

FOSTERING SURVIVAL OF UNIVERSITY SPIN-OFFS

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ABSTRACT

Despite an increasing attention to creating university spin-offs (USOs) in the past years, the results remain rather disappointing, with many academic ventures failing to reach their objectives. The purpose of this research study is to examine what competencies entrepreneurs need to develop in order to foster their startup survival and generated impact. This is researched by examining the impact of the degree of commercial expertise, resources made available by parent universities, the quality of an entrepreneur's networks and the ability of the USO to acquire patents on the USO survival rate. By conducting interviews among entrepreneurs from Dutch USOs, this research study aims to help future entrepreneurs in setting up their business. Specifically, the findings indicate that the above mentioned factors all help in fostering USO survival, although some more than others. Commercial expertise and resources made available by parent universities are both very helpful in the early stages of development, though they could be compensated by high quality networks. Acquiring patents is crucial for tech USO in order to become a successful and sustainable business. This research study contributes to the academic entrepreneurship research field by building on previous research on these factors and the survival rate of USOs. This study also contributes relevant insights to entrepreneurs and managers of academic ventures by demonstrating the importance of USO determinants fostering the survival and growth of their USO.

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Keywords

University spin-offs, survival rate, commercial experience, resources, networks, patents

1. INTRODUCTION

Nowadays it is well-known that universities can play an important role in the development of new technologies. The creation of businesses of the bases of these technologies, and other university research, has become an important part of innovations policies in most countries (Wright et al. 2007). These new businesses, known as university spin-offs or USOs, have become more and more important over the last years. They will generate new innovations, accelerate productivity, and create jobs and prosperity for regional economies (Van Praag & Versloot, 2007). These positives about USOs are still very relevant, so the spin-offs can positively contribute to a society when they are successful. Therefore, policy makers, governors and universities promote the establishment of university spin-offs. Besides this, university spin offs can help young entrepreneurs to gain a lot of experience in setting up a business, which could be very helpful for them, and possibly for society, in the future. Even with this known importance of USOs, the majority of institutions have a track record comprising a very limited number of successful spin-off firms (Mustar et al. 2008). And even though the early stage survival rate of USOs is generally higher than the rate of other startups, USOs are less successful in the long term. Therefore, it is important to study USOs and find out which factors can foster USO survival.

This paper discusses various factors that can foster USO survival, and explain how and why they are important for both universities and the academic entrepreneurs. Rasmussen & Wright (2015): "Understanding how universities can promote the establishment and growth of spin-offs requires detailed knowledge about how these firms develop and the type of conditions and support that facilitate their success." When this knowledge is missing, the university does not provide enough support to the spin-off, while the spin-off itself does not ask for this support enough. That often results in unnecessary poor results from the startup, which is what both parties want to avoid. Although there has been a lot of research into USO survival already, there is still a lot of uncertainty about the most important factors on the survival rate. This is the first reason why this research was conducted. On top of that, most previous research has been monitoring American and/or English universities, while this paper focuses on Dutch universities. This could provide a new perspective on spin-off survival rates, since there could be differences between the countries and their approaches.

The research question of this paper is: ***How can different competencies of entrepreneurs and universities foster the survival rate of Dutch university spin-offs?***

To answer this question, this paper reviews some previous research, but also conduct interviews among entrepreneurs of spin-offs from Dutch universities. These interviews provide personal experiences from the entrepreneurs, which can provide a wider perspective on the matter. Besides that, it is more focused on universities in the Netherlands, while previous research is mostly conducted in other countries. This could highlight potential differences between Dutch USOs and those from different countries. To answer the research question, four important factors that influence USO survival rate are considered. These factors have been picked based on research in previous papers. The four factors that are discussed are: the degree of commercial expertise (Mathisen and Rasmussen, 2019), the amount of resources made available by the parent university (Calvo et al. 2012) (Lockett and Wright, 2005) (Thursby and Kemp, 2002), the quality of the entrepreneur's networks (Perez and Sánchez, 2003) (Walter and Ritter, 2006) and the ability of USOs to acquire patents (Fernández-López et al. 2020) (Franzoni and Lissoni, 2006). Interviews were

conducted with entrepreneurs of spin-offs from Dutch universities to gain more insight into these factors and how they foster USO survival.

The availability of commercial expertise focusses mainly on whether the entrepreneurs have had previous commercial experience, or if they had received advice from someone that did have this experience. If the commercial experience was indeed available, the entrepreneurs explain why and how this experience was helpful to them in the early stages of their USO. If the commercial experience was not present, the entrepreneurs explain why and how it could have been useful to them, and what they would do different if they were to start another business. The degree of commercial expertise is expected to foster USO survival.

The amount of resources made available by the parent university is the next factor that is discussed. The entrepreneurs explain which resources, either financial or non-financial, were made available to them and how they used these resources. They also elaborate on whether they needed more or less resources for their company to succeed in the early stages of development. The amount of resources made available by parent universities is expected to foster USO survival.

The influence of the quality of the entrepreneur's networks is also examined. When starting a business, it can be very important to have access to some good networks. Potential customers, investors, suppliers or other researchers who could help the entrepreneur can all be found from these networks. Universities usually have access to a very wide range of these networks and therefore spin-offs could use this access. That's why the influence of the quality of these networks on the survival rate of USOs in their early stages is examined. The quality of an entrepreneur's networks is expected to foster USO survival.

Lastly, the ability of USOs to acquire patents. This factor considers whether the entrepreneurs got any patents for their business and its technology, and why and how these patents were useful to them. If they did not acquire any patents, they elaborate on why they did not and if and how patents could have potentially helped their business in its early stages of development. The ability of the USOs to acquire patents is expected to foster USO survival.

The following section of this paper provides a theoretical framework, in which the four factors are discussed in more detail. Previous research is used to determine why these factors are important and how they play their role in USO survival rates. The third section provides the research methodology, which explains how the research for this paper was conducted and processed. The next section shows the results of the conducted interviews. After that, these results are discussed. The influence of all the factors on survival rate, and on each other, are explained. Lastly, both the theoretical and practical implications of the paper are discussed, as well as limitations and potential for future research.

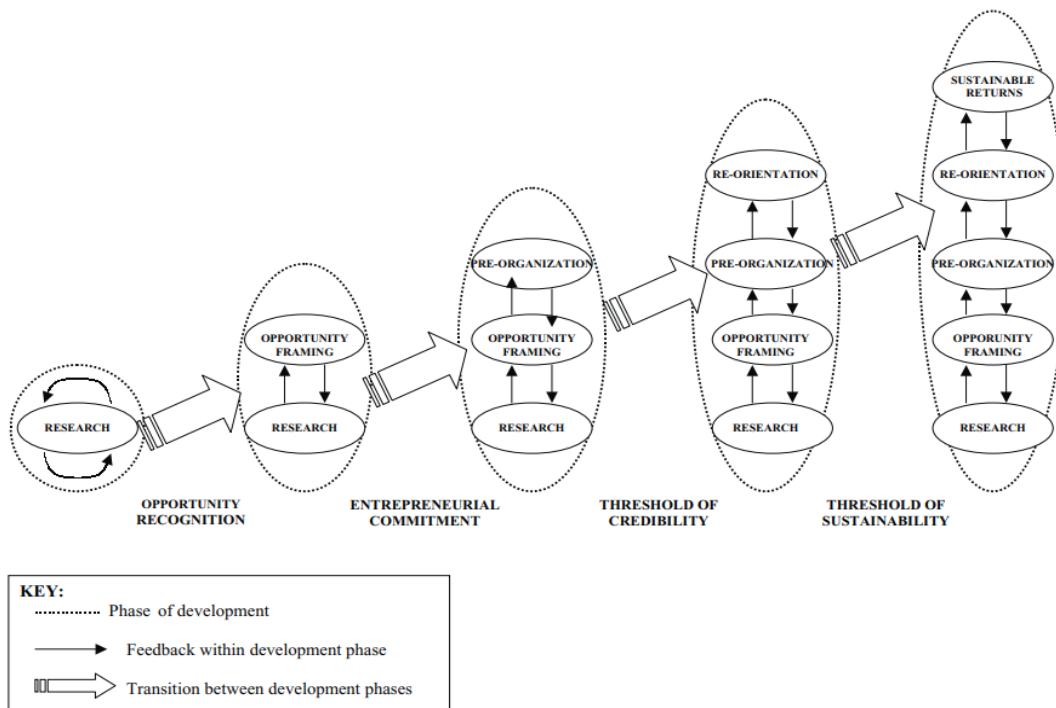


Fig. 1. The critical junctures in the development of university spinout companies.

2. THEORETICAL FRAMEWORK AND PROPOSITIONS

2.1 Theoretical framework

University spin-offs, or USOs, are defined in this paper as: new firms created to exploit commercially some knowledge, technology or research results developed within a university (Pirnay, Surlmont, & Nlemvo, 2003). They can be started by professors as well as by students themselves. It is very important for both the entrepreneurs and the involved universities to know what they should, and also should not, do to improve the survival rate of these USOs. Vohora et al. (2004) identified five different stages of USO development: the research phase, the opportunity framing phase, the pre- organization phase, the re-orientation stage and finally the sustainable returns phase (see figure 1). In order to become a successful and sustainable business, a USO must go through all these stages and complete the activities that must be done to reach the next stage. There are a lot of factors that influence whether or not a USO makes it through these stages successfully. This paper focusses on a few of these factors and explains why and how they influence the survival rate of USOs.

Based on prior research, this paper focuses on four factors that can foster USO survival rate. These factors are: the availability of commercial expertise, the amount of resources made available by parent universities, the quality of the entrepreneur’s networks and the ability of USOs to acquire patents.

2.2 Degree of commercial expertise

The first factor is examined in this paper is the degree of commercial expertise; do the entrepreneurs have, or have easy access to, relevant experience in commercializing a business idea? It seems that this experience can make a big difference in the early stage survival rate of USOs, since the lack of it could cause the business idea to not generate actual returns. These returns are

absolutely necessary for the business to survive and even grow. “Unless they either possess or can access relevant experience and specific capabilities to successfully frame opportunities so that they show promise of creating value and generating returns, they are likely to make little progress” (Vohora et al, 2004). Gaining returns early on makes it possible for a business to pay off debts, invest in the future and gain credibility among investors, customers and suppliers. Beside those positives, commercial experience also helps to prevent mistakes that entrepreneurs made in their previous businesses. Therefore, the experience can also save valuable time and expenses. These factors are very important to survive in the early stages of development. When lacking commercial expertise, even with a great business idea and a good business opportunity, a starting business could fail to generate returns and therefore fail to survive. For these reasons, a higher degree of commercial expertise fosters USO survival.

Proposition 1: A higher degree of commercial expertise will foster USO survival.

2.3 Resources made available by parent universities

The influence of the amount of resources being made available by the parent university of the USO is also examined. Resources can both be financial and non-financial. Some examples of non-financial resources include available space and materials for research or help from professors and other experts within a university. For universities it can be difficult to decide whether to, and to what level, make resources available for beginning USOs. A spin-off can have a lot of difficulties with finding resources in their early stages of development, since their credibility and financial resources are rather low. Because of these difficulties, resources from universities could be crucial in further developing the business idea into an actual business. Resources which are made available by parent universities can be used by USOs to create prototypes and test their products. Besides that, they can be helpful in exploring the market for business opportunities. These resources can also be used to expand the business and help growth. Considering these reasons,

the amount of resources made available by parent universities fosters USO survival.

Proposition 2: A higher amount of resources made available by parent universities will foster USO survival.

2.4 Quality of the entrepreneur's networks

The third factor will be the quality of the entrepreneur's networks. This factor can very much be connected to other factors, because an entrepreneur can obtain networks through previous commercial experience and through the university's networks. Having access to good networks with all kinds of stakeholders can be extremely important for young spin offs. These stakeholders could be potential customers, suppliers, investors, experts in the field etc. The credibility of the startup will be very low, which makes it hard to attract important stakeholders. It is important for a business to have close connections to their stakeholders, because long-term relationships with them can result in a very sustainable business. Networks with investors can provide the USO with the financial resources they need in order to survive and grow. Networks with experts can help USO to spot good business opportunities and act on them. Networks with suppliers and customers can help a USO in optimizing their supply chain. For these reasons, a higher quality of an entrepreneur's networks fosters USO survival.

Proposition 3: A higher quality of an entrepreneur's networks will foster USO survival.

2.5 Ability to acquire patents

The fourth and final factor that is examined is the ability of spin offs to acquire patents. A patent is a legal device that grants an inventor market exclusivity over a new invention or medication (Gupta et al. 2010). This means that if entrepreneurs are able to acquire a patent on their invention, they will have the sole rights to this invention for a certain amount of time. This prevents the business opportunity to be taken away by other entrepreneurs and therefore protects the USO, especially in the early stages of development. Patents are an indicator of invention and innovation but, as with other indicators, they have their pitfalls (Archibugi, 1992). These findings contribute to research showing rising levels of secrecy among academics in universities, due to an increasing focus on patenting and commercial outcomes, which impedes cooperation and information sharing (Hong and Walsh, 2009). So, even though patents do not guarantee successful USOs, they do safeguard future potentials. Also, patents are crucial when a USO wants to sell their idea or technology to another company, because without a patent the technology is pretty much invaluable since the company could just use it without buying it from the spin off. Lastly, acquiring patents shows outsiders that you are an expert in your field. This can help with attracting investors, business partners and other potential stakeholders. Considering these perspectives, the ability of acquiring patents fosters USO survival.

Proposition 4: The ability of USOs to acquire patents will foster the USO survival.

3. RESEARCH DESIGN

3.1 Research context

The main goal of this research is to find out which factors contribute to early stage USO survival rate and to figure out why and how these factors exactly contribute. To do this, Dutch USOs from technical universities were examined. There are several relevant parties which influence the survival rate of the USOs, for instance: the entrepreneurs, the Dutch tech universities, Novel-T (a technology transfer office in the region of Twente)

and the Dutch research council (which provides funding to Dutch USOs). Instances like Novel-T and NWO (the Dutch research council) can play important roles in the early stage survival rate of Dutch USOs. The technical University of Twente has created an ecosystem to aid entrepreneurs from the university, with Novel-T being an important player in this ecosystem. They provide entrepreneurs with advice, building networks and attracting funding. NWO invests nearly a billion euros a year in all kinds of research in the Netherlands, and can therefore also be a very helpful investor for tech USOs. With this ecosystem in place, there is definitely a good opportunity for Dutch USOs to survive early stages when having a good business idea. Therefore, it is interesting to research how this survival rate is influenced by the chosen factors.

3.2 Data collection

Conducting interviews with entrepreneurs from Dutch USOs was deemed the most comprehensive and fitting approach to collect the data. When conducting interviews, entrepreneurs can really explain their experiences and therefore give a broad and in-depth perspective on the factors and how they influenced the performance of their companies. They can better explain all the mechanisms behind the factors. On top of that, the entrepreneurs will be able to explain how other factors have influenced their success, while these factors may not have been considered yet in the existing scholarly literature. Therefore, interviews were the best way of collecting data for this research. The interviews were semi-structured, meaning that a certain set of questions were used to guide the conversation in line with proposed theoretical constructs, but the interviewees were also free to divert from the questions and bring up new ideas. This technique further motivates the interviewees to explain other factors than the ones that are being examined for the paper, once again benefitting the quality of the collected data.

3.3 Definitions theoretical constructs

To answer the research question of this paper, several propositions were made. These propositions were created using previous research and scientific papers which were retrieved from high-quality research databases, such as, Web of Science. In this study, the propositions are looking at the influence of degree of commercial experience, resources made available by universities, the quality of an entrepreneur's networks and the ability of the USO to acquire patents. The degree of commercial experience is defined in this paper as entrepreneurs, or their associates, having previous experience in setting up a business, based on the work of Rasmussen et al. (2011). The resources made available by universities are any resources, financial or non-financial, that the entrepreneurs received from their university. The entrepreneur's networks are defined as any networks which the entrepreneur had or had easy access to. These could be networks with suppliers, customers, investors or other stakeholders. The quality of these networks can be determined by profitability and sustainability. The ability of the USO to acquire patents is simply defined as the ability of the USO to acquire any patents to protect their ideas and technologies. With these propositions, the interviews were conducted to examine the influence of the factors on the survival rate from the perspective of the entrepreneurs themselves, and potentially find other important factors that played a role in this survival rate.

3.4 Data analysis

All the interviews were recorded and these recordings were all transcribed afterwards. Content analysis was used on these transcriptions to evaluate all the answers. Based on this analysis, the answers of the entrepreneurs were compared to the propositions that were made previous to the interviews. The

amount of entrepreneurs that agreed and the amount that disagreed with the propositions were counted and based on these results the proposition could be either confirmed or rejected. It was not always as simple as counting heads, because some entrepreneurs had strong, in-depth and comprehensive insights that revealed a complex nature of this phenomenon. So even though they were outnumbered by the other entrepreneurs who confirmed the proposition, they still made a strong case for rejecting it.

4. RESULTS

4.1 Degree of commercial expertise

The initial proposition was that the degree of commercial expertise would foster the survival rate of USOs. Entrepreneur 1 did not have any commercial experience when starting their business. They explained that the experience can be very helpful to entrepreneurs when they are able to use existing networks. However, they also explained: “the experience could make an entrepreneurs blinded. Starting with a blank page makes you able to come up with new things that no one else thought of before. So lacking this experience does not have to be negative.” Entrepreneur 2 also did not have previous commercial experience. They explained that this experience would have helped them with preventing expensive and time consuming mistakes. Entrepreneurs 3, 4, 5 and 6 all had, or had a partner with, commercial experience. They all confirmed that the experience was helpful to their company. Three of them mainly used the previous experience by using existing networks to gain customers. Entrepreneur 3 explained a different advantage of commercial experience: “we did very well by getting a CEO with commercial experience. A lot of other spin-offs make the researcher CEO, which makes rapid growth difficult. There is a big difference between CEO and CTO, because there is a difference in mindset between setting up technical features and actually selling a product.”

Considering these arguments, proposition 1, a higher degree of commercial expertise will foster USO survival, can be confirmed.

4.2 Resources made available by parent universities

The proposition was that the amount of resources made available to USOs by their parent universities would foster the survival rate of the USOs. All of the interviewed entrepreneurs got access to resources of their university. The USO of entrepreneur 1 was connected to a couple of supervisors. One of these supervisors assisted with technology development, while the other one helped with business development, networking and developing the competencies of the entrepreneur. Entrepreneurs 2, 3 and 4 were granted access to their university’s facilities, providing office space and equipment. Entrepreneurs 4 and 6 received financial support. This money was used for hiring personnel, setting up a website and other activities which helped their USO a lot in the early stages. As entrepreneur 6 stated: “This financial support is crucial, because no one else wants to invest in a small spin off.” Entrepreneur 5 explained that they were introduced to a complete ecosystem which helps start-ups (Novel-T.) “They provide a lot of knowledge in different aspects and they help to make you ready for the market.”

Based on these arguments, proposition 2, a higher amount of resources made available by parent universities will foster USO survival, can be confirmed.

4.3 Quality of entrepreneur’s networks

The initial proposition for this factor was that the quality of an entrepreneur’s networks foster the USO survival rate. Entrepreneur 1 stated that networks are very important for USOs. They explained that networks can be connected to commercial expertise and resources made available by parent universities. According to this entrepreneur, a USO does not really need commercial experience as long as they have good networks. When these networks are missing, commercial experience becomes more important. They also stated that universities can provide good networks to entrepreneurs, which can help the USO a lot. Entrepreneur 2 claims they are working with the best possible people in their field, who they connected with through networks from their parent university. Entrepreneurs 3, 4, 5 and 6 elaborated on using their networks with customers. Having these networks in place helped their business with actually selling their product and gaining revenues. Entrepreneur 6 explained: “We used our existing networks to sell our products to a few customers at first. By making their customer experience with our product very positive, they told others about our product and we were able to extend our customer base relatively fast.”

Proposition 3, a higher quality of an entrepreneur’s networks will foster USO survival, can be confirmed based on these findings.

4.4 Ability to acquire patents

The fourth and final proposition was that the ability of USOs to acquire patents would foster the survival rate of the USOs. Entrepreneur 1 did not acquire any patents for their company. Their business is not based on new research, and therefore there was no need for acquiring patents. The entrepreneur claimed that the importance of patents is dependable on the field in which entrepreneurs are active. In some fields funding can be dependent on patenting, while in other fields patents are not that important. Entrepreneur 2 did acquire patents and was convinced of their importance: “Investors need to see patents, otherwise they will not invest in the company. Young companies mostly do not actually use the patents, since they have no power to litigate if the patents are infringed. On top of that, when an entrepreneur wants to sell their company, big companies will only pay if you have patents. So, although patents are not directly useful, you cannot get anywhere without them.” Entrepreneur 3 also acquired patents for their business, claiming that they created freedom in operating. They stated: “because the patents are application designed, they can be used to make deals with customers so they can use the technology.” Entrepreneur 4 did not acquire any patents. Their company used the technology they created in a machine, which produced the products the company actually sold. Because they are not selling the technology, the entrepreneur claimed that acquiring a patent would only be harmful for the company. They explained that requesting a patents requires the entrepreneur to explain the technology in detail. This would only make it easier for other companies to copy the technology. “Now they’re only seeing a big machine but they cannot copy the technology inside. Getting patents and lawyers to defend them would have been way too costly.” Entrepreneurs 5 and 6 either had patents already or were planning on acquiring them. They both claimed that patents are crucial in attracting investors. They also explained that a company can create revenues from selling the patented technology.

Considering the arguments of these entrepreneurs, proposition 4, the ability of USOs to acquire patents will foster the USO survival, can be confirmed.

5. DISCUSSION

5.1 *The role of USO success determinants*

The findings of the conducted research are discussed in this section. It explains how the chosen factors foster the USO survival rate and how they potentially influence each other. The first factor that was examined was the degree of commercial expertise. All but one of the entrepreneurs confirmed the proposition, which stated that if the degree of commercial experience becomes higher, so would the survival rate of USOs. The last entrepreneur argued that first time entrepreneurs could have more freedom in thinking and could therefore be more innovative. The other entrepreneurs explained that previous experience helped, or could have helped, them in preventing mistakes, having existing networks and being able to bring a product to a market. So, when starting a business multiple times, it is important that entrepreneurs do not get stuck on previous ideas but rather come up with new, innovative ideas. A possible solution for this could be teaming up with new entrepreneurs. This would result in the team having both the benefits of commercial experience and the benefits of being a new entrepreneur. It can be concluded that previous commercial expertise does have a positive effect on USO survival rate, as long as it does not negatively influence the entrepreneur's innovativeness. The second proposition was that the amount of resources made available by universities would positively influence USO survival rate. All of the entrepreneurs received resources from their university, some financial and some non-financial. They all agreed that these resources are very helpful in the early stages of USO development, because resources are hard and expensive to find. Even relatively cheap resources, like a little office space or a small loan, could help startups a lot. Mainly to stimulate the transition from the research phase into the initial opportunity recognitions and feasibility analysis of Vohora's (2004) model, these resources are extremely useful. Since research is the very first task in the model, it is very important for USOs. However, a lack of space, money or some expertise can often lead to the USO not reaching the second or third phase of the model. These are resources that universities can often offer to beginning USOs, and by doing that they can increase the survival rate of these USOs. In conclusion, resources made available by universities do have a positive effect on the survival rate of USOs. The next factor is the quality of the entrepreneur's networks. The entrepreneurs explained that networks are important to build a sustainable business. Networks are very important in all stages of Vohora's (2004) model, but mostly play a big role in the later stages. This is when the product actually needs to be made and sold, which is why networks with suppliers and consumers are very important in these stages. Networks with investors are more important in the earlier stages, since this is where the financial credibility of the USO will be at its lowest. This factor can be very well connected to the last two factors. Previous commercial experience resulted in some of the entrepreneurs having built networks, which they reused in their new startup. The interviewed entrepreneurs also said that their university sometimes provided them with networks to use for their business. So, good networks can result from commercial experience and resources made available by universities. However, this could also work the other way around. When an entrepreneur has access to good networks, they might have less need for commercial experience or resources from their universities. So these factors could possibly compensate for each other. The final factor is the USO's ability to acquire patents. Most of the interviewed entrepreneurs had acquired at least one patent for their USO. They explained that patents are crucial when a business wants to attract investors, or when they want to sell their technology. Without a patent, the venturing becomes

significantly more challenging and requires USOs to think about alternative business development mechanisms. A young business will often not have the financial resources to litigate when their patent is infringed, which is one of the downsides of patents for startups. However, the patent will usually still protect their idea or technology from other businesses. For USOs that actually sell their technology, instead of using it to produce other goods, this is one of the most important factors out there. Without a patent, other companies can easily copy the technology and walk away with all the profits. On top of that, investors often know very little about the technology, and all they look at before investing are patents. Therefore, these tech USOs will need patents to attract investors and survive the early stages of Vohora's (2004) model. Obviously, other factors will still play a big role in the survival rate of these tech USOs, but without a patent their chances of survival will be extremely low. So, when considering all the conducted research, it can be concluded that these four factors positively influence the survival rate of USOs. Especially for tech USOs, the ability to acquire patents will be most important. The quality of the entrepreneur's networks could compensate for a lack in commercial expertise or resources made available by universities. If universities want to improve the survival rate of their spin-offs, they could also implement some changes. Building an ecosystem which aids entrepreneurs with their startups is one of these changes. Although this could take up quite some time and expenses, it can have a large impact on the survival rate. The entrepreneurs from the Dutch universities were all very positive about the ecosystem they were provided with. It helped them a lot in setting up their business and becoming successful. Therefore, it can be recommended to all foreign universities to try and build similar ecosystems.

5.2 *Theoretical implications*

This paper builds on previous papers on the topic of USOs and factors that foster USO survival (Hayter, 2013) (Hossinger, Chen and Werner, 2020). A lot of research has been conducted on this topic, but this paper made the research specific to Dutch tech universities. Therefore, also building on previous research conducted in the Netherlands (Scholten et al. 2015) (Zomer, Jongbloed and Enders, 2010). Previous research on the factors has also been done in different papers. This paper extended this research by interviewing entrepreneurs from Dutch USOs, and therefore generating novel and more in-depth insights into the early-stages of academic entrepreneurship and the influence of these factors on USO survival. Vohora's (2004) model explained the critical junctures in the development of university spin offs. This paper builds on this model and provides insights to entrepreneurs to overcome these critical junctures.

5.3 *Practical implications*

Even though a lot of research has been done on the topic of USOs, the ability of USOs to generate sustainable and impactful solutions is still rather disappointing. This paper aims to improve this survival rate and foster USO long-term impact, by examining some factors that influence it. If USOs want to survive the early stages of development, they will have to acquire patents for their ideas or technologies, especially if these technologies are sold. On top of that, it is very important for USOs to build up networks with investors in the early stages. In later stages, networks with suppliers and customers will also have to be build, to create a sustainable business and optimize the supply chain. When these networks do not yet exist, it could be helpful for an entrepreneur to team up with someone with previous commercial experience. This person can help with building these networks, along with aiding with useful advice and expertise. Another possible way to obtain networks is through the ecosystem of a university. When

this system is present, USOs should make use of them as much as possible.

5.4 Limitations and future research

For this specific research, only interviews were used to collect data. Although this provides more in-depth data than research through regression, it does not provide prove for a significant influence of the examined factors. Therefore, a similar research could be conducted with a regression model, to prove these potential significant influences. On top of that, the research was conducted at Dutch universities. These Dutch universities have created ecosystems which aim to support entrepreneurs when creating a business. Because of that, a similar research could be conducted in different countries, where these ecosystems do not exist. This could lead to very different results.

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Appendix

Email sent to entrepreneurs:

Dear Mr./Mrs.,

My name is Milan Nijhuis and I am a third year bachelor student at the University of Twente, studying international business administration. I am currently working on my bachelor thesis, in which I am doing research on University spin-off success rate in their early stages of development. Now, me and a few other students who are doing their thesis on a similar topic are looking for some entrepreneurs who could help us out by answering a few of our questions during an interview. This interview would take about 60 minutes of your time, and we would give you a list with the questions beforehand if you would like to prepare some answers. Also, all information about your company will be removed when processing the answers for the thesis. I would kindly like to ask you, as one of these entrepreneurs, to participate in such an interview. If you are interested and can spare a little bit of your time to help us out with our thesis that would be great! Please let me know if this is the case.

Thank you very much and hopefully see you soon,

Milan Nijhuis

Interview questions:

Did you, or anyone else you started the company with, have previous commercial experience?

(If yes): Can you explain why and how this experience was helpful for your company?

(If no): Can you explain how this experience could have helped your company in early stages?

What resources were made available to you by your University? And how were these used?

Do you feel like you need more or less resources to make your company successful?

How high would you estimate the quality of your University's faculty compared to similar faculty's at different Universities? How could the development and performance of your company have changed if it was started at a different University?

Can you please explain if your venturing is based on established research or on recent, more innovative findings?

Did you acquire any patents for your company?

(If yes): How and why were these patents useful for your company?

(If no): How do you think acquiring a patent could have improved your company's success?