resources include machines, tools and production facilities. Relational resources are delimited to customer relations.

The possession of a resource or a capability is not enough, however. In order to achieve a competitive advantage, resources and capabilities have to be utilized. This important notion was somewhat neglected in several early contributions on RBV, but the importance of resource utilization has been highlighted in other studies (e.g. Grant, 1991; March, 1991; Ray *et al.*, 2004). Thus, another important aspect to take into consideration is the degree of utilization of the resources identified above. Resource utilization can be a complex issue and some firms may, for example, be more proactive in their usage of certain resources, but more conservative in their use of other resources (Andersén, 2007). The case studies did, for example, illustrate a tendency to keep

producing the same products in spite of a potential ability to produce more complex products. Thus, a configuration approach based on both possession factors and utilization factors appears to be the best way to describe the resource configuration of companies.

Sample and data collection

The sample for the cluster analysis consists of micro-, small- and medium-sized Swedish manufacturing companies. The questionnaire was based on a literature review and on the case studies recently described. As suggested by Rouse and Daellenbach (1999), the survey was also discussed with a panel of industry experts. This panel consisted of representatives from companies and government agencies dealing with small businesses at the regional level (the expert panel was represented by ALMI Business partner, The Swedish Trade Federation, The Swedish Chamber of Commerce and the Rekarne Bank Foundation).

A mail survey was sent out to all manufacturing companies in Södermanland County, Sweden. The relevant companies (manufacturing companies with 1-250 employees) were identified from the Swedish equivalent of the US SIC-classification (SNI-codes). In total, 420 companies were contacted and the initial survey was followed up by two reminders if necessary. Of these companies, 205 answered the survey; however, 19 of the questionnaires were incomplete. Thus, the effective sample consisted of 186 companies, giving a response rate of 44 percent. Using the European Union definitions of MSMEs, the sample consisted of 108 micro-firms (1-9 employees), 55 small firms (10-49 employees), and 23 medium-sized companies (50-250 employees). Twenty of the micro-firms had only one employee.

Cluster variables

As previously described, the resources and capabilities analyzed were innovation capability, marketing capability, ability to produce low-cost products, ability to produce complex products, technological resources and relational resources. One problem with the study by Borch *et al.* (1999) is that the operationalizations of the resources were not very precise. The number of patents (one of the measures in the Borch study), can for example, be an indicator of technology resources but patents can also be the result of human, organizational or juridical resources. Technology resources can also result in non-patented products or processes. This problem can be resolved by a more straightforward approach by asking about the capabilities/resources, or by using several indicators for each resource. Due to the high number of variables analyzed in the study, the respondents were asked to estimate each capability in comparison to their competitors on a seven-point scale. Thus, respondents were, for example, asked to rate their capability to produce low-cost products in comparison to their competitors, and so on. Regarding the utilization aspect, respondents were asked to estimate the percentage of their sales that was dependent on the particular resource or capability. These measurements were used in order to measure the utilization of each resource:

- *Low-cost production capability* (*COST*). Percentage of sales from products manufactured at a lower cost than competitors.
- *Complex product capability* (*COMP*). Percentage of sales from products that can be regarded as complex/difficult to manufacture.

- *Marketing capability* (*MARK*). Percentage of sales that were dependent on marketing efforts directed to new customers conducted in the previous three years.
- *Innovation capability* (*INNO*). Percentage of sales that were dependent on new products developed or existing products refined during the previous three years.
- *Technological resources* (*TECH*). Percentage of sales that would not be possible with a less advanced production facility.
- *Relational resources* (*REL*). Percentage of sales that would not be possible without earlier established customer relations.

The utilization variables were transformed to a seven-point scale and the possession variables and utilization variables were added together in order to generate a resource index of each resource or capability for each company.

Variables for validation of the clusters

An important step in cluster analysis is to validate the clusters, by analyzing differences between clusters regarding variables other than those the clusters were based on. Five variables were chosen to validate the clusters.

Entrepreneurial orientation (EO) is a frequently applied measure in entrepreneurship research. It measures the strategic posture in terms of a company's level of proactivity, innovativeness and risk-taking (Lumpkin and Dess, 1996; Miller and Friesen, 1982). Relating the results of the cluster analysis to an established concept such as EO can provide an important contribution to entrepreneurship research. Also, EO has been successfully combined with the RBV in previous studies (Wiklund and Shepherd, 2003). The nine-item scale developed by Covin and Slevin (1989) was used to measure EO. The Cronbach alpha value was 0.88.

Sales region or market region was also used to validate the clusters. Respondents were asked to estimate the percentage of total sales that were export sales and the percentage of total sales that were sales from the same region (i.e. county). The sales region factor was calculated according to the formula: export sales $\times 4 +$ (export sales $-$ regional sales). This index describes the closeness to the product market. The purpose of the index is mainly to measure the level of export. However, the choice between regional and national sales is also an indication of a company's willingness to adopt a more risk-taking market strategy. The choice to market products in other countries is, however, a larger step than to sell the products within the country but outside one's own region; hence the weighting of the scales. Another important reason for inclusion of this measure (i.e. the regional-national measure) was the fact that several of the companies did not have any exports, which would make it difficult to analyze the sales region statistically. By taking the export factor times four, the choice to export had a greater impact on the sales region variable (than the regional-national measure), but the skewness and kurtosis values were still at an acceptable level (< 2.58).

Firm size is an important contingency variable (Donaldson, 2005). Earlier studies (Kellermanns and Eddleston, 2006; Yusuf, 2002) have indicated that the size of a firm can have an effect on entrepreneurial orientation. Thus, it would make sense if companies of different sizes possess different resource configurations. Number of employees was used to measure firm size. This value was collected from the annual

reports of the companies. As indicated by the sample description, this value had high kurtosis and skewness values. It was therefore transformed by taking the natural logarithm.

Two other variables were also used for cluster validation – supplier relations and level of formal education of employees. Supplier relations are an important success factor. However, it is not such an established potential strategic resource as customer relations. Also, it was not identified as a key resource in the case studies. The importance of knowledge-based resources makes it interesting to compare the clusters with the level of formal education. For both variables, the respondents were asked to rate their company on a seven-point scale in comparison to their competitors.

Choice of method for the cluster analysis

Hierarchical cluster analysis was used to identify clusters. Ward's method was chosen as the clustering algorithm. This method is very common in strategic management research (Ketchen and Shook, 1996), as well as in business research in general. According to Punj and Stewart (1983, p. 145), this method has demonstrated "superior performance" in hierarchical cluster analysis. The major weakness of hierarchical cluster procedures, as well as with the Ward's method, is the impact of outliers (Hair *et al.*, 2006; Ketchen and Shook, 1996). The highest standard score (D^2/df) of all cases was 3.4, which was acceptable according to the recommendations of Hair *et al.* (2006) for larger samples. Even so, an additional cluster analysis was conducted. The six cases with standard scores that exceeded 2.5 were removed and this did not have any effect on the cluster analysis.

Multicollinearity is another common problem in cluster analysis. Factor analysis is not always an appropriate method to overcome this problem (Hair *et al.*, 2006). By eliminating some variables, crucial information about the clusters can be overlooked (Dillon *et al.*, 1989). To overcome this problem, Mahlanbolis distance was used to measure the distances between the observations. This measure weights each variable equally and standardizes the variables (Hair *et al.*, 2006, p. 77). Mahlanbolis distance is quite unusual in business research (Ketchen and Shook, 1996), but this is probably due to the fact that it is not available in the most commonly used statistical software programs such as SPSS and SAS (Hair *et al.*, 2006; Ketchen and Shook, 1996).

4. Results

Number of clusters

The first step in cluster analysis is to identify the number of clusters. The root mean square standard deviation (RMSSTD), pseudo F statistics, and Dunn's index were used to determine the number of clusters. These are common methods in cluster analysis, and it is recommended that one should use several stopping rules (Hair *et al.*, 2006). The actual values are of little interest when determining the number of clusters; instead, it is the relative changes between different solutions that are used as the stopping rule. It thus makes sense to examine the results graphically. The results of the analysis are illustrated in Figure 1.

Large values in the pseudo F statistics and the Dunn's index indicate well-separated clusters (Wilkinson *et al.*, 2007). The pseudo F peaks at a six-cluster solution, and the Dunn's index has a large increase between the five-cluster solution and the six-cluster solution. RMSSTD is a value of homogeneity; thus, a low value indicates the best

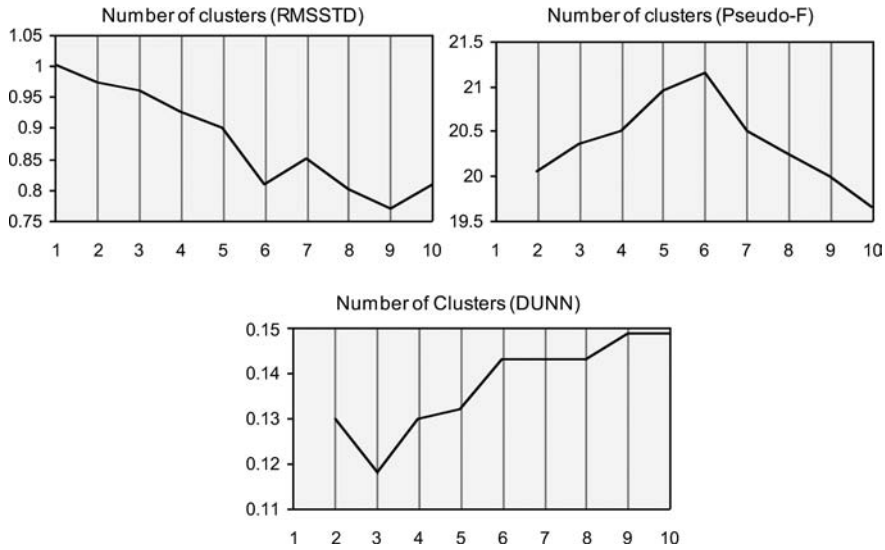

Figure 1.
Number of clusters

cluster solution (Wilkinson *et al.*, 2007). This value, however, generally decreases with the number of clusters; thus, smaller decreases (or an increase) in the RMSSTD indicate the optimal solution. There is an increase in the RMSSTD value between the six- and the seven-cluster solution, as well as a large decrease from five to six clusters. Thus, a six-cluster solution is supported by all three stopping rules. This conclusion was also supported by an, albeit subjective, analysis of the tree diagram.

Cluster profiles

ANOVA analysis confirmed that all five cluster variables showed significant differences across the clusters ($p < 0.001$, F-values ranging from 5.23 to 36.26). The centroids (i.e. the mean value of each cluster), the names of the clusters identified and the number of companies in each cluster are presented in Figure 2.

The six clusters identified will now be described:

(1) *Ikeas* ($n = 19$). These companies compete by producing low-cost products and are highly innovative in their product development. They are also skilled in marketing and have strong relations with their customers. Companies such as Ikea and Wal-mart are typical examples of larger companies in this group. The products are not very complex to produce. The low-cost production ability does not have to imply that they adopt a low-cost strategy in the product market. However, this is likely to be the case for the majority of these companies.

(2) *Technocrats* ($n = 50$). These companies have technological production capabilities and utilize them to a great extent. This also enables them to produce both complex and innovative products. However, the companies are inward-looking and do not market their products to a great extent. This distinguishes technocrats from, for example, prospector firms.

(3) *Conservatives* ($n = 40$). These companies can be regarded as highly non-entrepreneurial, and in entrepreneurship research they are generally

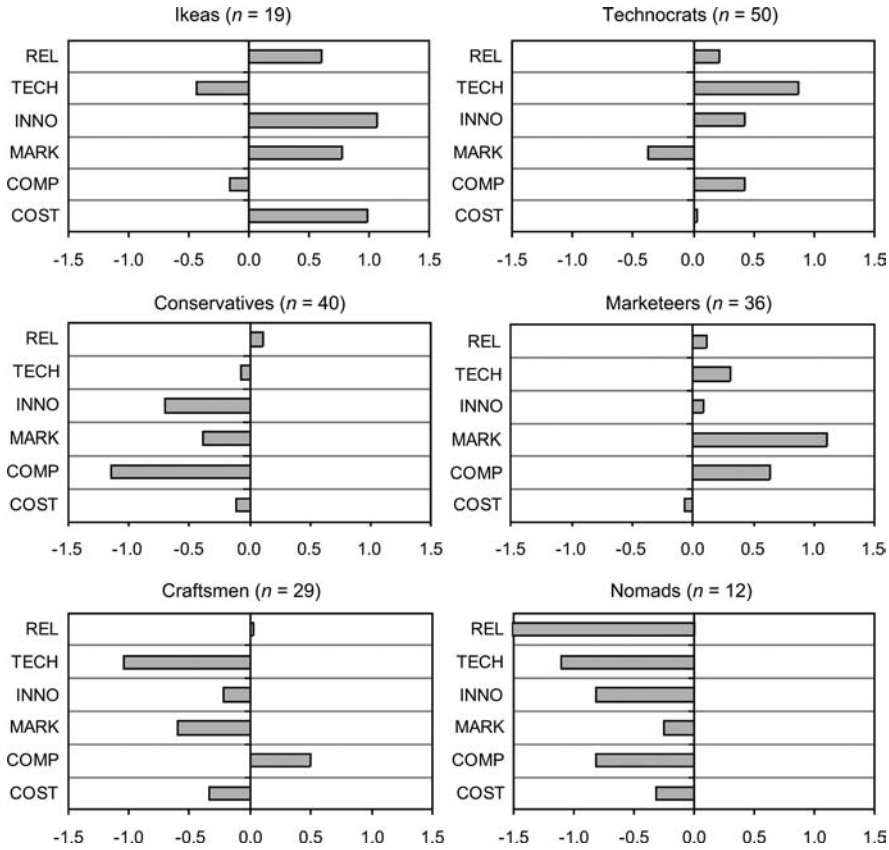

Figure 2.
Average factor scores

referred to as conservatives. Members of this group produce simple products and are below average in marketing as well as in innovation. This is generally the result of an unwillingness to adapt to a changing environment.

(4) *Marketeers* ($n = 36$). This group of companies is extremely market-oriented and competes by producing complex products that require advanced technological facilities. However, their average level of innovation distinguishes them from traditional entrepreneurs. Thus, they are highly outward-looking in their efforts to maximize returns from their existing products.

(5) *Craftsmen* ($n = 29$). A group of companies that are below average regarding several resources and capabilities. Their extremely low level of technological resources is the most apparent weakness. Their marketing capabilities are also well below average. They do, however, produce complex products. Thus, they are highly skilled but not in areas that require complex technological facilities; they produce more craftsman-like products.

(6) *Nomads* ($n = 12$). These firms are below average on all fronts regarding resources and capabilities. Their lack of relational resources stands out most. These firms wander the markets from customer to customer (lack of relational

resources) without much direction (lack of marketing capabilities). They do not have any apparent competitive advantages and can be classified as primitive and non-innovative.

As previously mentioned, all companies in the sample belonged to the manufacturing industry. However, manufacturing is a broad concept with several sub-industries. This makes it interesting to study whether or not some sub-industries are over-represented in some of the clusters. The proportions of companies of each cluster in various industries are presented in the Appendix. Most industries were evenly represented in the different clusters. However, the marketeers are under-represented in the metal industry and consist of companies that produce more complex products, such as machinery and industrial tools. Craftsmen, on the other hand, are highly over-represented in the metal industry (i.e. a more traditional industry consisting of foundries and welding companies, for example). These businesses generally require more craftsmen-related skills and less high-tech machinery. Thus, the industry analysis validates the results of the cluster analysis.

Cluster validation

Validation is an important step in the clustering process. If there are no differences between the clusters in variables other than those used as the basis for the cluster analysis, the clusters do not make much sense. Table II summarizes the results of the ANOVA tests conducted regarding other significant variables. With the exception of "sales region", all models were significant at the 0.01 level or at the 0.05 level. Sales region was only significant at the 0.10 level.

The variation in EO between the clusters is probably the most interesting. EO is an established measurement of entrepreneurship and there are several statistically significant differences between the groups. In spite of the average level of innovativeness in terms of product development (one of three dimensions of EO), the marketeers have the highest level of EO. This is, obviously, due to their high level of proactivity and willingness to take risks. There are also differences in the concept of innovativeness between the present study and the one used in the EO construct. In the cluster analysis, innovation refers to product innovation and improvement, whereas the EO definition of innovation also includes marketing aspects and the level of change in product lines – that is, variables that marketing-oriented companies can be expected

	EO	Size	Education	Supplier relations	Sales region
Ikeas	3.83	2.22	4.32	5.00	11.06
Technocrats	4.02	2.14	4.74	4.90	10.94
Conservatives	3.37	1.86	4.22	4.67	8.97
Marketeers	4.12	2.80	4.97	5.00	11.74
Craftsmen	3.09	1.38	4.68	4.93	9.29
Nomads	3.28	1.02	3.58	4.00	10.51
Levene statistic	1.25	2.24†	0.39	0.70	1.67
F-value	5.50***	5.81***	3.50**	2.40*	2.03†

Notes: †$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table II.
Cluster validation

to exceed. Nomads, craftsmen and conservatives all have low levels of entrepreneurial orientation, which can be expected. The high level or entrepreneurial orientation of the technocrats can most likely be explained by their innovativeness.

Marketeers and technocrats have the highest levels of formal education among their employees. The craftsmen have the third-highest level of formal education. These firms are also the top three regarding the ability to produce complex products. Thus, there appears to be a correlation between these variables. The nomad group stands out in the low level of formal education, thus providing another argument for the simplicity of this group. The marketeers and the Ikeas have the strongest supplier relations. This is another indication of the outward-looking posture of the marketeers. It does also make a great deal of sense that Ikea companies have to have good supplier relations. This is most likely a prerequisite for the low-cost production capability. Both Wal-Mart and Ikea are, for example, known for their rigorous approach towards their suppliers. For smaller companies, good relations with suppliers are most likely even more important, due to the lack of economic strength and thereby their inability to put pressure on their suppliers.

The sales region factor is only statistically significant at the 0.10 level and must be interpreted with caution. However, the numbers give an indication of what can be expected. The marketing-oriented companies – the Ikeas and the marketeers – are active outside their own region and their own country to the greatest extent. The conservative firms generally sell their product in the regional market.

From the analysis of differences in firm size, one can conclude that the marketeers are the largest companies. The lack of marketing in smaller firms, especially regarding more traditional marketing activities such as formal planning and analysis, has been highlighted in earlier studies (Coviello *et al.*, 2000) so this result is not surprising. The smallest firms consist of the nomads and the craftsmen. Further analysis showed that the marketeers are the only significantly different group regarding firm size (statistically significantly larger than the conservatives, the craftsmen and the nomads at the 0.05 level). Nevertheless, the nomads and the craftsmen generally have a smaller number of employees and this may be an indication that these companies are over-represented among micro firms. This is an indication that we are likely to get other cluster solutions when the sample includes micro firms and not just SMEs.

Differences in financial performance between the clusters would, of course, be highly interesting. Return on assets (collected from the annual reports of the companies) was therefore used to measure profitability. This measure is widely used in small business research (Murphy *et al.*, 1996). The centroid for each cluster is presented in the Appendix, and no statistically significant differences could be identified. This is in line with, for example, Miles and Snow's (1978) notion that there is rarely a single ultimate taxonomy. Instead, there are a number of methods (e.g. different resource configurations) to achieve high performance. As stated, the figures are not statistically significant and most, but not all, of the results are as expected. Ikeas and technocrats stand out from the other groups as high-performance companies. Marketeers, craftsmen, and conservatives have average performance whereas the ROA of the nomads is negative. The most surprising result is that the marketeers are the most entrepreneurial (have the highest level of EO), but still have quite average performance. This illustrates the complexity of the EO-performance relationship (e.g. Andersén, 2010). However, due to the fact that these figures are not statistically significant; these

numbers can only provide a vague indication of the performances of the different clusters, and this requires further investigation.

5. Discussion

The results in relation to other firm classifications

As previously discussed, it is common to divide firms into different groups based on the presence or absence of entrepreneurial behavior; for example, entrepreneurs and managers or entrepreneurs and conservative firms. Actually, the classification developed by Miles and Snow (1978) is to a great extent based on one dimension also. Prospectors are dynamic and proactive risk-takers whereas defenders focus on stability and efficiency. Analyzers are more flexible along the scale between prospectors and defenders. Thus, the Miles and Snow typology has several similarities to the taxonomies or scales used in entrepreneurship research. All models are, of course, simplifications of reality but the classification provided in this study illustrates more dimensions of resource possession and resource utilization than previous studies have described. Table III lists studies that have identified groups of firms that are similar (although not always identical) to those identified in the present study.

Of the clusters presented, it is only the conservatives that are in accordance with the traditional entrepreneurship-conservative scale (which is why this label was chosen for that particular cluster). The conservatives are below-average in product innovation and marketing, and mainly produce simple products; they are not very willing to take risks. Also, the validation of the clusters shows that these firms generally sell their product in the markets that are geographically close. All this is in accordance with established definitions of conservative or non-entrepreneurial firms. Nomads can be regarded as a version of conservative firms in the sense that they mainly possess inferior resources. However, they differ from conservatives by their extremely underdeveloped relational resources. As illustrated in Table III, firms with impoverished resources have been identified in several previous taxonomies and typologies, but have been labeled differently depending on the area of interest in the studies. Several of the other clusters are, however, entrepreneurial regarding some resources but conservative or average regarding others.

Cluster	Equivalent in other classifications
Ikeas	Efficient innovators (Sum *et al.*, 2004), (low-cost) prospectors (Miles and Snow, 1978), cost leadership (Porter, 1980)
Technocrats	Technological firms (Borch *et al.*, 1999), technology leader (Bantel, 1998; Galbraith *et al.*, 2008), (high-tech) prospectors (Miles and Snow, 1978), differentiators (Sum *et al.*, 2004), science-based firms (De Jong and Marsili, 2006), innovators (Miller and Roth, 1994)
Conservatives	Impoverished firms (Borch *et al.*, 1999), defenders (Miles and Snow, 1984), passive entrepreneurs (Avlonitis and Salavou, 2007), technology followers (Galbraith *et al.*, 2008), economic core (Greene and Brown, 1997), care takers (Miller and Roth, 1994)
Marketeers	Ambitious (Greene and Brown, 1997), analyzers (Miles and Snow, 1984), marketeers (Miller and Roth, 1994)
Craftsmen	Resource constrained (Greene and Brown, 1997)
Nomads	

Table III.
Equivalents in other classifications

Ikeas are entrepreneurial in their marketing efforts and are innovative, but they are conservative regarding their investments in physical resources and produce mainly simple products. Thus, they have much in common with prospectors in terms of their abilities in marketing and innovation. On the other hand, they also share some characteristics with defenders due to their concentration on low costs and lack of technological resources. According to several scholars (Karagozoglu and Brown, 1988), to focus on low-cost strategies is a highly non-entrepreneurial strategic posture. Also, Miles and Snow (1978, p. 29) define reactors as "organizations (that) seldom make major adjustments in their technology" and state that they "devote their primary attention to improving the efficiency of their existing operations". This group of firms is similar to the "efficient innovators" identified by Sum *et al.* (2004), i.e. firms that are innovative and compete on low costs, thus adopting a cost leadership approach (Porter, 1980). The combination of low-cost production capabilities and marketing capabilities contradicts the notion put forward by Borch *et al.* (1999) that a cost-leadership strategy is synonymous with a defender strategy. Kald *et al.* (2000) have argued that both prospectors and defenders can adopt differentiation strategies as well as low-cost strategies, and this idea is supported by the identification of the Ikea companies.

The other groups are also proactive in certain respects and reactive regarding their investments and utilization of other resources. Technocrats are highly proactive and risk-taking in their efforts to have top-of-the-line production facilities, but they are weak in their marketing capabilities. Previous taxonomies and typologies have mainly emphasized the up-side of technology-focused firms (e.g. Bantel, 1998; Borch *et al.*, 1999, Galbraith *et al.*, 2008). However, the taxonomy presented in this article has illustrated that technocratic firms often have average low-cost production capabilities – a finding supported by the study conducted by Sum *et al.* (2004). Also, due to their inferior marketing capabilities they can be regarded as highly conservative and non-entrepreneurial in their marketing activities. Thus, as indicated by previous classifications, companies that are highly technology-oriented cannot necessarily be classified as highly entrepreneurial in all dimensions of management.

Marketeers, on the other hand, are extremely active in the product market but are at an average level regarding innovation. Marketeers have several similarities to the ambitious firms in the Kirchhoff (1994) typology, characterized by low levels of innovation and high growth. These firms have high levels of human resources and social resources (Greene and Brown, 1997), and the cluster validation showed that marketeers have the most educated employees and the strongest relations with their suppliers. Thus, the identification of the marketeers provides a strong validation for the study conducted by Greene and Brown (1997).

Craftsmen companies have some similarities to the resource-constrained companies described by Greene and Brown (1997). In contrast to resource-constrained companies, craftsmen have a low level of innovation capabilities. However, they are similar in the sense that they rely on highly educated personnel in order to produce complex products and they do not possess complex technological resources. Craftsmen have few equivalents in other typologies. However, conservatives (as defined in the present study), nomads, and craftsmen can all be defined as conservative or managerial firms depending on the definition chosen.

Implications for RBV

The development of this taxonomy raises several questions regarding the relative value of strategic resources. When analyzing the different groups of companies, it becomes evident that the ability to make the best use of potential strategic resources most likely differs between the strategic groups. Let us assume that a company, by chance, manages to attract an employee with extraordinary skills in product development. The employee is a relative of the owner/manager of the firm, thus having strong social relations and thereby creating an imperfection in the factor market in terms of resource immobility (Peteraf, 1993). A marketeer company could benefit from this resource, by the ability to market the products developed by the new employee. A technocratic company might, on the other hand, be able to utilize the skills of the employee to a greater extent through its technological resources. However, technocrats might have difficulties in fully utilizing the potential of the developed products, in the product market. A nomad company or a craftsman company might have problems in utilizing the resource due to technological limitations. This hypothetical example illustrates how the taxonomy presented in this article can provide a deeper understanding of the complexity of resources, and highlights the importance of resource configurations for developing competitive advantages through strategic resources. To assume that companies, provided that they possess the threshold resources to compete in the product market, have the same ability to make use of strategic resources may be to oversimplify the resource concept. Thus, the notion of resource barriers (Wernerfelt, 1984) or hindrances to imitation (Barney, 1991) becomes more complex, due to differences in resource configurations and thereby the possibility to utilize resources. The consequence of this is that it becomes much more difficult to identify a strategic resource or strategic resources and the distinction between Ricardian rents and Pareto rents becomes more imprecise. Let us go back to a hypothetical example and assume that the only firms that are able to gain a competitive advantage due to the new employee are marketeer companies. Does the strategic resource then consist of the new employee and his capabilities, or is it the bundle of resources (i.e. in terms of the employee capabilities in combination with the existing (non-strategic?) resource configurations) that constitutes the strategic resource bundle? In order to explain this, we might have to develop (or apply) more sophisticated models of resource classifications.

Resource configuration can also have an effect on the possibility of acquiring strategic resources. Capabilities are generally built inside the firm, and different levels of utilization of resources will most likely result in different capabilities on a long-term basis through learning-by-doing processes. It is, for example, possible that marketeers will continue to develop their marketing capabilities and that craftsman companies will develop their non-technological-based ability to manufacture complex products. The results of such path-dependent processes can be unique competences, resulting in competitive advantages. This also applies to resources that can be bought at factor markets. Technocrats are, for example, more active in the market of new technologies, whereas Ikeas are highly innovative in their efforts to scan the factor market for innovations in how to lower their production costs even further. However, the companies with low-tech production facilities, such as conservatives or craftsmen, can also have a higher demand for such resources. The lack of dynamism in the taxonomy presented leads us to the limitations of the study.

Limitations

As with all studies, this study has some limitations that must be taken into consideration. First of all, the taxonomy developed is not very dynamic. The stability of the different clusters has not been analyzed and it is, of course, possible that firms can reconfigure their resource base. Age differences between the clusters could not be identified. Thus, it is unlikely that firms follow some kind of pattern, by wandering from one strategic group to the other, through the life cycle of the company. However, a conservative firm that is acquired by a new entrepreneurial owner/manager will most likely attempt to reconfigure the resource base by, for example, investing in new technological resources. Thus, understanding the stability and dynamics of resource configurations will be an important field of research for future studies.

Although it is common in strategic management research, cluster analysis as a method has been criticized. Ketchen and Shook (1996) have described several weaknesses in earlier cluster analysis contributions. In the present study, several of those weaknesses were taken into consideration – for example, by examining outliers (due to the great impact outliers have when Ward method is used), by validating the clusters (which enables analysis of F-statistics and significance levels), by using several stopping rules, and by adapting the mahlanbolis distance in order to minimize the effects of multicolinearity. That said, cluster analysis is not as rigorous as other statistical methods and there are always elements of subjectivity when conducting this analysis. Thus, other scholars should be aware of the limitations of cluster analysis when referring to this study.

Regarding generalization, there are some other aspects that must also be considered. The sample consisted of Swedish companies and the possibility of generalizing the results to other contexts can be questioned. Much care was taken in identifying resources and capabilities: an extensive literature review, 14 case studies, and consultation with a panel of experts. However, cluster analysis is obviously dependent on the clustering variables and it is impossible to overcome some elements of subjectivity in the selection of variables. Samples consisting of firms that are more homogenous in size could also result in other cluster solutions. However, the identification of groups that differ from the traditional entrepreneurial-conservative division has support in previous studies.

Conclusion

This study has illustrated the usefulness of going beyond the one-dimensional division of entrepreneurial and non-entrepreneurial companies. The specific taxonomy of conservatives, Ikeas, technocrats, craftsmen, marketeers, and nomads provides a contribution to research on taxonomies of manufacturing SMEs. The taxonomy presented here is also a validation of some previously developed typologies and/or taxonomies of firms. The identification of Ikea firms, made possible from the use of production capability variables in terms of complexity and low-cost capabilities, supports the notion that a low-cost capability can be adopted by entrepreneurial firms as well (and not only by defender firms or conservative firms). The study has also illustrated that a technocratic firm can be highly conservative in certain areas. These contributions have been possible by clustering firms on the basis of contemporary research in RBV and can hopefully spur more research based on multidimensional scales.

In addition, the study highlights the importance of resource configurations for the value of strategic resources by demonstrating that different firms have different abilities to make the best use of potential strategic resources. This also indicates that earlier contributions on RBV may have oversimplified the concept of strategic resources.

I do not in any way suggest that the concept of entrepreneurship or entrepreneurial orientation is obsolete. However, the concept could benefit from sometimes being deconstructed: both in terms of the specific constructs that EO is an aggregation of (i.e. risk-taking, innovativeness, and proactiveness) and also regarding different aspects of management. For example, by analyzing differences in entrepreneurial behavior in various areas of management such as marketing management, managerial decisions regarding investments in new technology, managerial attitudes towards relationship marketing, product development etc. Another interesting area of study is to analyze differences in the EO-performance relationship between the clusters. The relationship between EO and performance has been analyzed in several studies. However, the results have been mixed (Andersén, 2010) and whereas some studies have found a positive relationship (Covin *et al.*, 2006, Madsen, 2007), others have failed to do so (Hughes and Morgan, 2007, Slater and Narver, 2000). One explanation might be differences in resource configurations, and it is not unlikely that some of the groups in the taxonomy presented here would benefit more from an EO-oriented strategic posture than others.

References

Andersén, J. (2005), *Strategiska resurser och långvarig lönsamhet: en resursbaserad modell för varaktiga konkurrensfördelar i små tillverkningsföretag*, School of Business, Mälardalen University, Västerås.

Andersén, J. (2007), "A holistic approach to acquisition of strategic resources", *Journal of European Industrial Training*, Vol. 31 No. 8, pp. 660-77.

Andersén, J. (2010), "A critical examination of the EO-performance relationship", *International Journal of Entrepreneurial Behaviour and Research*, Vol. 16 No. 4, pp. 309-28.

Ansoff, H.I. (1965), *Corporate Strategy: An Analytic Approach to Business Policy for Growth and Expansion*, McGraw-Hill, New York, NY.

Aragon-Sanchez, A. and Sánchez-Marín, G. (2005), "Strategic orientation, management characteristics, and performance: a study of Spanish SMEs", *Journal of Small Business Management*, Vol. 43 No. 3, pp. 287-309.

Avlonitis, G.J. and Salavou, H.E. (2007), "Entrepreneurial orientation of SMEs, product innovativeness, and performance", *Journal of Business Research*, Vol. 60 No. 5, pp. 566-75.

Bantel, K.A. (1998), "Technology-based, adolescent firm configurations: strategy identification, context, and performance", *Journal of Business Venturing*, Vol. 13 No. 3, pp. 205-30.

Barney, J.B. (1986), "Strategic factor markets: expectations, luck, and business strategy", *Management Science*, Vol. 32 No. 10, pp. 1231-41.

Barney, J.B. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-120.

Barney, J.B. and Hesterly, W.S. (2008), *Strategic Management and Competitive Advantage: Concepts and Cases*, Pearson/Prentice Hall, Upper Saddle River, NJ.

Beaver, G. (2003), "Small firms: owners and entrepreneurs", *Strategic Change*, Vol. 12 No. 4, pp. 177-83.

Black, J.A. and Boal, K.B. (1994), "Strategic resources: traits, configurations and paths to sustainable competitive advantage", *Strategic Management Journal*, Vol. 15, Summer, pp. 131-48.

Borch, O.J., Huse, M. and Senneseth, K. (1999), "Resource configuration, competitive strategies, and corporate entrepreneurship: an empirical examination of small firms", *Entrepreneurship Theory and Practice*, Vol. 24 No. 1, pp. 49-70.

Citrin, A.V., Lee, R.P. and McCullough, J. (2007), "Information use and new product outcomes: the contingent role of strategy type", *Journal of Product Innovation Management*, Vol. 24 No. 3, pp. 259-73.

Coviello, N.E., Brodie, R.J. and Munro, H.J. (2000), "An investigation of marketing practice by firm size", *Journal of Business Venturing*, Vol. 15 Nos 5-6, pp. 523-45.

Covin, J.G. and Slevin, D.P. (1989), "Strategic management of small firms in hostile and benign environments", *Strategic Management Journal*, Vol. 10 No. 1, pp. 75-87.

Covin, J.G., Green, K.M. and Slevin, D.P. (2006), "Strategic process effects on the entrepreneurial orientation-sales growth rate relationship", *Entrepreneurship Theory and Practice*, Vol. 30 No. 1, p. 57.

De Jong, J.P.J. and Marsili, O. (2006), "The fruit flies of innovations: a taxonomy of innovative small firms", *Research Policy*, Vol. 35 No. 2, pp. 213-29.

Dess, G.G. and Davis, P.S. (1984), "Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance", *Academy of Management Journal*, Vol. 27 No. 3, pp. 467-88.

Dillon, W.R., Mulani, N. and Frederick, D.G. (1989), "On the use of component scores in the presence of group structure", *The Journal of Consumer Research*, Vol. 16 No. 1, pp. 106-12.

Donaldson, L. (2005), "Vita Contemplativa: following the scientific method: how I became a committed functionalist and positivist", *Organization Studies*, Vol. 26 No. 7, pp. 1071-88.

Frohlich, M.T. and Dixon, J.R. (2001), "A taxonomy of manufacturing strategies revisited", *Journal of Operations Management*, Vol. 19 No. 5, pp. 541-58.

Galbraith, C.S., Rodriguez, C.L. and DeNoble, A.F. (2008), "SME competitive strategy and location behavior: an exploratory study of high-technology manufacturing", *Journal of Small Business Management*, Vol. 46 No. 2, pp. 183-202.

Galbreath, J. and Galvin, P. (2008), "Firm factors, industry structure and performance variation: new empirical evidence to a classic debate", *Journal of Business Research*, Vol. 61 No. 2, pp. 109-17.

Ghosh, B.C., Liang, T.W., Meng, T.T. and Chan, B. (2001), "The key success factors, distinctive capabilities, and strategic thrusts of top SMEs in Singapore", *Journal of Business Research*, Vol. 51 No. 3, pp. 209-21.

Gibb, A. and Li, J. (2003), "Organizing for enterprise in China: what can we learn from the Chinese micro, small, and medium enterprise development experience", *Futures*, Vol. 35 No. 4, pp. 403-21.

Grant, R.M. (1991), "The resource-based theory of competitive advantage: implications for strategy formulation", *California Management Review*, Vol. 33 No. 3, pp. 114-35.

Greene, P.G. and Brown, T.E. (1997), "Resource needs and the dynamic capitalism typology", *Journal of Business Venturing*, Vol. 12 No. 3, pp. 161-73.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2006), *Multivariate Data Analysis*, Prentice Hall, Upper Saddle River, NJ.

Hambrick, D.C. (2003), "On the staying power of defenders, analyzers, and prospectors", *The Academy of Management Executive*, Vol. 17 No. 4, pp. 115-8.

Hitt, M.A., Dacin, M.T., Levitas, E., Arregle, J.L. and Borza, A. (2000), "Partner selection in emerging and developed market contexts: resource-based and organizational learning perspectives", *Academy of Management Journal*, Vol. 43 No. 3, pp. 449-67.

Hughes, M. and Morgan, R.E. (2007), "Deconstructing the relationship between entrepreneurial orientation and business performance at the embryonic stage of firm growth", *Industrial Marketing Management*, Vol. 36 No. 5, pp. 651-61.

Kabanoff, B. and Brown, S. (2008), "Knowledge structures of prospectors, analyzers, and defenders: content, structure, stability, and performance", *Strategic Management Journal*, Vol. 29 No. 2, pp. 149-71.

Kald, M., Nilsson, F. and Rapp, B. (2000), "On strategy and management control: the importance of classifying the strategy of the business", *British Journal of Management*, Vol. 11 No. 3, pp. 197-212.

Karagozoglu, N. and Brown, W.B. (1988), "Adaptive responses by conservative and entrepreneurial firms", *Journal of Product Innovation Management*, Vol. 5 No. 4, pp. 269-81.

Kathuria, R. (2000), "Competitive priorities and managerial performance: a taxonomy of small manufacturers", *Journal of Operations Management*, Vol. 18 No. 6, pp. 627-41.

Keh, H.T., Nguyen, T.T.M. and Ng, H.P. (2007), "The effects of entrepreneurial orientation and marketing information on the performance of SMEs", *Journal of Business Venturing*, Vol. 22 No. 4, pp. 592-611.

Kellermanns, F.W. and Eddleston, K.A. (2006), "Corporate entrepreneurship in family firms: a family perspective", *Entrepreneurship Theory and Practice*, Vol. 30 No. 6, p. 809.

Ketchen, D.J. Jr and Shook, C.L. (1996), "The application of cluster analysis in strategic management research: an analysis and critique", *Strategic Management Journal*, Vol. 17 No. 6, pp. 441-58.

Kirchhoff, B.A. (1994), *Entrepreneurship and Dynamic Capitalism: The Economics of Business Firm Formation and Growth*, Praeger, Westport, CT.

Knight, R.M. (1989), "Technological innovation in Canada: a comparison of independent entrepreneurs and corporate innovators", *Journal of Business Venturing*, Vol. 4 No. 4, pp. 281-8.

Leitner, K.H. and Güldenberg, S. (2010), "Generic strategies and firm performance in SMEs: a longitudinal study of Austrian SMEs", *Small Business Economics*, Vol. 35 No. 2, pp. 169-89.

Lumpkin, G.T. and Dess, G.G. (1996), "Clarifying the entrepreneurial orientation construct and linking it to performance", *Academy of Management Review*, Vol. 21 No. 1, pp. 135-72.

McCann, J.E. III, Leon-Guerrero, A.Y. and Haley, J.D.J. (2001), "Strategic goals and practices of innovative family businesses", *Journal of Small Business Management*, Vol. 39 No. 1, pp. 50-9.

McMahon, R.G.P. (2001), "Deriving an empirical development taxonomy for manufacturing SMEs using data from Australia's business longitudinal survey", *Small Business Economics*, Vol. 17 No. 3, pp. 197-212.

Madsen, E.L. (2007), "The significance of sustained entrepreneurial orientation on performance of firms – a longitudinal analysis", *Entrepreneurship and Regional Development*, Vol. 19 No. 2, pp. 185-204.

March, J.G. (1991), "Exploration and exploitation in organizational learning", *Organization Science*, Vol. 2 No. 1, pp. 71-87.

Mehra, A. (1996), "Resource and market based determinants of performance in the US banking industry", *Strategic Management Journal*, Vol. 17 No. 4, pp. 307-22.

Miles, R.E. and Snow, C.C. (1978), *Organizational Strategy, Structure, and Process*, McGraw-Hill, New York, NY.

Miller, D. (1996), "Configurations revisited", *Strategic Management Journal*, Vol. 17 No. 7, pp. 505-12.

Miller, D. and Friesen, P.H. (1982), "Innovation in conservative and entrepreneurial firms: two models of strategic momentum", *Strategic Management Journal*, Vol. 3 No. 1, pp. 1-25.

Miller, D. and Friesen, P.H. (1986), "Porter's (1980) generic strategies and performance: an empirical examination with American data: part I: testing Porter", *Organization Studies*, Vol. 7 No. 1, pp. 37-55.

Miller, D. and Shamsie, J. (1996), "The resource-based view of the firm in two environments: the Hollywood film studios from 1936 to 1965", *Academy of Management Journal*, Vol. 39 No. 3, pp. 519-43.

Miller, J.G. and Roth, A.V. (1994), "A taxonomy of manufacturing strategies", *Management Science*, Vol. 40 No. 3, pp. 285-304.

Murphy, J.W., Gregory, B. and Hill, R.C. (1996), "Measuring performance in entrepreneurship research", *Journal of Business Research*, Vol. 36 No. 1, pp. 15-23.

Newbert, S.L. (2007), "Empirical research on the resource-based view of the firm: an assessment and suggestions for future research", *Strategic Management Journal*, Vol. 28 No. 2, pp. 121-46.

Pavitt, K. (1984), "Sectoral patterns of technical change: towards a taxonomy and a theory", *Research Policy*, Vol. 13 No. 6, pp. 343-73.

Payne, A. and Frow, P. (2005), "A strategic framework for customer relationship management", *Journal of Marketing*, Vol. 69 No. 4, pp. 167-76.

Penrose, E.T. (1959), *The Theory of the Growth of the Firm*, Blackwell, Oxford.

Peteraf, M.A. (1993), "The cornerstones of competitive advantage: a resource-based view", *Strategic Management Journal*, Vol. 14 No. 3, pp. 179-91.

Porter, M.E. (1980), *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, Free Press, New York, NY.

Porter, M.E. (2008), *On Competition*, Harvard Business School, Boston, MA.

Punj, G. and Stewart, D.W. (1983), "Cluster analysis in marketing research: review and suggestions for application", *Journal of Marketing Research*, Vol. 20 No. 2, pp. 134-48.

Rangone, A. (1999), "A resource-based approach to strategy analysis in small-medium sized enterprises", *Small Business Economics*, Vol. 12 No. 3, pp. 233-48.

Ray, G., Barney, J.B. and Muhanna, W.A. (2004), "Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view", *Strategic Management Journal*, Vol. 25 No. 1, pp. 23-37.

Roberts, P.W. and Dowling, G.R. (2002), "Corporate reputation and sustained superior financial performance", *Strategic Management Journal*, Vol. 23 No. 12, pp. 1077-93.

Rouse, M.J. and Daellenbach, U.S. (1999), "Rethinking research methods for the resource-based perspective: isolating sources of sustainable competitive advantage", *Strategic Management Journal*, Vol. 20 No. 5, pp. 487-94.

Rumelt, R.P. (1984), "Towards a strategic theory of the firm", in Lamb, R.B. (Ed.), *Competitive Strategic Management*, Prentice Hall, Englewood Cliffs, NJ, pp. 556-70.

Sanchez, R. and Heene, A. (1997), "Reinventing strategic management: new theory and practice for competence-based competition", *European Management Journal*, Vol. 15 No. 3, pp. 303-17.

Slater, S.F. and Narver, J.C. (2000), "The positive effect of a market orientation on business profitability: a balanced replication", *Journal of Business Research*, Vol. 48 No. 1, pp. 69-73.

Smith, K.A., Vasudevan, S.P. and Tanniru, M.R. (1996), "Organizational learning and resource-based theory: an integrative model", *Journal of Organizational Change Management*, Vol. 9 No. 6, pp. 41-53.

Song, M., Droge, C., Hanvanich, S. and Calantone, R. (2005), "Marketing and technology resource complementarity: an analysis of their interaction effect in two environmental contexts", *Strategic Management Journal*, Vol. 26 No. 3, pp. 259-76.

Sum, C.C., Kow, L.S. and Chen, C.S. (2004), "A taxonomy of operations strategies of high performing small and medium enterprises in Singapore", *International Journal of Operations and Production Management*, Vol. 24 No. 3, pp. 321-45.

Tether, B.S. and Storey, D.J. (1998), "Smaller firms and Europe's high technology sectors: a framework for analysis and some statistical evidence", *Research Policy*, Vol. 26 No. 9, pp. 947-71.

Verhoef, P.C. (2003), "Understanding the effect of customer relationship management efforts on customer retention and customer share development", *Journal of Marketing*, Vol. 67 No. 4, pp. 30-45.

Vicente-Lorente, J.D. (2001), "Specificity and opacity as resource-based determinants of capital structure: evidence for Spanish manufacturing firms", *Strategic Management Journal*, Vol. 22 No. 2, pp. 157-77.

Wagner, E.R. and Hansen, E.N. (2005), "Innovation in large versus small companies: insights from the US wood products industry", *Management Decision*, Vol. 43 No. 6, pp. 837-50.

Walter, A., Auer, M. and Ritter, T. (2006), "The impact of network capabilities and entrepreneurial orientation on university spin-off performance", *Journal of Business Venturing*, Vol. 21 No. 4, pp. 541-67.

Wernerfelt, B. (1984), "A resource-based view of the firm", *Strategic Management Journal*, Vol. 5 No. 2, pp. 171-80.

Westhead, P. and Howorth, C. (2007), "'Types' of private family firms: an exploratory conceptual and empirical analysis", *Entrepreneurship and Regional Development*, Vol. 19 No. 5, pp. 405-31.

Wiklund, J. and Shepherd, D. (2003), "Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses", *Strategic Management Journal*, Vol. 24 No. 13, pp. 1307-14.

Wilkinson, L., Engelman, L., Corter, J. and Coward, M. (2007), "Cluster analysis", in SYSTAT (Ed.), *Statistics I II III IV*, SYSTAT Software, San Jose, CA, pp. 65-124.

Yusuf, A. (2002), "Environmental uncertainty, the entrepreneurial orientation of business ventures and performance", *International Journal of Commerce and Management*, Vol. 12 Nos 3/4, pp. 83-103.

Zahra, S.A. and George, G. (1999), "Manufacturing strategy and new venture performance: a comparison of independent and corporate ventures in the biotechnology industry", *Journal of High Technology Management Research*, Vol. 10 No. 2, pp. 313-45.

Appendix

Table AI.
Proportion of companies of each cluster in different industries

	Ikeas (%)	Tech. (%)	Cons. (%)	Mark. (%)	Craft. (%)	Nomad (%)	Total (%)
Metal	42	40	40	22	62	25	39
Machinery	5	8	8	19	7	8	10
Tools	5	8	5	14	7	8	8
Printing	0	4	15	6	7	0	6
Wood	11	6	3	6	3	0	5
Electronics	5	4	8	3	0	8	4
Plastic	5	4	5	0	0	0	3
Cutlery	5	2	5	3	0	0	3
Textiles	0	2	3	3	0	8	2
Furniture	5	2	0	0	3	8	2
Building	0	2	3	0	3	0	2
Other	16	18	8	25	7	33	16

Table AII.
Average return on assets

Group	ROA (%)
IKEAs	5.99
Technocrats	6.39
Conservatives	4.32
Marketeers	3.47
Craftsmen	4.64
Nomads	−0.45

About the author
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