

Peer-reviewed academic journal

**Innovative Issues and Approaches in
Social Sciences**

IIASS – VOL. 8, NO. 3, SEPTEMBER 2015

Innovative Issues and Approaches in Social Sciences

IIASS is a double blind peer review academic journal published 3 times yearly (January, May, September) covering different social sciences: political science, sociology, economy, public administration, law, management, communication science, psychology and education.

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IIASS has started as a Sldip – Slovenian Association for Innovative Political Science journal and is now being published in the name of CEOs d.o.o. by Založba Vega (publishing house).

Typeset

This journal was typeset in 11 pt. Arial, Italic, Bold, and Bold Italic; the headlines were typeset in 14 pt. Arial, Bold

Abstracting and Indexing services

COBISS, International Political Science Abstracts, CSA Worldwide Political Science Abstracts, CSA Sociological Abstracts, PAIS International, DOAJ.

Publication Data:

CEOs d.o.o.

Innovative issues and approaches in social sciences

ISSN 1855-0541

Additional information: www.iiass.com

BUILDING A UNIVERSITY FOUNDERS ORIENTED SPIN-OFF RESEARCH FRAMEWORK

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Abstract

To understand the impact of university founders on (university) spin-offs' success, we must first understand the roles (and functions) of founders, how university founders move through different roles and what is their level of engagement. In the present article I build a university founders oriented research framework; first offering a literature review, next looking at different roles of founders and delving in specific into two issues (lock-out vs. exit strategies and hands on vs. hands off approach). Lastly, I dedicate myself to developing a university oriented spin-off development framework that takes into account various development stages of university spin-offs.

Key words: university spin-offs, spin-offs, academic entrepreneurs, university founders, roles

DOI: <http://dx.doi.org/10.12959/issn.1855-0541.IIASS-2015-no3-art08>

Introduction

Universities are deploying from their strictly teaching function to a more research based role, also employing various channels of knowledge transfer. Most relevant commercialization channels include patenting, licensing, consulting, and firm founding. However, there are numerous indications that their success rate is a skewed one and there seem to be some “blockbuster rewards” by those universities that are adept at commercialization. What is more, it was indicated that most university TTOs are not profitable. Nonetheless, several authors find that university spinoffs are less likely to fail than industry startups at least in the short term.

I will rely on the definition of academic spin-offs from Nicolaou and Birley (2003a: 333-334), but shall narrow it. A university spin-off involves a transfer of a (core) technology from an academic institution to a

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company and the founding member(s) include at least one academic founder, who was at the time of founding affiliated with the academic institution.

The paper is built on previous works by authors studying various aspects of university (or academic) spin-offs. To name just one, the work by Bjørnali and Gulbrandsen (2010: 109), in which they study board evolution in university spin-offs and. I use their suggestion and apply it to questions of university founder changing roles inside university spin-offs. Authors such as Djokovic and Souteris (2008) were able to link the modus of university founder participation with the success of the spin-off.

To understand the impact of academic founders on academic spin-offs' success, we must first understand the roles of founders, how founders move through different roles; as well as circumstances that accompany those different scenarios. I look not only at the roles performed by university founders, but also at the level of engagement they exhibit. This is hence a part of a broader work dedicated to the issue whether or not university founders' roles and their level of engagement have any kind of impact on the achieved results of academic spin-off and understand what measures would need to be developed to research this.

Literature overview

Up until quite recently the research on entrepreneurial universities as well as university spin-offs has been quite lacking. According to Rothearmel et al (2007) the entire field of university entrepreneurship prior to 1990s was in the embryonic development stage. Furthermore, neither the broader field of entrepreneurship nor the more specialized area of university entrepreneurship have given us a dominant theoretical paradigm on which empirical research can coalesce. The rise of the research on the phenomena of university spin-offs has been gradual and fragmented.

The Success of University Spin-offs and New Firm Difficulties

There seems to be a distinction in efficiency between academic spin-offs and non-academic spin-offs. Although there is some data to support the notion that firms with an academic entrepreneur perform better as non-academic spin-offs in terms of proof of concept research, patenting, and the receipt of follow-on venture capital investment (Toole and Czarnitzki, 2007, 2009). The results are (mostly) not the same for considering other indicators such as sales, employment and return on investment of academic spin-offs (compare for e.g. Ensley and Hmieleski, 2005; Wennberg et al, 2011; Czarnitzki et al, 2014).

University spin-offs face several problems during their development, which include acquiring sufficient intellectual property, sufficient organizational knowledge and acquiring funding. The high risk nature of new innovative firms has led to a phenomenon known as the 'funding gap' in which new technology firms find themselves unable to find adequate funding for their ventures (Peneder 2008; Abatecola et al. 2012; Shane, 2004) and the inability to raise venture capital (VC) is often cited as the main reason for spin-off failure. Van Geenhuizen and Soetanto (2009) distinguished also market-related and management obstacles, with the lack of market related knowledge¹ being the most often encountered obstacle by academic spin-offs. Additionally, O'Shea et al. (2008: 660) note a region's "knowledge infrastructure" and industry factors act as "external determinants of spinoff activity".

Determinants of Spin-off Activity inside the University

Context

Literature and research is often devoted to determinants of spin-off activity within a university context. Authors are mainly focused on organizational determinants of university spin-off activity, institutional determinants of spin-off activity, external determinants of spin-off activity (such as the availability of the seed capital, funding programs for spin-offs and similar), the economic impacts of spin-offs or have applied a qualitative approach focusing on specific technological fields or research organizations (see for example O'Shea et al, 2014; Krabel and Mueller, 2009 and literature review therein). Most research is devoted to determinants pertaining to the beginning of the spin off activities (the most notable categories dealing with later stages are those analyzing

¹ They point out that although university founders receive courses or workshops, the marketing knowledge and skills cannot be fully achieved through courses. Also, the spin-offs' markets are often highly specialized *niche* markets, whereas courses are mostly standardized.

economic impacts or external determinants). But O'Shea et al (2014) and Djokovic and Soutaris (2007) also mention a limited number of research efforts connected to the development (and performance) of university spin-outs. Much attention is also given to the role of TTOs in general as well as more particularly with regard to spin-off activity (Colyvas et al, 2002; Phan and Siegel, 2006).

Involvement and Determinants of University Founders

Krabel and Mueller (2009), O'Shea et al (2014) and Phan and Siegel (2006) indicate that there have been “a small but growing number” of studies devoted to individual attributes of scientists.

Etzkowitz (2014; 1983) speaks of the entrepreneurial scientist as a new professional role. He sees three styles of participation in technology transfers, reflecting different degrees of industrial involvement (Etzkowitz, 2014). First is what he calls hands off approach, where scientists leave the technology transfer process entirely in the hands of technology transfer offices. The second are knowledgeable participants, who are willing to play a significant role in arranging its transfer. In the third modus Etzkowitz (2014: 20) puts forward a “seamless integration of campus research groups and research programs of a firm”. These scientists are more involved, hence more favorably predisposed to act as university founders.

We can also differentiate between academic entrepreneurship as a stage in an academic career or as an alternative career (Etzkowitz, 2014: 20). There are two viable paths here; researchers taking a sabbatical (or other types of (temporary) leave of absence) and later return to academia or those involved simultaneously in both the business endeavor and their academic career in a certain time period. Business activity may lead to a career in industry. It is often emphasized this is the path more often taken by researchers in earlier stages of their career (especially pre-tenure). Similarly, Nicolau and Birley (2003b) talk about “academic exodus” (when the inventor leaves the faculty to solely be involved with the new spin-off) or “academic stasis” (where the inventor stays (primarily) in the university and may or may not have a position in the company). Similarly, Meyer (2003) argues commercialization does not always entail the same goals and distinguishes “academic entrepreneurs” from “entrepreneurial academics”. The latter category is “scientists /.../ who are not necessary interested in setting up a fast growing company.” (Meyer, 2003: 107) This can have significant implications for further development of the spin-off as well as the role of the university founder inside the university spin-off. Autio (2000 in Meyer, 2003) finds that not all SMEs are growth

oriented. This can be applied also to spin-offs since “growth may not be the first and foremost aim of an academic spin-off” (Meyer, 2003), especially if we take into consideration so-called “entrepreneurial academics”.

Let us look at the characteristics of university (or academic) founders. The results by Krabel and Meyer (2009) indicate that the entrepreneurial activities of scientists heavily depend on patenting activity, entrepreneurial experience, and personal opinions about the benefits of commercializing research and close personal ties to industry.

Some overlap with the above results was found in an early study by Roberts (1991), which studied MIT technical entrepreneurs. He concludes that the characteristic influences on one becoming a technical entrepreneur are: family background; education and age, mid 30s as the age of founding; work experience, high productivity in terms of patents and papers, challenged by “source organization” work, goal orientation, personality and finally motivation (designed as important were: moderate needs for achievement and power, low need for affiliation, long felt desire for own business, heavy orientation towards independence and less concern for financial rewards).

Fishman et al (2014) also looked at MIT's academic entrepreneurs. They found the quest for the validation of their technology to be the strongest motivation for researchers to engage in entrepreneurial activities (and especially spin-off). Other motivating factors were mentioned in Fishman et al (2014), such as seeing “business” as interesting and stimulating; as well as the stimulus offered by the potential accumulation of wealth. Furthermore, Lam (2011: 1354) employs three concepts: “gold” (financial rewards), “ribbon” (reputational/career rewards) and “puzzle” (intrinsic satisfaction) to examine different aspects of scientists' motivation for pursuing commercial activities. He finds that there is a diversity of motivations for commercial engagement, and that many do so for reputational and intrinsic reasons and that financial rewards play a relatively small part. Berkowitz and Feldman (2008: 69) as well as several other authors have put forward that personal attributes are nonetheless conditioned by local work environment.

More insight on the founders themselves is according to Djokovic and Souteris (2008) offered by older works, reporting that many spinouts started on a part-time basis (the academics keeping their position at the university and “moonlight” into the new firm); and questioned their success and linking “academic exodus” with growth, finding that spinouts

with the highest growth rates were the ones involving academics who left the university.

Spin-off Teams

Researchers and practitioners have realized that effective innovation requires more than just a good idea and that building a spin-off is a “collective, network building achievement that centers on the inception, diffusion, and adoption of a set of ideas among a group of people who become sufficiently committed to these ideas and transform them into a social institution.” (Van de Ven et al, 1986: 95) The questions of how to build the team is hence pivotal to spin-offs (Dahl and Klepper, 2015; Rose, 2015).

We can expect that individual attributes of university founders will be relevant to what their position is during the spin-offs' development. The advantage of keeping the academics involved in the spinout process can be to increase the effectiveness of the technology transfer. It is also often indicated that the engagement of the university founder may be beneficial in the stages of attracting funding; they are usually skilled in grant writing, as well as have a positive effect on attracting venture capital, possibly due to their technical skills¹.

However, one of the common deficiencies of university spin-offs is their tendency to over-focus on technical aspects, even to the detriment of achieving (necessary) business goals (Otto, 1999; Ambos et al, 2008). This is corroborated by studies such as Daniels and Hofer (1993 in Ambos et al, 2008) and Lockett et al (2003), showing that academic inventors often bring a strong knowledge of technology, but also focus too much on technical issues to the detriment of business considerations. Clarysse and Moray (2004) found that entrepreneurs who come out of a pure academic environment only gradually learn to adapt to the needs of business. But there are some “star scientists” that excel in generating academic and commercial success (see for example Zucker et al (2002) focusing on biotechnology; as well as the literature focusing on individual cases).

¹ Some studies have found university spin-offs to be more likely to obtain VC than other technological start-ups (Ortín-Ángela and Vendrell-Herrerob 2010). Some believe that the presence of the university founder has a positive effect on procuring funds, however other also warn that many research-based spin-offs do not receive funding because they have no experienced manager within the start-up team (Clarysse and Moray, 2004). Once funding is obtained venture capitalists are able to exert control over the firm.

Since spin-offs that include a university entrepreneur seem to do better in the first stages (proof of concept, etc.), and worse in later stages¹, this enhances our hypothesis that the involvement of the university researcher may be pivotal in early stages, but not later on.

With regard to the role of founders and founding team, the literature generally debates the effect of the involvement and role of academic and/or surrogate entrepreneurs during the spinout formation process on the performance of spinouts. The debate partially stems from the notion that in technology based spin-offs, teams with both technical and business skills are generally considered to have better chances of success compared with teams consisting solely of technical or business experts (Otto, 1999). As mentioned by Wright and Filatotchev (2014), Lockett et al (2005) and Franklin et al (2001) external entrepreneurial actors or so-called “surrogate” entrepreneurs are often involved in opportunity search. According to Franklin et al (2001) they raise the probability that the venture will succeed commercially.

Not all researchers concur in this issue, based on their dissimilar findings (for *vice versa* findings see for example Djokoic and Souteris, 2008; Birley, 2002). Clarysse and Moray (2004) highlight some further problems of involving surrogate entrepreneurs, including their high turnover, problems in accepting the academics as well as their lack of technical understanding. Hence, *ibid.* offered a different solution, relying more on the university founder (and their team) than on “surrogate entrepreneurs”, suggesting that instead of hiring a CEO at the start-up of the company, it might be a more efficient choice to “coach” the start-up team. Inside his case studies Meyer (2003) showed that managers can and do change the orientation of university spin-offs towards growth; and that this re-orientation can also follow when the university founder is getting a business education. We could conclude that this may change the “entrepreneurial academic” towards an “academic entrepreneur”.

Towards a university founder oriented framework

New Firm Development Stages

We first offer a comparative Table of spin-off development phases as seen by some selected authors and match them to four stages of university spin-off development we call inception, conceptualization, positioning and maturity.

¹ However, according to some (see for example Stephan, 2014) some public spin-offs seem to still thrive in regard to some innovation indicators such as the average number of radical innovations.

Levie and Lichtenstein (2010) provide a review and assessment of all stage models of firm development from 1962 through 2006 and find no general consensus on stages, or empirical evidence of stage models' efficacy. Still, this approach to understanding firm development predominates. *Ibid.* propose a dynamic states model, which differs from stage models in two ways. First, the dynamics states model does not have a specific number of stages through which firms pass and second that the stages are more complex and nonlinear than stages models suggest. More practical "stages" are described in Rose and Patterson (2016-forthcomming), whereas van Geenhuizen and Soetanto (2009) distinguish spin-offs according to their years of existence. The problem with the latter approach was addressed already in Van de Ven et al (1986: 91) emphasizing that different stages of spin-off development are not strongly correlated with the age of firms.

Table 1: Spin-off development phases

Develop. phases	Van de Ven et al, 1986	Mustar et al, 2000	Vohora et al, 2004	Degroof and Roberts, 2004	Vanaelst et al, 2006	Ndonzuau et al, 2002	Kazanjian and Drazin 1990
Phase 1: Inception	Gestation		Research	Origination	Research commercialization and opportunity screening	Generating business ideas from research	Conception and Develop.
Phase 2: Conceptualization	Planning	Spin-off creation	Opportunity framing, Preorganization	Concept testing	Organization-in-gestation-phase Proof of viability of a newly established venture	Finalizing new venture projects out of ideas, launching spin-off firms from projects	Commercial-ization
Phase 3: Positioning	Contract services, Proprietary Products Stage	Spin-off development	Reorientation	Start-up support			Growth
Phase 4: Maturity	Multiproducts		Sustainability		The maturity phase	Strengthening the creation of economic value by spin-off firms	Stability

Source: author's elaboration

However, for the needs of our research, we have developed a 4 phase (or stage) model as seen above, since we need to have some way of tangibly distinguishing between them. We expect the phases or stages to have different time-frames for different types of spin-offs; hence they are defined descriptively.

The inception phase includes *inter alia* (please note that we are putting forward only some typical activities, however some activities listed will continue throughout other stages/phases as well): research, research

commercialization and opportunity screening (generating ideas on both the business as well as technical level), IP applications (if necessary/prudent). The conceptualization phase includes concept testing, opportunity framing - development, decision to proceed with founding a spin-off by the university founder, contracts on IP signed with the university, (interim) team building, interim management, research& development are still in full progress. Positioning includes establishing the management team and filling other necessary positions, VC funding is sought, changes in equity happen, there are possible management changes, reorientation can occur, IP decisions are made, decisions on the business orientation of the firm are made, (product) development continues. In the last stage of maturity some exit strategies such as IPO, merger or acquisition are considered, equity is further diluted, business is scaled up.

Roles of Different Groups inside Academic Spin-Offs

Inside the development stages different groups (sometimes called entrepreneurial groups) will play different roles while involved in a “collective action” inside the new firm (Ruef, 2010: 7). Ruef (2010) distinguishes the roles based on two criteria: regular contribution to the organization and financial stake. We have however decided to put the emphasis on the centrality vs. periphery of roles they play in different spin-off development stages. Ruef (2010) already notes that these are only ideal-types that apply inside the development phases.

TTO staff plays a pivotal role in the beginning. Relying on abundant literature on university technology transfer (from theoretical to practical) we can safely conclude that opportunity search is undertaken primarily by the TTO staff and the academic¹. Individuals from incubators and accelerators can also take on more important roles that will go also beyond the timeframe of the TTOs' involvement.

Another group that can be influential and may play an intermediate role is the so called “cadre of angels” (Etzkowitz, 2014: 25). These are scientists that have already gone through the experience of founding a company, have an extensive network and ties; and may help the new venture either with financial support, or (more usually) with advice. The management team enters either immediately as part of the founding team or during early stage development. The legal incorporation of the company is sometimes seen as the entrepreneurial event marking the

¹ The role of the TTO in future stages of spin-off development may differ. It can range from a predominantly “hands-off” or “pro-academic entrepreneur” approach, such as at MIT (Fishman et al, 2014), to a more “hands-on” TTO approach, such as at Yale (Breznitz, 2014).

company's move from the pre-startup to the post-startup era (Clarysse and Moray, 2004). This is often connected to the founding team splitting into the management team and the board of directors (Vanaelst et al. 2006) – bellow we are treating them together. Other interested groups can have strong influence inside the spin-off, especially the investors (in later stages). Relationships and roles are often fluid during spinoff creation and development. In the view of the resource dependence perspective, the evolution of the groups involved is a response to the changing resource needs of the spin-offs.

Table 2: Predicted roles of involved groups along development spectrum

Phase/ group	University Founder	TTO Staff	Angel Investors	Entrepreneurial Resource Organizations	Management and Board of Directors	VC/ Oth. Investors
Phase 1	C	C	N/A	M	N/A	N/A
Phase 2	C/M	C/M	C	C	C	M
Phase 3	M	M	M	C	C	C
Phase 4	P	N/A	N/A	M	C	M/C

Source: author's interpretation

Legend: C= central; M=medium; P=peripheral; N/A= not applicable

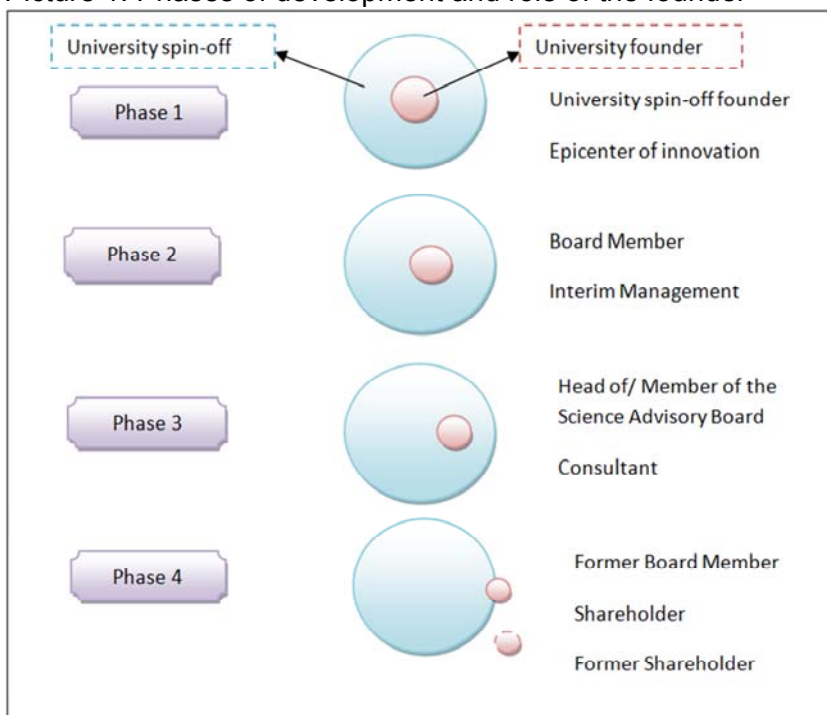
The general inattention to power in the field of organizational theories is somewhat intriguing given that leading organizational theorists have indeed addressed this matter at least to some degree. The conflict within groups can be a cognitive conflict, stemming from diverse skills and opinions of group members, a process that can lead to fortification of business strategies. But it can also be an affective conflict for which Ensley (1999) believed that the skills diversity could lead to frustrations towards individual group members. Power struggles between different groups do exist and are sometimes seen in practice as well as acknowledged by the literature (Van de Ven et al, 1986; Ensley, 1999; van Geenhuizen et Soetanto, 2009). There is nonetheless some evidence that especially the need for rapid decision-making could lead to a sublimation of personal conflicts inside start-ups (Eisenhart and Burgeois, 1998).

University Founders and their (Evolving) Roles in University Spin-Offs

Different roles seem to be associated with different stages of company's development; roles of the university founders shifting from one of centrality to peripheral roles, such as participating in the advisory board.

Although many university researchers who participate in the creation of a business entity typically expect to stay in control of the entire commercialization process (or at least to control the endeavor to the point they satisfy some of their (commercialization) aspirations) they are more often than not moved from the central figure of the whole enterprise to periphery. Thus they are gradually sidelined and lose most if not all influence in the company (Rose and Patterson, 2016-forthcoming).

Picture 1: Phases of development and role of the founder



Source: Author's interpretation; partially based on Don Rose, Research to Revenue Workshop, 2015

In the (pure) research stage or the stage of the inception of the technology itself, the researcher is the epicenter of the whole endeavor,

since it consists mostly of the invention process¹. Traditional notion is that “nascent university founders” are mostly PIs (primary investigators), or there is a coalition of researchers. More uncommon is a situation where a more periphery member of the original team steps into the position of the university founder. The involvement of a more established researcher facilitates the use of university laboratories for research, which tends to stretch beyond the phase of inception, at least to the phase of conceptualization and beyond (often in the positioning phase as well). This however is not favored by universities or the public since it is perceived as an unfair draining of public resources². But we must note that the gap is closing between established scientists trying their hand as academic entrepreneurs (or as entrepreneurial academics) and young researchers searching for new opportunities in an “academic exodus” scenario. Whereas, the older PIs usually have more experience, more prior entrepreneurship experience (at least as consultants) and higher social capital; the young researchers have stronger motivation (since this is many times their only path). Indeed, older researchers seem to realize that university spin-offs are built also in order to “help-out” the younger colleagues (Roberts, 1991).

As already mentioned, external entrepreneurial actors or so-called “surrogate” entrepreneurs are other times involved in opportunity search. However, often the university founders have the role of the interim management (or member of the board) in the early stage and will hence also be able to greatly affect the business decisions. However, also a full management team may be recruited early on (Wright and Filatotchev, 2014: 250). However, the academic researcher is (often) involved in the process of the CEO recruitment.

Generally, the university founder is the central figure in the phases of inception (phase 1) and conceptualization (phase 2) - both in terms of opportunity finding as well as official positions inside the spin-off. Their usual roles being that of the founder (or one of the founders) of the university spin-off, the epicenter of research endeavors, board member and (possibly) the interim management.

In the positioning phase business elements come in the forefront, both in terms of management, as well as the management of funds and distribution of equity. The spin-off will attract more people and the

¹ Univeristy founders' role is not always solely dependent on researchers' motives and wishes, since also factors such as university rules may come into play (Breznitz (2014:210-211) points to some limitations at Yale).

² Some examples to the contrary have been reported in the past (Roberts, 1991: 12).

specializations of tasks will commence. The management team will usually need to be found at this stage, if not yet engaged.

The quality of the management team and the team in general is considered as, if not more important than the technology in this stage (Wright and Filatotchev, 2014: 250). As for any spin-off the acquisition of a good managerial team is dependent on four types of elements: personal contacts, experience and knowledge, physical resources, and financial resources (Witt et al, 2008)¹. Also the bulk of research has either already been conducted at this stage or it no longer relies solely on the university founder (and his lab), the main emphasis being rather on development. There is usually a bigger team, which is quite possibly not exclusively (or not at all) reliant on the university founder and his university lab.

The path of the university founder towards more peripheral roles thus begins here. It may begin either due to the preferences of the university founder or due to the business decisions of the “new” management. The university founder will either assume the role of SAB head or become a consultant. The founder’s role thus becomes more limited toward the scientific, technical and/or research decisions (advice). Their influence on business decisions diminishes. Also the founder’s technical influence can be minimized, especially if the technical plans differ from business goals². From accounts of practical examples we conclude this is also sometimes the start of dissatisfaction of the university founder, providing they have a different vision going into the business endeavor. Also if the academic becomes involved in the venture but does not leave the university (hence taking the academic stasis career pathway), there may be important implications for the often conflicting demands on the university founder’s time. University founders that decide to remain employed by the university are faced by balancing a number of different functions that are both academic (research, teaching and administration) and commerce oriented (developing and spinning-out the company). On the other hand, research has shown that spin-off engagement increases over time (Van de Ven et al, 1986). The more involved the academic

¹ *Ibid.* have not found a significant positive correlation between the networking activities of founders and the spin-off success; which is somewhat unusual, but shows that founders participations goes only so far. However, it is a possible indicator that not only the engagement in the (here: networking) activities are important, but also the level of this engagement may play a significant role.

² For example investors will usually prefer spin-offs with solid plans and carefully thought out plans to address well-defined markets. Investors (or the management itself) will usually wish to narrow the portfolio of the business. This may very well not correspond to university founders' initial aspirations.

inventor becomes in the commercialization of new technology through a spin-out company the less time he or she (all other things being equal) may be able to commit to their academic role (Lockett et al, 2003). *Vice versa* is true as well; as time goes by the university founder might get caught back in various academic functions, not permitting him ample time to dedicate to the spin-off.

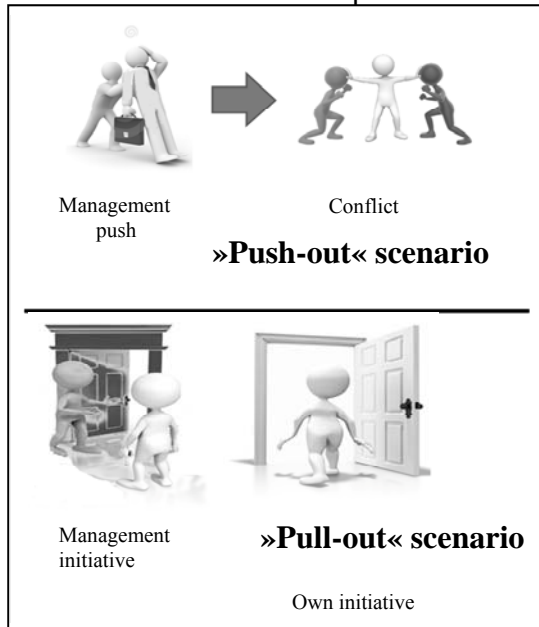
Inside the last phase of the spin-off, the maturity phase, the founder is sometimes faced with complete lock-out from all decision making processes. This is a good time, if it is monetarily viable for the spin-off as well, for him to make an exit strategy. The usual roles of the university founder at this stage are therefore one of the shareholder and often a formal board member. However, the university founder will perhaps step away from the spin-off entirely, not even owning any equity. But even in the maturity phase this path to periphery will be delayed or even not happen at all, if the university founder has taken the academic exodus path and his involvement is continuously aligned with interests of other groups and his own aspirations.

Relationships between Groups: "Lock Out" or an "Exit Strategy"?

Whether we are talking about a "lock-out" or an "exit strategy" depends on whether we are dealing with a "push-out" or "pull-out" scenario. In a "push-out" scenario the road of the founder toward the periphery is insinuated by the management of the company (or what we call "surrogate entrepreneurs"); believing it is better for the spin-off if the founder has less influence on the business side of the spin-off (or has less influence overall in the spin-off). If the university founder opposes this idea we are faced with a conflict.

What is the basis of a potential conflict? Due to the fact that university researchers will tend to be more technically oriented, their ability to define business opportunities and attend to business opportunities may be lower. Authors have noted that it is true even in general that business models need to be abandoned later on and major and minor adaptations to the initial model are inevitable. However, it would seem in a university spin-off this reality is easier faced by the management team than by the university founder. This sets the stage of potential conflicts and can initiate the beginning of the university founders "path" to periphery.

Picture 2: “Push-out” and “pull-out” scenarios



Source: author's interpretation

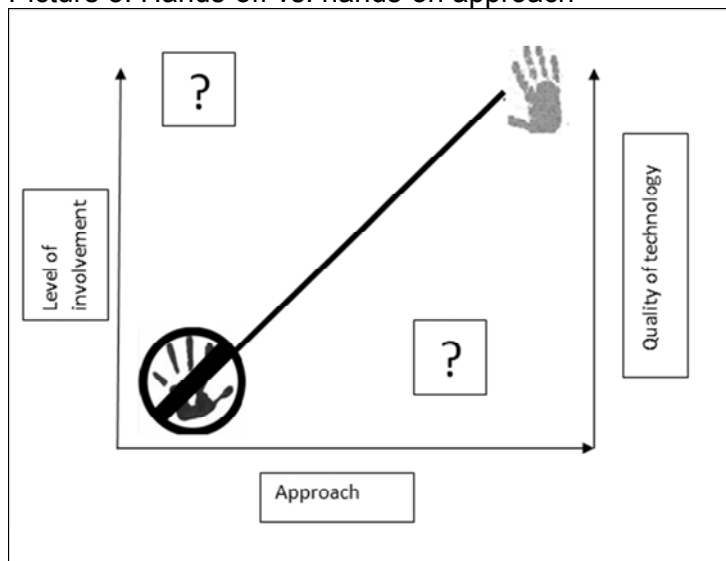
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A “pull-out” scenario follows the path the founder has taken voluntarily. It can either be an “early decision pull-out” or a “late decision pull-out”. In the first case, the founder has had an exit plan all along. That is he was planning on pulling out of the management and perhaps even owner structure of the spin-off from the beginning on. A late decision to pull-out may be based on founder’s own initiative, realizing - as the spin-off develops - he no longer wishes to participate in the managerial or business side of the venture or even does not wish to have any more links to the spin-off at all (not even owning equity). The initiative for a late decision pull-out may come also from the spin-off management, however in this scenario the founders internalizes that suggestion (at least to the degree of agreeing with it) and makes an exit. Hence, no conflict ensues.

The Level of Engagement: a Hands-On or Hands-Off Approach?

We believe not only the (evolving) roles of university founders play a part and can contribute to the success of the whole venture, but also especially the level of engagement university founders' exhibit. Or in other words, we are talking here about the willingness to work or the level of commitment to the spin-off (Van de Ven et al, 1986).

Picture 3: Hands-off vs. hands-on approach



Source: author's interpretation

Hence, it is not only of importance if the funder has a certain position (for e.g. a position in the scientific board), but it is pivotal if he is indeed active within it. The level of engagement can also be seen through founders' willingness for actions that may sometimes not be optimal for him overall and he would not engage with them would he not be an active participant in the spin-off. Examples of such actions could be a decision to not publish (due to intellectual property concerns), or to publish an article in perhaps a less scientifically excellent journal, but with a more entrepreneurial readership, which might alert potential (business) partners to the spin-off.

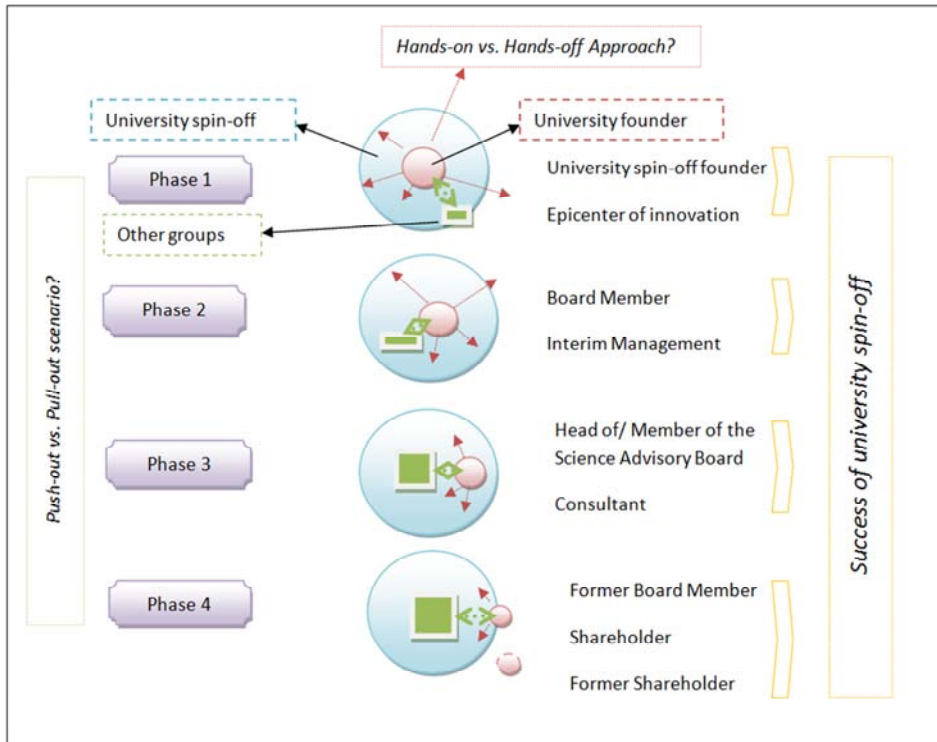
As we have written above there is an increase of time that the spin-offs demand as they develop, which has been already documented in prior research. We believe that the determining factor is not only time spent on working on the spin-off, but also the level of engagement exhibited

not only through time dedicated but also through activities university researcher is engaged in during it.

A university founder oriented framework

As seen from the literature above a myriad of different founders attributes can be considered that can influence university founder's decision to be a more active or a more passive actor in the spin-off. Interestingly, the level of engagement has so far been neglected when looking at university founders.

Picture 4: General framework



Source: Author's interpretation

The level of engagement cannot be seen as a standalone factor. We see the interesting situations in relation to the quality of the technology itself. Where the technology is solid and has commercial potential, the higher level of founder's engagement may only be seen as an additional plus. In a situation when technology is sub-par, we can hardly expect that founders' high level of engagement will play much of a difference. However, the interesting situations are when the technology is not

excellent, but still satisfactory – which are the situations where the level of engagement of the university founder might have the most effect.

In Picture 4, relationships between founders and other groups (especially the managerial group) and the level of engagement are taken into account inside different spin-off development phases¹.

Conclusions

As sub-organizational pressures towards commercialization of science and organizational re-orientation toward entrepreneurial universities grow, scientists are becoming more proactive in commercializing their research results. More and more research is oriented into factors of success, including looking into attributes pertaining to university founders.

The article offers a university founder oriented research framework that takes into account various phases of spin-off development. In order to be able to understand the effects of university founder roles and the level of their engagement on spin-off success, these roles and engagement levels need to be researched and analyzed; the framework providing a tool to do so.

The contribution is hence twofold. Firstly, I alert to the fact that spin-offs are not static and should be considered dynamically inside research pertaining to university spin-offs. Secondly, I provide a framework for research on if and how the roles and the level of engagement of university founders affect university spin-off success.

¹ Contemplation on measures of success goes beyond this article.

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