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WORKING PAPER

Exploring the Boundary between Entrepreneurship and Corporate Venturing: From Assisted Spin-outs to Entrepreneurial Spin-offs

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June 2007

2007/472

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D/2007/7012/43

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ABSTRACT

Corporate entrepreneurship and corporate spin-offs have gained importance over the last decades. Corporate spin-offs play an increasingly important role in the development and growth of emerging, high-technology industries, thereby contributing to economic growth. While previous studies on corporate spin-offs have taken the established firm as a point of departure, a central issue concerns the locus of entrepreneurs. We adopt a bottom-up approach by considering those spin-offs that are created by employees, based upon an opportunity spotted while working for the parent company. Based upon the knowledge-based theory of the firm and the literature on opportunity identification, we develop a typology of corporate spin-offs. We identified three types of corporate spin-offs: Assisted spin-outs, Restructuring-driven spin-outs and Entrepreneurial Spin-offs. These types of corporate spin-offs differ from each other in terms of nature and formality of knowledge transfer; detection and implementation of opportunity identification; and performance. Based upon an in-depth analysis of 41 corporate spin-offs in Flanders, we found that Entrepreneurial Spin-offs outperform both Assisted and Restructuring-driven spin-outs on all four performance indicators. Our findings imply that

parent companies often miss possibilities to capture value from opportunities that were originally developed in the parent company.

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1. INTRODUCTION

The importance of corporate entrepreneurship (CE) for successful organizational performance and renewal has been the subject of interest in the literature over the past three decades. In one of the earliest studies, Peterson and Berger (1971) show that entrepreneurial activities help companies to develop new businesses that create revenue streams. CE has been viewed as the driver of new businesses within on-going enterprises as achieved through internal innovation, joint ventures or acquisitions; strategic renewal (Guth and Ginsberg, 1990; Hitt, Nixon, Hoskisson and Kockhar, 1999); product, process, and administrative innovations (Covin and Miles, 1999); diversification (Burgelman, 1991); and processes through which individuals' ideas are transformed into collective actions through the management of uncertainties (Chung and Gibbons, 1997). Sharma and Chrisman define CE as ". . . the process whereby an individual or a group of individuals, in association with an existing organization, create a new organization, or instigate renewal or innovation within that organization" (1999: 18). CE activities enhance a company's success by promoting product and process innovations (Burgelman, 1983, 1991). CE activities can improve organizational growth and profitability and, depending on the company's competitive environment, their impact may increase over time (Brazeal, 1993).

Previous literature has taken the established firm as a point of departure to study corporate entrepreneurship and the phenomenon of corporate spin-offs (Covin and Miles, 1999; Sharma and Chrisman, 1999). They start from the assumption that established firms initiate spin-outs

within their organization. The conceptualisation is oriented towards a top-down approach in which the established company takes the decision. These studies mainly focus on assisted spin-outs and restructuring-driven spin-outs, that are supported by their parent organization. However, not all established firms are willing to support entrepreneurial initiatives undertaken by their employees. Agarwal et al. (2004) found that parent organizations with abundant, but underexploited knowledge are especially fertile grounds for spin-off formation. This raises important issues regarding the boundary between entrepreneurship and corporate entrepreneurship. In this paper, we identify a new group of corporate spin-offs namely entrepreneurial spin-offs. Entrepreneurial spin-offs are created by employees who wish to pursue business ideas that are not supported by the parent company. This type of spin-off is driven by a bottom-up approach.

This study applies the knowledge-based theory of the firm and the literature on opportunity identification to develop a typology of corporate spin-offs. We suggest that the nature of knowledge e.g. tacit or explicit knowledge, that is being transferred from the parent to the corporate spin-off has an impact on the performance of the corporate spin-off. The nature of knowledge that is being transferred will be influenced by the formality of the knowledge transfer. We predict that the performance of entrepreneurial spin-offs will be better than that of assisted spin-outs and restructuring-driven spin-outs due to the nature of the knowledge transfer.

This study addresses a significant gap in the literature by providing empirical evidence on a typology of corporate spin-offs. In their study, Parhankangas & Arenius (2003) propose a taxonomy of corporate spin-offs based on the nature of the parent firm-spin-off firm relationship. Helfat & Lieberman (2002) have made a distinction between de novo and de alio

entrants based on pre-entry experience. However, this study develops a typology based upon the knowledge-based theory and the entrepreneurship opportunity identification literature.

The following section reviews the literature on corporate entrepreneurship, knowledge transfer and growth. Section 3 outlines the conceptual development of a typology of corporate spin-offs based on the knowledge-based perspective and the entrepreneurship literature, more specifically the opportunity identification literature. Section 4 outlines the method we used to conduct the empirical validation of the model, which is based on detailed analysis of 41 spin-off cases. Section 5 presents our findings relating to the validation of the model. Section 6 presents some conclusions while section 7 discusses implications for management and policy.

2. CORPORATE ENTREPRENEURSHIP, KNOWLEDGE TRANSFER AND GROWTH

In recent years, the entrepreneurial abilities of corporate organisations have become a major subject of discussion among both practitioners and academics (Sharma and Chrisman, 1999). A number of authors (Guth and Ginsberg, 1990; Schendel, 1990; Zahra, 1995, 1996) have suggested that within the realm of existing organisations, entrepreneurship encompasses three types of phenomena that may or may not be interrelated: 1) the birth of new businesses within an existing corporation; 2) the transformation of existing organisations through the renewal or reshaping of the key ideas on which they are built; and 3) innovation.

While the first has been referred to as internal corporate venturing (Zajac, Golden and Shortell, 1991), intrapreneurship (Pinchot, 1985), corporate new venture division (Sandberg, 1992), internal innovation, internal venturing (Guth and Ginsberg, 1990), the second has been called strategic renewal (Guth and Ginsberg, 1990), strategic change, revival, transformation

(Schendel, 1990), strategic departure, new product development (Vesper, 1984), reorganisation, redefinition (Zahra, 1993), organisational renewal (Stopford and Baden-Fuller, 1994). Innovation is considered inherently to be a central component. These concepts suggest changes in either the strategy or structure of an existing corporation. The main difference between the two is that corporate venturing involves the creation of new businesses whereas strategic renewal leads to the reconfiguration of existing businesses within a corporate setting. Corporate venturing refers to "*corporate entrepreneurial efforts that lead to the creation of new business organizations within the corporate organization. They may follow from or lead to innovations that exploit new markets, or new product offerings, or both. These venturing efforts may or may not lead to the formation of new organizational units that are distinct from existing organizational units in a structural sense*" (Sharma & Christman, 1999).

Covin and Miles (1999) introduce a slightly different vision on corporate entrepreneurship. They conceptualise four forms of corporate entrepreneurship: sustained regeneration, organizational rejuvenation, strategic renewal and domain redefinition. 1) Concerned primarily with continuous innovations, **sustained regeneration** is the most frequently recognized CE form. Here, the firm develops cultures, processes, and structures to support and encourage a continuous stream of new product introductions in its current markets as well as entries with existing products into new markets. Firms that engage in sustained regeneration are those that regularly and continuously introduce new products and services or enter new markets. 2) **Organizational rejuvenation** refers to the corporate entrepreneurship phenomenon whereby the organization seeks to sustain or improve its competitive standing by altering its internal processes, structures, and/or capabilities. Demonstrating process and administrative innovations rather than product innovations, organizational rejuvenation shows that firms can become more entrepreneurial through processes and structures as well as by introducing new product and/or

entering new markets with existing products. 3) **Strategic renewal** finds the firm seeking to redefine its relationship with its markets or Industry competitors by fundamentally altering how it competes. Thus, the nature of rivalry with competitors alters as the firm concentrates on renewing the strategies it uses to align successfully itself with its external environment. CE as strategic renewal allows the firm to more profitably exploit product-market opportunities. 4) Through **domain redefinition**, the firm proactively seeks to create a new product market position that competitors have not recognized or have underserved. The focus here is exploring for what is possible rather than exploiting what is currently available. By engaging in domain redefinition the firm, in effect, takes the competition to a new arena where its first or early mover status to create some bases for sustainable competitive advantage. Through domain redefinition, firms often seek to imprint the early structure of an industry.

Covin and Miles (1999) reserve the term “corporate entrepreneurship” to refer to cases where entire firms, rather than exclusively individuals or other “parts” of firms, act in ways that generally would be described as entrepreneurial. Sharma and Chrisman (1999) and Covin and Miles (1999) both take the established firm as point of departure to study corporate entrepreneurship and corporate venturing. They start from the assumption that established firms support the entrepreneurial actions within their organization. However, most established firms are not willing to support entrepreneurial initiatives. For instance in the case of domain redefinition (Covin and Miles, 1999), where the firm proactively seeks to create a new product market position that competitors haven’t recognized or have underserved, one can imagine that not all parent companies are prepared or willing to create a new product market position. Therefore, some entrepreneurs leave their parent company to start their own company to pursue their own business ideas that are not supported by their parent company. In this regard, other studies have looked at entrepreneurial spin-offs that are created by employees who wish to

pursue business ideas that are not supported by the parent company (Agarwal et al, 2004). The potential for employee entrepreneurship results from parent firms being imperfect and permeable repositories of knowledge and causes new organization to emerge from other organizations (Stinchcombe, 1965). Parent organizations with abundant, but underexploited knowledge are especially fertile grounds for spin-off formation (Agarwal et al, 2004).

According to the knowledge-based view, knowledge is the most important strategic resource of the firm and is a basic source of competitive advantage (Conner & Prahalad, 1996). Past research has found that the initial transfer of knowledge from the parent to the corporate spin-off (CSO) can have long-lasting effects on the performance of CSO (Huber, 1991). A knowledge-based relationship refers to the way in which the knowledge base of both companies overlap. This overlap can take place on a production, technology and marketing level (Rumelt, 1974; Sapienza et al., 2004). The transfer of production knowledge from the parent firm can be valuable in helping spin-offs to realize production systems and techniques and to adjust them to customer needs. The transfer of technological knowledge from the parent to the spin-off may allow the spin-off to possess a more solid technological knowledge base. This can help the spin-off to shorten the development time from product idea to commercial product. A transfer of marketing knowledge from the parent firm allows the corporate spin-off to better focus on certain customer groups and distribution channels, and create more efficient marketing strategies.

Technology transfer from the parent refers to the degree to which the spin-off transfers technological knowledge from its parent firm. The transfer of technology from the parent to the spin-off can be formal (e.g. patents and licenses) or informal. Strong intellectual property protection can be important for spin-off companies because it may be the only competitive

advantage available to the spin-off at the time of the company' creation. When a new firm is founded, it does not have advantages based on superior manufacturing or marketing and distribution, which allow it to out-compete other firms (Teece, 1986). The existence of strong intellectual property protection may enable the founder of the spin-off to build the value chain for the new firm before competitors have copied its new technology. The formal transfer of technology from the parent to a CSO or USO will be highly dependent upon whether the parent supports the spin-off or not. For example, where the CSO is set up by employees who are unhappy with the current way of doing things at the parent firm, they can transfer technological knowledge to the spin-off company, but there will probably be no transfer of patents or licenses. Having no formal transfer of technology does not mean that the importance of technology transfer from the parent cannot be high.

3. DEVELOPMENT OF TYPOLOGY

Drawing upon the literature review above, we propose in this section a theory based typology of corporate spin-offs (Miles and Snow, 1978). In order to derive this typology, we distinguish two major theoretical perspectives, which have been used to look at CSO's: the entrepreneurship perspective and the knowledge perspective. While the former has emphasized the role of the individual in identifying opportunities, the latter has looked at the organisation as a social community specializing in the speed and efficiency in the creation and transfer of knowledge (Kogut and Zander 1995). The knowledge perspective is particularly important in explaining the genesis of CSOs because it has focused on how and why opportunities are spotted.

3.1. The Entrepreneurship Perspective

A first perspective to consider is the detection and implementation of the opportunity identification. Cahill et al., (1999) distinguish two types of corporate spin-offs based upon the underlying motivation to spin-off: a) corporate spin-offs arising from strategic restructuring of existing businesses and b) corporate spin-offs arising from new knowledge sources within the parent company or entity. Restructuring-driven spin-outs can be distinguished by the fact that they are clearly brought about by strategic responses in the operation of the parent e.g. divestiture of activities, which no longer provide a strategic fit with the base strategy of the parent. Two major events may trigger the formation of Restructuring-driven spin-outs: 1) the parent company decides to divest an activity and 2) a take-over of the parent company by a competitor. Consequently, the employees decide to create a Restructuring-driven spin-out in order to continue the activities they performed within the parent company. Depending upon the support they receive from the parent in creating the spin-out, the knowledge transfer may be formal or informal. Given that these spin-outs involve the separation of parts in which the parent is no longer interested, there is likely to be low relationship with the parent's activities (Haynes, et al., 2003).

Assisted spin-outs tend to come from development activities in large companies which give rise to new discoveries. The typical characteristics of the latter spin-outs are twofold. First, spin-outs of opportunities for development of technologies, which are not core technologies for the main strategic goals of the parent company. Second, establishment of new technology based companies to commercially develop and exploit research results, which have not been taken up by existing industry. Several large companies have implemented corporate venturing schemes to spur Assisted spin-outs (Becker and Gassmann, 2006). For example, Siemens set up and funded technology ventures that commercialise internally developed technologies such as

unused patents from Siemens' patent portfolio. Similarly, Lucent created a corporate incubator to exclusively create ventures that exploit technologies which were not a good strategic fit with the parent's core business. Assisted spin-outs are well supported by their parent firm which often result in a formal transfer of technology and knowledge from the parent to the spin-out. Given this support, there would appear to be a relatively high degree of relatedness with the parent's activities.

As noted above, it is not always the parent company that identifies an opportunity. Rather, individual employees may draw on their explicit and especially tacit human capital derived from undertaking particular tasks in order to identify opportunities (Davidsson and Honig, 2003). Experience-based knowledge can provide cognitive pathways that can be followed that lead to creativity (Amabile, 1997). Employees of established firms may encounter novel ideas and opportunities while working for their parent firm. However, the parent firm often does not allow the employee to continue working on the idea or opportunity since this is not in line with the strategy of the parent firm. The parent's reward system may be such that it is unable to provide employees with sufficient incentive to exploit the opportunity within the parent group structure. In large, integrated diverse organisations, bureaucratic measures may be adopted to try to ensure performance, but these measures may restrict experimentation and constrain innovative activity (Francis and Smith, 1995). Managers may also face investment restrictions from headquarters, particularly where their activities are peripheral to the main product line of the parent company (Wright et al., 2001). Consequently, these employees may decide to pursue the opportunity by themselves and to create a corporate spin-off. This is in line with the observations of Porter (1980) who found that a typical corporate spin-off arises as employees of established firms with a new idea either do not communicate it to superiors or confront an unwillingness of their superiors to try it, perhaps, because it undermines much of the

investment the firm has made in the past. We label this group Entrepreneurial spin-offs since they are created through the entrepreneurial motivation of individual entrepreneurs. Since these Entrepreneurial spin-offs are often not supported by their parent firm, mostly an informal transfer of knowledge takes place and little explicit knowledge is being transferred.

3.2 The Knowledge Perspective

Within the knowledge perspective, a core element in explaining how firms are created is 'knowledge transfer'. The transfer of knowledge is dependent upon several elements. Following Argote et al (2003), the transfer of knowledge depends on multiple factors, which can be grouped into:

- (a) properties of knowledge to be transferred (Winter 1897, Birkinshaw 2002, Szulanski 1996, Kogut and Zander 1993 and 1995),
- (b) properties of the units involved in the transfer (Von Hippel 1994), among them the absorptive capacity or prior experience or the status elements such as expertise and social connections (Argote 2003).
- (c) properties of the relationships between those units, among them structural elements such as communication between the partners and the mechanisms underlying (Zahra and George 2002), the network structure (Reagans and McEvily 2003) when knowledge flows from outside the organisation, or the quality of the relationship between the source and the recipient (Szulanski, 1996).

In our explanation of the origin of corporate spin-offs, the properties of the units involved in the transfer are equal. Hence, we focus our discussion on the differences of (a), the properties of knowledge and (b), the properties of the relationships between the different units.

Knowledge properties.

The dominant stream of the knowledge literature categorizes knowledge into explicit and tacit knowledge (Polanyi, 1962). Polanyi uses the example of riding a bicycle as an example of tacit knowledge. The knowledge that underlies skilful performance (such as riding a bicycle) is tacit knowledge, in the sense that the performer is not fully aware of the details of the performance and finds it difficult or even impossible to articulate this knowledge (Nelson and Winter, 1982). In line with this, tacit knowledge is often defined by the fact that it is difficult to communicate. In contrast, explicit knowledge can easily be codified and translated (Polanyi, 1967, Nonaka and Takeuchi, 1995). Tacit knowledge is defined by its disassociation from practice, experience or know-how. It is deeply rooted in action, commitment, and involvement in a specific context (Nonaka, 1994). The technical dimension of tacit knowledge covers concrete know-how, crafts and skills that apply to specific contexts (Nonaka, 1994). This knowledge could be understood as consisting of know-how and information, concepts that correspond to the procedural and declarative distinction made in cognitive sciences (Kogut and Zander, 1995).

The degree of tacitness is a function of the extent to which the knowledge can be codified and communicated (Winter, 1987, Boisot, 1995). Explicit or codified knowledge is embedded in product and process technologies (Rumelt, 1974), patents (Robins and Wiersema, 1995), organizational processes, routines and rules (Nelson and Winter, 1982). Employees working in particular areas may develop tacit knowledge that is beyond their job remit and which they have little incentive to communicate to senior management.

In terms of knowledge transfer, it is clear that the transfer of tacit knowledge is both difficult to manage and to control. Tacit knowledge accumulated in the minds of the employees cannot easily be protected from flowing out of the organisation. Explicit or codified knowledge is easier to control in terms of its flow in and out of the organisation.

Sapienza et al. (2004) argue that post-spin-off growth will be maximized when the knowledge base of the spin-off is only partially related with that of the parent while too little or too great relatedness inhibits growth by constraining learning. For example, where relatedness of knowledge is too great, there is little scope to learn through the creation of new knowledge through combining existing knowledge with new items. The implication is that such knowledge is more likely to be codified knowledge since this can be more easily transferred from the parent to the spin-off. In contrast, tacit knowledge developed by employees reflects the creation of new knowledge that is likely to be only partially related to that of the parent.

Relation properties

To distinguish between different forms of knowledge transfer, it is equally important to make a difference between the types of relations. Knowledge connections are formed through both, formal and informal relationships between individuals and groups (Inkpen, 1996). Internal knowledge sharing within a multiunit organization requires formal hierarchical structure and informal lateral relations as coordination mechanisms (Tsai, 2002). The informality of the relationship is one of the characteristics that influence the ease of communication, especially of tacit, system dependent, or complex knowledge (Schulz, 2003). Informal relations have also a positive effect on the transfer of best practices (Szulanski, 1996). Informal communication tends to be regarded as more effective than formal communication because it facilitates the deep interaction needed for the creation of shared knowledge (Churchman and Schainblatt, 1965).

Corporate ventures have both informal and formal ways to catalyse the transfer of knowledge between them and the parent organisation. In their study, Clarysse et al., (2007) found that formal knowledge transfer from the parent institute, in this case the university, to the university spin-off has a restrictive effect. A formal relation seems to be used to value the explicit

knowledge (or technology) that has been transferred from the parent institute to the new venture. This valuation is difficult in early ventures and raises bargaining issues between the parent organisation which maximizes the value of the knowledge and the entrepreneurial team that minimizes this value.

4. METHOD

A corporate spin-off is defined as new business start-up, which develops and markets new products or services based on proprietary technology or skills. This activity was originally developed in a larger parent firm. Our typology is tested using a sample of corporate spin-offs in Flanders. We used four databases to identify the corporate spin-offs used in this study: 1) the lists of spin-off companies of public research organization in Flanders, 2) the portfolio of venture capitalists being active in early stage investments and located in Flanders, 3) a database of the IWT, which is a government agency that provides R&D subsidies to Flemish SMEs, and 4) a random sample drawn from the entire population of companies that are active in high-tech and medium high-tech sectors (see Heirman and Clarysse, 2004 for a detailed description) Our sample consists of 41 corporate spin-offs that are founded between 1991 and 2002.

The primary data source is a structured survey where we focus on the resources, market characteristics and success and growth of the company at time of founding (first year) and today (moment of interview). The questionnaire was conducted during a 1.5-hour face-to-face interview with the founder or CEO of the company. Additional information on the company was collected via secondary data sources such as web sites, brochures and press releases. We distracted the financial data from the company's balance sheet that is available through the National Bank of Belgium.

Performance is a complex and multi-dimensional concept that is difficult to cover with any single measure. The most commonly used objective measures of success include growth measures and profitability measures. In the paper, we operationalize performance using the growth in employees and

revenues; and the growth in cash flow and net return on total assets. To measure the growth in employees, we use the annual average growth. We define the annual average growth in employees as the number of employees today (FTE) minus the number of employees at founding (FTE) divided by the age of the company. This method gives the linear employment growth of a company. We use a similar approach for the growth in revenues. We calculate the annual average growth in revenues as the revenues toady (000 Euros) minus the revenues at founding (000 Euros) divided by the age of the company.

In this paper, we use cash flow as a measure for the company's liquidity. In contrast to static liquidity measures such as the current and quick ratio, cash flow is a more dynamic measure that captures the ongoing liquidity of a company's operations (Kamath, 1989). The cash flow takes the timing of incomes (e.g. revenues, financial income…) and charges (remunerations, trade debtors…) into account. To measure the sustainability of a company on the long run, we use the net return on total assets of a company. This profitability ratio (Davidson and Dutia, 1991; Blaine, 1993; Boubakri and Cosset, 1998; Roberts, 1999) is computed as the net result divided by total asset.

5. EMPIRICAL VALIDATION OF THE MODEL

The nature and formality of the knowledge transfer, combined with the detection and implementation of the opportunity identification can have a major impact on the performance of corporate spin-offs. We identified three types of corporate spin-offs: Assisted spin-outs, Restructuring-driven spin-outs and Entrepreneurial spin-offs. We will now elaborate on each type of corporate spin-off. First we will give more insights into the characteristics of the different types of corporate spin-offs. Next, we will discuss their performance.

Assisted spin-outs

Assisted spin-outs tend to come from development activities in large companies that give rise to new discoveries. The typical characteristics of these spin-offs include: 1) spin-off of opportunities for development of technologies which are not core to the main strategic goals of the parent company or 2) establishment of new technology based companies to commercially develop and exploit research results, which have not been taken up by existing industry. The Assisted spin-outs in our sample have a formal linkage with their parent firm, implying that the parent has an equity participation in the spin-out or a license agreement with the spin-out. In this case, the parent firm gives active support to create the corporate spin-off and often a transfer of resources takes place.

An example is the following company that is active in the construction of machinery. This company was contacted by a nearby hospital to develop a new transport system for hospital beds. This was a rather unusual request for the company, its core activities are concentrated around the manufacture of cranes. Nevertheless, the company decided to start with the developments of this new transport system and soon a prototype was available that could be tested in the hospital. The director of the hospital was extremely enthusiastic and shared his enthusiasm with other colleagues. Consequently, other colleagues began to be interested in purchasing the same system for their hospitals. The company had never dreamed of having such a great demand. The CEO was in a dilemma: should he continue the developments of hospital beds within the current company although these developments did not fit with the core activity of the company, or should he create a separate company to house these activities? Perceiving there to be a large number of potentially interested customers, he decided to create a spin-off to further commercialize the transport system for hospital beds. Today, this new company has an established reputation in the hospital transportation industry.

In another example, a Flemish pharmaceutical company focused its attention 100% on research and development during the first years of operation, without performing commercial activities. At the time, the first product was ready to launch, the CEO decided not to integrate the marketing and sales department in the company. The rationale behind this was the management's perception of the difference in mentality and style of work between R&D and marketing and sales. Therefore, he established a new company with only one goal namely selling the product. In our sample 25% of the CSOs can be labelled Assisted spin-outs.

Restructuring-driven spin-outs

Restructuring-driven spin-outs are distinguished by the fact that they result from strategic responses in the operation of the parent. Two events may trigger the formation of Restructuring-driven spin-outs: 1) the parent company decides to divest an activity and 2) a take-over of the parent company by a competitor. Typically, a parent company divests activities that no longer provide a strategic fit with the base strategy of the company. Divesting non-core activities may also result from major restructuring of the main business (Haynes, Thompson and Wright, 2003). The parent firm wishes to focus on certain core activities and consequently decides to dispose of certain other activities. This disposal can be the trigger to create a corporate spin-off. As an example, in 1991, a French telecom company started to commercialise a new decode system for electronic data exchange. The company spent more than 250.000 Euro on marketing and sales in order to commercialise this decode system. After a first evaluation in 1993, the decode system turned out to be a commercial failure, so the telecom company decided to take the decode system off the market. An employee of the telecom company found out about the termination of the commercialization of the decode system. However, he really believed in the market opportunities of the decode system, and

decided to buy the IP rights of the decode system from the telecom company. He started his own company in 1994 to further develop and commercialise the decode system.

Another motivation to set up a Restructuring-driven spin-out is where another company acquirers the parent company. In this case, it often happens that employees can no longer identify themselves with the culture of the new company. They therefore decide to set up their own company based on their previous working experience. This happened in a company that was active in the research, development and manufacturing of optics for high-power lasers. After the acquisition of the company, the new parent firm decided to terminate all research activities in Belgium and to transfer all research activities to the new headquarters in the United States. The researchers in Belgium could choose between a research position in the United States or a job as a sales representative in Belgium. A handful of researchers refused to become sales representatives and began to explore the possibilities to continue the research projects in another company. The result is a new company that carries on some of the research activities that were initiated in the previous parent company. This new company is a direct competitor of the American firm. About 25% of the CSO in our sample are Restructuring-driven spin-outs.

Entrepreneurial Spin-Offs

Entrepreneurial spin-offs are spin-offs set up by individual employees who leave their parent company to fulfil their entrepreneurial aspirations. A first reason to set up this kind of CSO is the recognition of a market opportunity by an entrepreneur. Secondly, employees develop an idea to start a new activity within the parent company, but receive no support. This idea rejection is a signal for the employee to leave the parent and start his/her own company. Finally, some employees want to be independent and therefore decide to become self-employed.

For example, the sales manager of a large chemical company found out that there was a huge need for a particular type of synthetic powder. He decided not to communicate this opportunity to his parent company, but to leave and pursue this opportunity himself. Through his network of customers, the manager was able to perform a thorough analysis and to make up a business case to examine the need for this synthetic powder. He quickly discovered that there is a huge market for such powders. Consequently, the sales manager resigned and started his own synthetic powder manufacturing company.

Some employees also leave the parent company to start a corporate spin-off when the parent rejects their business idea. In 1996, a young researcher gave up a promising academic career to join a large pharmaceutical company. He received a very good offer to work at a unit specialized in developing new drugs. A crucial step in the development process is the design of the organic synthesis scheme necessary for product production. At the time, the synthesis itself was outsourced to other companies. After a couple of years, the researcher developed the idea to start a new unit at the pharmaceutical company, which could perform the synthesis. In his mind, the new unit would start with the synthesis of in-house developed drugs and could later synthesize drugs for other companies as well. In addition, he saw several opportunities in the chemical industry, which uses synthesis in a variety of processes. After he wrote down his business idea, the researcher talked to his direct supervisor whose reaction was negative. After this rejection, the employee left the pharmaceutical company and started a company specialized in organic synthesis.

In other cases, the employee wants to become self-employed. The employee decides to create a corporate spin-off since he no longer wishes to work for a parent firm, but prefers to work on

an independent basis. These entrepreneurs often rely on the experience built up while working for the parent firm. In the late nineties the board of directors of a Flemish IT-company decided to expand the company. This expansion would mostly take place through the acquisition of smaller IT companies. The CEO of the IT company did not share the enthusiasm of the board of directors to pursue an acquisitive growth strategy. Subsequently, during a particular acquisition, the board of directors decided to continue with the acquisition without the approval of the CEO. Because of this acquisition, there was a shift in responsibilities within the new company. From now on, the CEO had to share his responsibilities with a managing director. This new situation quickly led to frictions, so the CEO decided to resign and start a new career as a self-employed software consultant. More than half of the CSOs (51%) in our sample are Entrepreneurial Spin-offs. Figure 1 gives an overview of the actor that implemented the opportunity identification in the three types of CSOs.

[Insert figure 1 here]

Next, we examine if the three types of corporate spin-offs differ significantly in performance. First, we examine the contribution of the different types of corporate spin-offs in terms of employment creation and revenue generation. Next, we gain insights in the sustainability of these companies by looking at the evolution of the liquidity and profitability. Liquidity is a primary indicator of a company's ability to survive, while profitability is the second requirement after survival is assured (Patrone and duBois, 1981)

Growth in Employees and Revenues

We find that all three categories of corporate spin-offs demonstrate a growth in employees. Entrepreneurial Spin-offs have the largest annual average growth in employees. Although the

number of observations in our sample is small, we observe in table 1 that the growth in employees of Restructuring-driven spin-outs is considerably lower than that of Assisted spin-outs and Entrepreneurial Spin-offs. The results for growth in revenues for the three types of corporate spin-offs, as indicated in table 2, are quite comparable than those for employment growth.

[Insert table 1 here]

[Insert table 2 here]

An interesting success indicator is the combined growth in employment and revenues. For this, we divide the annual average growth in revenues (000 Euros) by the annual average growth in employment (FTE). This calculation results in a measure that indicates how much extra revenues the company generates per additional employee (000 Euros/FTE) hired. Table 3 shows that Restructuring-driven spin-outs perform much worse than the two other types. The average Restructuring-driven spin-outs generates less than 50 thousand Euros per additional employee. As the other type of corporate spin-offs, these companies are high-tech start-ups that develop and market new products and services. It is very likely that the majority of the employees are highly skilled engineers or scientists. The average personnel costs for such employees are much higher than 50.000 Euros. This finding implies that Restructuring-driven spin-outs worsen their financial position per additional employee they hire.

[Insert table 3 here]

Growth in Cash Flow and Net Return on Total Assets

Liquidity and profitability in the first five years after start-up are also important indicators of success. Liquidity refers to the ability of a company to pay its debts as they become due. In

other words, liquidity measures the company's possibility to fulfil short-term obligations. We use cash flow as a measure for the company's liquidity. Figure 2 shows that the three types of corporate spin-offs start with a positive cash flow. After the first year, the cash flow of Restructuring-driven spin-outs drops and realize a positive cash flow only five years after founding. The other two groups of CSO perform much better. Both the Assisted spin-outs and Entrepreneurial spin-offs have an increasingly positive cash flow.

[Insert figure 2 here]

Next to the liquidity of a company, its profitability is of major importance. This ratio provides an indication of how efficiently the company employs its total capital. When a company faces profitability problems, the company need to transfer the losses and consequently burns capital. This process cannot last for a long time, since the company's capital is limited. Figure 3 shows the evolution of the return on total assets during the first five years after incorporation. The figure clearly demonstrates that Restructuring-driven spin-outs have a negative net return on total assets during the first years of their existence, which result in a high risk. Only 5 years after founding, these spin-offs reaches a positive net return on total assets. We also observe a large difference between Assisted spin-outs and Entrepreneurial Spin-offs. The profitability of Assisted spin-outs is only slightly above zero during the first five years after founding. Usually, these companies result from a technology push, which requires significant investments in research and development before product launch. To generate revenues, they perform contract research, often for their parent company as a main client. In contrast, Entrepreneurial Spin-offs are based upon a concrete market opportunity or product. Starting from profitable consulting contracts, these companies market products with a time-to-market less than six months after founding (Heirman and Clarysse, forthcoming).

[Insert figure 3 here]

6. CONCLUSION

The literature on corporate entrepreneurship and corporate spin-offs has traditionally taken the perspective of the parent company. In this view, it is the parent who takes the initiative to spin-out a venture to explore new opportunities or as a result of a management buy-out. However, in our view this represents only a partial view of the entrepreneurship in corporate entrepreneurship and which plays down the role and locus of the entrepreneur. This raises important issues regarding the boundary between entrepreneurship and corporate entrepreneurship. In this paper, we extend this top-down view by also considering a bottom-up view, namely an entrepreneurial point of view. Employee-entrepreneurship derives from the fact that parent companies are imperfect and permeable repositories of knowledge which can cause new ideas and ventures to emerge from existing parent companies. These employees identify new opportunities that their parents are not willing to pursue and decide to create a new venture to explore the opportunity.

Drawing upon the literature, we identified three types of corporate spin-offs. First, Assisted spin-outs emerge from new knowledge sources within the parent company. Second, Restructuring-driven spin-outs are companies that result from a strategic restructuring of existing business. Third, using a bottom-up approach, we identified a third type of corporate spin-off namely Entrepreneurial spin-offs. Entrepreneurial Spin-offs are initiated by one or more employees in order to exploit an opportunity they have spotted while working for their parent firm. Contrary to Assisted spin-outs, these companies exploit knowledge, technology or

expertise accumulated at the parent company but maintain no relationship with the parent. Nor is type of corporate spin-off a response to certain restructuring events that occurs at the parent (like the Restructuring-driven spin-outs). The Entrepreneurial Spin-offs are a result of a market opportunity not communicated with the parent, an idea rejection by the parent or the whish of the employee to become self-employed.

Developing a typology is most interesting if different levels of performance are matched to the different categories. In order to measure performance, we looked at the annual average growth in employees, the net return on total assets and the cash flow since these are indicators of short and medium term viability. Overall, Restructuring-driven spin-outs have the weakest performance on the three performance measures e.g. growth, profitability and liquidity. It takes a long time for these spin-off to grow, experiencing difficult cash positions and profitability constraints. These may not be unexpected since they tend to arise as more reactive approaches. Assisted spin-outs and Entrepreneurial Spin-offs perform much better. Both Entrepreneurial Spin-offs and Assisted spin-outs have a relatively high average growth in employees. In comparison to Restructuring-driven spin-outs, their liquidity position is much better, which means that they have larger degrees of capitalisation. However, their growth is financed in a different way. As aforementioned, Assisted spin-outs are the only companies that maintain a formal link with the parent organization. These spin-offs receive considerable support from the parent company, which often means that they receive a mix of loans, revenues through contracts and straight equity from the parent company.

Entrepreneurial Spin-offs grow much more endogenously. Profit is re-invested in the company. Often these companies exploit an idea that embodies a close to market product or they use knowledge developed within the company for consulting purposes. Entrepreneurial Spin-offs

have a higher financial performance than Restructuring-driven spin-outs. A possible explanation is the information asymmetry inherent to Entrepreneurial spin-offs. The founders of Entrepreneurial spin-offs possess the entrepreneurial drive to set up and run their own company. Often, they do not share all the information they have on the perceived opportunity since they want to create their own company to explore the opportunity themselves (e.g. as in the case of the sales manager of the chemical company described earlier in the paper). Due to this information asymmetry, it is not always easy for the parent company to evaluate the true potential of the opportunity. In case of Assisted spin-outs or Restructuring-driven spin-outs, the information asymmetry is much lower since the parent company was the first to detect the opportunity.

7. IMPLICATIONS FOR MANAGERS AND POLICY

Most established firms are very sceptical about spinning out parts of their knowledge or technology. New ideas and projects should result in a mainstream business within the company. Spin-offs are sometimes a sign of failure (the project had not the expected results and we stopped it) or they are an indicator of straight opportunism (an individual departed from the company). Individual employees despite the company culture and structure create most of them. This finding indicates that established firms should be more aware of corporate entrepreneurship as a mean to start new lines of businesses. The Assisted spin-out is the only type of corporate spin-off, which is set up with the help of the parent company. In future research, it might be interesting to distinguish between the levels of help received and the degree of professionalism, and examine the influence this might have on the performance of corporate spin-offs.

Our analysis shows that Restructuring-driven spin-outs under perform on all four success indicators. Comparing the results of employment and revenue growth with the cash flow and net return on total assets indicates that this type of spin-offs have very little chance of survival. One explanation for this finding relates to the characteristic of Restructuring-driven spin-outs. This type of company is created when the parent decides to kill a project or another company acquires the parent. The latter reason implies that the Restructuring-driven spin-outs and the former parent become competitors from day one. However, the former parent company is an existing company with a customer base, a network of supplier, distributors, etc. On the contrary, the corporate spin-off has to build relationships with different partners, which requires both substantial investments and most importantly time. As a result, the spin-off has very little legitimacy compared to the former parent, which hinders its growth. Therefore, it is very risky for employees to start a company that results from a restructuring event occurring at the parent. The employee/manager increases his chance of survival when he/she succeeds to differentiate the start-up significantly from the former parent company.

The best performing group however are the Entrepreneurial spin-offs. It might be interesting for managers of parent firms to look at possible ways to stimulate employees to create Entrepreneurial spin-offs and investigate how to capture value from these spin-offs. Moreover, it might be that the Entrepreneurial spin-offs also benefit from receiving support from the parent firm. This may help them in obtaining access to valuable resources. This could potentially have a positive impact on their performance.

Since the beginning of the nineties, policy makers have shown great interest in innovative start-ups for reasons of economic growth and regional development. Many studies have shown that these companies contribute the creation of employment and the generation of high levels of

exports (REF). Therefore, policy makers have implemented different support schemes for these companies ranging from support for export, facilitating access to financial means to subsidies for technological development and have shown special interest in the phenomenon of academic spin-offs. For example in Flanders, universities are structurally supported by the Government to set-up academic spin-offs. These funds are used to professionalize the support for researchers who want to found and build their own company. This study shows that corporate spin-offs also play an important role to create a certain dynamics in a region. However, supporting schemes for corporate entrepreneurship implemented by policy makers are scarce. Similarly to existing initiatives, policy could stimulate awareness at (large) companies of corporate entrepreneurship and support corporate venture capital.

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Table 1: annual average growth in employees

Type of CSO	N	Mean	Media	Stdev
Assisted spin-outs	10	3.85	1.17	5.38
Restructuring-driven spin-outs	10	2.31	1.00	5.02
Entrepreneurial spin-offs	21	4.49	1.34	8.93

Table 2: annual average growth in revenues (000 Euros)

Type of CSO	N	Mean	Media	Stdev
Knowledge Based SO	10	332.1	209.6	377.4
Restructuring-driven spin-outs	10	263.2	100.8	515.1
Entrepreneurial spin-offs	21	373.3	276.9	1197.7

Table 3: extra revenue per additional employee (000 Euros/FTE)

Type of CSO	N	Mean	Media	Stdev
Knowledge Based SO	10	145.4	96.1	208.2
Strategic Restructuring SO	10	47.9	75.3	78.4
Entrepreneurial SO	21	256.5	131.8	412.8

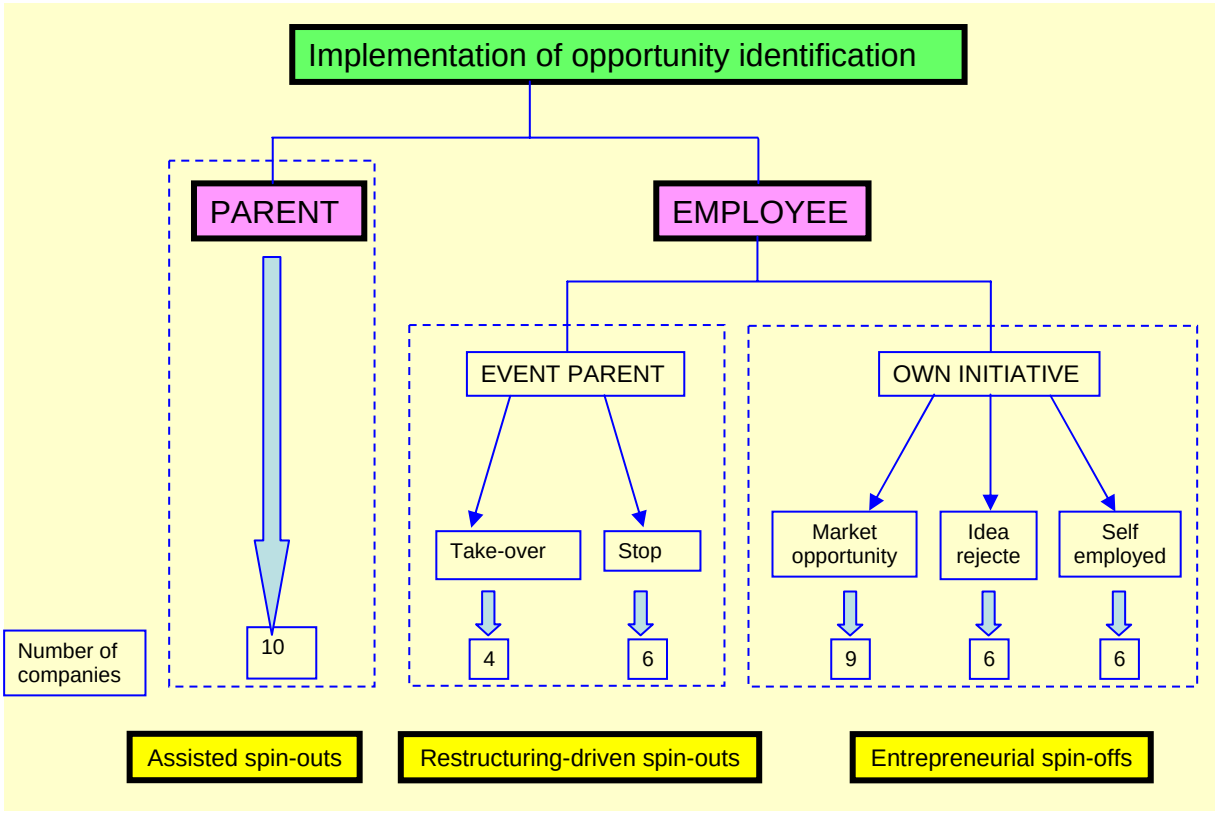

Figure 1: three types of corporate spin-offs

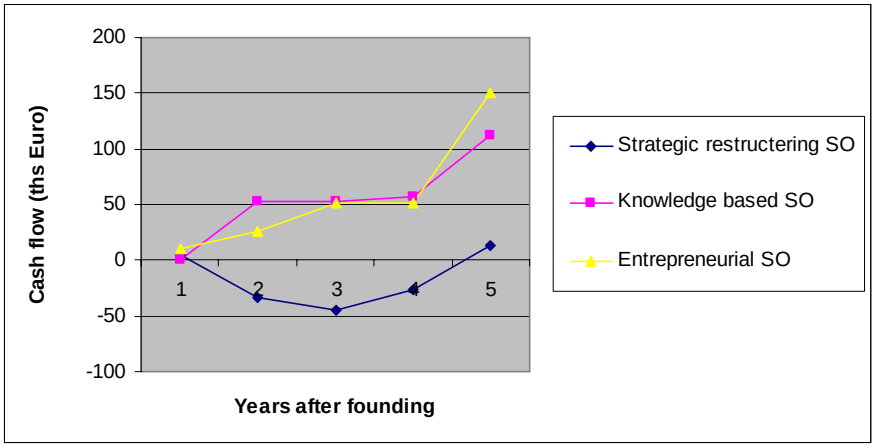

Figure 2: cash flow of the three types of corporate spin-offs

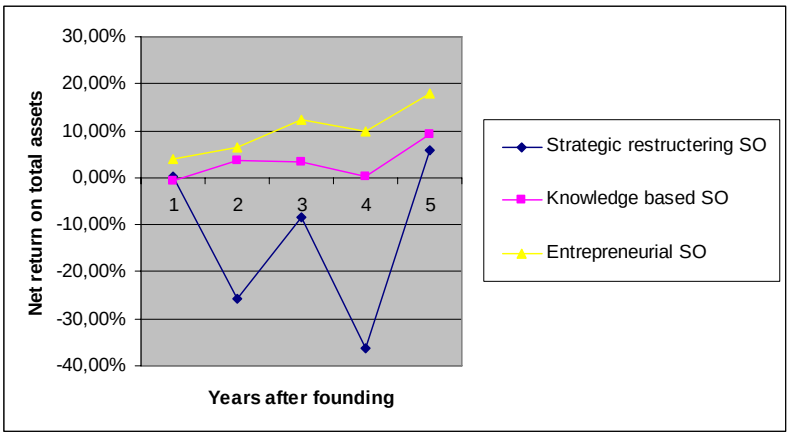

Figure 3: net return on total assets of the three types of corporate spin-offs