

# Strategy For Developing Entrepreneurial University Through University Spin-Offs

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**Abstract:** This paper indicated the perception of university-based companies. Spin-off is perceived by the market of investors as a signal of firm quality, with university-based firms registering higher valuations and lower uncertainty levels compared to a matched sample of independent firms. However, despite the benefits yielded by links with universities in terms of a greater propensity to innovation, in the long term university spin-offs do not out-perform their counterparts. It analyses risk manifestations and management difficulties. Besides, the failure of entrepreneurs, seeing the organisation developing without them, pushes us to a subsequent and specific implication on exit strategies identified in this context.

**Key words:** strategy, spin-off, University entrepreneurship

## I. INTRODUCTION

University spin-offs are companies that transform technological inventions developed from university research that are likely to remain unexploited otherwise.

University researchers adopt three main mechanisms to transfer knowledge: conferences and scientific publications, training of skilled labour force, and commercialization of knowledge (Landry et al., 2006). Of these, the commercialization of university activities has become a key component in government agendas (Wright et al., 2006). There are fundamentally two main reasons why policymakers emphasize the concept of the entrepreneurial university. Firstly, the creation of more direct links between science and utilization may foster the process of technology transfer and contribute to global economic development. Secondly, in a context of restricted institutional funds, business activities may represent an important alternative source of financing for universities. Based on these assumptions, national governments have adopted a series of policy measures to increase recognition of intellectual property rights and create a supportive environment for the development of university-based firms. Universities have developed business incubators and formal programs for technology transfer. Consequently, universities are able to leverage the technology-transfer process directly while a variety of benefits are simultaneously provided to university-based firms (Ensley and Hmieleski, 2005). For instance, thanks to its affiliation with a university, a firm can access cutting-edge scientific knowledge more easily and more quickly (Smilor and Gill, 1986) and reduce the cost of acquiring resources it needs to build and maintain its competitive advantage (Mian, 1996). In addition, links with universities can have reputation effects that, in turn, can

facilitate collaboration with other organizations and enhance the credibility of a firm in the eyes of powerful stakeholders (Mian, 1997). University-based firms are therefore expected to exploit these benefits in terms of superior performance. However, little is known about the ability of these firms to translate the potential benefits into performance gains. Indeed, involvement of academics in creating new ventures may not be driven by an entrepreneurial attitude, but rather by the prospect of enhancing their academic position (Fini et al., 2006). Consequently, concerns remain that the goal of achieving substantial returns from the commercialization of university research is yet to be achieved (Lambert, 2003; Shane, 2004).

Recent studies found university-based firms do not perform as well as independent firms (Ensley and Hmieleski, 2005). So this has created an interest in understanding the potential drawbacks that hinder the translation of the benefits of being a university-based firm into substantial performance gains. Moreover, it would be useful to gain an understanding of how these benefits are valued by potential investors. Does the market of investors perceive the benefits of university affiliation and are they reflected in higher valuations and better performances?

In the last decade, the launch of second-tier markets in developing countries has, at least in part, fulfilled the aim of providing small and medium enterprises with the means to finance growth. Indeed, stock exchanges have successfully encouraged small firms to gain access to public listing by setting up dedicated markets with less stringent requirements. This gives us the opportunity to analyse successful university-based firms in a uniquely entrepreneurial activity, an Initial Public Offering. In the short run, we question if the status of affiliation with university institutions is perceived as a credible quality signal by investors. In the long run, we compare the performance of university-based and independent firms and investigate the determinants of the differences between the two categories. In particular, this paper focuses on the role played by the composition of Top Management Teams (TMTs) and their eventual ownership of the firm. This is particularly interesting in light of the risk-relevance given by potential investor in university-based firms to the business development skills of management (Wright et al., 2006).

## II. LITERATURE REVIEW

*Spin-offs phenomenon*

Spin-off is defined as “an independent firm the founder of which has left his previous job to start up a business of his own to exploit an idea deriving in some way from his previous employment” (Parhankangas and Kauranen, 1996). The

phenomenon of spin-off apprehends a particular career, namely creation of new companies by individuals having chosen an opportunity career-advancement (type “for the account of...” ) as figure 1 shows.

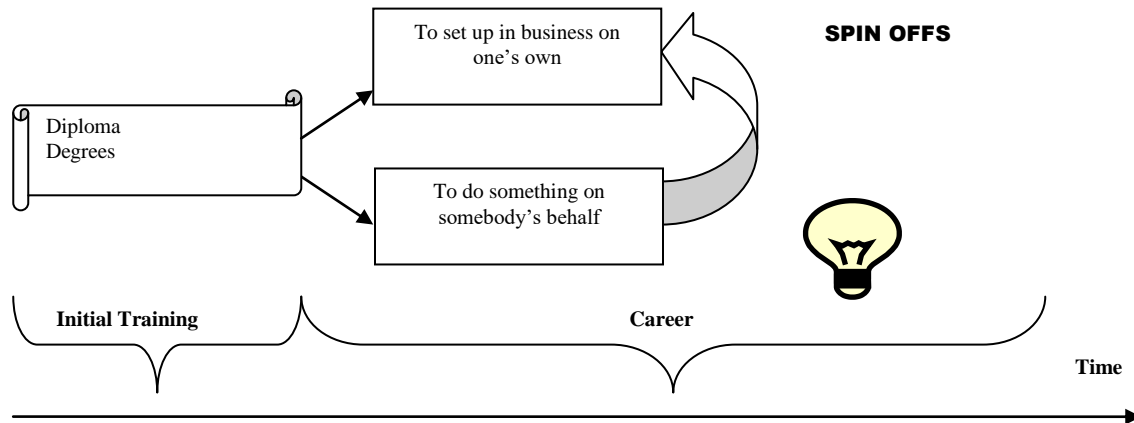


Fig. 1 - Description of the “spin-off” phenomenon

Source: Pirnay, 2001

### University spin-offs

The dissemination of knowledge generated in universities beyond the confines of the academic community itself is considered to be a driver of national and regional economic growth (Mustar et al., 2006). Given the importance policy makers place on the concept of the entrepreneurial university, commercialization of university activities has become a key objective for governments and universities (Clarysse et al., 2005). Moreover, in the last decade, budget constraints changed the model of how public funds are allocated and encouraged an increasing number of university officials to view technology transfer as an alternative source of revenue for their institutions. This induced universities to initiate joint-ventures with private companies and to developed research programs with tighter commercial perspectives (Geuna and Nesta, 2006). While collaborative relationships between universities and firms have existed for nearly a century in the United States, it is only in more recent decades that the interest of universities in the commercialization of new technologies has considerably increased elsewhere in the world (Siegel et al., 2003)<sup>1</sup>. A series of policies have been adopted by national governments, including European ones, with the aim of fostering the technology transfer process and of creating a supportive environment in which to create new technology based firms.

<sup>1</sup> In particular, the incentive for universities to extend their focus from basic research to commercialization is related to favourable legislation (e.g. Bayh-Dole Act of 1980 in the U.S.) that decreases the uncertainty associated with the commercialization of government funded research (Shane, 2004) and facilitates technological diffusion from universities to firms.

The growing importance of an entrepreneurial culture to the universities has seen a great many new studies appear in the literature that focus on the following aspects: the role of legislation and the national system in stimulating academic enterprise (Shane, 2004), factors in the university environment facilitating the creation of business activities (O’ Shea et al., 2005), the institutional conditions under which spin-offs are incubated (Lockett et al., 2005), the characteristics of individual academics who become entrepreneurs (Landry et al., 2006), the benefits firms derive from affiliation with a university institution (Mian, 1996), and the value creation capacity of university commercial initiatives (Lambert, 2003). This study is related to the latter two streams of literature.

### III. RESEARCH METHODOLOGY

This paper is the result of theoretical reflections combined with a case study analysis. “Qualitative research takes place in the natural world, uses multiple methods that are interactive and humanistic, focuses on context, (...) is fundamentally interpretive” (Marshall and Rossman, 2006). Our analysis concentrates on a single case study (Yin, 1984), built on an individual lived experience (Gall, Borg and Gall, 1996), with in-depth interviews, to understand, first an individual and, then, an organization. The case method “investigates a contemporary phenomenon within its real life context, (...) is most relevant when the boundaries between phenomenon and context are not clearly evident and when multiple sources of evidence can be used in support of research questions” (Yin, 2003, p.14). A case methodology allows research to illustrate or explain the decisions and motivations that underlie observed process beyond evidence-collection (Sarantakos,

1993) and to identify and understand those detailed interactive processes which are crucial for the understanding of a complex business context (Bryman, 1988; Remenyi, Williams, Money and Swartz, 1998; Gregson and Harrison, 2006).

As Crabtree and Miller (1992) offered useful conceptualizations of the cycle of inquiry, we entered a cycle of interpretation seeking no ultimate truths. The concerned case is a spin-off in the chemical sector, issued out from a spill-over of a well-known French company *Air Liquide* and the French atomic energy commission (CEA). Our purpose is to catch in depth the complexity of the studied phenomenon (the process of enterprise creation and the founders retreat), in order to appreciate and understand its dynamics. This case was chosen because it allowed us to obtain full data of one of the company’s founders, a still painful adventure now in reorganisation : acceptance and life reorganisation stage according to mourning theory (Pailot, 2000). We transformed in-depth interviews, close and personal, into a case study, integrating documents analysis.

Sources of information included primary and secondary ones. Primary sources are based on semi-structured interviews with one of the founders. Elite interviewing has, in one hand, many advantages as it provides valuable information, an overall view of the organization, a familiarity with the legal and financial structures, and an ability to report on an organization’s policies, histories and plans. In the other hand, it presents disadvantages as the initial contact, and taking charge of the interview (Marshall and Rossman, 2006). Three interviews were conducted for a total of ten interview-hours. Direct observation wasn’t able because of his exit of Technology Solutions.

Secondary sources included artifacts and documents from spin-off firm, catalogues, journal and magazine articles (table 1).

Table 1 : Case study data sources

<i>1- Primary Data</i>
<i>Interviews :</i> <i>1- Spin-off, Technology Solutions Founder, President, Manager (3 interviews, 10 hours)</i>
<i>2- Secondary Data</i>
<i>Press releases :</i>
- <i>March 1<sup>st</sup> 2018 : 40-30 to acquire Technology Solutions to confirm its commitment in nanoelectronic and to reinforce its development in ultra cleanliness.</i>
- <i>October 14<sup>th</sup> , 2019 : Technology Solutions to announce advanced Technologies, to be compatible with Four For One ® Technology.</i>
- <i>June 20<sup>th</sup>, 2020 : Technology Solutions to deliver Four For One ® Technology to a major Korea Microelectronics Manufacturer.</i>

Source: Developed by the author, 2020

#### IV. RESULTS DISCUSSION

The university spin-off is among the most stimulating and puzzling research issues. In general terms, valuing a company

going public is already a question of considerable practical and theoretical importance, for policy makers, academics, as well as investors. In particular, it is important to understand how the linkage of a firm with a university is valued and whether it does affect its performance or not. IPO-firms therefore provide a favorable setting in which to study the valuation and performance of a company by using market-based measures. Consequently, this study examines the market valuation and performance of the university-based firms and compares them with their independent counterparts.

The uncertainty and information asymmetries surrounding IPO-firms make it difficult to discern firm quality. Much of this uncertainty is due to the lack of information available prior to the public offer, when the company is still in private hands. The primary means for communicating information about the firm is the offering prospectus, that is mandatory published by all the companies seeking floatation on a stock market. Since owners and managers can be held legally accountable with regard to the accuracy of the information disclosed in this document, it represents the best source of information on the quality for the firm. Previous research has relied on signalling theory to guide the exploration of those signals contained in the prospectus that might impact the potential investors’ assessments of firm value and post-issue performance (Ritter and Welch, 2002).

The resource-based view of the firm (Wernerfelt, 1984) also applies to our prospectus-based approach. Consistent with this view, information contained in the prospectus might indicate firm-specific resources that could encourage investors to more highly value the IPO-firm, based on its potential for achieving sustained competitive advantage. Accordingly, being a university-based firm could be viewed as a valuable and non-substitutable resource sustaining future performance. The signaling theory and the resource-based view are therefore two complementary keys to investigating the extent to which IPO prospectus information on university-linkages is valued by the market and related to performance.

For Marchesnay (1998), the treatment of the risk by the researchers remains more than circumspect. For the ISO (2002), it is a question of assessing the risk, of treating it, of accepting it around and of communicating. That means that, in first stage, the risk is clearly defined (internal and external risks, accidental risks, risks related to the environment, risks related to the functions of the company, legal risks, social risks, etc.). Once located and determined, the risk is analysed and evaluated according to the probability of occurrence and the consequences in terms of gravity in order to offer forecasts. Lastly, it is treated according to whether it is accepted or refused, controlled, financed, reduced and transferred to thirds. All in all, the process of risk management starts to be better apprehended.

To simplify the process, the majority of creators and entrepreneurship researchers are about in osmosis to suggest two main categories of risks: operational and strategic. Within the framework of start-up, Moreau and Bernasconi (2002)

prefer a distinction between operational risks and total risk. The operational risks exist within each stage (innovation not accepted by the market, funds raised lower than the needs), while the total risk is the final failure of the project. According to this characterization, the sequential and simultaneous modes will be both reducing and generating risks.

In the sequential development, there are operational risks. Each stage reached does not guarantee the success of the following one. Obviously, Technology Solutions illustrates perfectly the failure of the passage between a phase and the next one. It appears also that the sequential development in theory strongly resembles a disguised simultaneous development. At the take-off, the founders continue to invest massively in initial technology and in partners' prospection.

In a simultaneous development, we prefer a global vision to take into account a total risk. There is no change for the individual risks (global vision generates more complexity) but it allows a total risk reduction of the project. By this choice, the Technology solutions' creators could perhaps have avoided "forgetting" the industrial phase which is finally programmed only six years after the start. It appears that the creators made three fundamental strategic mistakes. The first one was to ask for an insufficient amount at the second round (Moreau and Bernasconi, 2002; Montchaud, 2004).

As R & D directors, they did not transform themselves into managers and especially into majority shareholders in their spirit. Their mistake was to invest the totality of the resources in the standard and its improvement. They remained R&D directors, they wanted to finalize the perfect product and to sell it only at this time. All the difficulty lies in the knowledge of the moment when it is necessary to stop searching and leaving a marketable finished product. However, if the founders do not recognize it, others know that it is too late for them and benefit from it to negotiate their exit point.

## V. CONCLUSION

This paper indicates the university spin-offs have gained access to the public equity markets in recent years. The main contribution is to investigate the previously unaddressed issue of the valuation of university-based firms. To this extent, we adopt a market-based perspective by selecting a sample of European university-based firms that recently went public.

Matching the sample with independent firms, it is found that on average university-based firms are less profitable at the listing. On the other hand, these firms are more innovative and the affiliation with a university, associated with more prestigious TMTs, is perceived by the market of investors as a signal of firm quality. The listing of university spin-offs is indeed associated with higher valuations and lower uncertainty levels.

However, despite the benefits yielded by university affiliation, we find that university-based firms do not out-perform independent companies in the long run. Three years after the IPO, stock market abnormal returns show that university-based firms do not register better performance than independent firms. It could be that managers of university spin-offs are less focused than their independent counterpart on assessing R&D project in order to select and finance only profitable ones. Therefore, more realistic valuation of intellectual property and of its marketability might improve the performance of university spin-offs.

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