CAHIER DE RECHERCHE n°2010-01 E2

Strategic activities in support of young French SMEs

BRANCHET Bénédicte
AUGIER Bernard
BOISSIN Jean-Pierre
QUERE Bertrand

Abstract:

In this paper we closely study young French Small and Medium Enterprises (SMEs). We highlight the structure of these target firms and we build a typology of corresponding business models. The business models stemming from this typology are typical (to the greatest extent possible) and actionable. We are particularly interested in identifying groups of SMEs where government assistance would be particularly effective and strategically valuable for the national economy. One of our conclusions is that the typology is not based on a classical growth model that reflects progressive phases of development in the life of a young firm. Furthermore, it is ineffective and wasteful to focus government assistance efforts on firms based on their age. We identify groups of business models where assistance would be more efficient and strategically more effective.

Keywords: SME, growth, growth model, typology

More than ever, in these times of economic crisis, the activation of concrete governmental assistance to small businesses is crucial. In particular, owing to the necessarily limited nature of these resources, it is important to optimize the system of allocation mechanisms. We intend to globally re-examine the current allocation system in France. Admittedly, there is already a vast array of possibilities for businesses to receive assistance. What we propose with this project is redefining eligibility criteria and boundaries in order to target those firms to be supported in a new global approach. This paper, designed to study businesses, constitutes the first stage of the above mentioned project. We have decided to focus on young Small and Medium Enterprises (SMEs) which are a priori the most vulnerable businesses.

French SMEs represent 98% of the total number of French firms but produce only 42 % of added value (OSEO, 2007). This last percentage explains why the majority of studies only focus on large companies, despite the fact that they

represent only 2% of the total number of French firms. This is perhaps attributable to the fact that these large firms tend to have financial operations and methods that are more "spectacular" than those of small firms. In this paper, we take the opposite view of the situation by studying SMEs, those small firms that are largely forgotten in the field of economic analysis.

In this paper, we study young French SMEs which have attained a certain size (which will be further detailed later in the paper), those with the greatest potential for growth. These SMEs also present the greatest potential risk for today's French economy. Our goal is to thoroughly analyse this group of firms in order to better understand how they are organised and structured. We are particularly interested in identifying groups of SMEs where government assistance would be particularly effective and strategically valuable for the national economy. To accomplish this end, we create a business model typology for young French firms of a certain size. The business models stemming from this typology are typical (to the greatest extent possible) and actionable. In this study we define our business models based on financial statements.

The first part of the paper is dedicated to the contextualisation of our theme. The second part deals with the target firms, how they are defined and provides a rapid description of the same. Part three concerns itself with data mining techniques in order to develop the structure of our target firms and a typology for the corresponding business models. Finally, we present our discussion and conclusions.

1 Contextualisation of the treated thema

A recommendation establishing a first, common SME definition was adopted by the European Commission in 1996. The 2003 European recommendation defined the SME as a firm with a staff of fewer than 250 people, a turnover lower than €50M and total assets below €43M (Commission of the European Communities, 2003). This definition corresponds to a large variety of firms and includes firms that are very different from one another. In France, in July 2008 (source: INSEE), there were 2 919 598 firms with a staff of fewer than 250 people and SMEs represented 98 % of all firms (OSEO, 2007). In June 2008, this definition was

improved by introducing three different categories of enterprises, as can be seen in the next graph. The aim of this new definition is clear: "The new definition is more suited to the different categories of SMEs and takes better account of the various types of relationships between enterprises. It helps to promote innovation and foster partnerships, while ensuring that only those enterprises which genuinely require support are targeted by public schemes." (European Commission, 2008).

Take in Figure 1

Among the French SMEs, only 51 % are corporate bodies. Forty-nine percent are individual businesses (structures lacking official corporate status as defined by French law), and thus do not have, for the most part, a priori, either a structure allowing for growth, or a tangible project that can drive further development. In our study, we propose an analysis of firms having growth potential and that are likely to be able to generate wealth. For this reason, individual businesses are not taken into account in our study, nor are those companies with an annual turnover of less than €1M. In terms of the entrepreneurial profiles of Marchesnay (1998), we only retain those with entrepreneurial competitive legitimacy (as opposed to those with a patrimonial competitive legitimacy that likely would not reach the threshold at which potential growth is most likely).

Similar to the Small Business Act created in 1953 in the United-States which established the Small Business Administration to "encourage and develop small business growth", the "Pacte PME" (SME agreement) was adopted in 2005 in France. This agreement is an important element of the French government assistance deployment system targeting SMEs. Its aim is to encourage increased turnover of the most innovative SMEs in order for them to become international firms. Particularly, its purpose is to intensify the link between the SMEs and their largest clients. Basically all these "assistance kits" are based on growth models.

This study refers to the more global framework of organizational life cycle and more particularly growth models. The latest models define temporally successive stages of the development of the firm (sequential phases). J. Levie and M. Hay list 63 different published stages models in their review paper (Levie, Hay, 1998). More recently, P. S. Rönkkö (Rönkkö 2008) revisited various models. The six-stage-model known as "Greiner's growth phases model" was found to be the

most influential stage model by Levie and Hay (1998) in their analysis of citations and links between different models. L. Greiner originally proposed a five phase growth model (Greiner, 1972). Later, he added a sixth phase (Greiner, 1998). Greiner's growth model describes phases that organizations go through as they grow. Each growth phase is made up of a period of relatively stable growth, followed by a crisis when major organizational change is needed if the company is to carry on growing. The first phase is characterized by "growth through creativity" (start-up company, entrepreneurial, informal communication, hard work and poor pay), this phase ends by a leadership crisis. The second phase is the "growth through direction" (sustained growth, functional organization structure, accounting, capital management, incentives, budgets, standardized processes), it ends by an autonomy crisis. The third phase relies on "growth through delegation" (decentralized organizational structure, operational and market level responsibility, profit centers, financial incentives, decision making is based on periodic reviews, top management acts by exception, formal communication), it ends by a control crisis. The next three phases are phase 4, "growth through coordination and monitoring" (ending by a Red-tape crisis, new culture and structure), phase 5, "growth through collaboration" (ending by a crisis of internal growth; this leads to developing partnerships with complementary organizations) and phase 6, "growth through extra-organizational solutions" (merger, outsourcing, networks …). Each phase was hypothesized to be about four to eight years in length. To each phase could be associated different modalities of supporting the firms experiencing these phases. In this paper we consider only young firms (discussed later in this section) which implies that they should, for the most part, belong to one of the three first phases. As a result, building sub-stages in these first phases of development seems probable and logical. We imagine that we ought to find sub-stages that are sufficiently typical to allow us to build differentiated support plans for young SMEs at a later point in this larger project.

Growth stage models are widely criticized (McMahon 1988); on one hand, because of their very large number (as a result, there is no clear winner). On the other hand, such growth stage models are frequently not empirically based. McMahon appreciates the methodology used by Hanks et al. (1993) in their empirical research. Quoting McMahon (1988), "Hanks et al. (1993) see the strength of a taxonomic approach to identifying and specifying stages in an enterprise life-

cycle model as deriving from use of multivariate analysis of empirical data to reveal common patterns and relationships in the data. They acknowledge only Smith et al. (1985) as having previously employed a taxonomic approach to developing an enterprise life-cycle model, but note that that (the) research had a very small sample size and various other weaknesses." Hanks et al. (1993) studied 133 manufacturing SMEs from "high technology" industries in the United States and build a typology in four development stages (Start-up, Expansion, Maturity, Diversification) and two disengagement phases (Life-style, Capped growth). Saives et al. (2005) studied 110 Canadian biotech firms and defined four clusters.

Our study follows a similar approach. We search for a business model typology among young French SMEs of a defined size (cf. next section), which will allow us, in a later publication, to propose action plans for support to efficiently targeted firms. We will use data mining techniques, the main difference being, when compared to other studies in this field, the nature of the observed firms (all firms, instead of firms from certain sectors) and the use of a much larger database size. We limited our study to young firms, which are, as we will see, the most vulnerable (highest death rate during earliest phase). This is helpful in light of the large size of the database. This fits with our hypothesis that younger firms are simultaneously weaker and yet could, a priori, generate more wealth than older ones. From a government standpoint, assisting young firms is thus more promising than helping older ones.

2 The target firms

2.1 Database building

For our purpose, we use the Diane database built by Bureau Van Dijk (http:// www.bvdep.com). It is constituted of all individual and consolidated year-end financial statements given by French firms to the commercial court. It is notable that this is not a sample, it is the exhaustive collection of all available data on the subject.

The average life expectancy for a firm in France was measured by INSEE in December, 2006. Seventy percent of the firms survived for three years, 56 % for five years and 47 % for seven years. Globally, more than half of the created firms disappear by their seventh "birthday". Even if all these deaths are not explained by bankruptcy, this early phase is well known as one comprising the majority of dangers for firms. In this paper, we want to focus on this difficult phase in order to later define the best ways of supporting these young fragile SMEs. In order to consider the entirety of this potentially difficult time in the life of a firm, here we observe all French firms that are less than ten years old.

To extract the data, we use the February 2008 version of Diane. Among the firms with a staff of fewer than 250 people, we retain those that were created after January first 1998 and are in a "normal" situation (i.e. not those that are in liquidation or financial restructuring or recovery, or those that have been taken over, merged or bought). As stated earlier, we focus our analysis on those SMEs that have already reached a threshold and, as a result, could present, a priori, the highest potential for growth. We choose to define this threshold at €1M annual turnover and we eliminate all firms with less than €1M annual turnover.

The firms having consolidated accounts (otherwise stated, a parent company) or those included in a consolidated account (a subsidiary company) have specific entrepreneurial behaviours when compared with independent firms; they may also have specific factors for explaining account structures which are absent in independent firms. To assure that these parent and subsidiary companies do not perturb our results, we eliminate all firms having consolidated accounts and all firms belonging to a known shareholder being a corporate body with greater than 25 % holdings in the subsidiary company. In France, SMEs are obliged to provide consolidated accounts only if their total assets are above €15M and have a net turnover above €30M. As a result of these regulations, some of the firms in our database have subsidiary companies but provide only individual accounts. The subsidiary has thus been discarded; however, there are examples where the parent firm has not been eliminated from our database owing to the difficulty in identifying them.

Take in Figure 2

25/01/2010

At the end of our selection, we have 37,878 companies in our database. We have full accounts for the last year in which accounts were reported. These are composed of the detailed balance sheets, detailed income statements, and some annexes elements concerning debts and loans. We also add classical computations as intermediate management balances (added value, operating profit before depreciation and amortization …) and different ratios: financial independence ratio, self-sufficiency ratio, depreciation ratio, debt ratio, export ratio, profitability ratio, operating ratio, current ratio and productivity ratio. Also included are some descriptive variables on the firm: year of creation, staff count, activity, location... We briefly describe these companies in the next part.

We use the software SAS and SPAD to analyse the database.

2.2 Brief description of our target companies

The 38,000 SMEs that we observe represent 2.6 % of all French firms, either independent or non-independant (considering only corporate bodies and legal entities), with a staff of fewer than 250 people. They are located all over France: 11 % are in Paris, 26 % in the Ile de France and 23 % in the nine provincial departments containing the largest provincial cities [1].

For 15 % of the firms the financial accounts are closed in 2007, in 2006 for 76 % of them and in 2005 for 9 %. Thirty-seven percent of the firms were created in 2000 or before, 50 % in 2001 or before, 74 % in 2003 or before and 13 % in 2005 or later. Firm age is determined based on the *closing date* of the financial accounts we have. As can be seen on the next graph, 29 % of the firms are two years old or less, 26 % are five or six years old and 21 % are seven years old or more.

Take in Graph 1

The form of business entity is more often SARL [2] (55 % of the firms), SAS [3] (30 %), and less frequently, EURL [4] (7 %) and SA [5] (5 %). On average, the firm's staff number 17 people (with a standard deviation of 27 people). Sixty-one

percent of the firms have ten or fewer people and 94 % of the firms have 50 or fewer people. Only two percent of them have a staff of between 101 and 250 people, so, they are primarily small business firms. Overall, these firms represent 635,250 staff members (including members of Direction, solo entrepreneurs….). This corresponds to 2.5 % of the active working French population [6] and to 7.1 % of the French population working in SMEs with a staff of fewer than 500 people (OSEO, 2007).

Take in Graph 2

Among our target firms, 32 % are in trade and repair (see next graph). This is higher than the 25 % average of all French firms that are in trade and repair with a staff of fewer than 250 people (independent or not and only corporate bodies). Thirty six percent are in realty and services to firms and four percent in transport and communications; these two main types of activities, taken together represent 40 % of our target companies, and correspond to 35 % of all French firms. Manufacturing industries and energy are also overrepresented at 11 % in our target firms, considering the 8 % national global average. On the other hand, construction is underrepresented (nine percent in our target firms, 12 % among all firms) and financial activities, and agricultural and food industries are almost non-existent among our target companies. Collectively the latter two groups represent four percent of the national total. Figures in our database do not necessarily fit with average figures for all French firms with a staff of fewer than 250 people since, as we explained before, we target those young SMEs with a profile that is interesting given the goal of this paper.

Take in Graph 3

We now study the turnover generated by each of these main activity sectors. On the next graph, trade and repair represent 45 % of the accumulated turnover of the target firms. If we add realty, services to firms and manufacturing industries, we reach 79 % of the total turnover. Compared to the other sectors, manufacturing industries produce the greatest relative turnover (1.5 times more than its proportion in terms of number of firms), followed by trade and repair (1.4 times more),

whereas realty and services to firms are the lowest (1 % of firms produce 0.5 % of the net turnover).

Take in Graph 4

The activities which comparatively need larger staff are manufacturing industries (19 % of the total staff), hotels and restaurants (7 %) and transport and communication (7 %). Realty and services to firms represent 26 % and trade and repair 25 % and are the groups with the smallest staffs relatively speaking.

Take in Graph 5

On the next graph, added values can be seen for all firms producing goods or services (for this calculation we eliminate the "ordinary" tradesmen). Hotels, restaurants and manufacturing industries are, relative to their size, the largest contributors to added value, ahead of transport and communication and building. 71 % of the accumulated added value is created by realty, services to firms (32 %), trade and repair (22 %) and manufacturing industries (17 %).

Take in Graph 6

Using a vertical market analysis to determine the position of an observed firm in terms of the final market, 52 %, that is to say a large majority of our target firms are service providers. Fifteen percent are retailers, 12 % wholesalers, ten percent manufacturers and nine percent entrepreneurs. As can be seen on the next graph, more than a half of our target firms (56 %) are associated with a local or regional market and only 3 % with an international market.

Take in Graph 7

Concurrently, 2.4 % of the target firms have an export rate (see annex A for definition) that is higher than 80 % and 4 % have one higher than 60 %. For 26 % of the target firms, the export rate is strictly positive, compared to an average same export rate of 3.7 % for SMEs with fewer than 250 employees. This rate rises to 22.5 % for SMEs with staff between 10 and 249 employees (CAS, 2008), which is ,

nonetheless still less than our 26%. But this figure drops very quickly: only 11 % of the firms have an export rate higher than ten percent, 8 % higher than 20 % and 5 % higher than 40 %.

We now consider the financial size of the target firms. The next table summarizes the main information: on average, the target firms have total assets equal to 2,562 k€, with a standard deviation of 5,459 k€. Fifty percent of the firms have total assets lower than 1,229 k€ (median = Q2) and 50 % of the firms have total assets of between 681 k€ and 2,376 k€ (interquartile distance = Q3 – Q1).

In k€	mean	Standard deviation	median	Interquartile distance
Total assets	2562	5459	1229	[681, 2376]
Net turnover	3789	6202	2179	[1563, 3799]
Total costs and expenses	3889	6470	2183	[1536, 3874]
Net operating income	151	675	70	[9, 202]
Net income or net loss	108	709	60	[10, 160]

Table 1

Even if we choose to target the largest SMEs, by retaining only those with more than €1M annual turnover, our target sample is still very diversified when considering the financial size of the firms. The relative interquartile distance ((Q3-Q1)/Q2) equals 2.5 for the net income or net loss and 1.4 for total assets. It is narrower for net turnover (1), which is understandable due to the choice of our turnover target. The sum of net turnover of all target firms is €143,536M, the sum of added value €39,483M.

The variables reckoned on the balance sheet and the intermediate management balances are also very dispersed as can be seen in the next table (see annex A for definitions of the variables).

In k€	mean	Standard deviation	median	Interquartile distance
Working capital	448	1819	170	[24, 460]
Working capital requirement	184	1548	34	[-81, 248]
Added value	1042	1667	592	[259, 1186]
Operating profit before depreciation and amortization	214	807	96	[16, 254]
Operating cash-flow	160	847	81	[18, 200]

Table 2

3 Structural description of the target firms

Here we use data analysis techniques whereby we simultaneously observe all of the variables (all firm features and characteristics) using multi-dimensional analysis, to obtain a more global vision (without a priori) in order to understand what structures the target firms. We do this by identifying the most important variables by which they are organized.

In this research we applied Principal Component Analysis (PCA). The firms are projected on a subspace with the least possible deformation. The axes of this subspace structure the primary data. The axes are sorted by order of importance and, as linear combinations of the original variables, can thus be interpreted. Finally, a hierarchical and ascending classification analysis was performed for grouping firms of similar "behaviors" into clusters (i.e. categories) always taking into account the multidimensional features of these firms and without a priori. These clusters were then characterized by the initial variables.

For the PCA, we chose 14 variables (weight of main balance sheet and income statement items, asset account total, net income or net loss, net turnover and part of short term debts, i.e. those of less than one year) as active variables.

3.1 The structuring axes

We found four main axes structuring the target firms that are described below. These four axes fit with 51 % of the explained total inertia (i.e. weighted mean of the squared distances between the individuals and the gravity center of the point cloud).

The first axis is oriented around the **composition of assets** recorded in the balance sheet; it reflects the possible structure of total assets. On one side of the axis, we have firms with a strategy of "balance sheet's top", with a large weight of fixed assets. We found here, in particular, firms with relatively more financial assets. On the other side of the axis, we found firms with a typical behaviour of "balance sheet's bottom" with relatively large current assets (trade accounts receivable in particular); they have also rather large accounts payable. This axis also

corresponds to the degree of capitalistic intensiveness of the firm, i.e. the level of investment needed for its activity.

The second axis is based on **financial size**, organizing the firms in terms of their total assets, their turnover, and their total and operating income and expenses. It sorts the firms according to the size of their balance sheets and income statements (total sum of the income or the expenses, but not the net income, net profit or net loss). Axis two is slightly dominated by some firms with large total assets, large operating expenses, large turnover and a large gross amount of debts. We could interpret this axis as representing the level of maturity of the firm on its growth path.

Axis three principally presents the different **nature of the activity supported**. At the extremities, on one hand, there are firms which are selling goods, having relatively large inventories in total assets. This could indicate that they deal with a large variety of goods or expensive goods. On the other hand, there are service provider firms, that are rather large (total assets, loans, debts); their other external charges are relatively sizable in their income statement, which is quite compatible with service production, and they have two intermediate management balances that are also rather large, being period production and added value,.

Axis four is an axis of **total equity and liabilities' structure**, between "top" (equity) and "bottom" (current liabilities) strategies of total equity and liabilities' structure. It opposes companies having relatively large equity (significant financial self-sufficiency i.e. high solvency) and rather large retained earnings associated with high turnover, with those companies having a high debt ratio in terms of total equity and liabilities (financial liabilities particularly). Thus it presents the variety of financing structures ranging between unique use of equity to unique use of liabilities.

3.2 A typology of the target firms

We then performed a cluster analysis on this data. We chose to read the database in ten categories. For each cluster, we can characterize the situation of the firms as can be seen in the accounting records. Annexe A shows the reckoning definition of the variables (aggregates and ratios) we use in the description.

The cash-position firms

8 % of the target firms

The weight of cash position accounts in the total assets of the firms of this cluster is much larger than on average. The comparatively small hotels and restaurants from Paris and Alpes-Maritimes are overrepresented in this cluster. Their profitability is rather large. These firms are in the same type of activities with low added-value as the cluster "the firms with relatively large fixed assets and profitability" (see below). However, either they do not need a large amount of capital to start, or they already have depreciated their initial fixed assets (the depreciation ratio is rather large). The added-value that they thus can generate produces a large cash-position.

The profitable experts

9 % of the target firms

These firms are quite frequently engaged as local service providers in realty and services to firms and are overrepresented in this cluster. They have rather small balance sheets (with a large proportion dedicated to the bottom – current assets) and small income statements, with quite a large staff, that is rather qualified and well paid. They are characterized by a relatively large profitability. Short-term investments reflect invested cash. They have low fixed assets (two times less than the average); as a result, the productivity of invested capital is very large (because of the low amount of invested capital) and they have few debts (they do not need debt to finance their activity).

The relatively small artisans

7 % of the target firms

They have a rather small balance sheet, a small income statement and the profit they realise is rather small. Relatively they have very small amounts of debt and loans, and quite a low level of staffing. Their total assets are merely composed

of current assets and their EBITDA margin is rather small. Firms in building are overrepresented in this cluster.

The rather small good producers with low profitability

17 % of the target firms

These firms are rather small (based on balance sheet size), and relatively old. More often than on average, they are reselling goods. They have a large balance sheet's bottom (current assets): they are obliged because of their activity to extend credit to their clients. They have low margins with some financing problems. Those who export and those who have globally a rather small profitability are relatively overrepresented in this cluster.

The local tradesmen with large inventories

14 % of the target firms

More often than on average, firms in this cluster are in trade and repair activities with quite a small staff, and a rather small balance sheet whose total assets are characterized by the relative value of inventories, but a rather large income statement with a rather high turnover. Those who have small profitability ratios are overrepresented in this cluster. Relatively large inventories could reflect a large variety of goods or expensive goods (as could be the case for car dealerships for example). They have a rather large working capital requirement which is financed by banks (overdraft facilities which explain the comparatively very low cash) and trade payables.

The ordinary service providers with small current ratio

11 % of the target firms

These firms are offering services more often than goods and are relatively frequently located in Ile de France. For them, the weight of the balance sheet's bottom (current assets, liabilities) is rather important. Their income statement is

characterized by the weight of the other external charges accounts, which is understandable because they are relatively frequently service providers, and thus do not need (a priori) large other purchases (goods, raw materials). They finance their activity by trade accounts payable and place some cash in short-term investment (perhaps because they have seasonal activities or activities where there is a time gap between expenses and income). They have low fixed assets, a low WCR, which they finance almost entirely by short-term resources. A priori, they are ordinary service providers, as compared to the class "the profitable experts".

The mutable firms
1 % of the target firms

When the firms of this cluster have rather large EBITDA and a high corresponding margin, they suffer more often than on average from large financial expenses with a rather small financial net income. Their turnover is rather small, while their gross amount of debt is comparatively very large, which explains the small financial net income. They use their debt to finance rather large fixed assets, with a large proportion of tangible fixed assets. Their investments have been externally supported (investment grants) by public or local bodies allowing the financial supporters to maintain strategic or needed activities in a community. We could interpret this cluster as firms which have just invested in relatively large amount of fixed assets (as a result their depreciation ratio is rather low) but do not have enough sales to cover their depreciation and the financing of their fixed assets. The firms with comparatively very small staff which are engaged in realty and services to firms, and particularly business administration, are overrepresented in this cluster.

The firms with relatively large fixed assets and profitability
14 % of the target firms

The firms in this cluster are characterized by the heavy weight of the fixed assets in their total assets, particularly for the tangible fixed assets. Considering the activities which are overrepresented in this cluster, this can be interpreted as the

need for a large amount of capital to start (they also could perhaps have bought their buildings). Considering the average over the total of the targeted firms, the firms in this cluster have rather larger profitability and liquidity ratios. A priori, they belong to the sector with rather low added-value, which could explain the relatively low productivity of invested capital (added-value is in the numerator). Taxes and similar levies on the income statement are relatively high because of the "taxe professionnelle" which is a significant local tax in France, based on the level of fixed assets.

The financial firms

17 % of the target firms

These firms are characterized by the important weight of their fixed assets with an overrepresentation of financial assets, and, to a lesser extent, an overrepresentation of intangible fixed assets. More often than on average they produce services (likely up-market services) with significant, well paid human capital. They are comparatively very small and rather young (thus the depreciation ratio is rather low), with an EBITDA margin (9.3 %) perceptibly higher than for the whole of the target firms (6.7 %). Their financial assets are in the form of participation in other firms (as we noted above, there are no practical obligations for the great majority of the target firms to provide consolidated financial statements). Thus, they have rather good financial results from their operating activities and they add to them rather large incomes from their invested capital (financial assets). In this case, firms could be seen as providing investment support. The firm itself could therefore, be considered as a tool for strategic financial investment.

The export oriented firms

2 % of the target firms

The firms of this cluster are more often than average in manufacturing industries which export their production (goods rather than services). This activity which is represented relatively more frequent could explain the rather small productivity of invested capital. They have a rather very large financial size, with a rather large staff. They are the grassroots of the international class, the forerunners

of the larger export firms. Because of their activities, the expenses of their income statements are characterized by the weight of the provisions for liabilities – operating.

4 Discussion and conclusion

As a result of our analysis, we obtain ten clusters of characterized firm behaviours based on their year-end financial statements. Each of them reflects a very typical business model which has been described.

We notice that the variable firm age does not participate much in defining the clusters, that is to say, some of them are characterized by age level, but not all. Moreover, we do not find each cluster characterized by age level (a different level for each different cluster), as we would have expected if they there were following successive growth phases. We cannot, therefore, organize our clusters as though there was a chronological follow-on (according to the age of the firms that constitute the clusters) among at least a few of the clusters. This also means that optimal government intervention doesn't occur when assistance is directed at young firms purely considering their age. Optimisation of assistance can effectively be measured by comparing the level of aide provided versus results seen at the firm level (life expectancy and development) and on a more global economic level (delta of staff and added value).

In France, the use of age as criteria to segment SMEs reposes on a prevalent logic of accumulation. The legal reserve in total equity and liabilities illustrates this position: the legislator thinks that increasing equity is a guarantee against firm death. In the same way, the firm manager becomes more and more experienced in firm management and thus gains autonomy, needing less outside aide, as firm age increases. With the results of our target firms typology we have shown that many other variables participate to a much greater extent than age in understanding young firm structure: composition of total assets, size, nature of the support of the activity (goods or services), and the structure of the equity and liabilities (i.e. the four axes we describe in the previous section). Thus it is a waste to assist young firms with

age as criteria for help given. This is not a denial of classical growth models, our propositions are made at a macro-economic level, while the growth models previously cited are applicable to the firm.

To a lesser extent, the observation is the same for staff count as for age. An easy and typical way of understanding and dealing with SMEs is to perceive them via staffing level intervals. Notice that the notion of SME, as given in the first part of this paper, is mainly built on this staff size definition. Staff size has a place in our clusters definition, but does not provide even a short succession of clusters (succession associated with stages of firm development).

We notice that increasing staff levels correspond to a certain level of firm growth, i.e. there is a volume effect which necessarily leads to increased delegation (of authority, of operations). The act of delegation (in a large sense of the term) produces behaviour similarities across all SMEs. In organizational terms, it is also quite understandable that we find a correspondence between similar staffing levels and similar behaviours. This could explain why firm maturity can be better understood by examining staffing levels than by considering firm age.

Behind the use of staffing level for defining clusters of firms to which government might want to provide assistance, there is the generally accepted hypothesis that added-value and staff are linked: a priori, staff creation growth sectors are the ones with high added-value (and the opposite is also true). We verify this hypothesis by calculating the correlation coefficient between these two variables on all target firms, and within each cluster (see next table). Notice that we can only see and measure linear relations with this tool.

Table 3: Staff and added-value	
	correlation coefficient
the rather small good producers with low profitability	0.71
the profitable experts	0.51
the ordinary service providers with small current ratio	0.62
the relatively small artisans	0.64
the firms with relatively large fixed assets and profitability	0.7

25/01/2010

the cash-position firms	0.54
the local tradesmen with large inventories	0.78
the export oriented firms	0.48
the mutable firms	0.31
the financial firms	0.66
All target firms	**0.64**

The link between added-value and staff thus exists. It is stronger in some clusters, such as "the local tradesmen with large inventories", "the rather small good producers with low profitability" and "the firms with relatively large fixed assets and profitability". But this is a static vision: staff creation could already be finished and the potential of new staff creation low. With this in mind, the clusters with the highest link between added-value and staff are probably those with the greatest social risks (i.e. where SME death has the greatest negative impact on the global economy).

Our built clusters seem to be characterized more by other variables such as composition of total assets, than by age or staff levels. We tried to put age and / or staff as active variables in the PCA; but we obtained less good results (explained inertia and cluster separation) but they were roughly of the same nature. The main characterizations of the clusters in the size field are resumed in the following table. All variables we mention are statistically significant, we qualify their level between --- (very small) to +++ (very large).

Table 4: size characteristics of target firm clusters							
	Total assets	Net turnover	Added -value	staff	age	assets	EBITDA margin
the cash-position firms	---	--	-	-	++	current	++
the profitable experts	--	-	+	++		current	+
the relatively small artisans	--	-	-	-		current	-
the rather small good producers with low profitability	-	+	-		+,++	current	--
the local tradesmen with large inventories	-	++	--	-	++	current	--
the ordinary service providers with small current ratio	-					current	
the mutable firms	++	--		--		fixed	+++
the firms with relatively large fixed assets and profitability	+	--	-			fixed	+
the financial firms	-	---	---	--	--,-	fixed	+
the export oriented firms	+++	+++	++	+++	++		

Each cluster corresponds to a different business model. The top six are characterized by the weight of their current assets while the following three have a large proportion of fixed assets. In the last one, no specific total asset structure characterizes the cluster. Some clusters are more strategic than others (the export oriented firms for example) and could be supported by specific and adapted assistance. Some clusters are weaker (the mutable firms for example) and require adapted help. Some clusters are more classical or traditional (the cash-position firms, the local tradesmen with large inventories), or have a slightly smaller global growth potential (the relatively small artisans), still others have a more atypical business model (the financial firms). To be efficient, government assistance should be adapted and oriented toward each of these clusters in a tailor made fashion. Because of the variety of firm business models we have highlighted, we consider it wasteful to provide help that is adapted to the greatest number of SMEs (even if this split is by age or staff, as we saw above) and to try to help the "average" firm, which in any case does not exist. For optimization, assistance should be defined by as many specific assistance processes as there are clusters considered as interesting in terms favourable risks. Clearly, there already exist a plethora of assistance systems for different types of SMEs. What we propose with this study is to apply a global approach to re-examine the allocation system and to redefine the criteria and boundaries for support in order to better target those SMEs deserving support and the level and manner in which the support can best be provided.

In other words the essence of this study is central for economic policy, especially in this period of crisis. Compared to Germany and going beyond differences due to business sectors, France is said to lack medium enterprises which could be profitable to the economy and the level of employment in this country. French institutions like OSEO or FSI (Fonds stratégique d'Investissement), a subsidiary of the CDC (Caisse des Dépots et Consignations), are respectively devoted to sustaining innovation and growth of SMEs or to holding minority interest in order to support different businesses over the long term. Therefore, research such as this is intended to provide a better knowledge of the criteria which should be taken into account by these institutions and by the State to enhance the targeting of businesses with the greatest potential for the nation.

25/01/2010

Finally, further tracks for investigation can be imagined. We would like to add a more temporal axis to our analysis by inserting historical records of annual financial statements in our database: we will thus be able to include evolution paths in our study. Another research possibility would be to build a comparison with Germany, which is often proposed as a model of economic performance. We would like to have a database composed of the same variables, in order to analyse German SMEs and to compare SME structures. Last but not least, we could suggest that government assistance "tracks" be developed using identified optimisation specificities related to each cluster. For the most strategically important clusters, at least, adapted measures could be defined in order to optimize and enhance the provided assistance and to improve its effectiveness.

Notes

[1] Alpes Maritimes, Bouches du Rhône, Haute-Garonne, Gironde, Hérault, Loire Atlantique, Nord, Bas-Rhin, Rhône

[2] Société à Responsabilité Limitée. The SARL is broadly equivalent to the L.L.C (Limited Liabilities Company) or the PLC (Private Liabilities Company) in the United Kingdom and the corporation in the United States or the GmbH (Gesellschaft mit beschränkter Haftung) in Germany

[3] Société par Actions Simplifiée. It is most similar to a joint stock company or limited company in British law, or a limited liability company under United States law. It is a type of simplified corporation.

[4] Entreprise Unipersonnelle à Responsabilité Limitée. EURL is like a SARL with a single person

[5] Société anonyme : corporation

[6] INSEE, enquêtes Emploi du 1er au 4ème trimestre 2007

References

Contextual

OSEO (2007), *Quels emplois pour les PME ? Étude sur les PME et l'emploi en France*, available at http://www.oseo.fr/notre_mission/ publications/etudes_rapports/academiques/quels_emplois_pour_les_pme (accessed 27 November 2008)

CAS, (2008) « Peu de PME tournées vers l'exportation : les exportations françaises sont assurées essentiellement par les grands groupes », available at http://www.france2025.fr/xwiki/bin/view/France2025/Peu-de-PME-tournees-vers-lexportation-les-exportations-francaises-sont-assurees-essentiellement-par-les-grands-groupes (accessed 27 November 2008)

Commission of the European Communities, (2003), « Commission recommendation of 06/05/2003 concerning the definition of micro, small and medium-sized enterprises » available at http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/decision_sme_en.pdf (accessed 27 November 2008)

European Commission, (2008) « The new SME definition", available at http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/sme_user_guide.pdf (accessed 27 November 2008)

Academic

Afuah, A. (2004) *Business models – a strategic management approach*, Mc Graw Hill Irwin, New York

D'Amboise, G., Muldowney, M. (1988) "Management theory for small business: attempts and requirements", *Academy of Management Review*, vol. 13, no. 2, p. 226-240

Greiner, L.E. (1972) "Evolution and Revolution as Organizations Grow" *Harvard Business Review*, vol. 50, no. 4, p. 37-46.

Greiner, L.E. (1998) "Evolution and Revolution as Organizations Grow", *Harvard Business Review*, vol. 76, no. 3, p. 55-64

Hanks, S.H., Watson, C.J., Jansen, E., Chandler, G.N. (1993) "Tightening the life-cycle construct: a taxonomic study of growth stage configurations in high-technology organizations", *Entrepreneurship Theory and Practice*, vol. 18, no. 2, p. 5-29

Levie, J., Hay, M. (1998) "Progress or just proliferation? A historical review of stages models of early corporate growth", Working paper, London Business School. London

McMahon R.G.P (1988) "Stage models of SME growth reconsidered", *Small Enterprise Research*, vol. 6, no. 2, p. 20-36.

Magretta, J. (2002) "Why business models matter", *Harvard Business Review*, vol.80, no. 5, p. 86-92

Marchesnay, M., Julien, P.A. (1990) "The small business as a transaction space", *Entrepreneuship and Regional Development*, vol. 2, p. 267-277

Marchesnay, M. (1991) "De la théorisation en sciences de gestion", *Sciences de Gestion – Economies et Sociétés,* Tome XXV, no. 4, p. 195-209

Marchesnay, M. (1998) "Confiances et logiques entrepreneuriales", *Economies et Sociétés,* série *Sciences de Gestion*, no. 8-9, p. 99-117

Smith, K.G., Mitchell, T.R., Summer, C.E. (1985) "Top level management priorities in different stages of the organizational life cycle", *Academy of Management Journal*, vol. 28, no. 4, p. 799-820

Rönkkö, P.S. (2008) "Growth and internationalization of venture capital backed technology-based new companies", Thesis submitted in partial fulfilment of the requirements for the degree of Master of Science, Helsinki University of Technology, Espoo, April 30

Saives, A.-L., Ebrahimi, M., Garnier, C., Desmarteau, R. H. (2005) "Les logiques d'évolution des entreprises de biotechnologie", *Revue française de gestion*, no. 155, p. 153 - 171

Annex A

Reckoning definition of the variables used in the descriptions

Balance Sheet

Working capital = permanent capital (equity + long-term provisions + long-term liabilities) – net fixed asset

WCR: working capital requirement = cyclic assets (inventories, accounts receivable) – cyclic liabilities (short term liabilities, accounts payable)

Cash: working capital - working capital requirement = cash uses – cash sources = net cash and cash equivalent (short-term investment)

Income statement

Period production = sold production + change in stocks of finished goods + capitalized production

Added value: net turnover + change in stocks of finished goods + capitalized production – good and basic commodities purchase – other external charges

OPBDA: operating profit before depreciation and amortization = gross profit or loss on trading = added value + revenue grants – taxes - wages and employee benefit expenses

Profit: net income or net loss = total income – total expenses

Operating cash-flow = OPBDA + finance profit – income tax

Ratio

Structure and liquidity

Financial independence ratio = equity / permanent capital *100

Depreciation ratio = depreciation / gross property and equipment * 100

Current ratio = net current assets / short-term liabilities

25/01/2010

Management

Debt ratio = funding liabilities / total equity * 100

Export rate = (net turnover – net turnover in France) / net turnover * 100

Part of operating cash-flow = operating cash-flow / (net turnover + revenue grants) * 100

Productivity and profitability

Solvency = total equity / total equity and liabilities * 100

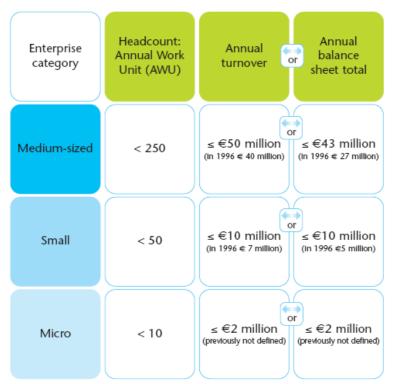Profit margin = operating and finance profit / net turnover * 100

EBITDA margin = (operating profit + depreciation + amortization + provision) / operating income

Productivity of invested capital = added value / total assets * 100

Productivity of production potential = added value / (tangible fixed assets + intangible assets) * 100

25/01/2010

Figures and Graph

THE NEW THRESHOLDS *(Art. 2)*

Enterprise category	Headcount: Annual Work Unit (AWU)	Annual turnover	or	Annual balance sheet total
Medium-sized	< 250	≤ €50 million (In 1996 € 40 million)	or	≤ €43 million (In 1996 € 27 million)
Small	< 50	≤ €10 million (In 1996 € 7 million)	or	≤ €10 million (In 1996 €5 million)
Micro	< 10	≤ €2 million (previously not defined)	or	≤ €2 million (previously not defined)

In (European Commission, 2008)

<u>Figure 1</u>

Sample Building

Diane data base → With available accounts / < 10 years old / « normal » situation at February 2008 / Without consolidated account / Not a subsidiary → Sample

38,000 firms

<u>Figure 2</u>

Graph 1

Graph 2

Graph 3

25/01/2010

Graph 4

Graph 5

Graph 6

25/01/2010

Graph 7