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Exploring the diversity of SMEs: a taxonomic approach in a French Region.

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Diversity of SMEs: a taxonomic approach in a French Region

ABSTRACT

This paper examines a large database of small to medium sized enterprises (SMEs) in the Rhône-Alpes region around Lyon and Grenoble in south eastern France in order to develop taxonomy of these firms. Motivating this study is the enormous diversity found across SMEs, which makes it difficult to create reliable definitions for them. This is a problem for small business research because inadequate classification and definition makes measurement and comparison of data problematic. In keeping with taxonomic studies factor and cluster analysis were employed to generate the taxonomy. The purpose of the study is to generate a number of SME archetypes so as to offer researchers and policy makers a more reliable system of classification of SMEs.

Keywords: SMEs, taxonomy, French database

INTRODUCTION

The importance of small to medium enterprises (SMEs) in national economies is widely recognised. These companies represent the overwhelming majority of all businesses in most countries and play a key role in job creation and economic growth (Ayyagari, Beck, & Demirgüç-Kunt, 2003; OECD, 2010b). In this paper we define SMEs using the European Commission definition which identifies them as autonomous firms with less than 250 employees, annual turnover of below €50 million and assets of less than €43 million (OECD, 2004). Using this definition SMEs account for 99% of all enterprises in OECD countries, about 97% of all enterprises in APEC countries and 99.8% of the non-financial sector EU-27 in 2015 (European Commission, 2015). SMEs are also major contributors to employment and employment growth, which has made the SME sector an interest for governments since the publication of the Birch (1979). Throughout the world governments have created services and organizations specifically responsible for developing policies and programs to support SMEs (Birch, 1987). Yet despite the importance of SMEs relatively little attention has been given to them in the mainstream management literature in comparison to large companies.

Academic research into SMEs emerged in the 1970s in conjunction with growing interest by governments into the potential value of such firms to economic and employment growth. This led to the development of specialist academic journals in the small business and entrepreneurship field, along with academic and industry associations, dedicated research centres and government agencies (Blackburn & Schaper, 2016; Katz, 2008; Tan, Fischer, Mitchell, & Phan, 2009). Researchers have attempted to enhance the understanding of SMEs, particularly their characteristics and the dynamics of their development (D'Amboise & Muldowney, 1988; Gibb & Scott, 1985; Julien, 1990; Robinson & Pearce, 1984; Storey, 1982, 1994).

Over recent decades, the study of SMEs has progressively merged with the field of entrepreneurship (Volery & Mazzarol, 2015). Nevertheless, SME research remains an important and specific field that is both rich and heterogeneous. While entrepreneurship focuses on the attributes and behaviours of individuals creating and developing businesses, small businesses research is more

concerned with the characteristics and behaviour of the firms and how they are managed (Breen, 2004). Entrepreneurship research has increasingly focused on high-growth often high-tech start-ups and young firms referred to as "Gazelles", "Born Globals" or "Unicorns". Such firms are exciting and if successful can generate significant economic and employment growth. However, they are also quite atypical of the vast majority of SMEs. High growth firms typically represent around 3% to 6% of employment and 8% to 12% of turnover generated by SMEs in different countries. Further, the younger smaller "Gazelles" account for less than 1% to 2% of all companies (OECD, 2010a). These firms are highly innovative and entrepreneurial, but also highly risky and prone to failure (Acs, Åstebro, Audretsch, & Robinson, 2016; Davila, Foster, He, & Shimizu, 2014).

Establishing effective and sustainable government policy to support these companies is thus problematic because of the uncertainty surrounding their development (Shane, 2009). Nevertheless, the allure of high growth entrepreneurial firms and their ability to generate good returns to investors plus jobs and economic growth for governments continues to focus attention on this minority of unpredictable outliers while the majority of ordinary SMEs are largely ignored and dismissed as "Muppets" (Nightingale & Coad, 2013). Yet if our aim is to understand the behaviour of businesses and those who manage them, it makes no sense to ignore or dismiss 98% to 99% of all firms and concentrate only on the atypical outliers. However, without proper definition or classification, such research cannot be effectively conducted.

The aim of this paper is to develop taxonomy for SMEs so as to better define and classify them. This is undertaken using a database collected in the Rhône-Alpes region of France. It aims to explore the undeniable heterogeneity of SMEs in order to identify any distinct SME archetypes. In this study we explore the following two research questions:

1. What are the main criteria for discriminating SMEs in taxonomy?
2. What are the categories, or archetypes that constitute this taxonomy?

DEFINITIONS AND CLASSIFICATIONS: DIFFICULT OPERATIONS

Numerous definitions of SME or small business can be found across different countries and even within the same country. Most use employment and/or annual turnover as the primary measurement variables. There is no universally recognised definition of "SME" or small business, and due to the diversity of these firms a single definition is unlikely to be satisfactory. This has implications for research and policy development. Despite decades of research into SMEs the field remains open to criticism for its lack of strong conceptual and theoretical foundations and reliable measurement (Tan *et al.*, 2009; Nightingale & Coad, 2013). The paucity of reliable definition and classification within the SME sector is a fundamental problem. This lack of clear definition or universally accepted classification of SMEs generates ambiguities for researchers and policy makers. Researchers studying SMEs without precise definitions are at risk of producing findings that cannot be considered reliable

when applied to other SMEs. An example being a study into the United States steel industry highlighted by (Headd & Saade, 2008) where paucity of definition skewed the findings:

“In a study of the steel industry as a microcosm of the U.S. economy, Acs (1984) recognised that mini-mills were not large mills on a small scale, but unique entities with distinct characteristics and production processes. Not unexpectedly, there are even different types of mini-mills. Grouping businesses together without accounting for their inherent characteristics can yield results that are not applicable to other groups of businesses or businesses as a whole, hampering the ability to make meaningful inferences.” (Headd and Saade (2008), p. 2)

Such an example illustrates the importance of having good definition and classification. Without this government policies developed to support SMEs may only be applicable to some of them and have little or no benefit to others.

Typologies and taxonomies, different classification schemes

Historically scientists have made use of classification systems to fully understand the differences between different plants and animals, or different minerals and other elements (McKelvey, 1978). For example, if biologists want to study frogs, they will need to develop a robust system of definition and classification of these animals, to be able to differentiate them from snakes or salamanders and to list the different types of frogs that exist: there are about 4,800 known species of frogs, which all share common characteristics that define them as frogs, but with many distinctive differences that make each of them unique. It would be unscientific to conduct research on frogs without first exploring these fundamental questions of definition and classification.

The terms "typology" and "taxonomy" are sometimes used interchangeably, but they refer to quite different things (Carper & Snizek, 1980; McKelvey, 1975; Rich, 1992). Following the recommendations of McKelvey (1982), we reserve the term "typology" to a deductive approach, offering a classification according to criteria coming from a theory, and the term "taxonomy" to an inductive approach, based on an empirical observation, seeking to discriminate groups sharing certain characteristics.

A large number of typologies (and to a lesser extent, of taxonomies) have been developed over the years in the field of small business. However, most of them tend to focus on specific areas of SME behaviour, or on the characteristics of their owners-managers (Carland, Hoy, Boulton, & Carland, 1984; Dunkelberg & Cooper, 1982; Filley & Aldag, 1978; Gartner, 1989; Huppert, 1981; Julien, 1990; Liles, 1974; Marchesnay, 1988; Miller & Friesen, 1982; Preston, 1977; Rizzoni, 1991; Stanworth & Curran, 1976; Thompson, 1999). As a result, there are now a range of specific types of business definitions such as "Gazelles" (firms aged less than 5 years, with an average annual growth exceeding 20% over three years), "Unicorns" (less than 10 years old, valued at over one billion

dollars) or "Born Global" (that have generated most of their sales from overseas markets within the first two years of existence), that have now become specific research sub-domains.

A range of criteria are used to define and measure the behaviour and performance of such firms. These include the level of R&D expenditure (high technology businesses); the age of the business (start-ups); the governance or property type (family businesses); the location (home business), or the purpose for which they were created (social enterprises). However, even in these particular groups there is often a lack of adequate definition enabling a sound understanding of the research context. Yet this lack of definition and classification is even more pronounced when it comes to non-specified or "ordinary" SMEs.

FROM MAPS AND TYPOLOGIES TO CONTINUUMS

The development of taxonomy has been an essential building block within science since the times of Ancient Greece, from where the origins of the terms "*taxis*" (arrangement) and "*nomia*" (method) are derived. Science owes much to the work of botanist Carl Linnaeus (1707-1778) in developing the foundations of modern taxonomic classification systems (Wolfshohl, 1991). The importance of taxonomy in science cannot be overstated. They provide a foundation of parsimonious classification and definition that reveal the underlying structures and behaviours within an otherwise complex system, making them valuable to discussion, research and pedagogy (Miller & Roth, 1994). The extant academic literature suggests that numerous classification systems have been proposed for SMEs since at least the 1980s. For example, D'Amboise and Muldowney (1988) proposed a classification system based on five criteria: the context of its activity, its organization, its management team characteristics, its success or failure, and the age of the company.

A more general approach has been proposed by Julien (1990) who identified four criteria based on the characteristics of the SME: its governance, strategy, maturity and industry sector. An innovation taxonomy proposed by Rizzoni (1991) identified six distinct types classified according to eight dimensions. However, unlike the works of Pavitt (1984; 1990) or Gartner, Mitchell, and Vesper (1989), these classification systems were not developed empirically and are more typology than taxonomy. Table 1 provides a list of further works building different typologies, based on the strategy, growth, market concentration of industry and innovation. Noting these concerns Tan et al. (2009) proposed a classification of new ventures that maps the business on two dimensions with key questions of: i) "is it a business?" (B); and ii) "can you keep it?" (K). A typical start-up would have B and K high scores, while a research project would have lower scores. As an analytical tool for venture creation, it may prove useful, but less so for general SMEs.

Insert Table 1 about here

The complexity of these classifications has led some to adopt a continuum approach using multiple criteria. For example, Julien (1990) proposed such a system, even though he cautioned that it

was simplistic because these continuums are not always linear, and there are thresholds and sectoral differences within them (see Figure 1). Torres, proposed a dichotomy based on the “SME” and the “anti-SME” (Torrès & Julien, 2005), the anti-SME resulting from a "denaturing" process, when the SME loses its specificities.

Insert Figure 1 about here

Taxonomies: beyond theory based classifications

Doty and Glick (1994) suggest that typologies are often used in management science due to their ability to provide analytical frameworks to better understand complex organizational forms and behaviours. However, they note that many typologies are too simplistic. They also discuss the difference between the classification systems, typologies and taxonomies. Taxonomies are described as classification into mutually exclusive and exhaustive groups, defined by explicit decision rules, where typology refers to categories derived from a conceptual approach that:

“...identify multiple ideal types, each of which represents a unique combination of the organisational attributes that are believed to determine the relevant outcome(s).”
(Doty and Glick (1994), p. 232)

According to this approach the more accurate classification systems are taxonomies, derived from empirical observations of the phenomena studied. However, they are also more complex than the typologies, and their development takes more time. This approach is not without difficulties (Sanchez, 1993). For example, Hambrick (1984) suggests that:

"...choosing variables to classify, framing the domain of the taxonomy, developing longitudinal taxonomies, manipulating variables, and incorporating organizational performance into strategic taxonomies." (p. 27)

A review of the literature identified several taxonomies relevant for studying SMEs (Birley & Westhead, 1994; Carper & Snizek, 1980; Dunkelberg & Cooper, 1982; Hambrick, 1984; McKelvey, 1975, 1978; Miller & Friesen, 1977, 1978; Pinder & Moore, 1980; Rich, 1992; Sanchez, 1993). One of the best know is that of Pavitt (1984) on innovation in British companies. This study is based on a longitudinal database of about 2,000 innovations commercialised between 1945 and 1979. Although the focus was on innovation and marketing in the United Kingdom, the sample size and its longitudinal nature provided a solid foundation upon which to build the taxonomy. The study was later updated with additional data (Pavitt, Robson, & Townsend, 1989). Archibugi (2001) suggested that the approach taken by Pavitt was rigorous and has inspired a lot of research as well as political decisions. It also helped to question the more popular approaches classifying firms and industries based on their level of R&D intensity.

Another taxonomy is that proposed by Gartner et al. (1989) for the classification of start-up businesses. This taxonomy was developed from a survey of 106 executives in Canada and the United

States having recently created a start-up. They identified eight specific types of new businesses, described by four main dimensions: Individual, Organization, Environment and Process. This results into "a location-based framework" with 8 archetypes coming from the observation of the reality. As Gartner *et al.* (1989) explain:

... "Research that compares the "average" entrepreneur or new venture to the "average" non-entrepreneur or established business usually overlooks the diversity that exists within the entrepreneurial phenomenon itself. That is, a wide range of entrepreneurs, new business ventures (NBVs), start-up processes, and new business environments exist (Gartner, 1985). No "average" or "typical" entrepreneur can represent all entrepreneurs. No "average" or "typical" NBV can represent all NBVs." (p. 170)

They also note that:

"...this perspective on the diversity of NBVs is similar to the population ecology approach, which indicates that the study of new organizations is essentially the study of variation (Aldrich, 1979; Hannan & Freeman, 1977; McKelvey, 1982)."

RESEARCH DESIGN

The dimensions of our taxonomy were identified from a systematic review of the literature in relation to the definition of SMEs as reported in major academic journals between 2008 and 2011. This systematic exploration followed the three-step methodology originally developed by Webster and Watson (2002). All dimensions are empirically observable and measurable and have been grouped into seven categories: size, management characteristics, organisational configuration, governance, strategy, market, and growth factors. In addition, each of the dimensions may be represented using a continuum or a multipoint scale.

For this project, a list of descriptors was developed for use in the database of SMEs located in the Rhône-Alpes region and also a series of questions for the small firms about each of the dimensions. Taking into account the recommendation made by Hambrick (1984), we added additional descriptors for a better identification of the context of the small firm (such as growth and turbulence of the market, key factors of success, or difficulties to anticipate changes or competition dynamics).

The database

Building a robust and useful taxonomy requires access to a sufficiently large database of SMEs with sufficient data to reflect their diversity. This project was able to benefit from such a database, built as part of a partnership between the faculty of the University of Lyon (Coactis research group) and the Rhône-Alpes region in the south eastern part of France.

Beyond the database, the research team developed a diagnostic and assessment tool to help SMEs supported by the Rhône-Alpes region. The system allows questions to the SME owner-

managers (for about 1 and a half hours), and collection of primary data in ten key areas: strategy, marketing / sales, production, human resources, finance, innovation, internationalization, systems information, organization, environment / sustainable development and management team. The tool is integrated in the SME support processes of the Rhône-Alpes region so that the database is incremented daily.

For this particular study we extracted data collected over the year 2013 from about 594 SMEs. This choice was made because of the availability of complementary secondary data from a financial database accurate for 2013. The sample comprised 70.2% of manufacturing SMEs (manufacturing or mainly manufacturing). The sizes of these SMEs are very heterogeneous, with an average turnover in 2013 of 4,158 k€ (standard deviation 8547 k €) for an average size of equal to 24.86 employees (standard deviation 34.53).

Methodology

The methodology followed a two-step approach to build the SMEs profiles: (1) factor analysis and (2) classification analysis (or cluster analysis). Given the number of variables included in the analysis and the also number of correlated variables, it was necessary to first reduce the available information by conducting a multiple correspondence analysis (MCA). This allowed the most correlated variables to be grouped within the same factors, as multicollinearity is a potential risk (Hambrick (1984). In particular the risk that a single construct relying on these variables might be counted multiple times. To avoid this risk the factors identified by the MCA as linear combinations of correlated variables were incorporated into the second stage of treatment, the cluster analysis.

For this second step, the size of the database required a mixed classification analysis (hybrid clustering, (Wong, 1982)). This method starts the analysis with a classification by *moving averages*, as it is well suited to the partitioning of large databases, to reduce the information to be processed and before conducting the hierarchical cluster analysis (HCA). The HCA is recognised as the most efficient analysis, but not adapted to large data set (de Jong & Marsili, 2006). This approach enabled the reduction in total information and the creation of an initial "extended" partition of the sample. This preceded the HCA on the centres of the classes generated by the moving averages. The resulting dendrogram is presented in Figure 2 with different classification possibilities. The analysis used a classification into seven classes as summarised in Table 2.

Insert Table 2 about here

RESULTS

The analysis found that SMEs belonging to the same group exhibited similar profiles as predicted via the variables included in the questionnaire. In addition a selection of one typical firm inside each group was used as an illustration, or archetype, typically one of the SMEs that closely represented the

group's centre. Table 3 shows the main characteristics of the SME classes while Table 4 outlines the details of the seven classes of SME.

Insert Table 3 about here

As outlined in Table 4 a total of 7 classes of SME were identified from the analysis. These classes were labelled: i) Reactive SMEs; ii) Operationally Focused SMEs; iii) Ad Hoc SMEs; iii) Established SMEs; iv) Entrepreneurial SMEs; v) Anti-SMEs; and vi) Participative SMEs. The specific characteristics of each class are discussed below.

Insert Table 4 about here

Reactive SMEs

Reactive SMEs were firms that displayed relatively little innovation, export orientation or long-term strategic vision. They produced in response to customer demand more often than the average (50% against 30% in the total sample). Their strategic outlook was therefore short-term. They also tried to maintain a competitive position based on lower pricing and reliability (especially in delays), which were common aspects of their customers' expectations (one *Reactive SME* out of two). Such firms felt that they do not possess any particular competitive advantage (23.5% of *Reactive SMEs* against only 7.5% of SMEs in the total sample), and did not try to innovate or internationalize. Almost all these SMEs had not produced any new product or process innovations over the previous three years and about 60% of them did not export, with the remaining 40% exporting very little. A case example is the firm MECAPREC¹ as an archetype for this group of *Reactive SMEs*. This small firm of about thirty employees sells several products into the precision engineering industry. The firm focuses on product customization. Each product is designed for a particular customer in a "make-to-order" mode. MECAPREC carefully monitors the performance of its production system, especially in terms of times and delays, including the procurement cycle, manufacturing cycle, availability of machines and products change. This firm makes 100% of its annual turnover in France and doesn't plan to expand internationally. Finally, it has launched no innovative new products or processes over the past three years.

Operationally Focused SMEs

The second class of SMEs were labelled *Operationally Focused SMEs*. These firms were generally much larger (about 21% of between €5 million and €10 million in 2012), and older (one third above 25 years) than the average. Their management teams were mostly male and specialize in production, HR and/or quality issues. The proportion of workers in their staff was rather high (e.g. in half the cases, workers account for over 60% of employees). *Operationally Focused SMEs* were not very

¹ For confidentiality reasons the names have been changed in the descriptions of archetypes.

dynamic in terms of strategy (few recent strategic moves recorded, their industry tends to decline), nor very innovative. They were also less focused on offering innovations to their customers. In contrast, they concentrated on issues such as time, delivery reliability, quality and the price of products. *Business-Driven SMEs* are more likely to be sub-contractors for big firm customers (30% against 21% in the total sample), and their information systems and IT tools were well-developed. They were dependent on their customers (25% against 12% in the total sample). For example, sales generated by their three largest customers exceeded 35% for almost a third of such firms compared to 15% in the total sample. They also perceived this as an issue as many were operating in declining industries and felt more often than average that business perspectives were unfavourable.

A case example of an *Operationally Focused SME* is the firm ASSEMBLAUTO. Although small (8 employees and € 600,000 in revenue in 2012), this SME exhibits most of the specific characteristics for this profile. Its industry sector is part of the automotive industry more precisely the vehicle assembly sector. The variety and level of product customization is very low. This small firm is a subcontractor for big customers and its production is carried out in specialised workshops. ASSEMBLAUTO's owner-manager notes that the degree of dependence vis-à-vis customers is very important. Its main customer comprises 95% of its turnover, and the three major customers represent 100% of its sales. The situation of the company appears rather difficult. Although its owner-manager rates the business outlook as favourable, the market is currently declining and faces low strategic, innovative and commercial moves, which do not suggest a very favourable future.

Ad Hoc SMEs

Ad Hoc SMEs are the smallest and least structured firms in the sample. The majority (70%) made less than €1 million in turnover in 2012, and 64% had no management team, while 75% had no formal description for any of their jobs. *Ad Hoc SMEs* were also the least equipped with computers: they did not rely on their information system to improve the performance or efficiency of their business. These SMEs generally favoured informality for the strategic management process, and had no formalised approach for the development of their competences. *Ad Hoc SMEs* were also not internationalised. This lack of structure can be explained by their youth: 40% of *Ad Hoc SMEs* were less than 8 years old (against 29% in the total sample). One out of two did not sell to large companies and they were more likely to sell customised products or services to individual clients. Most of them based their development on better quality/price than their competitors (for 24% against 10% in the total sample), and it was difficult for them to innovate as they perceived many obstacles to innovation. The firm ENERSOL is an example of this type of SME. It operates in the solar power industry. The firm was established in 2008 and had four employees in 2013 with a turnover of €332,000 in 2012. This SME is not formalised in its strategy, has only basic computer equipment and its sales force was not considered as efficient by its owner-manager. However, it provides solutions that meet specific customer needs, and puts emphasis on the quality of products and services as well as on customers'

satisfaction. As a result the firm has grown thanks to opportunities, seizing them as they arise without any formal planning.

Established SMEs

Established SMEs were the most widespread type in the sample (22%). They mainly operated in the manufacturing sector (61% of cases), were medium-sized firms (making between €1 million and €5 million turnover), and yet were among the older SMEs (31% were over 25 years old against 23% in the total sample). They were also very much customer oriented and put high value on the quality of their products: 55% of these SMEs stated they primarily take into account the needs of their customers (against 31% in the total sample). These companies focused strongly quality, by including innovation (56% of the *Established SMEs* said their innovations aimed to improve the quality of their products, against 34% in the total sample). The majority (63%) of these SMEs had dedicated service managers (responsible for stock management, purchasing, etc.), including a manager for QSE (Quality, Safety, Environment). Generally speaking, these SMEs exhibited medium scores on many indicators used in the study. An example is CUISIMOB. This SME was established in 1932 and operates in the furniture and kitchen/bathroom equipment manufacturing. According to its owner-manager, this sector is not very turbulent and business perspectives are fairly favourable. CUISIMOB products have a strong reputation and customers are generally very satisfied. This SME has also developed a sophisticated digital customer relationship management system and puts the commercial approach at the centre of its attention. Its owner-manager is however not really happy with the level of business skills of its business, which also reveals his high expectations in that matter. CUISIMOB perceives its market's expectations quite high, particularly in terms of quality of the products. They have therefore hired an employee in charge of the QSE and innovation.

Entrepreneurial SMEs

Entrepreneurial SMEs were more likely to be active in the service sectors, especially professional, scientific and technical services and information and communication services. They tend to mainly sell services (29% against 17% in the total sample), or services complemented with a small number of products (18% against 12%). Most of the *Entrepreneurial SMEs* were small (61% of them had a turnover of less than €1 million in 2012), very young (47% of them have less than 8 years) and employed no workers (77% of cases). *Entrepreneurial SMEs* operate in niche markets (67% against 49% in the total sample) with a rather high growth rate. They take advantage of these growing markets and their business perspective rather favourable (63% consider they are in an acceleration stage against 45% in the total sample). Such firms reported constantly exploring new knowledge and exhibited a fairly high level of empowerment from their employees. This allows them to innovate both in terms of products/services (new products/services to the market in 82% of cases, for example), or marketing (e.g. a new design for 59% of them against 39% in the total sample). In this way they try

to meet the expectations of their market, especially in terms of innovation. They are also more likely to formally protect their IP with copyright (35% against 13% in the total sample), registered brands (71% against 48%), or designs (30 % against 19%), and were fairly well integrated into networks (45% of them are part of a cluster). The owner-managers of *Entrepreneurial SMEs* were more confident in their ability to grow their business. For example, they think they have a fairly clear and consistent idea of what they want to do (57% of cases) and indicated that they were comfortable with decisions making even in risky or uncertain situations.

STUDESIGN is a good example of an *Entrepreneurial SME*. Founded in 2007 it operates in the design industry, in a growing niche market. The SME had 3 employees in 2012 and its turnover was around €233,000. It perceives its value proposition as always more efficient than the average of the market thanks to strong innovation in products/services, marketing, and organization. They use all sorts of legal protections for their IP, such as patents, registered designs and models, copyrights and trademarks and carry out an intensive exploration of new knowledge. The owner-manager plans new developments for her business, and she anticipates an exponential growth of their turnover in the coming years, including an international expansion. STUDESIGN is led by a woman in her forties who has specific expertise in strategy and management as well as strong commercial skills. Strong growth is for her primarily synonymous with exciting challenge but also a way to increase the chance of sustainability, independence and well-being of her employees.

Anti-SMEs

Anti-SMEs were mainly manufacturers (71% of cases) and operating business-to-business (82% of cases). Their main difference is that they have many characteristics of large companies, that is why we have chosen to name this group after Torrès and Julien (2005). They are very internationally oriented. For example, 98% of them were actually exporting, in Europe and their internationalisation was not just for export. They also purchased raw materials abroad in 86% of cases, and even recruited employees from abroad (in 30% of cases against 9% in the total sample). About 37% had located part of their production in another country (against 17% in the total sample). These SMEs were among the larger, older and more structured firms of our sample. Some 27% of *Anti-SMEs* ha a turnover of over €10 million in 2012 against 8% in the total sample, and 36% were more than 25 years old, with many skilled managers, including directors of international operations (in 55% of cases). These *Anti-SMEs* also had management teams composed of men and women in 70% of cases. One out of two owner-managers of *Anti-SMEs* believed their value proposition was performing better than the market average (against 35% in the total sample), which was often a growing niche market. These SMEs had also been very innovative in the recent past (filing patents in 57% of cases), and the current business dynamics were driven by the implementation of their development plan. They used for this many tools helping them to formalise their strategy over the long term. These SMEs were looking primarily for profitability (in 53% of cases) that served their shareholders. *Anti-SMEs* had a share structure

where the capital were held by the leader was the lowest and 37% of them had invited financial investors into their share register (against 15% in the total sample).

The archetype for this profile is KONEKTIK. This SME of 44 employees had an annual turnover of €4.8 million and offers a range of products in various industries, mainly in the electronic connectors sector (65% of sales) and the engineering industry (29%). Beyond the diversification of its product portfolio, KONEKTIK has features usually found in very large companies, including an organisation in business units and a high level of internationalisation. This company receives 40% of its annual turnover abroad and 15% outside Europe. It also purchases some of its raw materials abroad, owns at least a distribution subsidiary for which they recruit foreigners. Innovation is central to this development. Expectations are extremely strong in their markets, which encourages innovation by both the exploitation of existing knowledge and the exploration of new knowledge. Furthermore, the formalisation is very important in this business: Each employee has specific rules for his job, and monitoring the implementation of decisions is perceived as crucial for their success.

Participative SMEs

Participative SMEs put employees at the heart of their development. The level of structural empowerment was extremely high in these SMEs, with a delegation of authority and accountability of employees much higher than in the rest of the sample. Among other skills related to the development of their business, owner-managers of such small firms are very comfortable with the definition of roles and responsibilities of their teams (in 55% of cases against 17% in the total sample), with conflict management (44% against 11%), and with team management (52% against 19%). The strategy of these firms is built from their resources and skills and owner-managers have the feeling they are able to make the most of this resources and competences. Moreover, human resource management (in 63% of cases against 37% in the total sample) and, to a lesser extent, corporate social responsibility (in 31% of cases against 13% in total) are very important for these companies. These seem to allow them to innovate more than the average, both in terms of products/services innovation, processes innovation or market innovation (involving trademark protection in 60% of cases).

INFRABAT operates in the building and infrastructure sector and is a typical *Participative SME*. Its owner-manager values delegation and empowerment of the firm's human resources (13 employees). He focuses heavily on the availability of information to employees about the company's projects, on internal communication, on delegation and participative decision making. The owner-manager of INFRABAT explicitly relies on his own resources and skills to build its strategy. He thinks he has a specific expertise in human resource management and feels very comfortable with the definition of the roles and responsibilities of his employees (although this is not formalized), as well as with team management and project management. He is very careful about the management of human resources and about the social responsibility of the firm. He has placed vocational training at the heart of his HR management, allows the employees to develop professionally within the company

and provides compensation practices - where bonus payments or saving plans are linked to long-term performance. INFRABAT is a company that innovates rather by exploiting existing knowledge.

DISCUSSION OF RESULTS AND CONCLUSIONS

According to Levratto (2009, p.137):

"Since the mid-1970s, SMEs are among the main beneficiaries of public policy. (...) The budget and tax expenditures in favour of these companies occupy essentially today's public policy landscape for the growth and employment."

However, the need to better target public policies for SMEs remains. Simple and universal criteria or taxonomy that allows the otherwise diverse SME population to be classified into a small number of sub-sectors would enable policy to more efficiently address the needs of small firms. A French Government report published in 2006 highlighted that attempts to define homogeneous sub-groups of SMEs was difficult because they relied on excessively simple criteria applied to very heterogeneous entrepreneurial realities. The needs of SMEs therefore remain poorly understood and consequently many public policies are not appropriately tailored or targeted. Furthermore, small firms are offered too many support policies, which are difficult to assess and use. They encompass initiatives in many different areas such as: employment, investment, accounting, R&D, training, entrepreneurship, environment, export. Classifying the specific nature of each SME (its product and market, its competitive situation, the type of its production process) allows a better understanding of its needs. This requires taxonomic approaches based on quantitative and robust analysis rather than typological approaches that typically follow rigid ex ante segmentations.

This research has demonstrated the development of an original classification system that could not be obtained by any existing typology, since the criteria are multiple and not all involved in the definition of the classes. Each class is a group of SMEs facing a complex yet relatively homogeneous strategic situation within the class, and can be specifically examined as such. It is suggested that that the traditional measures or classification systems used to research or develop policies to support SMEs are at risk of misunderstanding or missing many firms as they fail to identify the differences between firms. For example, assisting a *Reactive SME* to get more autonomy vis-à-vis its big customers is unlikely to involve the same actions than could help a *Business-Driven SME* to innovate or internationalise. Nor would they assist an *Ad Hoc SME* to become better organized, or an *Entrepreneurial SME* to secure external equity financing. The archetypes or classes outlined in this taxonomy offer researchers a potential foundation upon which to build future investigations within other jurisdictions to assist in the replication of these findings. This study has a number of limitations, which potentially open future research avenues. In particular, the study drew on only French SMEs in a particular region with a sample size of only 594 firms. It was also limited to a specific time period. To ensure the robustness of the 7 classes over a longer period, there should be regular testing of the

taxonomy. Finally, developing a comparative approach with other countries would allow us to assess the degree of universality of the taxonomy.

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Table 1: Main references on typologies

| Typologies | References |
|----------------------------------|---|
| Relying on strategic orientation | Liles (1974); Stanworth and Curran (1976); Filley and Aldag (1978); Dunkelberg and Cooper (1982); Miller and Friesen (1982); Carland et al. (1984); Thompson (1999) |
| Relying on growth | Greiner (1972); Basire (1976); Churchill and Lewis (1983) |
| Relying on market specificities | Preston (1977); Huppert (1981) |
| Relying on innovation | Tidd (2001); Mazzarol and Reboud (2009); Jones-Evans (1995); Autio and Lumme (1998); <i>Rizzoni (1991)</i> |

Figure 1: Typology based on continuum (Julien, 1990; Torrès & Julien, 2005)

| | | |
|--|-------|--|
| Small size----- | ----- | Small size |
| Centralised management----- | ----- | Decentralised management |
| Low level of labour specialisation ----- | ----- | High level of labour specialisation |
| Intuitive and short-term strategy ----- | ----- | Explicit and long term strategy |
| Simple, informal, internal and external IS ----- | ----- | Complex, formal internal and external IS |
| Local market----- | ----- | World market |

Table 2: The seven classes within the cluster analysis

| Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 |
|---------------|----------------------------|-------------|------------------|----------------------|------------------------|--------------------|
| Reactive SMEs | Operationally Focused SMEs | Ad Hoc SMEs | Established SMEs | Entrepreneurial SMEs | Anti SMEs ² | Participative SMEs |
| 8.6% | 11.1% | 13.6% | 22.0% | 17.0% | 13.5% | 14.1% |
| 51 | 66 | 81 | 131 | 101 | 80 | 84 |

Note: see

² *Anti SMEs have been opposed to classical SMEs by Torrès & Julien (2005) as a small-sized firm that is highly decentralized, with a high level of job specialization and an explicit, long-term strategy, having complex, formal internal and external, information systems and working on a world market. Our sixth class groups small firms that are quite similar to this definition.*

Table 2 in Appendix for the complete table.

Figure 2: Dendrogram from the Hierarchical Cluster Analysis

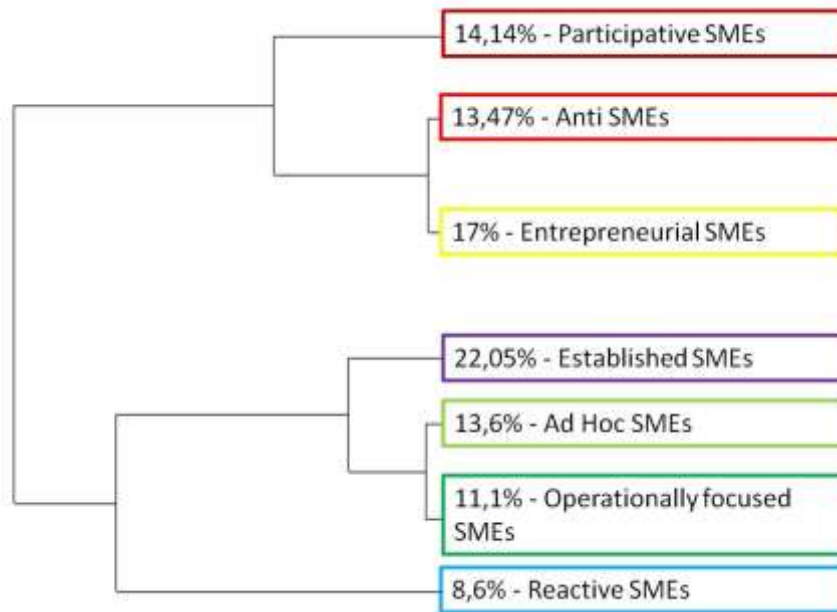


Table 1: Main dimensions for the descriptors (Reboud, Clark, and Mazzarol (2012): Mazzarol, Reboud, and Clark (2011))

| Main elements of the taxonomy | Description of the key factors included | Examples of questions |
|-------------------------------------|---|---|
| Size | Although this taxonomy is customised for SMEs (rather than large firms), size is included as a key dimension to reflect the range of firms included within this major category of enterprises. Following the OECD (2004), we consider size of SMEs in terms of employees and revenue. | Q8: sales year N and N-1 Q65: employees (EFT) Etc. |
| Managerial Characteristics | The attributes of SME leaders, which have been extensively studied as drivers of innovation and entrepreneurial activities, include intrinsic motivation, risk taking propensity, optimism, and openness to innovation, independence and locus of control. | Q6: subsidiary ? Q125: Owner-manager's (OM) motivations Q126: OM's risk taking propensity Q84: exploration / exploitation skills Q85: perceived barriers to innovation Etc. |
| Organisational Configuration | This taxonomy recognises and incorporates the extent to which labour is specialised, the type of organisational structure, the level of centralization, as well as the nature and formality of organisational systems in SMEs. | Q106/Q107: organisational structure Q120/121/122: Management board characteristics Q73: Management formal/ informal Etc. |
| Governance | The role of governance in shaping SME characteristics and innovative behaviour is included by evaluating the type of management employed, the nature of the firm ownership, and the source of financing and investment in the firm. | Q92: structure of the capital Q98: preferred source of funding Q124: empowerment Etc. |
| Strategy | The taxonomy includes five potentially important strategy dimensions including the style of strategy making (intuitive to formalised), the planning horizon (short to long term), and the formality of the strategic planning process (informal to structured). Also, the basis of the competitive strategy (niche to differentiated) and the underlying type of innovation (incremental to radical/disruptive) are considered. | Q40: strategic orientation formalisation Q29: time frame Q19: niche market Q20: type of competitive advantage Q75: type of innovation (product/ service) Etc. |
| Market Orientation | Market-related characteristics include the geographic scope of sales (from local to global), the industry sector, and the length of the product life cycle. Also, the underlying nature of the technology involved in the products and processes, and the levels of capital intensity. | Q15: geographic repartition of the sales Q4/9: industry Q52/58: products/services lifecycle Etc. |
| Growth | Sales growth is evaluated using a multi-point scale (from declining to fast growth). The mode of growth is considered in terms of the source of resources (from internal to external). In addition, reflecting the age of the firm, the stage in the life-cycle from start-up to maturity is considered | Q8 + external source: sales growth Q25: growth perception Q5: age (year of creation) Etc. |

Table 2: Detailed classification of the taxonomy

| <i>Class</i> | <i>Type (example)</i> | <i>Description</i> | <i>Sample Firms</i> | <i>% from total</i> |
|--------------|--|--|---------------------|---------------------|
| Class 1 | Reactive SMEs (MECAPREC) | <ul style="list-style-type: none"> • non-innovative • non-exporting • market expectations mostly focused on price and lead time • owner-manager only shareholder • short term perspective • no competitive advantage • customised product / service | 51 | 8.6% |
| Class 2 | Operationally Focused SMEs (ASSEMBLAUTO) | <ul style="list-style-type: none"> • manufacturing SMEs • Rather big SMEs (sales) • Rather old SMEs (25 years) • Over 60% employees are workers • market expectations mostly focused on reliability and lead time • mainly men in the board • short term perspective • importance of processes • manufacturing and industry • specialised, expertise oriented | 66 | 11.1% |
| Class 3 | Ad Hoc SMEs (ENERSOL) | <ul style="list-style-type: none"> • not well organised • No procedure manual • Small (less than 1M€) • Do not trade with big firms • Young firms (less than 8 years) • Few workers, few managers • Don't innovate because perceive difficulties • Don't succeed in analysing their competitors • Short term perspective • Perceive a strong dependency from lead customer • Their competitive advantage is the price • The owner-manager decides for everything • Many garages | 81 | 13.64% |
| Class 4 | Established SMEs (CUISMOB) | <ul style="list-style-type: none"> • Development based on quality (product) • Customer oriented • Manufacturers (60%) • Structured • Market expectations: product quality • 1 to 5 M€, more than 25 years • Subsidiaries • Stagnation | 131 | 22% |
| Class 5 | Entrepreneurial SMEs (STUDESIGN) | <ul style="list-style-type: none"> • Entrepreneurial • Growing • Market is growing • Niche market • Rather in service industries (30%), like computing and communication • Young and small • Innovation drives the strategy • Customize their offer • Are interested in international (scan the market) | 101 | 17% |
| Class 6 | Anti SMEs (KONEKTIC) | <ul style="list-style-type: none"> • Internationalised • Big SMEs (5 to 10M€ sales) • Women in their board • Have an R&D activity • File patents • Structured • Long term perspective • Have a board and shareholders • Manufacturing | 80 | 13.47% |
| Class 7 | Participative SMEs (INFRABAT) | <ul style="list-style-type: none"> • High level of empowerment • CSR and HRM matter • Plan • Have brands and trademarks • Are autonomous (84%) • Not international | 84 | 14.1% |