TU DELFT

Stimulation of Dutch startups in the Aerospace

A comparative case study on the barriers that Dutch startups will face entering the aerospace market and how they can be overcome

Author:
Kelly van WIRDUM

Studentnumber:
4327411

Master thesis submitted to Delft University of Technology in partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE

MANAGEMENT OF TECHNOLOGY

FACULTY OF TECHNOLOGY, POLICY AND MANAGEMENT

November 28, 2017

Colophon

Thesis of: Kelly van Wirdum

Institution: Delft University of Technology

Faculty: Technology, Policy and Management

Program: Management of Technology

Date: November 28, 2017

City: Delft

Title of Thesis: Stimulation of Dutch startups in the aerospace industry

Graduation committee

Chairperson:

Prof. Dr. M.S. (Marina) van Geenhuizen

Economics of Technology and Innovation

First Supervisor:

Dr.ing. V.E. (Victor) Scholten

Economics of Technology and Innovation

Second Supervisor:

Dr.ir. B.M. (Bauke) Steenhuisen

Policy, Organisation, Law and Gaming

Executive summary

The aerospace industry may seem a very innovative and renewing sector. However, when looking at the evolution of the aeroplane, it is clear that no radical innovation has taken place the last 70 years. It is not surprising considering the domination of the industry by big, traditional companies, who are known to be slow innovators. The most important source of innovation are startups, and these are lacking in the aerospace industry. The many barriers of the aerospace industry make the industry unattractive for startups. The research objective is: *How can startup companies be stimulated to enter the aerospace industry, an industry dominated by big, traditional, companies?* To develop a theory on how to make the aerospace industry more attractive for startups detection of the barriers and solutions is needed. Factors that do have a positive influence on the entrance of startups in the aerospace industry are support programmes and the self efficacy of the entrepreneur. A literature study on success factors and barriers that startups have faced in comparable industries led to a long list of potential barriers. To determine which of these barriers apply to the aerospace, a case study on six Dutch startups in the aerospace industry is conducted. By using semi-structured interviews barriers are acknowledges, along with the severity of the barrier, the link with support activities and the level of self efficacy of the founders. There were four barriers that were perceived by all six cases. The first one lack in financial strength, a barrier that every industry faces but the aerospace even more because of their capital intense product, strict regulation, and slow industry. Support programmes can increase the financial strength with funds. The second barrier is the network density, having a dense network is absolutely crucial in the aerospace industry. Support programmes often have partners or can offer their own network to their startups as support. The third barrier are the strict regulations of the aerospace industry and the certification. This is a very time and money consuming barrier, incubators do not offer support with certification The best support for this barrier would be a collaboration with a large company, who can help and offer testing facilities free of charge. the last barrier is the slowness of the industry, unfortunately there is no support activity that can help with this barrier. Striking was that the level of entrepreneurial self efficacy did not seem to influence the type and severity of the perceived barriers. It did seem to influence what support activities are important. The higher the level of self efficacy the less need for support activities. Some important findings were that the cases did not experience the power of the large companies as a barrier and that the cases were not looking for collaborations to overcome barriers, an easier way to overcome barriers is to form a collaboration with a large company that has all the right resources and network. For any further research, the number of cases can be extended. For example adding cases that did fail, cases that are not part of a support programme.

The results of this study can contribute to practical matters by startups, interesting in entering the aerospace industry, and support programmes, wanting to improve their support activities.

Contents

1 Introduction

In the aerospace industry, a few “traditional” and big companies are dominating the market. This domination of a few companies is mainly the case for the civil aviation industry and less in the military aerospace. They are working for many years in this industry and have the proper resources (people with technology skills, machinery, financial resources and intellectual property).

Often when big and traditional companies dominate the market, these companies become rigid (Schilling, 2013), unable or not willing to quickly adapt to changes in the industry or change their way of working. Leading to a lack of innovation because they are not pressured into innovation as they don’t need innovation as a strategy to stay ahead of their competitors. When looking at the aeroplane, the main product of the aerospace industry, the last radical innovation was in 1950 with the introduction of the jet engine.(Dow, 2009) After this big change there clearly has not been a lot of innovation, aeroplanes still look the same (only bigger) and perform the same as they did since 1950, see figure 1.1. Most innovation that takes place in this industry is incremental innovation to optimise the supply chain, optimising the materials and the production process of the aeroplanes. (Starr and Adams, 2015)

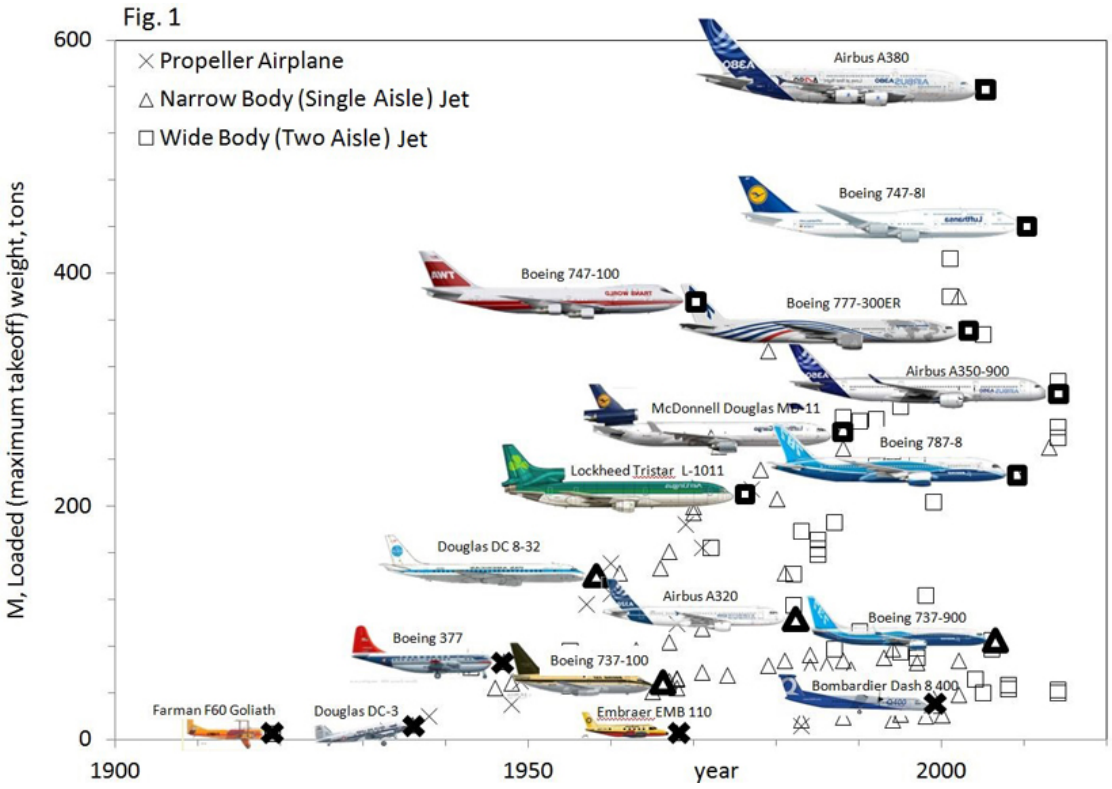

Figure 1.1: The evolution of aeroplanes from 1900 (Bejan et al., 2014)

Viewing innovation in technology can be done as a linear process of thee consecutive phases as stated by Ortt.phases.(Ortt, 2010)

1. The innovation phase
2. The adoption phase
3. The market stabilisation phase

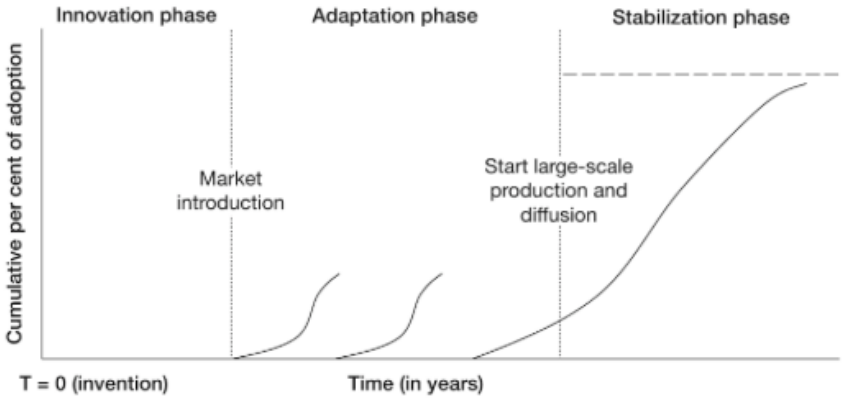

Figure 1.2: Innovation diffusion pattern (Ortt, 2010)

The development of these phases, in general, are shown in figure 1.2 When looking at the development pattern in the aerospace industry the development of the aeroplane is in the market stabilisation phase: in other words, there have not been any radical innovations in the last 70 years concerning the aeroplane.

1.1 Problem Definition

The above section gave a short introduction where the aerospace industry stands when looking at innovation development of the aeroplane. It became clear that there has not been any radical innovations the last 70 years when looking at the evolution of the aeroplanes, one of the biggest segments of the aerospace industry. Important is to keep in mind that the aerospace industry is a very large industry that consists of more segments. To start with the name aerospace industry, this is already a combination of the aeronautical industry and the space flight. These segments can also be under divided in sub segments. Figure 1.3 shows a collection of all these segments.

The military aviation market is very different from the commercial aviation, The military aviation segments is hard to compare to the commercial and general aviation, first of all the developments and innovation is often confidential information and the market intentions are different. For this reason the military segment of the aerospace industry will not be researched in this study.

There are some segments of the aerospace industry where innovation did take place over the years. For example the materials that are used in the aerospace did change over the past years. The aeroplanes are definitely lighter than 50 years ago by using composite materials. A total new segment of the aerospace

industry are the drones, they may seem a bit out of place but because the drones are not seen as a separate industry yet they are part of the aerospace industry or as the Netherlands Aerospace centre calls it, an area of attention. Because the drones are not yet acknowledged as a separate industry, they have to comply with the aviation regulations, which makes it hard to develop these drones. So there has been some innovation, but not enough to shaken up the industry.

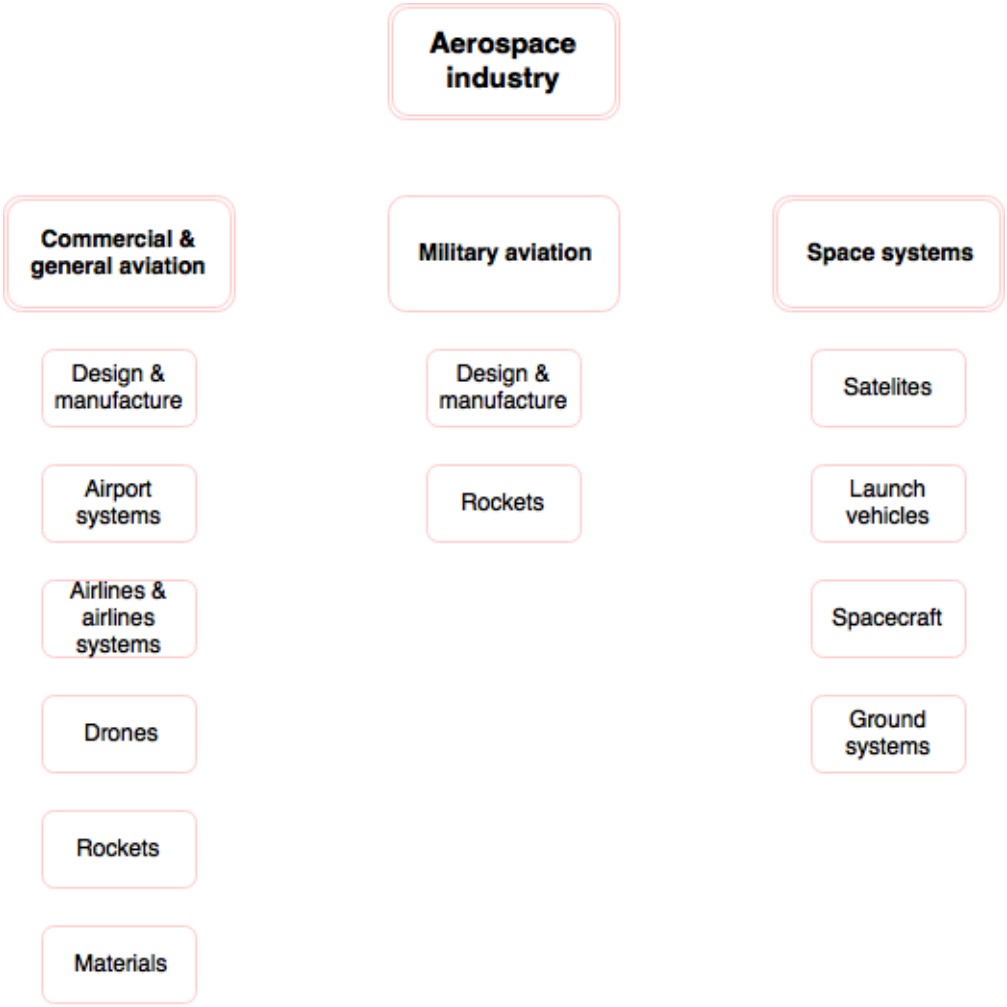

Figure 1.3: Different aerospace market segments

Before going on about the lack of innovation it is important to answer the question why innovation is so important. For the aerospace industry it is easy to answer this question, why not innovate the aeroplane, the way we fly, the airports etc.. As said earlier the way we fly has not changed the last 70 years while our flying behaviour did change the last 70 years, the climate did change the last 70 years and the technology has changed the last 70 years. Innovation in the aerospace industry can lead to faster aeroplanes, shorter travel times, sustainable flight, safer flights and cheaper flights.

The reason why there haven't been any radical innovation in this industry can have several reasons. One of the characteristics of large companies in a traditional industry is that they simply are no radical innovators, they are good in making changes to existing technology or processes but not in coming up with breakthrough ideas, due to the "genetic" set-up of large companies. The culture and the values of a company, the structure of large companies, and often the lack of encouraging out-of-the-box thinking, or their inability to attract out-of-the-box thinkers. While it is this out-of-the-box thinking that is the source of most radical innovation. One of the approaches for big companies that want to innovate in a traditional market is to shift the focus of innovation from what is inside the organisation to what is outside the organisation. With this the key to success shifts from a mechanism of controlling and owning this radical innovation to promote and stimulate learning about the commercial potential of radical innovation. (Stringer, 2000) Large companies can do this by supporting and involve startups within their company. Companies can do this by facilitating incubators or accelerators that offer startups the right support activities to increase there change on success or by developing collaborations between large companies and startups. Startups can profit by the resources of the large companies in exchange for their innovativeness.

Large companies are often no innovators; this is also the case for the large companies that dominate the aerospace market particular in the civil aerospace and the airline industry. However the awareness of their problem is rising with these companies, they seem to realise that they are no innovators, for example the number five of biggest airlines companies in the world, KLM:

> "Innovation manager KLM: start-ups essential for our R&D. KLM is hardly doing any research development, states the innovation manager Rogier van Beugen "KLM is not a product developer. Therefore KLM needs start-ups that are product developers."(van Essen, 2016)

Next to KLM the need for startups also starts to become clear for the aeroplane manufacturers. Airbus on acknowledging the need for startups that can bring innovation into the aerospace industry:

> Airbus Group CEO Tom Enders: "Aerospace must embrace the technology sector or risk its business being disrupted by the fast pace of development in other industries."(Warwick, 2015)

What is clear is that first of all there is the need for radical innovation in the aerospace industry, in particular when looking at the manufacturing of aeroplanes and the services that airports and airlines can offer. Second of all, it is unlikely that the large companies that are dominating the aerospace market at this moment will come up with this. Especially for the civil and the airline industry, it is crucial that more innovation will take place. Because of the lack of competition (large companies have all the power), they do not feel the pressure to innovate and for example, start developing a more sustainable aerospace industry. That entrepreneurs and startups are the sources of innovation is almost conventional wisdom

nowadays. Silicon Valley Innovation Centre gives three main reasons why startups are better innovators than the large established companies.(Roberts, 2015)

1. **Iterations made easier**

   A small group of people with the same ideas and goals for their startup are more likely to produce their first prototype to start iterations. Startup companies are faster and more flexible in a way they can improve or transform their prototype to customer response during the development phase.

2. **Thinking outside the box**

   One of the characteristics of entrepreneurs is to recognise opportunities where large companies often do not because this opportunity is not in line with the culture or the values of the company.

3. **Motivation, Focus and Energy**

   The dedication within a startup company is way bigger than within a large company where social loafing can occur. Social loafing is when the team an individual is working in is so big, the individual does not feel like they receive enough credit for their good work, and the other way around, they will not receive blame for mistakes or tardiness.(Schilling, 2013)

One of the characteristics of the aerospace industry is the domination by big and traditional companies who are slow innovators. And the need for startups in order to be innovative again. However a lot of market characteristics make it hard for startups to enter the market. To start with the high costs that are so remarkable for the aerospace industry. It is a combination of the exceptionally high capital investment requirements and next to that the high fixed costs that the industry brings along (Spreen, 2007).
Also, the knowledge needed in the aerospace industry is valuable. Both the technical knowledge as well as the knowledge of the certifications and regulations. The aerospace market may be one of the industries that have the most strict regulations when it comes to their products (European Aviation Safety Agency,). Certifying everything due to this regulations is highly time and money consuming for startups while the big companies in the organisations have political advantages when it comes to funding and subsidies for certifying. An example is Boeing that has a huge advantage from cooperation with NASA and the Department of Defence in the United States. Boeing can use all the testing equipment free of charge, and many patents and technologies are available at no cost. (Ecorys; Research & Consulting , 2009).
Grégoire Aladjidi, Head of Safran Corporate Ventures, and François Chopard, Managing Director of Starburst Accelerator, the leading incubator for startups in the aerospace industry debated about the future of the aerospace en the role that startups have in the future of the aerospace. They mentioned that barriers that are limiting the access to the market at this moment and agreed that the strict security regulations and long certification processes for innovations as one of these biggest barriers that startups have to face today (Safran,).
Combination of the dominant big companies with the high costs of the industry, strict regulations and the government support make the aerospace industry a though industry for startup companies. However the first step is taken, and the importance of the entrepreneurs in the aerospace industry is acknowledged (van

Essen, 2016), (Warwick, 2015). The second step is to find a way to make the industry more attractive for startup companies and to do that a further identification of the entry barriers is needed followed by a solution for overcoming these barriers.

These characteristics of the markets that keep new entrant away from the market are called barriers to entry. In order to attract more startups to the aerospace industry these barriers need to analysed followed by ways to lower these barriers or to overcome these barriers. One way to help startups entering the market is by becoming part of an accelerator or an incubator. The aerospace industry is not the only industry where startups are becoming popular. All over the world startups, companies are rising. Some 2016 numbers are 472 million entrepreneurs, 305 million total startup annually of which 1.35 million technical startups (Seed-DB, 2017), (Global Entrepreneurship Monitor, 2017). Considering that 90% of the startups fail, it is no wonder that along with the rise of the startup there is also a rise in support programmes for startups. The most common support programmes are accelerators and incubators. These support programmes offer different support activities to increase the startups change on success. The support activities differ from funds to education. However, it is not clear what support activities are most effective or most desired by startups. Along with the rise of startups more research is done into the growing popularity of entrepreneurship, what the characteristics are of entrepreneurs and how these characteristics influence their way of running a startup. One important phenomenon is the level of self-efficacy. A lot of research is done on self-efficacy in various domains such as education, business, career etc.. The level of self-efficacy of an entrepreneur can have a huge influence on how they experience barriers. Altogether this means when researching the barriers that are experienced by startups in the aerospace industry also the level of self-efficacy should be taken into account. Self efficacy concerns an individual belief in his or her own capabilities and abilities to accomplish certain tasks. In theory should an entrepreneur with a higher level of self efficacy have a higher believe in their startups change of success. this can lead to a totally different perception of barriers and may make it easier for these entrepreneurs to enter the aerospace industry.

1.2 Scientific problem

The scientific problem of this thesis is the lack of literature on the market characteristics and mainly the entry barriers of the aerospace industry, but also on how to overcome these barriers by using support activities and what the influence is of self-efficacy on these barriers. The aerospace industry is an industry with unique characteristics as mentioned before. Closing this knowledge gap will contribute to developing a theory on successful entry of startup companies. Previous literature on entry barriers of comparable industries can be used to identify the entry barriers of the aerospace industry. An example is the Dutch sustainable energy industry. The sustainable energy industry was also an industry that is dominated by big companies until a few years ago. When the demand of the market for sustainable energy began to grew more startups entered the industry with innovative sustainable energy ideas that differ from the standard

ways of generating, for example, wind energy. The Dutch sustainable energy market is stimulated by the Dutch government because they want to decrease the C02 emissions (Rijksoverheid,), which results into a rapid growth of startups in the Dutch sustainable energy market (Consultancy.nl, 2016) because of the support of the government.

1.3 Practical problem

The practical problem consists of two problems for different actors. First of all, if startups do not enter the aerospace industry the innovation development is slowed down in this industry which affects both the industry and the users of the industry, people want to fly faster, more sustainable or cheaper.
The next problem is that as long as there is not a clear overview of the entry barriers for startups in the aerospace startups may have a wrong idea about this barriers and might be scared away from the industry for no valid reasons. And when there is a clear overview of the barriers it is easier to come up with solutions that accelerators or incubators can offer to startups. So the practical problem applies for the whole industry, the startups and the users.

1.4 Research Objective

The aerospace market is in need of radical innovation! Sustainable and time efficiency are trending in every technological market, and the aerospace industry needs to follow this trend. However, the large companies that are dominating the market at this moment will not bring the radical innovation that they need. Therefore entrepreneurs and startups are needed to come with new out-of-the-box ideas. The problem with startup companies in the aerospace industry is the high entry level of the market. Therefore the research objective of this research is:
How can Dutch startup companies be stimulated to enter the aerospace industry, an industry that is dominated by big traditional companies?
The goal of this research objective is to develop a theory on the entry of startup companies in the aerospace industry, and how to make the aerospace more attractive for startup companies or how to stimulate startup companies to enter this industry. To formulate an answer for the research objective, the following research questions need an answer;

1. **What entry barriers do startups in the aerospace industry face?**
   (a) What barrier do startups in comparable industries face?
   (b) What barriers do entrepreneurs experience?
   (c) What is the severity of the experienced barriers?
2. **What is the influence of founder self-efficacy for startups on the perceived entry barriers of the aerospace industry?**

3. **What activities can support programmes offer startup companies to lower the entry barriers?**

4. **What recommendations can be given for stimulating startups in the aerospace?**

The first research question will be answered by doing an extensive literature study on what these barriers could be. The second, third and the fourth research question will be answered in primary research using constructed interviews with several startup companies.

1.5 Clarification

This thesis will contribute to the literature in terms of research done one trending subjects like entrepreneurship, barriers to enter and support programs for entrepreneurs, however, this research will distinct itself because it is specifically focused on the aerospace market. A unique market that is marked with a lot of uncertainties. This gain in literature will directly contribute to practice because the theory on how startups can become successful in the aerospace market can be applied by startups that want to enter the aerospace market. Also are the outcomes of this study also interesting for the large companies that want to stimulate startups to enter the aerospace industry and the support programmes. This study will give this group the barriers from the perspective of the entrepreneur. The role of self-efficacy can also be helpful in predicting which startups have a bigger chance of success, and are worth investing.

1.6 Definition of terms

This section will clarify some of the terms that are already used in this introduction and will be frequently used throughout the thesis. It is important that the definition of these terms are clear.

- **Startup**: a startup is a young company that is just begging to develop and create new products or services or that are inferior to existing products or services. These companies are usually small and are operated by a handful of founders or one individual founder. Other characteristics of startups are that they have a high failure rate because they have to deal with extreme uncertainties. (Blank, 2010), (Ries, 2011)

- **Entry barrier**: A barrier to entry is anything that prevents an entrepreneur from instantaneously creating a new firm in a market (R. Preston McAfee and Williams, 2014), (Carlot and Perloff, 1994). In this thesis the term barrier will come back all the time. The term barrier will also be used for success factors that can form a barrier when this factor is missing.

- **Incremental/radical innovation**: there are two kinds of innovation. The first one is incremental innovation, this is innovation that makes a relatively small change to existing practices. Radical innovation is an innovation that is very new and different from prior solutions (Schilling, 2013).

2 | Literature Review

With this literature study an answer to the first subquestion:*"What entry barriers do startups in comparable industries face?*, is formed. However, in order to develop a conceptual model, this literature study will also start with research on self efficacy and support programmes. The first section is about the mentioned entry barriers in the literature. These barriers are divided in four categories. The first category is firm specific, followed by founder specific, product specific and finally environment specific. To conclude all the barriers that apply to the aerospace industry a table is constructed for a clear overview. The second part of the literature review is about self efficacy and looks into the specific entrepreneurial self efficacy, this section will be closed with a questionnaire that can test the level of self efficacy of an entrepreneur. The last part of this literature review is focused on support programmes that offer support to startups. Incubators, accelerator, the differences between them and the effectiveness of support programmes is the focus of this part.

2.1 Entry of startups in the market

Entry barriers are the barriers that can prevent startups from entering the market or make it hard for startups to enter the market. The higher these barriers, the more unattractive the markets becomes for new entrants. For companies that are already operating in the market, high barriers are favourable because this gives them a competitive advantage, and makes the threat of new entrants low (Porter, 1979). Entry barriers can be divided into structural (or also called innocent) and strategic barriers (Salop, 1979). Structural barriers are barriers created by the conditions and environment of the industry; this can be for example financial conditions, such as economies of scale, switching cost, brand loyalty. Strategic barriers are barriers created more intentionally, or barriers that incumbent firms that are active within the industry on purpose retain, with the intention to make entry of the market more difficult. An example of strategic barriers can be predatory pricing. Structural barriers and their impact are more predictable because reviewing the condition of an industry can be done before entering the industry. This way the new venture knows what the conditions of the industry are and for example the costs of these conditions (West, 2007) (McAfee et al., 2004).

Over the years, research has been done on the entry barriers that new ventures will face when trying to enter a new industry. These entry barriers can be used as a strategy by companies that already entered the industry. For the existing players in the industry, it is beneficial to maintain the high entry barriers because these barriers make the market less interesting for new entrants which results in less competition. However, these high entry barriers can hurt the development and innovation of the whole industry because of the lack of new entrants. For the aerospace industry, this is the case right now. They are in need of new entrants (Braddorn and Hartley, 2007). To make the aerospace industry more attractive for these

new entrants it is crucial to have a clear overview of the obstacles they will face when trying to enter the market and how they can overcome these barriers. This part of the literature study will elaborate on the entry barriers. First, an overview of all entry barriers mentioned in existing literature, in general, will be made, using existing research on this subject. These will be placed in a comparison matrix and finally the ones that characterise the aerospace industry will be highlighted and used further on in this research.

2.1.1 Firm specific

The firm specific factors are factors that are specific to the firm, organisation or company itself. These connect with the characteristics and the culture of the startup company. One important factor that can determine the level of success of the startup company is the strategy that the company has (Nejabat and van Geenhuizen, 2016b), (Bjornalia and Ellingsen, 2014), (Barringer et al., 2004), (Leferink, 2016), (van Niekerk, 2016) (Robinson and McDougall, 2001). The strategy can be the market reaching strategy (Nejabat and van Geenhuizen, 2016b), but also the timing of entry strategy (Leferink, 2016), (van Niekerk, 2016). The mission and the vision of a firm is also part of the strategy because of the strategy based on this mission and vision that an entrepreneur has for its company and how the entrepreneur wants to achieve this (Barringer et al., 2004).The age of the firm is one of the characteristics that do influence the success chance of the company but cannot be influenced (Almus and Nerlinger, 1999). The age of the firms should be kept in mind when entering the market(Robinson and McDougall, 2001). The growth of firms decreases with the age of the firm (Hall, 1995),(Evans, 1987), (Jovanovic, 1982) so younger firms will have a steeper growth curve. Another factor that is hard to influence but is important for the success rate is the size of the firm (Almus and Nerlinger, 1999), small firms grow relatively faster than large firms, the size of the startup is negatively correlated with the growth of the firm (Evans, 1987), (Hall, 1995). Customer base and brand reputation influence the ability to acquire a large customer as a startup. Important to keep in mind that, especially in niche markets, not all startups are focused on building customer base because they only work on order (economies of scale is not applicable) or they are still busy with research and pilot production. Also connected with customer base are customer switching costs (Porter, 1998). Having high switching cost make it easier to maintain the customer base because they do not want to switch to another supplier because of the costs that will bring along. With ambiguity of the firm is meant how easy a firm can deal with uncertainties, sudden changes and how easily a company can adjust to this. Small firms are often more ambiguities than larger firms. Ambiguity also tells something about how flexible a firm is'(Covin and Slevin, 1989). The financial strength of the firm might be one of the most important factors that determine the success of the startup company. Richard Branson, a successful entrepreneur, stated that the biggest killer of the startup is poor cash flow (Elkins, 2017). According to a U.S. Bank study, 82% of businesses that fail do so because of cash flow problems (Schmid, 2017). Financial strength is one of the factors mentioned in every article in some way. Many of other factors

can be over won when the company has high financial strength, for example dealing with economies of scale that is negative for new companies, to deal with their lack of economies of scale a company need high financial strength. Also partnership, collaboration, forming of alliances etc. is mentioned in almost all literature. Collaboration in some way is one of the most important factors that can make the difference between a successful and a failing startup company because forms of collaboration can lower the other barriers more easily and let small startup firms benefit from the collaboration (Yang et al., 2013). Having tight links with other firms can provide the startup with additional know-how information about the industry, products or process, improve the capital status of the startups and can provide a network. (Almus and Nerlinger, 1999), (Variyam and Kraybill,). The last firm specific factor is the research & development investment. Especially for startups that are focused on innovativeness it is important that they keep investing in R&D and are the R&D expenses that are involved with market entry relatively high (Karakaya, 2002).

2.1.2 Founder specific

The founder specific factors are the characteristics of the founder or founders; this has to do with the capabilities and background of the founders. One of the most important factors is the technical knowledge. (Nejabat and van Geenhuizen, 2016b), (Almus and Nerlinger, 1999), (van Geenhuizen and Soetanto, 2009), (Karakaya, 2002), (Barringer et al., 2004). Technical aerospace knowledge is required to be successful as entrepreneur in the aerospace industry, aerospace engineering is a difficult part of engineering, and not a lot of people are specialised in aeronautical engineering. That makes this technical knowledge valuable. Lacking this knowledge is hard because it is hard to gain this knowledge further on in the developing process of a product or process(Eris et al., 2014). Along with the technical knowledge, market knowledge is also required to successfully enter the market (Nejabat and van Geenhuizen, 2016b), (van Geenhuizen and Soetanto, 2009), (Barringer et al., 2004). The lack of market knowledge is especially for technology-focused startups a problem because this often was not a part of their education. Lack of market knowledge is frequent problem for entrepreneurial engineers in combination with sales skills (van Geenhuizen and Soetanto, 2009) and managerial skills (Almus and Nerlinger, 1999), (van Geenhuizen and Soetanto, 2009), (van Niekerk, 2016). The lack of sales skills can have a big influence on the company in means of financing because the sale skills are the same skills that will help an entrepreneur to gain first of all investment capital, but also customers, clients etc. Providing extra courses in marketing and sale skills does not solve this problem, marketing knowledge and skills cannot be fully achieved by following a course but have to develop with experience (van Geenhuizen and Soetanto, 2009). Earlier the importance of collaborations is explained as a firm specific factor. However important to have access to collaborations in any kind the network density of the entrepreneur is important. How higher the density of the entrepreneurs network how easier it is to have access to collaborations, knowledge and investment capital. The higher the density of the network of an entrepreneur the easier the flow of resources will become (Powell et al., 1999). As an addition to the aerospace industry, a high density of the network can

eventually help the startup in the certification process. The size of the founder team is one of the factors that is hard to influence once the firm is created. Firms founded by one individual grow slower than firms that are founded by a team. This is based on the assumption that in a team a lack of knowledge of one person can be compensated by other members (Almus and Nerlinger, 1999) (Eisenhardt and Schoonhoven, 1990), (Reynolds, 1993), (Storey, 2016). Next to that have larger teams the advantages that they can possess more knowledge, talent, contacts/networks and resources (Barkman, 1994). The psychological advantage of larger teams is that within a team, members can offer each other support (Fesser and Willard, 1990). One of the factors that will get more important with a bigger founder team and especially with a bigger firm is the managerial skill of the founders. The lack of managerial skills have the same reason as the lack of market and sale skills; entrepreneurs have simply not focused on this subject during their education and experience is needed to gain this skills rather than a course.

2.1.3 Product specific

The product specific factors are the factors that are characteristic of the product or the service that forms the startup. Without a good product or service, the success rate of a startup is zero. Once developing the product or service it may be hard to change all the characteristics of this product. However, the product factors can indicate beforehand whether a product or service has the potential to become successful and these factors can keep in mind during the further development. The chosen technology is about what kind of technology is chosen to realise a product or service. Important, to be innovative, is that the chosen technology is superior to other technologies for example in costs, weight or required time. Having superior technology advantage is the only way for startups in the aerospace industry to compete with the big companies. With this technology, the entrepreneur is supposed to create value for the product or service. The ability of the entrepreneur to give the product a unique value for the customer is an important factor to achieve and maintain rapid growth (Kim and Mauborgne, 1997). Creating this value will only work when the chosen technology can meet these requirements. Product differentiation is the advantages of having brand identification and customer loyalties. Customer will identify the product of the same brand with earlier experience, so a high degree of product differentiation of established firms creates one of the most significant barriers for new entrants (Bain, 1956), (Bain, 1968). The differentiation creates a barrier by forcing the new entrants of a market to spend heavily in overcoming this product differentiation and create own product differentiation (Robinson and McDougall, 2001). For the aerospace, this barrier is extra high because risk plays such an essential role in this market. The failure of products that can cause for example malfunction of the aircraft can lead to losing many lives at once. An accident can damage the reputation of both the airline company, but also the aircraft manufacturer. Airline companies and aircraft manufacturers are more than willing to pay higher prices for technology that is proven to be safe to protect their reputation (nova workboard; a blog from young economists at Nova SBE, 2013). Economies of scale is the barrier that refers to the advantage of a decline in cost per unit of a product as the badge volume increases.Economies of scale are strongly related to (large) firm size and negative

related to new entrants (Robinson and McDougall, 2001), (Scherer and Ross, 1990). Economies of scale can be seen as a barrier because it forces the new entrant to enter the market with large-scale production with the risk that they will fail while they already spent a lot of money or come in at small scale and already start with a cost disadvantage (Porter, 1998). Both options are undesirable; the second strategy will apply when the product has other convincing value-added functions and may be a better strategy for entrants of the aerospace industry. The learning curve is the progress a firm makes due to gaining experience and require new skills. Incumbent firms have the advantage that they are already further on this learning curve. However, they can be on a stagnation level while new firms are often on the steep part of the learning curve. This does not take away the fact that new firms are at the beginning of the learning curve and simply miss experience. Switching cost is already named before. Switching costs are the costs that a customer will make when they are switching from product, brand or supplier, even though these costs are one-time it has a huge influence on the decision to switch. Switching cost can be the costs of new ancillary equipment, retraining costs of employers or the cost and time it takes to test and qualify the product of the new supplier (Porter, 1998). Again, when the switching costs are high the added value of the product also needs to be high to convince the customer to switch from the incumbent firms. The capital intensity of the market indicates the amount of money or financial resources that are needed to engage in its business. The higher the capital intensity of the market the higher the barriers to entering this market because of the financial resources that are needed to enter the market. The aerospace industry is without a doubt a very capital intense industry.

2.1.4 Environment specific

The environment specific factors is regarding the environment of the aerospace industry. One of the most significant obstacles in the aerospace industry are the policies and regulations they have to face every day. The regulations are all regarding the safety regulations that all aerospace firms have to meet. This certification process is a complicated, expensive and time consuming process. This factor may be one of the biggest reasons for startup companies to form a collaboration with big firms that can help them with this process because they possess all the testing facilities. Another barrier to entry can be created by the established companies to have the monopoly on the distribution channels. The new firms must persuade the channels to to accept the new products this is especially the case for wholesale and retail industries. Next to the cost disadvantages that startups have to deal with as the costs that regarding economies of scale, the learning curve, access to raw material etc. are there other costs disadvantages that startup will face in the industry, such as costs disadvantages because of the location of the firm.

2.1.5 Summary

All the factors that occur in the articles can form a barrier when the factors are lacking to some extent. To give a clear overview of all the barriers table 2.2 is made. The crosses in the table indicate that the factor occurred in the article with the number in the first row. The factors are mentioned as a success factor or a

factor that can form a barrier. The numbers in the first row represent the different articles used and these can be found in table 2.1. The factors are divided into the same four categories that can be found in this chapter. The category with the least factors is the environment specific, the reason is that this category is about the factors that are really specific for the industry. These were hard to find in the article because of the lack of aerospace industry articles. Assuming that during that this category will elaborate during the case study this is not a problem. There is room for all categories to develop and expand during the cases study.

Table 2.1: Articles used

	Article	**Title**
1	(Porter, 1998)	Competitive strategy; Techniques for Analyzing Industries and Competitors
2	(Langen and Pallis, 2007)	Entry barriers in seaports
3	(Nejabat and van Geenhuizen, 2016a)	University spin-off firms in sustainable energy in five countries: what determines their reaching of the market?
4	(Bjornalia and Ellingsen, 2014)	Factors Affecting the Development of Clean-tech Start-Ups: A Literature Review
5	(Almus and Nerlinger, 1999)	Growth of New Technology-Based Firms: Which Factors Matter?
6	(de Jonge, 2014)	Market Access for small ventures in the pharmaceutical industry
7	(van Geenhuizen and Soetanto, 2009)	Academic spin-offs at different ages: A case study in search of key obstacles to growth
8	(Karakaya, 2002)	Barriers to entry in industrial markets
9	(Barringer et al., 2004)	A quantitative content analysis of the characteristics of rapid-growth firms and their founders
10	(Covin and Slevin, 1989)	Strategic Management of Small Firms in Hostile and Benign Environments
11	(Leferink, 2016)	Commercial success factors for startups: A comparative case study research exploring commercial success factors for Dutch startups in the sustainable energy industry
12	(van Niekerk, 2016)	Exploring commercial success factors at start-ups

Table 2.2: Factor overview

		1	2	3	4	5	6	7	8	9	10	11	12
Firm specific	Strategy of the firm			X	X					X		X	X
	Age of the firm					X							
	Size of the firm					X							
	Customer base/brand reputation							X	X			X	X
	Ambiguity of the firm							X			X	X	
	Financial strength of the firm				X		X	X				X	
	Partners/Collaboration/Alliance				X	X				X		X	X
	R&D investment				X			X	X				
Founder specific	Technical knowledge			X		X			X	X			
	Market knowledge			X				X		X			
	Network density	X		X			X						X
	Size of the founder team					X				X			
	Sales skills							X					
	Managerial skilss					X		X					X
Product specific	Technology chosen			X			X		X			X	
	Value creation			X						X		X	
	Product differentiation	X		X		X				X	X		
	Economies of scale	X							X				
	Learning curve								X				
	Switching cost	X	X						X				
	Capital intensity of the product	X							X				
Environment specific	Investment capital		X	X	X			X		X			
	Policies/regulations	X	X	X	X		X	X	X	X			
	Local characteristics				X	X		X					
	Distribution chanels	X					X	X					
	Other costs disadvantages	X	X			X			X				

2.2 Self efficacy

"*Self efficacy refers to perceived capabilities for learning or performing actions at designated levels*"(Bandura, 1977). Since the introduction of the phenomenon self efficacy a lot of research is done on the influence of self efficacy in various domains, such as career, health, education, business etc.. Proved is that self efficacy has a huge impact on one's motivation, achievements and self-regulation (Multon et al., 1991). For example, in education, it is shown that the self efficacy of a student influences the student's activities chosen, level of effort, persistence and the achievements. Compared to students with a lower level of self efficacy these student participate more readily, work harder and achieve more. People with a higher level of self efficacy are also more eager to learn. Keeping this in mind, it is only logical that the self efficacy of an entrepreneur has a mediating effect on the chance success of their startup. People who have a low level of self-efficacy may avoid certain tasks they are uncertain about, while those who have a high level of self efficacy are likely to carry out these tasks, for example starting up a new business. Self-efficacy has numerous practical and theoretical implications creating entrepreneurial success in starting new ventures. Starting up new venture requires some unique skills and a specific mindset. One of the most severe barriers that entrepreneurs have to overcome when trying to enter the market is the anxiety about failure and their success throughout the whole process. However, an entrepreneur with a high level of self-efficacy, who does believe in his or her capabilities of breaking through in the market with their startup, is more likely to see the successful outcome and is more opportunity orientated. It results in that this entrepreneur will put more effort in achieving success or use the opportunity. Since the introduction of self-efficacy in 1977 research is done on the positive effect that a high level of self efficacy would have on the motivation and connected with that, the performance of one individual. However, it took a long time before there was a connection made between the self efficacy and an entrepreneurs effort and motivation to set up and grow a new venture. In the literature on entrepreneurial self-efficacy (ESE) the focus is mainly on the belief of the entrepreneur in its ability to take entrepreneurial actions, this belief is based on their managerial, technical and functional skills. First the capabilities of entrepreneurs were described similar to these of the effective managers. However, Chen et al. proved that these skills and mindset differ from those of a manager(Chen et al., 1998). Entrepreneurial self-efficacy has a positive effect on the likelihood of being an entrepreneur and the internal control of an entrepreneur. The biggest difference between the entrepreneur and the manager is the strong level of innovation and willingness to risk-taking of the entrepreneur. These capabilities are more critical for an entrepreneur than the earlier mentioned technical, functional and managerial skills(Noble et al., 1991). With the focus on these factors that are identified by Chen (Chen et al., 1998) the most important competencies in executing skills of an individual when fulfilling an entrepreneurial, technical and managerial role are the abilities to recognise opportunities and driving the venture through the fruition (Chandler and Jensen, 1992). these skills are seen as a measure of the entrepreneurial self-efficacy that differs the entrepreneur from a manager. The distinction between an entrepreneur and manager can also be made based on the difference in their motivation. there are five

patterns to explain the motivation of the entrepreneur (Miner, 1990):

1. *Desire to achieve through its own effort*
2. *Maintain personal control over the outcomes by avoiding risks and leaving little to chance*
3. *Obtaining feedback on the level of results of its performance*
4. *Desire to introduce innovation*
5. *Desire to think about the future*

In order to give the entrepreneurial self-efficacy a more comprehensive and understandable measure it is convenient to identify the unique qualities of the entrepreneur. The purpose of having this more comprehensive measure is to more easily identify who have a higher level of self-efficacy and along with that who will have a bigger chance of launching a successful startup. Six of these unique qualities that entrepreneurs believe they must possess in order to be successful are identified by Noble, Jung & Ehrlich (Noble et al., 1991)

1. ***Developing new product or market opportunities****: this includes the skills of opportunity recognition. An entrepreneur needs to be creative in the recognition and spotting of changes in markets. The need to believe in that the opportunity they identified forms a solid foundation for the launch of a startup. The skill of recognising opportunities is often mentioned in other literature. (Chandler and Jensen, 1992) (Chen et al., 1998)*
2. ***Building an innovative environment****: is all about the skills to encourage the environment to be innovative and take responsibilities for own outcomes. This is an addition to the factors from Chen(Chen et al., 1998), in a way that the entrepreneur distinct itself from a manager by the capability of building a working environment from the ground up. The entrepreneur must believe that he or she can build up this environment entirely new.*
3. ***Initiating investor relationships****: financial resources are one of the most important resources for a startup company. To obtain sufficient funds the entrepreneur needs skills in networking activities and in maintaining the network. In the startup phase of a new venture these activities can be the most time consuming and demanding activity which requires a high level of self-efficacy and vital skills.*
4. ***Defining core purpose****: To attract investors and employees, the entrepreneur needs to clarify the focus and his or her vision they have with their new venture. They need to settle on a shared core purpose to feel motivated to initiate a startup. The focus on the vision and the values of the startup is a critical skill by high-growth entrepreneurs in the research conducted by Eggers (Eggers et al., 1996)*

5. ***Coping with unexpected challenges****: depends on the ambiguity of the company and the entrepreneur. During the startup phase of a company, the entrepreneur will have to deal with a lot of uncertainties, rejections, fluctuation of the environment and other changes.*

6. ***Developing critical human resources****: refers to the ability of the entrepreneur to attract and protect the key values of the startup. One individual considering a startup company must recognise the need to involve others. The entrepreneur must believe in its capability to attract the right and talented individuals.*

Three of these identified skills, developing opportunities, innovative environments and dealing with unexpected challenges, are proved to be positive correlated with the entrepreneurial intention(Noble et al., 1991).

2.3 Support programmes

This part is a review on the effectivenesses of several solutions to overcome entry barriers for new ventures, startup companies, (university) spin-offs etc.. Incubators and accelerators both provide support in the form of services, advice (technical & legal), knowledge sharing (technical & legal) and offer office space, machinery and network connections. To become part of a support programme a strict selection takes place beforehand. The support period is for a specific time, rough 90 days and it ends with a demonstration day for potential investors and buyers. However the effectiveness of these incubator and accelerator programmes are questionable, and a lot of research has been done on this subject.

2.3.1 Incubators

Incubators are merely focused on new venture companies that are currently in their startup face and support startup with resources, on different levels, for example; office space, knowledge on business and management basics, and network activities, access to (bank) loans, professional mentor-ship and linkage to strategic partners. Economic development organisation sponsor about 33% of these incubators. Government entities sponsor 21%, and academic institutions sponsor 20%. In the United States, most of these incubation programmes are privately sponsored. Most of the incubation programmes offer their programmes on nonprofit base and want to contribute to the creation of jobs, stimulate innovation & entrepreneurship. About 25% will take equity in the programs that they hatch with the incubation programme.(Stagars, 2015)

One specific form of incubators are the university incubators. These incubators are set up by the universities and are exclusively for students from the university. This lowers the entry barrier of the incubator for the students that do not have any experience with entrepreneurship as they do not have any work experience. University incubators are explosively growing the last couple years however the effectiveness of these university incubators is questionable. One the fall downs of university incubators can be that they

are overprotective and are hindering the success of new and young firms (Trott et al., 2008). Spin-offs start with some major disadvantages because of their newness and small size. This limits spin-offs due to their lack of financial resources and assets, lack of business and commercial knowledge etc. Support activities are desirable for these spin-offs to overcome this disadvantages and university incubators are the perfect place to get this support. However, even though universities are pushing the creation of spin-offs, far too few spin-offs become a successful company. The reason might be that Universities are more interested in the quantity of the spin-offs rather than the quality of these spin-offs. Scholten, Trott & Hartman indicated four factors that could have a negative impact on the development of the spin-off by the university incubator;

1. **Remoteness;** The university incubator removes start-up firms from the harsh commercial environment where economic rationality and price based decision making dominates.

2. **Product Myopia;** University start-up firms, with their technology orientation, focus too early on a product category or a market segment which precludes the possibility of development for other market opportunities.

3. **University network;**The university incubator offers easy maintenance of past networks to academic colleagues and friends. Resulting in hindering the development of new networks that these start-up firms need to be building amongst customers, suppliers and competitors.

4. **Cushion effects;** The university incubator provides a cushion against the commercial reality of the competitive marketplace. It can cause severe problems for the firm when it leaves the incubator.

Embracing the spin-off too closely results in both hampering the freedom of the spin-off and gives a signal to the outside world that the spin-off is has not reached maturity yet. Parent organisation can support the spin-off with translating their knowledge and ideas into commercial products or services. However there should be a clear balance between making use of the expertise and advice of the parents and the ability to be independent and show this to the industry.
Massimo Colombo and Delmastro performed a study on 45 new technology based firms in Italy. These firms were part of incubators within a science park and were compared with firms that were not part of an incubator or science park in order to test the effectiveness of these incubators. Two facts concerning new technology based firms have to be kept in mind. First of all that they are a crucial element to innovation and the creation of jobs and second of all that they have to face higher obstacles than other firms. These are the two reasons that new technology based firms deserve governmental, institutional support. In means of input and output measures of the innovative activity within the firms only had a small difference between the firms that are part of an incubator and the firs that were not. However the Italian science parks and incubators are able to attract entrepreneurs and startups that have better human capital, in means of educational and prior working experience. And the firms that were part of incubators showed higher growth rates, performed better in adopting advanced technologies, and the establishment

of collaborations. And as last, the firms that were part of an incubator have less trouble in acquiring public subsidies. The research concludes that, especially in countries with weak national innovation, the support of incubators is an essential part of the development of new technology based firms.
The positive impacts for the startups acquisition of knowledge on business processes from the support of an incubator has positive effects on the development of new product, technical competence, enhanced reputation and the lower costs of sale for users(Studdard, 2006). The most effective is the gain in reputation for the startup by being part of an incubator. When accepting the entrepreneur to a (prestigious) incubator it gives a boost to the reputation of the entrepreneur and the startup. This boost can help the startup in further growth by having easier access to investments, brand building and acquiring collaborations.
Tamsay discussed that to develop a robust policy instrument for entrepreneurship, innovation and regional development the technology-oriented business incubators needs rethinking to make it more effective based on previous research that proved that incubators tend to fail in supporting entrepreneurship and innovation. To stimulate entrepreneurship and innovation, running the incubator as a private organisation is essential. Public funding should be involved in the process (Tamasy, 2007). Three reasons to cut public funding for the incubator are:

1. *Public funding only has a low impact on the motivation*
2. *It does not increase the likelihood of the survival of the firm, growth of the firm and innovativeness of the firm.*
3. *There is a positive correlation between the level of funding and the costs of the incubator*

The most important factors that have a positive influence on the effectiveness of the incubator is that the incubator should be established in an environment that is all about innovation, interaction with the right industries and access to resources in the form of experienced entrepreneurs or management teams as mentors. The more the incubator is focused on the job making and stimulating the entrepreneurial behaviour of the startup the more they are improving the effectiveness of the incubator (Alireza Ghasemizad1 et al., 2011).

2.3.2 Accelerators

Even though the terms incubators and accelerators are often mentioned in one breath, as one interchangeable term there are some minor differences between the two(Stagars, 2015). Since the number of accelerators is dramatically increasing in the united states it is essential to understand what makes an accelerator different from an incubator and why it is so popular, figure 2.1 shows the growth of accelerators in the united states over the last ten years.
Accelerators are known to be more profit-focused than incubators, which are often government funded. Accelerators are also more common in the technology and software industry. Miller and Bound identified the following five factors that differentiates accelerators from incubators (Miller and Bound, 2011)

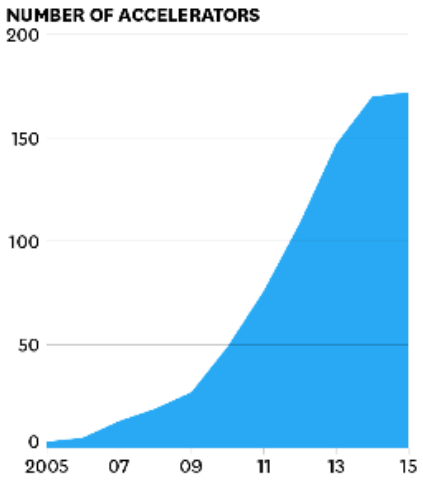

Figure 2.1: Number of accelerators in the United States (Hathaway, 2016)

1. *Application process is open to all and is competitive*
2. *They offer pre-seed investment in exchange for equity*
3. *Suitable for small teams rather than individual founders*
4. *Time-limited, approximate 90 days*
5. *Groups or classes of startups exist rather than individual startups*

The differences as stated by Cohen are shown in figure 2.2

	Accelerators	**Incubators**	**Angel Investors**
Duration	3 months	1-5 yrs	Ongoing
Cohorts	Yes	No	No
Business model	Investment; non-profit	Rent; non-profit	Investment
Selection frequency	Competitive, cyclical	Non competitive	Competitive, ongoing
Venture stage	Early	Early, or late	Early
Education offered	Seminars	Ad hoc, hr/legal	None
Venture location	Usually on-site	On-site	Off-site
Mentorship	Intense, by self and others	Minimal, tactical	As needed, by investor

Figure 2.2: Summary of the Differences between Incubators, Investors, and Accelerators (Cohen, 2013)

Later on, Cohen highlighted that the four most distinct factors of accelerators are that they are fixed term, cohort-based, mentorship-driven, and they end with a demo-day or graduation day. Cohen stated that these four factors make an accelerator unique.

One of the most critical differences is that accelerators are not free government supported programs but are for-profit operations which need to produce and return with the seeded startups. Firms may also offer accelerators because they see added value for startups using their technology for business. For example, Facebook ran an accelerator with the goal to encourage startups to use their platform.

Miller and Bound also elaborate on some shortcomings of accelerators.

1. *The focus is on smaller companies, which already have a business model.*
2. *A big part of the participant will still fail after the accelerator period is done. The program is only for a short period, and companies will still have to face the harsh real world and obstacles of new entrants in the industry. However, they will have a head start.*
3. *Participating entrepreneurs often feel exploited because of the phenomenon of "rich guys starting a startup accelerator so they can rip off founders." (Treehouse Blog, 2011). They offer startups a capital to help them as a loan. Not only have the startups to pay this loan back, but the accelerators also demand an equity stake of approximate 6%.*
4. *Some may argue that accelerators are more attractive for B-grade startups. Of course is a successful startup that does not need support is more profitable than a startup that can only be successful with the support of an accelerator.*
5. *The risk is that some entrepreneurs will see an accelerator as an experience, CV worthily, activity. They are participating because of the experience and not trying to build a serious, successful business. This will lead to many failures of startup companies which will have a negative impact on the accelerator image*

Hoffman and Radojevich-Kelley examined the role of the accelerator in assisting the startup firm. Their research leads to four proposition:

1. ***Motivation*** *: The motivation of the accelerator is that in change for equity the will provide support, education and funding to the entrepreneurs. They will only help startups with ideas that they believe are viable. The personal beliefs and interest of the accelerator make the accelerator concept unique.*
2. ***Higher success rates****: startups that are "accelerators graduates" have higher success rates compared to non-accelerator graduates as measured by longevity in business and receipt of further funding.*
3. ***Obstacles****: Accelerator identified insufficient experience and misunderstanding of the market as the biggest obstacles for startups.*
4. ***Value adding****: Accelerator programs identified networking and mentorship as their biggest value adding for startup companies.*

Isabelle researched key factors that influence the entrepreneurs choice of incubator or accelerator (Isabelle, 2013). Five key factors that entrepreneurs should keep in mind when choosing an incubator or accelerator are the following;

1. ***Stage of new venture****: An entrepreneur that is still in a very early startup face, and still developing an idea will have different needs and expectations than an entrepreneur that already has a product and potential clients. Incubators tend to have the image of being more suitable for early-stage startups and accelerator more suitable for next-stage startups focused on high growth.*

2. ***Fit between entrepreneurs needs and incubators mission, purpose & sector focus****: Incubators are only successful when the incubators and the participants have the same view on mission and purpose. Furthermore, it is more effective when the incubator focuses on a specific sector, resulting in more specific mentorship.*

3. ***Selection & graduation policies****: companies always have to apply to be selected by an incubator or accelerator. Incubators and accelerators use this to, first of all, determine whether an idea is viable and unique and second of all to determine if the focus, goal and mission of the entrepreneur match with their own.*

4. ***Nature & extent of services****: The research showed the highest rated support activities; office space, business basics and marketing education, help with the commercialisation of their technology and links and access to investors and strategic partners.*

5. ***The network of partners****: The most critical factor is the network of partners an incubator or accelerator has to offer.*

Hathaway acknowledged the fact that the number of accelerators is proliferating. It made him question what it is that accelerators do and what makes them so popular. He came with four different theories on what accelerators do for startups. First of all when comparing a group of companies that did en that did not take part in an accelerator program, the ones that took part in an accelerator programme saw this as reaching a milestone. However when looking at the broader sample, accelerators do not seem to accelerate startup developments, and sometimes even slow the startups down. When comparing similar startups that took part in an accelerator programme or raised angel funding, the startups that took place in the accelerator programme were more likely to achieve the next round of financing earlier. The value of accelerators comes from the intensive learning and mentorship environment of the accelerator. And as last but not unimportant. Accelerators do have a positive impact on the entrepreneurial ecosystem, particular when it comes to the financial environment that is needed.

Altogether is the accelerator and incubator plan a good solution for technically orientated startups. It gives the startups a kick start and provides them with a network, knowledge and asset benefits. However, there are a lot of shady accelerators that will provide a little funding and advice in exchange for proportional stake of equity.

2.3.3 Conclusion

Incubators and accelerators are both growing phenomena, and differences between these two and the effectiveness of these programmes for entrepreneurs and startup companies is a popular subject for research. Incubators can help startup companies to perform better in adopting advanced technology, achieve higher growth rates, easier acquiring pubic subsidies and translating their ideas into commercial products or services. Next to that being part of an incubator can help a startup with further growth by giving a boost to the reputation of the startups which helps them with brand building and acquiring collaborations. An incubator needs te ran as a private organisation to stimulate entrepreneurship and innovation because public funding only has a low impact on the motivation and does not increase the change of survival of the firm. The incubator should also be aware not to be overprotective and with that hindering the success of the young firm. The startup should not be held too closely because this can give wrong signals to the outside world that the startup has not reached maternity yet. Accelerators differ from incubators in terms that incubation programmes last longer than accelerator programmes which are of a fixed term. Incubation programmes also distinct them self by being cohort-based, mentorship-driven and they end with a graduation or demo-day. Some shortcomings of accelerators are that they are focused on small companies that already have a business plan, a big part will still fail, and there is a chance some accelerators will exploit startup companies by demanding stakes of equity while giving little back. What accelerators can offer to entrepreneurs is motivation and confidence in their startups. Mentorship and education on both technical, marketing and business knowledge. They also help entrepreneurs with broadening their network which makes it easier to receive funds.

When looking at the barriers that were mentioned at the end of the previous section and compared these with what accelerators and incubators can offer a lot of these barriers can be over won with the help of such programmes. Table 2.3 shows the connection of the barriers and the solutions offered by incubators and accelerators.

As shown in table 2.3 for many barriers solutions are available. Important is to keep in mind that this solution can lower the barriers but not entirely take them away. Brand reputation, network density can be achieved by the network of the incubator and the accelerator. Offering network opportunities is one of the biggest advantages that incubators and accelerators have to offer. The availability of this network also increases the chances on any collaborations. Accelerators also organise demo days were potential partners are invited. Overcoming the knowledge barriers is one of the biggest focus points of the accelerator. They offer intensive mentorship and a lot of education in the form of seminars and lectures to help entrepreneurs. Incubators are more focused on offering education and help with legal and human resources cases. Product specific barriers are hard to overcome because this is dependable on the idea of the startup. However, both incubator and accelerator are offering help with commercialising ideas into products or services. Fund and loans can lower Some of the financial barriers. Table 2.3 connects the barriers and the support activities. For the barriers the possible solution of an incubator and an accelerator

is given.

Table 2.3: Connection of barriers and solutions

Barriers	**Incubator solution**	**Accelerator solution**
1. Firms specific		
Age of the firm	-	-
Size of the firm	-	-
Brand reputation	Incubator's name	Demo-day/graduation
Ambiguity of the firm	-	-
Financial strength	Government funds	Funds/loans
Partnership/collaborations/alliances	Network availability	Demo-day
R&D investment	-	-
2. Founder specific		
Technical knowledge	-	Mentorship/education
Market knowledge	Education	Mentorship/education
Network density	Network availability	Network availability
Size of the founder team	-	-
Sales skills	Education	Mentorship/education
Managerial skills	Education	Mentorship/education
3. Product specific		
Technology chosen	-	-
Value creation	Commercializing ideas	Commercializing ideas
Economies of scale	-	-
Learning curve	-	-
Switching cost	-	-
Capital intensity	Government funds	Funds/loans
4. Environment specific		
Investment capital	Government funds	Funds/loans
Policies/regulations	Education	Mentorship/education
Other cost disadvantages	-	-

2.4 Conceptual model

The literature study covers three concepts. However, how do these three concepts relate to each other? A conceptual model is made using the findings of the literature study.

Making a conceptual design for a theory building research is a bit harder than a conceptual design for theory testing research. The model is abstract due to the uncertainties in relationships between different variables and factors. Base the relationships on assumptions and findings from the literature study. In figure 2.3 the conceptual model is shown.

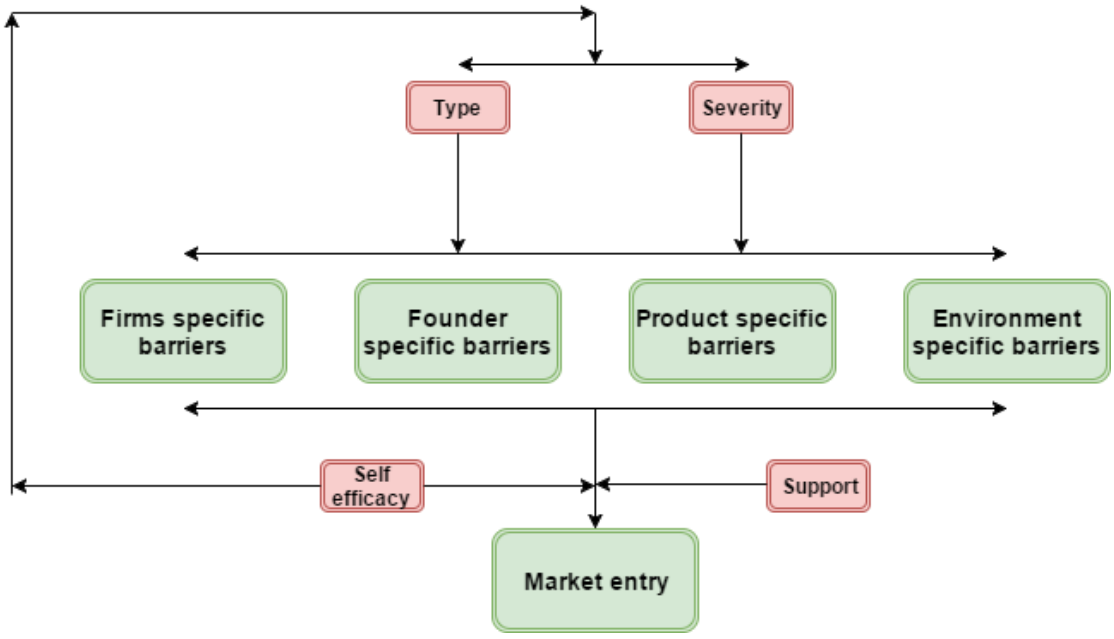

Figure 2.3: Conceptual model

When looking at the conceptual model 2.3 two colours are used. The first green boxes represent the barriers that are found during the literature study these are divided into four categories. What influences these barriers; are the type of barrier (what the barrier specific means) and the severity of the barrier. These two components are displayed in the first two red boxes. So the first relation is that it is presumed that there are different types of barriers and that the different types of barriers have a difference in severity.

The barriers have a negative influence on the market entry, the barriers make market entry harder, that relationship is proved in previous literature on entry barriers. However there are two moderating variables that influence the relationship between the barriers and the market entry.

The self efficacy of the founder of the startup and the support that the startup can receive from support programmes. These two variables should have a positive impact on the relationship between the barriers and the market entry. Meaning that the barriers that make the market entry for startups harder will be

easier to overcome by startups due to a high level of self efficacy or by support.
Next to that it is assumed that the level of self efficacy of the founder will have an influence on the barriers and the severity that are experienced. A high level of self efficacy expresses in high believe in own abilities and more opportunity oriented instead of problem oriented. This means that a founder with a low level of self efficacy may experience more barriers or a higher severity in barriers than a founder with a high level of self efficacy because of the lack of self believe.

In conclusion, the barriers that startups face make their entry to market more difficult. However, a high level of self efficacy and support activities make these barriers easier to overcome and make the market entry less difficult. And it is assumed that the market entry of startups in the aerospace industry will finally lead to more innovation in the aerospace industry. This research focuses on identifying the barriers and defining the relationship between the influences that these barriers have on market entry and the role that self efficacy and support activities have in this relationship.

3 | Methodology

The objective of this study is to develop a theory on how startup companies can be stimulated to enter the aerospace industry, to develop this theory four research questions will be used. This chapter will gives an overview on the methodology that will be used in order to answer these four different question and eventually to develop the theory on how Dutch startup companies can be stimulated to enter the aerospace industry. The type of research that will be used is discussed first followed by the units of analysis that are used, the data collection and the data analysis. Finally the justification, validity and reliability of the study will be discussed.

3.1 Type of research

The type of research that matches the best with this study is the multiple case study because of the type of objective for this study. The objective is partly theory and partly practice aimed. The literatures study build on the theory regarding to the barriers and the support to overcome this barriers for the startups and interviews with startups from the industry make it possible to let the startups share their experience regarding to this.

Yin stated that a multiple-case study is the best fit (Yin, 2014). The multiple case study instead of a single case study makes the study more generalizable. As stated by Dul & Hak (Dul and Hak, 2008): *"The objective of theory-building research is to contribute to the development of theory by formulating new propositions based on the evidence drawn from observation of instances of the object of study"*. They also state that theory-oriented research (the literature study) should result into a selection of variable that will lead to a simple causal diagram which can be used as guidance through the empirical part of the study.

This causal diagram is already presented in the previous chapter as the conceptual model. The case studies are performed cross-sectional, which includes that the observation of the unit of analysis (the several cases) are done in one single period of time and the observation is an empirical observation that is done in the real-life context. (Sekaran and Bougie, 2014) (Yin, 2014)

The unit of analysis, in other words the cases will be several Dutch startups that are connected with the aerospace industry. More about these cases will be described in the section unit of analysis. Between these cases a comparative study will be done. What does these cases have in common and what are the differences.

Table 3.1 shows in the first column the different research questions that will be answered in this study. the second column shows the type of research that will be used to answer the research question

Table 3.1: Type of research used to answer the research questions

Research question	**Type of research**
What entry barriers do startups in the aerospace industry face?	Literature study Comparative case study
What is the influence of entrepreneurial self efficacy for startups on the entry barriers of the aerospace industry?	Comparative case study
What activities can support programmes offer startup companies in order to lower the entry barriers?	Comparative case study
What recommendation can be given for stimulating startups in the aerospace industry?	Literature study Comparative case study

3.2 Units of analysis

Removed due to confidential information

3.3 Research Framework

The research framework that will be used for this research is shown in figure 3.1

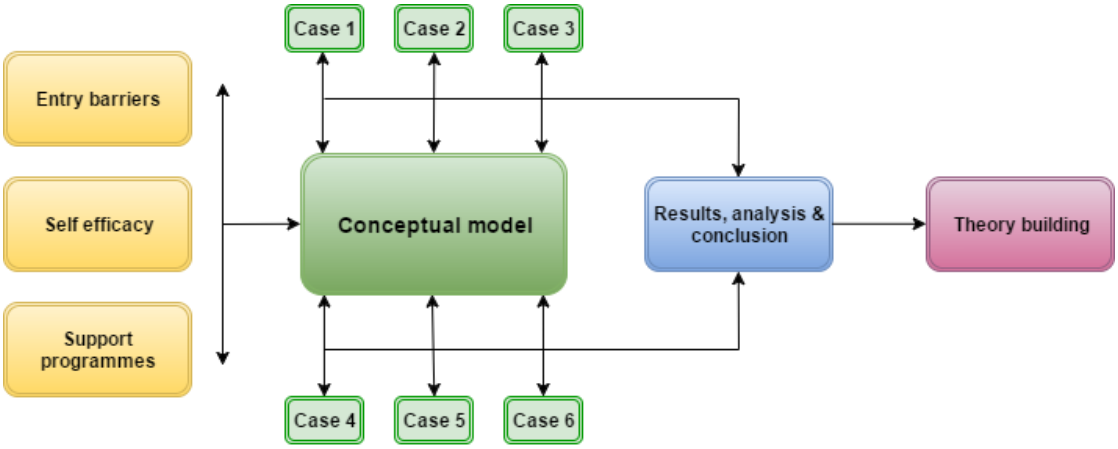

Figure 3.1: Research framework

This research framework is divided into four parts:

- **Literature study:** The yellow boxes represent the three concepts that are reviewed in the literature study that can be found in chapter 2. This literature study is the start of the research. The conclusion of the literature study leaded to the conceptual model that can be found in chapter 2, Figure 2.3.
- **Conceptual model:** The conceptual model is showed in the previous chapter 2, the literature study. The research is based on the conceptual model and the various relationships that are part of the model. The research is based on clarifying this conceptual model. Using this model the subjects of the interviews of the case studies are defined. When looking at the barriers this consist of two parts. First of all identifying the barriers, the type of barriers that the cases have faced and second of all the severity of the barriers by scoring the perceived barriers. To clarify the use of support, the cases have to identify the support activities, link them to the perceived barriers and score/rank these barriers. To test the level of self efficacy a questionnaire that can be found in appendix II will be used.
- **Cases:** The other green boxes represent the case studies that will be done on six different cases. The case study is based on the results from the literatures study. The interviews with the cases will be based on the list of the barriers that is found in the literature study, the questionnaire on self efficacy and the different support activities that are identified.
- **Results, analysis & conclusion**: The blue boxes represent the results the analysis and the conclusions that will be done based on the data that is required during the case studies.

- **Theory development:** The purple box shows the final phase of the study, the theory building. Using the theory building method as stated by Dul & Hak (Dul and Hak, 2008) the results of the case study will be placed in a cross case analyse which will lead to propositions.

3.4 Data collection

In order to answers the research questions and full fill the research objective two types of data collection will be used during this study. Both a literature study as interviews will be conducted. These two types of data collection will not be two separate sources of data but will be used to support and strengthen each other.

3.4.1 Literature Study

The literature study is a really essential part of the research. It will not only be the beginning of the research it will also be used as a guidance through the whole research. The literature study is already done in order to develop a conceptual model and to decide what kind of research fits best wit the conceptual model.

The literature study is used to formulate an answer on the first research question. This gave a clear overview of the barriers that startup companies face when entering the aerospace market and what the options are to overcome these barriers. Using the answers found in the literature, interview questions are set up. The interviews with several startup companies should provide answers on the second, third and fourth research questions. However these answers will be formulated using the responses of the interviews together with the information found in the literature study.

The literature that will be used for the literature study can consist of different types of sources. Books, academic papers, research, news articles etc. Internet, scientific databases, TUDelftlibrary will be mostly used to find the right sources.

3.4.2 Interview approach

The most information that probably can be found on the barriers that startup companies face when entering the aerospace industry will be mostly assumptions or derivatives from comparable cases and industries. This can be used to give an idea about the barriers that startups in real life will face, and can be used to form a conceptual model. However it can not guarantee how startup companies experience these barriers and how to stimulate startup companies to enter the aerospace market. Therefore interviews with these startup companies are needed. These interviews will be a combination of primary data (conducted during the interview) and secondary data that was collected during the literature study. Interviewing is, especially for theory building stages of a study a useful data collection method.(Sekaran and Bougie, 2014).

The interviews will have a semi-structured interview approach. The questions for the interviews will be

set up beforehand and will be based on the literature study, and all interviewees will get the same questions in the same order, however the interviewees will also get the opportunity to share their experience and elaborate on what they want to share. There are three subjects of the interviews. The interview guide can be found in Appendix I.

Self efficacy

This part is also discussed in the literature review. There is a lot of literature on the subject self efficacy among entrepreneurs. This subject will not be tested by interview question but by letting the interviewees fill in a questionnaire that can test the level of entrepreneurial self efficacy, this questionnaire can be found in Appendix II (Noble et al., 1991).
The goal is to find if there is a connection with the level of self efficacy and how startups experience entering the aerospace industry and the barriers. A high level of self efficacy causes entrepreneurs to have a high level of believe in their own abilities which can make them less impressed by the high entry barriers of the aerospace industry.

Barriers

The second subject of the interviews will be about the barriers that startup companies think they will face or the barriers they already faced. The interview questions will be based on the barriers that are mentioned in the literature.
The goal of this part is first to find out if startup companies are aware of the barriers they can face, second if there are more barriers that the startup companies face besides the ones that are mentioned in existing literature , third compare the barriers that are mentioned in the literature to how these barriers are experienced by startups. To find the differences and the similarities between the literature and the several startups a cross case analysis can be made.
The entrepreneur is also asked to score all the perceived barriers. By means of pattern matching these scores are analysed (Dul and Hak, 2008).

Support

The last subject is about ways to overcome the barriers by means of activities from support programmes. Support programmes can be incubators, accelerators, collaboration etc.

3.5 Justification

For this study the case study approach is used because there has not been enough research into this subject and the literature that can be found on this subject is not sufficient. Typical critique on case studies is that these studies may not be rigour and the lack of generalizability. Because this will be a multiple case study the rigour and lack of generalizability will be less an issue. Case studies often lead to data output that contains too much information and has too much detail (Sekaran and Bougie, 2014). This broad range of information makes it harder to identify the valuable data of the cases. Therefore results of this case study can be used to develop a theory on how to make the aerospace industry more attractive for startups, but more extensive study is needed to test this theory. Another issue with case studies were interviews are used to gather data is the replicability of the study. In other words, when another researcher conducts the same research will he or she come to the same results. To narrow this down as much as possible an interview guide is used for every interview. However the answers that respondents will give can differ depending on the interviewer, the circumstances, mood, timing etc.. Therefore the transcriptions of all interviews is included in a separate appendix.

3.6 Validity

The face validity of the research is about if the thing that is measured during a research is similar to what was supposed to be measured. To preserve the face validity during this research a clear interview guide is used for all the case studies. This interview guide contains all the questions that are asked during the interview. Next to the questions all the interviewees have to fill in the questionnaire on self efficacy, this questionnaire is used for many years to test self efficacy and therefore the questions are not changed. However to every interview a list with explanation of the more difficult terms is taken, to make sure if any of these terms need explanation the exact same explanation can be given every time. The subjects on the barriers and the support programmes are studied by using the questions as formulated in the interview guide, and every case has to fill in two structured tables to strengthen the face validity between the cases. The last measure to ensure the face validity is that the interview guide is shown to an outsider that could indicate any unclear questions. One of the benefits of a face to face interview is that the interviewee can ask questions when something is unclear and often when they answer the question they explain their answer, this way it is clear if the question is answered the right way.

The content validity of the research is to secure that the measures are adequately, the validity of the test instruments. For this research that is the interview. To ensure the content validity the interview questions are all based on the literature study. The questionnaire on self efficacy is a commonly used way to test the level of self efficacy. The list of barriers and support activities that are shown during the interview is set up using existing literature. The whole research is based on the conceptual model shown in figure 2.3, where this model is derived from existing literature in order to avoid personal assumptions.

3.7 Reliability

The reliability of the research shows the stability & consistency with which the measurements tool measures the concepts (Sekaran and Bougie, 2014). For the reliability of the research it is important to discuss the non-responses and if this leads to non-response bias, eight units of analysis were originally found. However only six of these eight cases are willing to participate in the case study. Non-response bias occurs when the non-responses differ from the responses or messes of the variances of the sample.
In this case the non-responses will not lead to a bias. Whether the case already had their product on the market was originally divided 50%-50-% and this is still the case with the final six units of analysis. The product of the samples were all different, and they all produced both software and hardware. The division of offering service also remained 50%-50%. And there was no difference in whether they faced rivalry on the market.
Since the two cases that will not participate do not show any remarkable characteristics that differ from the six cases that will participate a non-response bias is not likely in this study.

4 | Results

In this chapter only anonymous tables with global results are given due to confidentially.
Each case results starts with an introduction to the case. It is essential for the analysis to keep in mind the kind of company and the characteristics of the case. After the introduction the three subject of the case study are succinctly discussed, to start with what entry barriers do startups in the aerospace industry face? During the interview a list of barriers is showed to the interviewee, they had to point out which of these barriers they perceived and could add more perceived barriers, the next step was to indicate the severity of these barriers by giving a score between 1-5, one not severe to five very severe.

The next subject of the interview concerned the support programmes and their activities. The interviewee had to fill in which support activities they have benefited. They were also asked to make a link between the barriers and these support activities by defining what support activity made what barrier easier. They were also asked what they thought was the most important support activity the support programme had to offer, and what the reason was they joined this particular support programme. The results of the filled in tables are given at the end of each case result. The analysis of the results will be done in the next chapter

During the last step of the interview the questionnaire of entrepreneurial self efficacy is filled in, see Appendix II. All the results of the level of entrepreneurial self efficacy can be found in table 5.2.

4.1 Case 1

Table 4.1 gives a short analysis of the barriers that are named in case 1. The barriers can be found in the first column, and the severity score of the barrier can be found in the second column. The first row represent the support activities that case 1 recognized. The crosses indicate for which barrier case 1 was helped by the support activity. Not all barrier were matched with a support activity because the case did not experience a support activity as useful for that barrier.

Table 4.1: Results case 1

Barrier	**Score**	***Mentor-ship***	***Funds***	***Net-work availble***	***Commer-cializing ideas***	***Business & manage-ment education***	***Assets***	***Inter-action***	***Atmos-phere***
Firms specific									
Financial strength of firm	**4**		**X**	**X**					
Founder specific									
Market knowledge	**1**	**X**				**X**		**X**	**X**
Network density	**5**			**X**				**X**	
Product specific									
Value creation	**1**								
Capital intensity of product	**5**						**X**	**X**	
Focus	**4**	**X**				**X**			
Commercializing idea	**3**				**X**				
Environment specific									
Policies/regulations	**5**			**X**					
Local characteristics	**5**								
Dynamics of partners	**3**			**X**					
Slow decision making	**5**								
Slowness industry	**5**								

4.2 Case 2

When looking at table 4.2 the perceived barriers, with the severity score, and the perceived support activities are linked to each other. Again not all barriers are linked with a support activity and some support activities are marked as being useful for several barriers while other are only marked as useful for one single barrier.

Table 4.2: Results Case 2

Barrier	**Score**	***Mentorship***	***Funds***	***Network available***	***Reputation boost***
Firm specific					
Age of the firm	**5**				**X**
Size of the firm	**5**				**X**
Customer base/brand reputation	**5**				**X**
Cope with uncertainty & risk	**1**				
Financial strength of the firm	**4**		**X**	**X**	
Partners/Collaboration/Alliance	**1**	**X**			
Focus	**3**				
Shown experience	**5**				**X**
Launching customer	**4**			**X**	
Founder specific					
Network density	**5**			**X**	
Product/Service specific					
Economies of scale	**1**				
Switching cost	**1**				
Demand	**2**				
Environment specific					
Policies/regulations	**4**			**X**	
Politics	**4**				**X**
Government involvement	**3**				
Slowness industry	**5**				

4.3 Case 3

Table 4.3 gives a clear overview of all the barriers that are named in case 3. Remarkable is that in this case only three network activities were marked as experienced. This leads to a lot more barriers that are not linked with a support activity.

Table 4.3: Results Case 3

Barrier	**Score**	***Funds***	***Network available***	***Reputation boost***
Firm specific				
Size of the firm	**2**			
Cope with uncertainty & risk	**4**			
Able to adapt to change	**3**			
Financial strength of the firm	**3**	**X**		
Focus	**4**			
Endurance	**3**	**X**	**X**	
Size of team	**3**			
Founder specific				
Technical knowledge	**5**		**X**	
Network density	**5**		**X**	**X**
Product/Service specific				
Value creation	**3**			
Economies of scale	**3**			
Demand	**2**			
Environment specific				
Policies/regulations	**4**		**X**	
Local characteristics	**1**			
Slow decision making	**5**			
Involvement stakeholders	**5**			
Slowness industry	**5**			

4.4 Case 4

Table 4.4 gives the results of case 4. Again there are only three perceived support activities that leads to a lot of barriers that are not linked with an activity.

Table 4.4: Results Case 4

	Score	***Funds***	***Network available***	***Reputation boost***
Firm specific				
Age of the firm	**2**			**X**
Size of the firm	**2**			**X**
Customer base/brand reputation	**5**			**X**
Financial strength of the firm	**4**	**X**		
R&D investment	**2**			
Endurance	**4**	**X**	**X**	**X**
Founder specific				
Market knowledge	**4**			
Network density	**5**		**X**	
Size of the founder team	**4**			
Product/service specific				
Economies of scale	**3**			
Capital intensity of the product	**3**			
Business case	**5**			
Environment specific				
Investment capital	**4**	**X**		
Policies/regulations	**5**			
Lead time/ doorlooptijd	**5**			
Governmental involvement	**4**			
Liability	**5**			
Slow decision making	**5**			
Stakeholder involvement	**5**			
Slowness industry	**4**			

4.5 Case 5

The results of case 5 can be found in Table 4.5. This case did experience a lot more support activities. However the environment specific barriers, which are all scored with a severity of five are not matched with a support activity.

Table 4.5: Results Case 5

Barrier	**Confirm**	***Mentor-ship***	***Funds***	***Network available***	***Business & management education***	***IP-consulting***
Firm specific						
Strategy of the firm	**3**	**X**				
Age of the firm	**3**					
Customer base/brand reputation	**3**					
Financial strength of the firm	**5**		**X**	**X**	**X**	
Endurance	**5**	**X**	**X**		**X**	
Focus	**4**	**X**				
Founder specific						
Technical knowledge	**2**			**X**		
Market knowledge	**2**				**X**	
Network density	**2**			**X**		
Size of the founder team	**2**					
Product/service specific						
Technology chosen	**2**					
Value creation	**2**				**X**	
Product differentiation	**2**				**X**	
Capital intensity of the product	**4**					
Environment specific						
Policies/regulations	**5**					
Slow decision making	**5**					
Slowness industry	**5**					
Power large companies	**5**					

4.6 Case 6

Table 4.6 shows the results of case 6. This case did experience a lot of support activities and these support activities did help with barriers in all categories.

Table 4.6: Results Case 6

Barrier	**Score**	***Mentor-ship***	***Funds***	***Network available***	***Business & management education***	***Reputation boost***	***Assets***
Firm specific							
Age of the firm	**2**						
Size of the firm	**2**						
Customer base/brand reputation	**5**			**X**		**X**	
Financial strength of the firm	**4**		**X**	**X**	**X**		**X**
R&D investment	**2**						
Focus	**5**	**X**		**X**			
Founder specific							
Market knowledge	**2**				**X**		
Network density	**5**			**X**			
Team composition	**5**						
Product/Service specific							
Capital intensity of the product	**2**		**X**				
Environment specific							
Investment capital	**3**		**X**				
Policies/regulations	**4**			**X**			
Lead time/ doorlooptijd	**4**					**X**	
Slowness industry	**5**						
Governmental involvement	**4**						
Politics	**3**					**X**	
Dynamics of partners	**2**	**X**					

4.7 Cross case analysis

In this cross case analysis all the barriers that are mentioned are shown per case. This gives an overview of which barriers are mentioned the most and which barriers are mentioned the least. This gives not an indication of the importance of the barriers only of the recognition of the barriers by the startups. The last column gives the average score of the barrier, the higher the score the more severe the barrier is as stated by the startups.

The analysis can be found in table 4.7. The columns indicate the different cases and are numbered from C1-C6 and the rows indicate the barriers. The barriers that are mentioned in the case are marked with an X.

There were four barriers mentioned in every case. Financial strength of the firm, Network density, Policies/regulations and slowness of the industry. Remarkable is that slowness of the industry was not on the original list of barriers but is mentioned in every interview as one of the biggest barriers. These three barriers are connected with each other and also causes or strengthen a lot of the other barriers. The barriers that are mentioned in all the cases are marked green, the barriers that are mentioned in five out of the six cases are marked orange and the barriers that are mentioned in four of the six cases are marked yellow. The same way of analysing is done for the support activities. The two support activities that were recognized in all cases is funds and network availability. Followed by mentorship and reputation boost by brand name. The barriers that were not on the original list but are added by the startups are in italic. The results are further discussed in the next chapter.

Table 4.7: Cross case analysis

	Barrier	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**		**Score**
Firms specific	Strategy of the firm					**X**			**3**
	Age of the firm		**X**		**X**	**X**	**X**		**3**
	Size of the firm		**X**	**X**	**X**		**X**		**2.75**
	Customer base/brand reputation		**X**		**X**	**X**	**X**		**4.5**
	Ambiguity of the firm		**X**						**3**
	Financial strength of the firm	X	**X**	**X**	**X**	**X**	**X**		**4**
	Partners/Collaboration/Alliance		**X**						**1**
	R&D investment				**X**		**X**		**2**
	Shown experience		**X**						**5**
	Launching customer		**X**						**4**
	Endurance			**X**	**X**	**X**			**4**
	Size team			**X**					**3**
	Focus	**X**	**X**	**X**		**X**	**X**		**4**

Continued on next page

Table 4.7: Cross case analysis

	Barrier	C1	C2	C3	C4	C5	C6		Score
Founder Specific	Technical knowledge			X		X			3.5
	Market knowledge	X			X	X	X		2.25
	Network density	X	X	X	X	X	X		4.25
	Size of the founder team				X	X			3
	Team composition						X		5
Product/Service specific	Technology chosen					X			5
	Value creation	X		X		X			2
	Product differentiation					X			2
	Economies of scale		X	X	X				2.33
	Switching cost		X						1
	Capital intensity of the product	X		X	X	X	X		3.25
	Business case				X				5
	Commercializing ideas	X							3
	Demand			X					2
Environment specific	Investment capital				X		X		3.5
	Policies/regulations	X	X	X	X	X	X		4.5
	Local characteristics	X		X					3
	Dynamics partners	X					X		2.5
	Politics		X				X		3.5
	Government involvement		X		X		X		3.67
	Stakeholders			X	X				5
	Slow decision making	X		X	X	X			5
	Lead time				X		X		4.5
	Slowness industry	X	X	X	X	X	X		4.83
	Liability				X				5
	Power large companies					X			5

5 | Discussion

This chapter should provide an answer to the research objective: How can startups companies be stimulated to enter the aerospace industry, an industry that is dominated by big traditional companies? This chapter should also give a final answer on the other research questions, What is the influence of founder self efficacy for startups on the perceived entry barriers of the aerospace industry?, What activities can support programmes offer startup companies to lower the entry barriers?

Formulation of proposition

The cross-case analysis gave a clear insight into what are the most experienced barriers and what the severity of these barriers is. This chapter will discuss the barriers mentioned in four or more cases. The interviews are used to explain how the cases experienced the barriers and possible solutions. Propositions are based on the theory of Hak and Dul (Dul and Hak, 2008).

5.1 Firm specific

When looking at the firm specific barriers, three barriers are mentioned in four of the six cases, one barrier is mentioned in five of the six cases, and one barrier is mentioned in all six cases. Remarkable is that a total of five barriers is added to the original list.

The age of the firm is often seen as a barrier because it hurts their credibility, this can also be seen back in the literature review. Customers often ask about the age of a firm when they are not familiar with the firm. The young age of startups often results in lack of confidence by the customers that first of all a young firm can do what they promised and second of all that the company will survive the coming five years. Often, the young age of the firms is an advantage, young firms tend to grow faster, learn and adapt easier, and younger firms tend to be more successful from entering foreign markets early (Zhou and Wu, 2014; Zahra et al., 2017). But it seems that the young age of the firm can also form a barrier in the aerospace industry. A way to overcome this barrier is by gaining trust by previous results or by reputation. This reputation can get boosted by being part of a support programme. The support activity reputation boost by brand name named in four cases as a support activity they experienced. Three of these cases were part of the same support programme and stated that the reputation boost by brand name was the most important reason why they chose this programme and confirmed that the names that are connected with the programme did massively help them gaining credibility.

Close related to firm age is the size of the firm. Startups experience that because of the small size of the firm customers again question their expertise. Some of the startups regularly got questions about the size of their firm, the small size of the firm then made the customer doubt if they were big enough to carry out the job. Stated by case 2: *"Whenever the company is smaller than 10 persons they will question*

your credibility, they do not believe you can get a project done and offer support with just a few people in a team". In one case the size of the firm was forming a barrier because it was too big, too much money was spend on personnel that was not necessary because there was not even a product yet. So the difficulty with this barrier is that the small size of the firm may send out the wrong signal while a too big firm is not cost-efficient. Startups did experience that after they got some customers the questions about their age and size did decline because they rather used the previous customer for references. So this is a barrier that exists when entering the market. The next barrier is the customer base/brand reputation. This barrier is causing the same problem as the previous two barriers. When the brand reputation of a firm grows the questions about age and size will decline. Their age and size will matter less because they gained credibility by brand reputation. However, brand reputation is something that a company will earn over time. One startup talked about how customers want to see shown experience, which is difficult for startups. Support programmes can help with building this brand reputation, one of the benefits of support programmes is reputation boost by brand name, this support activity is marked as important by four of the six cases. For example case 2: *"From the moment we joined the Mainport Innovation Fund it gave us the advantage of being supported by some big names, this helped us massively with winning customers over*" When a startup is part of a support programme that has a good brand name, this reflects the brand reputation of the startup. For example, the fact that case 3 always could say that they had KLM as a partner made their product more attractive to other investors. The importance of brand reputation is also found back in the literature, for example, Aldrich & Ruef talked about the importance of convincing customers by using brand reputation (Aldrich and Ruef, 2006). Another research done by Reuben and Fischer stated that current costumers are valuable reputational signals to prospective customers, and in cases of products with high purchasing complexity the high status of the customer is the most important reputational signal and not per se the number of customers (Reuber and Fischer, 2005).

Focus is one of the barriers that five of the cases added to the original list of barriers. In many of the cases, the startups had a lack of focus in the beginning which resulted in a delay of all the ideas and products. They indicated that the best strategy is to focus on one idea and product in the beginning and first optimise this product and when this is successful consider new products, applications or ideas. However, focus can also become a barrier when the focus is on the wrong market or product. As stated by startup coach "focus is bad for early-stage startups" (Tolsma, 2017a). The focus can be wrong when making wrong assumptions at the beginning of the startup. When it comes to focus the focus should be on the activities that have priority to stay efficient (Tolsma, 2017b). But an (early stage) startup should not focus too soon on a market strategy because one of the strengths of startups is the ambiguous way in which they work. To decide whether the startup is focused in a good way mentorship as a support activity can help startups. Many support programmes offer mentorship with mentors that are very experienced in entrepreneurship and launching a business when startups are in doubt whether their focus is right these experienced mentors can give advice and share their own experience. However not all companies are open to mentorship, only three companies were positive about mentorship. The cases that were not positive

about mentorship are cases where the founders are older and already have experience with launching a business, they felt like they did not need someone that could tell them how to run their business. When looking at table 5.2, it can be seen that the two cases that scored the lowest on "Developing new product and market opportunities" are also the cases that indicated that they do benefit from mentorship. So the cases that have the lowest confidence in that the can develop new product and market opportunities are also the one who prefer mentorship as a support activity.

The financial strength of the firm is very important, because the industry is so slow a startup needs a certain endurance to survive the slowness of the industry, in order to have this endurance financial strength is needed. As said in the literature review, poor cash flow is the number one cause for failed startups. For the aerospace industry the financial strength is even more important because, the usual strategy, first look for investors and collect money, may not be the best strategy. The problem with investors, who are not familiar with the aerospace industry is that they expect to earn back money within a year of three years, in the aerospace industry it is likely that it will take a lot longer. It is important for startups to find investors that know how the aerospace industry works and is not expecting to have a return on investment within a few years. The barrier, when having regular investors is that the investor can declare bankruptcy when it is taking too long. This barrier was recognized by all cases. However funds is the most important support activity that support programmes can offer, so this is a very clear partial solution to lower the barrier of financial strength, when looking at the self efficacy level of the cases on initiating investor relationships, the average score of the cases is above four. This means that the cases do see the financial strength as a important and severe barrier, but they also have the confidence that they are able to initiate relationships with investors.

Proposition 1: Lack of financial strength is a necessary barrier for startups entering the aerospace industry

Proposition 2: Offering funds is a necessary activity that support programmes can offer to startups

Proposition 3: Offering funds is a necessary activity to increase the financial strength of the startup

5.2 Founder specific

In the category founder specific only two barriers are mentioned in more than half of the cases. Network is seen as necessary and forming a barrier when this is lacking in all the cases. As stated by (Aldrich and Ruef, 2006) network is essential for startups because the relationships with other companies can provide benefits such as information & capabilities that the startup does not yet possess. Case 1 stated for example that "*Being part of the incubator opened many doors for us, literally, whenever we are struggling with something we can always ask other companies of the incubator for advice. The atmosphere is just so inspiring here.* " All the startups are mainly focusing on one product that is specific for the aerospace market when working in a niche market network is maybe even more important, often these markets are small and of the everyone knows each other kind. When entering a niche market as a new player, it is essential to build a network as soon as possible. With a higher network density in a niche industry, the

firm is more likely to become successful because the interaction between firms is higher which results in gaining reliable information that is essential for the development and marketing of the product (Echols and Tsai, 2004). Network is also crucial to create collaborations and finding customers, which results in more credibility for the startup. Confirmation of the importance of a network is seen in literature such as Aldrich & Ruef who talked about how a more extensive network structure has signification influence on the success of a new organisation (Aldrich and Ruef, 2006). They explained the importance of two dimensions of the network. First the cruciality of the diversity of the network and second about the tie strength. The strong ties are the most important. Entrepreneurs rely on these ties for advice, assistance and support in many ways. These strong ties are likely to exist between startups and support programmes. One of the most valued support activities that most support programmes offer is the availability of a network. All cases did reckon the importance of a network and the network availability that support programmes should offer.

The second barrier is market knowledge. In some cases, the barrier regarding market knowledge was merely the broad aspect of market knowledge. This was the case for the startups that only exist of engineers, their technical knowledge was excellent, only the market knowledge was missing. With mentorship and additional education offered by support programmes, a part of this missing knowledge can be learned. Most of the startups indicated that this kind of knowledge is also something you will learn during the whole process it just cost more time that way. There were startups which did not consist of only engineers, or that exist of entrepreneurs with previous experience in starting a firm. They did have general market knowledge but not the specific knowledge about the aerospace market, which resulted in some surprises when realising that the aerospace industry is an industry with some unusual characteristics. Many cases admitted that they had made wrong assumptions about the aerospace market in the beginning which slowed them down in their development process.

Proposition 4: Low network density is a necessary barrier for startups entering the aerospace industry

Proposition 5: Offering network availability is a necessary activity that support programmes can offer to startups

Proposition 6: Offering network availability is a necessary activity to increase the network density of the startup

5.3 Product/service specific

When it comes to product/service specific, only one barrier is mentioned five times. The capital intensity of the product seems to form a barrier for startups. The products that the startups develop in the aerospace industry do require materials, machinery, people etc.. Additional is the certification of the products also expensive and very time-consuming. The slowness of the industry only increases this capital intensity. For support programmes, it is hard to lower this barrier, one of the activities that they can provide to decrease the capital intensity is offering assets, such as office space and machinery for low prices.

5.4 Environment specific

The environment specific barriers may be the hardest barriers because these cannot be influenced by others but are created by the nature of the industry. The two barriers that are mentioned by all six cases are both in the category environment specific.

The policies and regulations are one of the most characteristics barriers of the aerospace industry. There may not be an industry that has these strict regulations. Regarding this strict regulations a lot of problems came up during the interviews. First of all, a decision at ICAO takes approximate 20 years to make, because of this they want to secure regulations for the coming 20-30 years. To make regulations work for such an extended period, the regulations are set up in a way that it can be interpreted in different ways. Which results in regulations that are outdated, not specific and thus hard to understand, especially for startups that do not have an aerospace background. Next to that is the certification process very time and money consuming. The whole regulation process cannot be changed and will always form a barrier. One of the ways to make this process easier for startups is working together with big companies that are familiar with the regulation process. One of the startups is getting help from KLM (KLM is a partner of the support programme this startup is part of) with the certification process for example. KLM helped them with developing a function that was necessary to meet the regulations and will help them, when the product is finished, to get the certifications. Another startup also indicated that it is hard to find investors for the certification process. Their product is almost finished and the certification is the last hurdle before entering the market but because the certification cost is accountable for one-third of the developing cost of the product they are having problems with affording the certification process.

The other barrier is the slowness of the industry. This barrier is added to the original list of barriers and mentioned in every case. One of the starting points of this research was the slow level of innovation in the industry. Every case confirms the slowness of the industry. The decision making in the sector is exceptionally slow, caused by a large number of stakeholders that are involved in every decision. As said earlier, the policies and regulations are deliberately slow in the industry. When a change is made in the regulations this change has to last for the coming 20-30 years. Case 4 stated that in 2010 they won over a new customer, and they only received full coverage in 2017. The slowness of the industry is the nature of the aerospace industry and there is not some support activity that can change this.

Proposition 7: The policies and regulations in the aerospace industry is a necessary barrier for startups entering the aerospace market

Proposition 8: The slowness of the industry is a necessary barrier for startups entering the aerospace market

5.5 Severity barriers

To have a clear overview of the severity of the barriers table 5.1 is used. The barriers are ranked from the highest average score to the lowest average score. In how many cases the barrier is mentioned is indicated in the total column. There are two remarkable things. First of all that the barriers that have an average score of five are only mentioned in one case. And that the barriers that the barriers that are mentioned in a lot of cases all have a severity score between four and five.

Proposition 9: Barriers that have the highest severity are more likely specific barriers

Proposition 10: The barriers that are experienced the most are more likely to have a severity score between four and five

Proposition 11: The most barriers have a severity score between the three en five

Table 5.1: Severity barriers

Barriers	C1	C2	C3	C4	C5	C6	Total	Score
Shown experience		X					1	5,00
Team composition						X	1	5,00
Technology chosen					X		1	5,00
Business case				X			1	5,00
Stakeholders			X	X			2	5,00
Liability				X			1	5,00
Power large companies					X		1	5,00
Slowness industry	X	X	X	X	X	X	6	4,83
Slow decision making	X	X	X	X	X		5	4,60
Customer base/brand reputation		X		X	X	X	4	4,50
Policies/regulations	X	X	X	X	X	X	6	4,50
Lead time				X		X	2	4,50
Network density	X	X	X	X	X	X	6	4,25
Financial strength of the firm	X	X	X	X	X	X	6	4,00
Launching customer		X					1	4,00
Endurance			X	X	X		3	4,00
Focus	X	X	X		X	X	5	4,00
Government involvement		X		X		X	3	3,67
Technical knowledge			X		X		2	3,50
Investment capital				X		X	2	3,50
Politics		X				X	2	3,50

Continued on next page

Table 5.1: Severity barriers

Barriers	C1	C2	C3	C4	C5	C6	Total	Score
Capital intensity of the product	X	X		X	X	X	5	3,25
Strategy of the firm					X		1	3,00
Age of the firm		X		X	X	X	4	3,00
Ambiguity of the firm		X					1	3,00
Size team			X				1	3,00
Size of the founder team				X	X		2	3,00
Commercializing ideas	X						1	3,00
Local characteristics	X		X				2	3,00
Size of the firm		X	X	X		X	4	2,75
Dynamics partners	X					X	2	2,50
Economies of scale		X	X	X			3	2,33
Market knowledge	X			X	X	X	4	2,25
R&D investment				X		X	2	2,00
Value creation	X		X		X		3	2,00
Product differentiation					X		1	2,00
Demand			X				1	2,00
Partners/Collaboration/Alliance		X					1	1,00
Switching cost		X					1	1,00

5.6 Entrepreneurial self efficacy

The table with the results of the questionnaires on entrepreneurial self efficacy can be found in table 5.2. The following scores are used:

- Strongly agree: 5
- Agree: 4
- Neutral: -
- Disagree: 2
- Strongly disagree: 1

Some of the questions were answered with neutral because these questions were not applicable to the case. For this reason, the neutral answers did not have a score, and the average of the scores is calculated. When

looking at this table, there are some remarkable results. First of all when looking at the total average score, the sum of all average scores per category divided by the number of categories. The case with the highest average score is C3 and the two cases with the lowest score are C1 and C6. Both cases with the lowest score are part of the YES!Delft incubator and both teams consist of young engineers that launched their startup right after university. Both teams do not have previous experience with entrepreneurship. When looking at the table about the support activities Table 5.2 C1 and C6 are also the cases that recognised and valued the most support activities. The category that scored the highest average is building an innovative environment, the only question that did not score well in that category is I can bring product concepts to market in a timely manner. Three cases answered this questions with (strongly)disagree, two of these cases do not have a product on the market yet. The category that scored the lowest average is Developing critical human resources. I can recruit and train key employees is marked as neutral in three cases because these cases are not yet in the phase of hiring and training employees. The question I can identify & build management teams is scored with disagree by C1, C2 & C3, these three cases also indicated business & management education as one of the support activities they benefit from. The categories: developing new product and market opportunities, building an innovative environments and coping with unexpected challenges, are proved to be positive correlated with the entrepreneurial intention(Noble et al., 1991).

Proposition 12: Founding teams that only exist of engineers with no previous entrepreneur experience are more likely to have a lower level of entrepreneurial self efficacy and benefit from more support activities

Proposition 13: Developing critical human resources is what founding teams of startups are most likely to be insecure about

Proposition 14: Founders who are uncertain about identifying & building management teams are likely to benefit from management education as support activity

Table 5.2: Self efficacy

	C1	C2	C3	C4	C5	C6
Developing new product and market opportunities						
I can see new market opportunities for new products & services	4	4	5	5	5	4
I can discover new ways to improve existing products	5	4	5	4	5	4
I can identify new areas for potential growth	4	4	5	4	5	-
I can design products that solve current problems	4	5	5	2	5	4
I can create products that fulfill customers' unmet needs	4	5	4	4	5	4
I can bring product concepts to market in a timely manner	2	5	4	5	1	2
I can determine what the business will look like	1	5	5	4	4	4
Average score	**3,71**	**4,57**	**4,71**	**4**	**4,29**	**3,67**
Building an innovative environment						

Continued on next page

Table 5.2: Self efficacy

	C1	C2	C3	C4	C5	C6
I can create a working environment that lets people be more their own boss	-	-	4	4	5	-
I can develop a working environment that encourages people to try out something new	4	4	5	4	5	4
I can encourage people to take initiatives & responsibilities for their ideas & decisions regardless of outcome	4	-	5	4	4	-
I can form partner or alliance relationships with others	4	4	4	5	4	4
Average score	**4**	**4**	**4,5**	**4,25**	**3,5**	**4**
Initiating investor relationships						
I can develop & maintain favorable relationships with potential investors	4	4	5	5	-	-
I can develop relationships with key people who are connected to capital source	4	4	4	4	-	4
I can identify potential sources of funding for investment	4	4	4	4	-	4
Average score	**4,0**	**4,0**	**4,33**	**4,33**	**-**	**4,0**
Defining core purpose						
I can articulate visions and values of the organization	4	4	5	4	4	4
I can inspire other to embrace vision and values of the company	-	-	5	5	-	4
I can formulate a set of actions in pursuit of opportunities	-	4	4	4	-	4
Average score	**4**	**4**	**4,67**	**4,33**	**4**	**4**
Coping with unexpected challenges						
I can work productively under continuous stress, pressure & conflict	4	1	5	4	4	2
I can tolerate unexpected changes in business conditions	4	2	5	4	5	4
I can persist in the face of adversity	-	4	4	4	5	-
Average score	**4**	**2,33**	**4,67**	**4**	**4,67**	**3**
Developing critical human resources						
I can recruit and train key employees	2	4	5	-	-	-
I can develop contingency plans to backfill key technical staff	4	-	2	2	2	4
I can identify and build management teams	2	4	4	-	2	2
Average score	**3,33**	**4**	**3,67**	**2**	**2**	**3**
Total average scores	**3,68**	**3,82**	**4,43**	**3,82**	**3,94**	**3,61**

5.7 Linking the propositions together

In this chapter 14 propositions are stated per subject. However all these propositions are connected with each other, this connection is hard to see in the propositions because everything is done per category. Figure 5.1 gives a short overview of all the propositions. The model looks like the conceptual model only the factors are more specific and there is more information on the relations between different factors.

The four barriers that are certain are: Network density, the financial strength, policies & regulations and slowness of the industry. These four barriers are named in all cases and are described in propositions 1-8. In the model it is clear that the support activities to support network density and financial strength are offering network and funds. There is no decisive answer on how support programmes can influence the barriers policies & regulations and the slowness of the industry.

The severity influences the barriers, and there is also a connection between the amount of experienced barriers (by how many cases a barrier is experienced) and the severity of the barriers. The exact connections can be found in propositions 9-11.

The last propositions are about the level of self efficacy of the entrepreneur. Remarkable is that there is no connection found between the level of self efficacy and the number of perceived barriers or the level of self efficacy and the perception of the severity of the barriers. While, in the conceptual model this connection was assumed. The level of self efficacy did have an influence on the support.The details on the relation between self efficacy and support can be found in proposition 12-14.

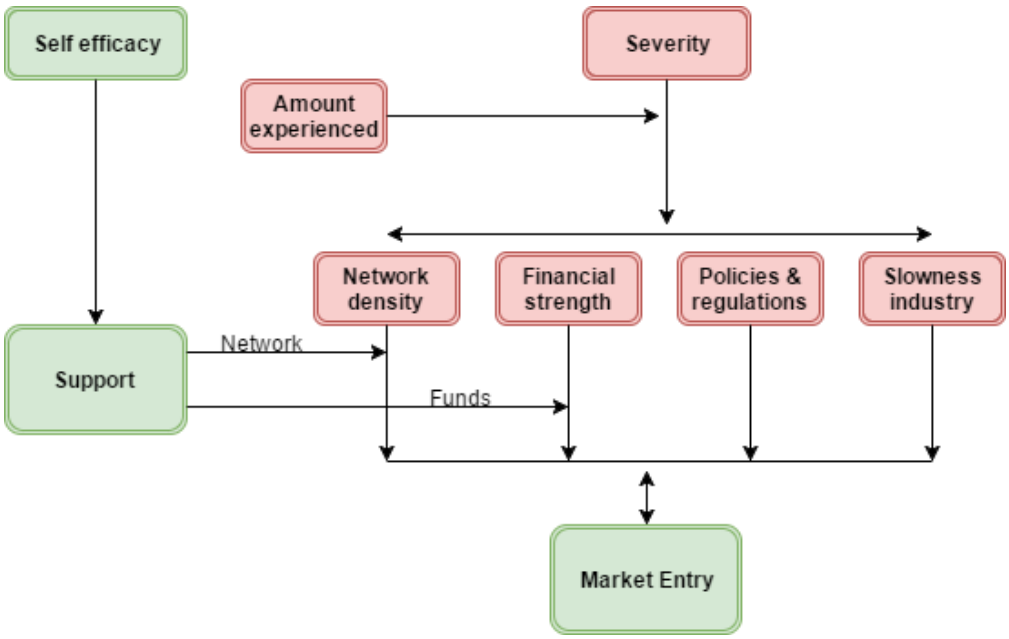

Figure 5.1: Model of propositions

6 | Conclusion

6.1 Theory building

Using all the answers on the research questions and the propositions that were formed using the guidelines from Dul & Hak(Dul and Hak, 2008) the theory on how startup companies can be stimulated to enter the aerospace industry can be build. The first step was to find out what the barriers are that startups have to face when entering the aerospace industry. A literature study resulted into a list of barriers that startups in comparable industries did face, using this list during the case study resulted in a list of barriers that startups in the aerospace industry did confirm that they perceived these barriers, to indicate how severe barriers are compared to each other all the barriers were scored with a score between one and five. Next to a list of barriers, this also gave a clear idea of which barriers are the biggest problem. In order to find out if the level of self efficacy of the founder did have influence on the perceived entry barriers, a questionnaire to determine the level of self efficacy was included with the interview. It became clear that the lower the level of self efficacy of the entrepreneur the more they benefit from support activities. Cases with a high level of self efficacy are looking for other support activities and have other preferences for support activities. This means that a support programme should keep in mind what the level of self efficacy of the founder is in order to offer the right activities. Activities that are necessary for support programmes to offer are funds, this is the main reason for startups to look for support and second of all they should offer network. It is a huge advantage when startups can use the existing network of the programme because it will lower all the barriers in some sort of way. The effect of network availability is bigger when the support programme is focused on the right industry, so support programmes who are specialized in the aerospace industry gained more advantages for their startups. For startups with a lower level of self efficacy mentorship and business and management education is efficient while startups with a higher level of self efficacy are more interested in only funding and network. Nevertheless will a high level of self efficacy probably have a positive effect on the change of success of the startup. All founders scored high on the different levels of entrepreneurial self efficacy only developing critical human resources seems to be of less importance, startups are often small companies were human resources plays a small role. It is important to have confidence in one's ability to develop new product and marketing opportunities, building an innovative environment, define the core purpose and cope with an unexpected challenge because this is what entrepreneurship is all about. Recognize opportunities and react to these opportunities by launching a startup, the strengths of a startup are the fact that they are innovative and able to adapt fast to any changes in the market. Believe in the ability to initiate investor relationships is important for startups in the aerospace industry because of the capital intensity of the industry and the fact that all startups marked lack of financial strength as one of the biggest barriers.

To make the aerospace industry more attractive for startups to enter, it is first of all important that the

startups are aware of the barriers that they may face when entering the aerospace industry. By knowing which barriers they will face the startups can be better prepared and it will be easier to react to these barriers on time. Knowing what the barriers are will also make it more obvious to become part of a support programme and the support programme can be selected on the support activities that they offer. It may be helpful when support programmes will make a more obvious link between which activities will help with overcoming which barriers so the goal and the purpose of the support programme will become more clear for the startups. The most important activity that support programmes can offer is the availability of network and the reputation boost and the best way to offer this is by involving partners with the support programme that have a lot of brand reputation, for example the Mainport Innovation Fund has Schiphol group and KLM as partners and these partners have made the difference for the startups that were supported by the Mainport Innovation Fund. In return these partners can help the support programmes with the selection of the startups, these partners are more familiar with the development in the market and the potential of startups.

One of the things that will be hard to change is the image of the aerospace industry. The reputation of being a difficult industry is based on the assumptions that the technology is difficult, the industry is dominated by big companies, capital intensity and being very innovative. However this study proves that lacking technology knowledge can be solved by hiring the right people. There were two cases were the founder did not have the technical knowledge but did see an opportunity in the aerospace market and made sure they hired people who could take care of the technical part while they were responsible for the finances of the company and achieving customers. The capital intensity of the industry is hard to change however alongside with the increase of startups in other industries is the increase in funds that are available for startups. The power of big and traditional companies is only mentioned by one case as a barrier, the other five cases did not experience their power as a barrier. Which misconception may result in the biggest change of image is that the aerospace industry is innovative. The aerospace industry is one of the industries with the least innovation, and this lack of innovation is exactly why there is need for startups and why startups can really make a difference in the aerospace industry. When it becomes clear that startups are needed it is also likely that there will be more support activities to support startups to become successful.

6.2 Further results

The propositions are based on the results from the tables and questionnaires that were filled in during the interviews. Additionally, to these results, there were some things that were striking during the interviews but were not obvious seen back in the results or propositions.

There was a clear division between the set up of the startups that also effects how they experienced barriers etc.. Groups can be formed based on these differences.

The first group is a group of young engineers that launched the startup right after university. They did not have previous work or entrepreneur experience. Typical for this group is that the level of technical knowledge is very high, but because of lacking experience and education on management & corporate subjects, all the other things that are involved with running a technical startup is new. Case 1 and case 6 are both part of this first group. When comparing the results of these cases, some resemblances are noteworthy. Both of the cases are part of the same incubator. This is explained easily by the fact that Delft University of Technology powers this incubator and the goal is to commercialise the technical ideas of students from the TU Delft. In table 4.3: cross cases analysis support activities, it can be seen that these two cases are also most in need of different support activities. Assets, such as office space and machinery were both seen as a significant support activity while other cases did not need this support activity. Even though these cases are missing business & management knowledge, they see education in business & management not as an important support activity. Both cases do not see there lack in this knowledge as a barrier and both are convinced that this is something they will learn along the way, that this is not the most efficient or fastest way to run a business is something they are aware of. What they do see as a barrier (as the only two cases) is the dynamics of partners. Both the cases experience the lack of dynamic partners as a barrier. They experienced that the partners were not as dynamic and flexible as they are which leads to delays. Other cases may not see this as a barrier because they are more used to working with external partners and the fact that it can take some time to order parts etc..

The second group is actually the opposite of the first group namely a group of older entrepreneurs that already have many experience in owning and running a business. Case 2,3 and 4 belong to this group. Because these cases already have a lot of entrepreneurship experience they are in less need of support activities. Their most significant motivation to join an incubator is because of the funds and the network availability. They do recognise the activity mentorship but are not interested in mentorship because they have their own vision on the company and they have the feeling they do not need mentorship and have the belief that mentorship is only time-consuming because they need to keep explaining why they do certain things. These three cases are also attracted to incubators because of the reputation boost by the name of the support programme. All three cases are part of the Mainport Innovation Fund and the main reason is the involvement of KLM and Schiphol airport, just the fact that they can use these brand names as partners gives a massive boost to their credibility and reputation. It seems that more experienced entrepreneurs know exactly what they need from a support programme in order to give their startup a boost. They were very clear about their motivation for choosing the support programme.
Within this group there is another division, two of the cases, case 3 and case 4 the technology is actually "bought" by the entrepreneur. In both these cases some wrong assumptions were made regarding the aerospace industry, this is due to their lack of experience with the aerospace industry and made things a bit harder for them, this confirms the complexity of the aerospace industry. Notable is that both these cases indicated that the number and the complexity of the stakeholders that are involved with every deci-

sion are forming a barrier for their startup. One of the explanations is that they indicated the involvement of stakeholders, and other cases did not, can be that they also have experience in different industries and that the other cases may not know that this it is not common that there are so many stakeholders involved. Or because they were already familiar with the aerospace industry, they were more prepared for the existence of these stakeholders.

There is one case that is not mentioned in a group yet. This is case 5. This case also has some unique characteristics. First of all, this case is a combination of the first and the second group, namely an experienced and older engineer with a lot of experience in the aerospace industry, however not a lot of experience as an entrepreneur. Also striking for this case is that the founder is alone, and has no team (yet). As stated by literature a firm founded by one individual grow slower than firms that are established by a team, this case is the most far away from bringing a product to the market. The other two cases which do not have a product on the market do have working prototypes and are a few months away from bringing their product to the market.

6.3 Unexpected results

This part will discuss some of the results that were expected but did not turn out that way. Some barriers that seemed to be important but turned out to be not as important or the other way around. For these results, it is important to discuss the source of these results. What caused these results, why were the assumptions wrong or was the measurement wrong etc..

To start with the age and size of the firm. Many researchers discuss the effect of age and size on the growth of the firm. The young age and small size of a firm are seen as an advantage and are assumed that a small and young firm will have a steeper growth curve than an older and bigger firm. However, most cases experienced the small size and young age of the firm as a disadvantage because customers are judging their credibility based on size and age when a portfolio is not built yet. This can be due to the characteristics of the aerospace. While in other industries the small size and young age is an advantage in the aerospace industry this is a disadvantage due to the that brand reputation that is so important in the aerospace industry because of the safety issues and the liability. Customers are reticent when it comes down to working with a new company, when something goes wrong with one of these new products they do not want to be responsible. As stated by case 4: *"At the end of the day; they all want to be the first one, but no one want to be the first one"*, what is meant is that everyone wants to be innovative and new but at the same time they do not want to be the first one to try something new in case things go wrong. This fear for things going wrong descended from back in the days when the aviation was very risky. Case 5 compared the aerospace sector with a swamp; *very dangerous however a safe path is set out with strict regulations and whatever you do, you do not leave this path because it is too dangerous*. So the dangerous nature of the aerospace industry is what causes the distrust in new companies. Support programmes can

offer help with this barrier with their own brand name or brand name of their partners. the Mainport Innovation Fund has Schiphol and KLM as partners for example and Case 3 stated *"Whenever I mention KLM as a partner and that KLM is going to help with the certification process, our credibility instantly grows with the customer."*

A barrier that seemed important is forming collaborations, partnerships or alliances. Many literature can be found on the benefits of corporate venturing (strategic alliances between large and small companies). However, most of the cases in this study were not interested in this kind of collaborations. This can be because they are still too young an later on in the process they will see the added value of a partnership but more likely is that most of the startups have enough support from the support programme at this moment. Case 2 stated that *"In the beginning, when it is not crystal clear what the benefits are for both parties, a collaboration will never happen"*. Meaning that when startups are part of a support programme they do not see the added value of a collaboration. It is interesting for future research to see if the willingness to form collaborations is bigger for startups that are not part of a support programme, the benefits of a corporate venture might be more attractive because they do not have the support of any other kind. It might also make a difference when the startups are older. Maybe when they have outgrown the support programme, the next step is forming a collaboration. To find more exclusion about this subject further research is needed. The effectiveness of collaborations is not tested during this research so the added value is unknown.

Another barrier not mentioned once is missing managerial skills, three cases missed managerial skills, but they did not experience this as a barrier for their company and were confident that they would gain this knowledge along the way. All these cases did not have a big team working for them, so maybe they did not experience a lot of managerial challenges yet. To exclude this barrier, more research is needed to compare the differences in growth and the speed of growth of startups that do have managerial skills from the beginning and startups who are learning it along the way.

Next is the power of the large companies. Only one case felt that the power of the large companies formed a barrier for small startup companies. This specific entrepreneur already had a lot of work experience and had a realistic view of how they make decisions in the aerospace industry. Since he worked for ICAO for a while, he knew that the boards that are responsible for decisions about regulations consist mostly of people from the big players in the aerospace industry and that they are deliberately maintaining the slowness of the industry. It is hard to determine if the startups do not face the power of large companies as a barrier or that they do not recognise what barrier the power of the large companies cause. For example; the slowness of the industry is a barrier that is experienced by every case, and part of this slowness is caused by the power of the large companies, but everyone may not recognise this.

The last unexpected result is the relation between a higher level of self efficacy and the perception of barrier. At the beginning of the research it was assumed that the higher the level of self efficacy the lower the perception of barriers. Individuals with a higher self believe may simply perceive less barriers because they are certain about their own abilities. However, when looking at the results, the cases that did have a higher level of self efficacy reckon the same amount of barriers or even more. During the interviews it became clear that the entrepreneurs with a higher level of self efficacy may even had a more realistic view on the entry barriers. Another assumption made in the beginning was that the entrepreneurs with a higher level of self efficacy will perceive barriers less severe than entrepreneurs with a lower level of self efficacy. Again, the results showed different. All things considered, entrepreneurs with a higher level of self efficacy perceive the same amount of barriers, with the same severity, as entrepreneurs with a lower level of self efficacy. So the self efficacy of an entrepreneur does not have a moderating effect on the perception and the severity of the barriers. An explanation can be that the self efficacy of the entrepreneur may not influence the number of barriers and the severity but it does influence how they deal with these barriers. This is not tested during this study but to can be tested in further research. So, entrepreneurs with a higher level of self efficacy may more easily overcome the same barriers as entrepreneurs with a lower level of self efficacy.

Even though the level of self efficacy seemed to not have a moderating effect on the perception and severity of the barriers, another relation did occur within the results. The entrepreneurs with a higher level of self efficacy were in significant less need of support activities. The entrepreneurs with a higher level of self efficacy seemed very certain about what support activities they did need and which support activities only slowed them down (mentorship for example). This result can lead to a change in how support programmes offer support to startups. Support programmes to offer less "active support" can focus on entrepreneurs with a high level of self efficacy, while support programmes that offer more active support can focus on entrepreneurs with a lower level of self efficacy

Not unimportant is to keep in mind that this can also mean that there is an error in the way the level of self efficacy is measured. The questionnaire that is used is from the year 1999, the last 20 years a lot more of research is done on the topic self efficacy, also in combination with entrepreneurship, success of startups etc.. Maybe a revision of the way we measure entrepreneurial self efficacy is in place. However, that is far beyond the scope of this research, where the most used questionnaire on entrepreneurial self efficacy is used.

6.4 Limitations & recommendations for further research

Due to several constraints, there have been some limitations to this research, taking these limitations and the results of this research in minds leads to recommendations for further research to strengthen and validate the results and found out more about startups in the aerospace industry. Some limitations were formed by practical matters such as limited time, reach, budget etc.. More interesting are the recommendations for further research that follow from results of this study. So in what way can the results of this study serve as an input for future studies. This sections gives a complete overview of both the recommendations based practical limitations and the recommendations based on new theories.

To start with the number cases, conducting a multiple case study with six cases, the more cases, the better and more reliable the results will be. However, due to time limitations for this research six cases were sufficient for this study. It was also hard to find more cases that meet the requirements within the Netherlands. This leads to the second limitation.
Secondly, all cases that are used were Dutch aerospace startups, even though the aerospace industry is a international industry it is not unlikely that there are differences between different nations and how startups experience the entry of the aerospace market. The results of this study only apply to the Dutch aerospace industry, to make the results more global cases from all around the world should be used. It would be interesting to see if aerospace startups from other countries receive more support form the government and how that influences their perception of barriers. Additional, it can be interested to see what the statistics are on number of aerospace startups in different nations.
Thirdly the study is done on cases that already past the five year age border, other cases that did fail in the first five years may have experienced other barriers or experienced barriers more severe. For a complete overview of barriers that startups face, the cases that did fail should also be studied. This would be value adding in a way that "successful cases" and "failed cases" can be compared. It is interesting to find out it the cases did experienced the same barriers and if they did, what the differences in support are. This could contribute to a study on what makes the differences between a successful startup and a failed startup. Then again it may be hard to find failed cases that want to share their experience with the barriers and to reveal why they failed.
Fourthly, all the cases for this study were part of a support programme from an early stage. Some barriers might be lowered right away by becoming part of this support programme. Becoming part of a support programme from an early stage on might also influence the perception of the barriers, the entrepreneur might immediately not see forming collaborations a barrier any more because they already receive support from their support programme. During this study cases from different support programmes were chosen purposely, it might be interesting to also look at cases that are not part of a support programme at all. Again this can increase the comparability. How do startups that are not part of a support programme overcome barriers, do they get support in an other way or how can they overcome barriers them self, or is

it too hard to overcome barriers without support, what percentage of cases without support fails and what percentage of cases with support fails etc..

Next the small number of methods of analysis can be performed in any further research. Gathering more information, maybe by using surveys, a better statistical measured can be performed with an increased sample size.

The last recommendations for any further research is to explore the effect of self efficacy on a broader scale. The influence of self efficacy turned out different than assumed at the beginning of the research, so further research to find out whether the new assumptions concerning self efficacy of entrepreneurs are correct is needed. At this moment only the level of self efficacy of founders of startups that already has some sort of success is determined and compared. For a better understanding of the effect of self efficacy the level of self efficacy of non-entrepreneurs and of entrepreneurs that have a failed startup should be tested to compare this with the level of self efficacy of successful entrepreneurs and determine what the relationship is. For this study only an understanding of the influence of self efficacy of entrepreneurs was sufficient, a more complete understanding would be interesting to find out what the relationship is between certain levels of self efficacy and the change of launching a successful startup. However for this study, it is hard to use the effect of self efficacy for theory building on how to make the aerospace industry more attractive.

It should be taken into account that the difficulty of gathering data on startups in the aerospace should not be undermined. It is hard to find startups that meet all the requirements. Especially when the next step would be to look at cases that did fail, and it might be even harder to convince these cases to participate in the research since the failure of one's own company might be a delicate issue.

All limitations and recommendations considered, the results of this research are a good start, and the barriers and activities that are found can be used as indicators for further research.

The long list of recommendations for further research shows that this research is just covering the top of the iceberg when it comes to finding relations between the aerospace industry, startups, barriers, support and self efficacy.

6.5 Theory contribution

The contribution to entrepreneurship literature of this research is as follows, the results of this research can partly fill the literature gap between entry barriers and the aerospace industry. In other words, there was already a lot of literature on entry barriers and factors of success for startups but not a lot of literature that applies this information on the aerospace industry. This industry has some particular characteristics, which makes research specifically about this industry necessary.

This research made the first steps in building a theory on how startups companies can be stimulated to enter the aerospace industry, an industry that is dominated by big, traditional companies. This information can be used in the entrepreneurship literature and the management literature. The propositions give results on experienced entry barriers in the aerospace industry, the support activities that can help overcome

these barriers and information about the level of self efficacy of founders of successful aerospace startups. Earlier on in this chapter the other remarkable results and possible reasons are discussed. New findings during this study also involve the self efficacy of the founders. What is remarkable is that the level of self efficacy does not seem to influence the number and severity of perceived barriers. There is not a clear difference in the number of experienced barriers and the level of self efficacy. There is a clear difference in the level of self efficacy and the support activities. The higher the level of self efficacy the less need for support activities there is. The main reasons for support for founders with a high level of self efficacy are funds and network, while the main reasons for entrepreneurs with a lower level of self efficacy are also assets and mentorship. For any further research, additions need to be made to the conceptual model. Figure 6.1 shows the new and improved conceptual model. In this model, the level of self efficacy does not influence the type and severity of barriers any more. Instead, the level of self efficacy influences the support activities that again influence the market entry.

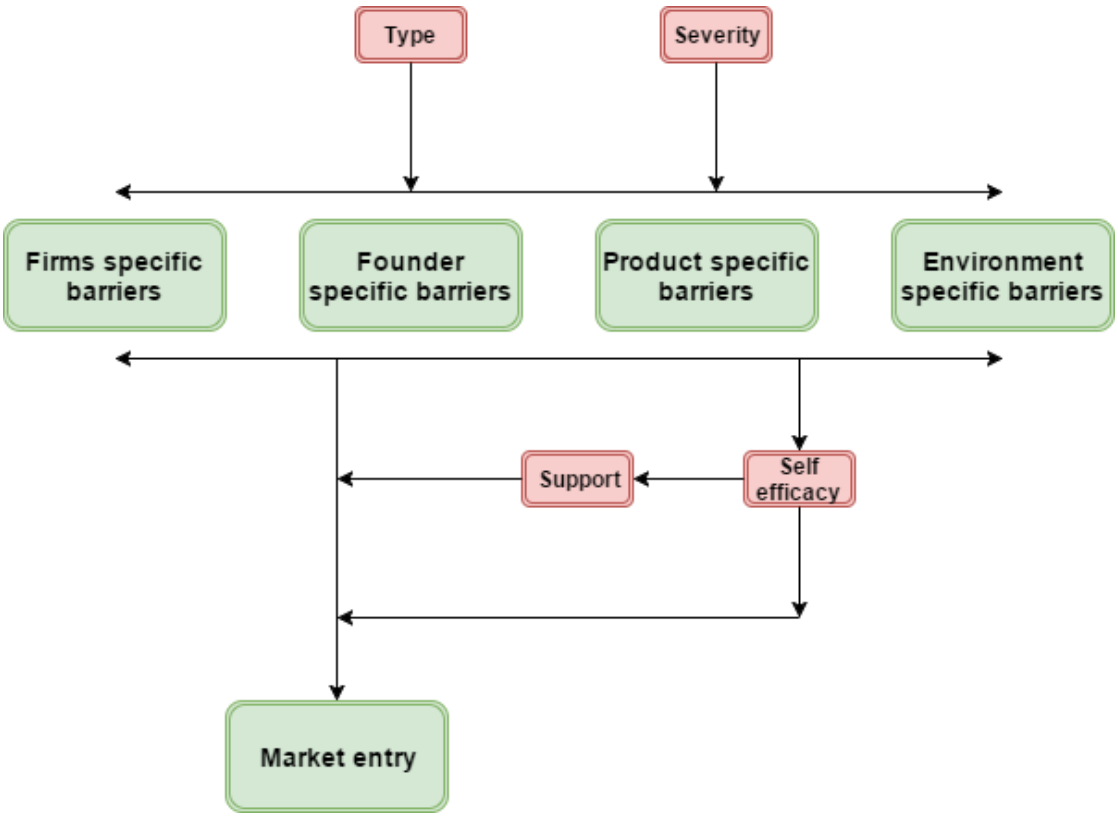

Figure 6.1: Improved conceptual model

6.6 Practical contribution

The results of this research contribute on a practical level that the results can be used by entrepreneurs that want to launch a startup in the aerospace industry. When they know the barriers that startups usually face and how severe these barriers are they are better prepared and can think of what solutions they can use to overcome these barriers, using the given recommendations. The fact that these startups are better prepared may attract more startups to enter the aerospace industry since this information may change the image of the aerospace industry being a hard industry to survive as a startup. And this should eventually serve the goal of more innovation in the aerospace industry, what is the reason for this whole research.

Another practical contribution is that the results can be used by support programmes to improve their programme. First of all offers this research a list of barriers that are first hand experienced by startups, including how severe they perceived these barriers. This can be valuable to the support programmes because they may have wrong assumptions of the barriers, or may underestimate the severity of some barriers. This research gives a clear idea about the experience of barriers, not only from literature but from experience of Dutch startups. Second of all this research is making a match between the barriers and the activities. The startups indicated what support activity had helped them with what barrier. This results in two advantages for the support programmes. First of all, they can offer more barrier specific support. Second of all, they can also persuade startups with this more customised way of providing support. The activities that are linked with the barriers are only a guideline for the support programme. They should customize the activity per barrier using the results as a starting point. However, there are a lot of barriers that are not linked with a support activity yet. For these barriers it is even more important to do research into these barriers and how they can be over won. For the support programmes, this will eventually result in becoming more attractive for startups, so more applications for their programme and likely increase in success of their support programmes. Developing and offering support programmes for these barriers is were support programmes can distinct there self from other programmes. Important is to also consider the severity of the barriers. During this research there is been a lot of talking about lowering the barriers, but the real job of a support programme may not be lowering the barriers, but push the startups higher to overcome the barriers because a lot of barriers can not be lowered, and these are the barriers that causes the most problems.

7 | Appendix

Appendix I

Interview Guide Startups

1. **Introduction**
    - Introduction to the research (focus, goal etc.)
    - Explaining all terms
    - Company history? (age, size, product etc.)
2. **Entry aerospace market***"What entry barriers do startups in the aerospace industry face"*
    - Which entry barriers can you identify?
    - Were you aware of these (entry) barriers before hand?
    - What were your expectations about the entry barriers of the aerospace industry and which did turn out as you expected and which did not?
    - Did the entry barriers ever made you question your entry of the aerospace industry?
    - Which barriers of the table can you confirm? And which would you add?
    - Which barriers of the table would you mark as the most important/biggest influence?
3. **Self efficacy**
    - Fill in the questionnaire about entrepreneurial self efficacy
4. **Support programme***"What can support programmes offer startups?"*
    - What kind of support programme?
    - How did you pick this support programme?
    - What is the main focus of the support programme?
    - What is the biggest advantage of the support programme?
    - Which barriers were lowered by the support programme? and how would you otherwise overcome these barriers?

Appendix II

Table 7.1: Questionnaire ESE

	I	II	III	IV	V	VI
Developing new product and market opportunities						
I can see new market opportunities for new products and services						
I can discover new ways to improve existing products						
I can identify new areas for potential growth						
I can design products that solve current problems						
I can create products that fulfil customers' unmet needs						
I can bring product concepts to market in a timely manner						
I can determine what the business will look like						
Building an innovative environment						
I can create a working environment that lets people be more their own boss						
I can develop a working environment that encourages people to try out something new						
I can encourage people to take initiatives and responsibilities for their ideas and decisions regardless of outcome						
I can form partner or alliance relationships with others						
Initiating investor relationships						
I can develop and maintain favourable relationships with potential investors						
I can develop relationships with key people who are connected to capital sources						
I can identify potential sources of funding for investment						
Defining core purpose						
I can articulate visions and values of the organisation						
I can inspire other to embrace vision and values of the company						
I can formulate a set of actions in pursuit of opportunities						
Coping with unexpected challenges						
I can work productively under continuous stress, pressure and conflict						
I can tolerate unexpected changes in business conditions						
I can persist in the face of adversity						
Developing critical human resources						
I can recruit and train key employees						
I can develop contingency plans to backfill key technical staff						
I can identify and build management teams						

Appendix IIV

Overview of all propositions

Proposition 1: Lack of financial strength is a necessary barrier for startups entering the aerospace industry

Proposition 2: Offering funds is a necessary activity that support programmes can offer to startups

Proposition 3: Offering funds is a necessary activity to increase the financial strength of the startup

Proposition 4: Low network density is a necessary barrier for startups entering the aerospace industry

Proposition 5: Offering network availability is a necessary activity that support programmes can offer to startups

Proposition 6: Offering network availability is a necessary activity to increase the network density of the startup

Proposition 7: The policies and regulations in the aerospace industry is a necessary barrier for startups entering the aerospace market

Proposition 8: The slowness of the industry is a necessary barrier for startups entering the aerospace market

Proposition 9: Barriers that have the highest severity are more likely specific barriers

Proposition 10: The barriers that are experienced the most are more likely to have a severity score between four and five

Proposition 11: The most barriers have a severity score between the three en five

Proposition 12: Founding teams that only exist of engineers with no previous entrepreneur experience are more likely to have a lower level of entrepreneurial self efficacy and benefit from more support activities

Proposition 13: Developing critical human resources is what founding teams of startups are most likely to be insecure about

Proposition 14: Founders who are uncertain about identifying & building management teams are likely to benefit from management education as support activity

Bibliography

Aldrich, H. E. and Ruef, M. (2006). *Organizations Evolving*. Sage Publications, 2nd edition.

Alireza Ghasemizad1, M. K., Abbasi, A., and Mohammadkhani, K. (2011). Improvement of technology business incubators' effectiveness: An explanatory model. *African Journal of Business Management*.

Almus, M. and Nerlinger, E. A. (1999). Growth of new technology-based firms: Which factors matter? *Small Business Economics*.

Bain, J. (1956). *Barriers to New Competition*. Harvard University Press, 3th edition.

Bain, J. (1968). *Industrial Organization*. Wiley, 2nd edition.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. bandura. *Psychological Review*.

Barkman, R. (1994). Entrepreneurial characteristics and the size of the new firm: a model and an econometric test. *Small Business Economics*.

Barringer, B. R., Jones, F. F., and Neubaum, D. O. (2004). A quantitative content analysis of the characteristics of rapid-growth firms and their founders. *Journal of business venturing*.

Bejan, A., Charles, J., and Lorente, S. (2014). The evolution of airplanes. *Journal of Applied Physics*.

Bjornalia, E. S. and Ellingsen, A. (2014). Factors affecting the development of clean-tech start-ups: A literature review. *Elsevier*.

Blank, S. (2010). What's a startup? first principles. `https://steveblank.com/2010/01/25/whats-a-startup-first-principles/`.

Braddorn, D. and Hartley, K. (2007). The competitiveness of the uk aerospace industry. *Applied Economics*.

Carlot, D. and Perloff, J. (1994). Modern industrial organization. *HarperCollins College Publishers*.

Chandler, G. and Jensen, E. (1992). The founder's self-assessed competence and venture performance. *Journal of Business Venturing*.

Chen, Greene, and Crick (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing*.

Cohen, S. L. (2013). What do accelerators do? insights from incubators and angels. *Technology, Governance, Globalization*.

Consultancy.nl (2016). De 100 belangrijkste startups in de nederlandse energiemarkt. http://www.consultancy.nl/nieuws/12354/de-100-belangrijkste-startups-in-de-nederlandse-energiemarkt.

Covin, J. G. and Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal*.

de Jonge, C. (2014). Market access for small ventures in the pharmaceutical industry. Msc thesis, Delft University of Technology.

Dow, A. (2009). *Pegasus, The Heart of the Harrier : the History and Development of the World's First Operational Vertical Take-off and Landing Jet Engine.* Pen & Sword, 1st edition.

Dul, J. and Hak, T. (2008). *Case Study Methodology in Business Research*. Elsevier, 1st edition.

Echols, A. and Tsai, W. (2004). Niche and performance: The moderatingrole of network embeddedness. *Strategic Management Journal*.

Ecorys; Research & Consulting (2009). Competitiveness of the eu aerospace industry with focus on; aeronautics industry. https://www.albertacanada.com/EU_AerospaceIndustry.pdf.

Eggers, J. H., Leahy, K., and Churchill, N. (1996). Entrepreneurial leadership and the development of small businesses. *Paper presented at the 14th Annual Entrepreneurial Research Conference,*.

Eisenhardt, K. and Schoonhoven, C. (1990). Organizational growth: Linking founding team, strategy, environment, and growth among u.s. semiconductor ventures. *Administrative Science Quarterly*.

Elkins, K. (2017). Billionaire richard branson: This is 'the biggest killer of start-ups'. http://www.cnbc.com/2017/01/17/billionaire-richard-branson-this-is-the-biggest-killer-of-start-ups.html.

Eris, O., van den Eijnden, W., and Roling, M. (2014). How do new product development startups handle missing expertise? *Institutional Repository*.

European Aviation Safety Agency. Easa regulations. https://www.easa.europa.eu/document-library/regulations.

Evans, D. S. (1987). Test of alternative theories of firm growth. *Journal of Political Economy*.

Fesser, H. R. and Willard, G. E. (1990). Founding strategy and performance: a comparison of high and low growth high tech forms. *Strategic Management*.

Global Entrepreneurship Monitor (2017). Entrepreneurial behaviour, attitude & ecosystem. http://www.gemconsortium.org/.

Hall, B. H. (1995). The relationship between firm size and firm growth in the u.s. manufacturing sector. *Journal of Industrial Economics*.

Hathaway, I. (2016). What startup accelerators really do. |*Harvard Business Review*.

Isabelle, D. A. (2013). Key factors affecting a technology entrepreneur's choice of incubator or accelerator. *Technology Innovation Management Review*.

Jovanovic, B. (1982). Selection and the evolution of industry. *Econometrica*.

Karakaya, F. (2002). Barriers to entry in industrial markets. *Journal of Business & Industrial Marketing*.

Kim, W. and Mauborgne, R. (1997). Value innovation; the strategic logic of high growth. *Harvard Business Review*.

Langen, P. W. D. and Pallis, A. A. (2007). Entry barriers in seaports. *Maritime Policy & Managemen*.

Leferink, T. (2016). Commercial success factors for startups: A comparative case study research exploring commercial success factors for dutch startups in the sustainable energy industry. Msc thesis, Delft Univerisity of Technology.

McAfee, R. P., Mialon, H. M., and Williams, M. A. (2004). What is a barrier to entry? *The American Economic Review*.

Miller, P. and Bound, K. (2011). The rise of accelerator programmes to support new technology ventures. *Nesta*.

Miner, J. (1990). Entrepreneurs, high growth entrepreneurs, and managers: Contrasting and overlapping motivational patterns. *Journal of Business Venturing*.

Multon, K., Brown, D., and Lent, S. D. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology*.

Nejabat, R. and van Geenhuizen, M. (2016a). University spin-off firms in sustainable energy in five countries: what determines their reaching of the market? *56th European Regional Science Conference*.

Nejabat, R. and van Geenhuizen, M. S. (2016b). University spin-off firms in sustainable energy in five countries: what determines their reaching of the market? *56th European Regional Science Conference*.

Noble, A. F. D., Jung, D., and Ehrlich, S. B. (1991). Entrepreneurial self-efficacy: The development of a measure and its relationship to entrepreneurial action. *FRONTIERS FOR ENTREPRENEURSHIP RESEARCH*.

nova workboard; a blog from young economists at Nova SBE (2013). Competition in the aircraft industry. `https://novaworkboard.wordpress.com/2013/05/19/competition-in-the-aircraft-industry/`.

Ortt, J. R. (2010). Understanding the pre-diffusion phases. *Gaining Momentum: Managing the Diffusion of Innovations*.

Porter, M. E. (1979). How competitive forces shape strategy. *Harvard business review*.

Porter, M. E. (1998). *Competitive strategy; Techniques for Analyzing Industries and Competitors*. The free press, 1st edition.

Powell, W. W., Koput, K. W., Smith-Doerr, L., and Owen-Smith, J. (1999). Network position and firm performance: Organizational returns to collaboration in the biotechnology industry. *Research in the Sociology of Organizations*.

R. Preston McAfee, H. M. M. and Williams, M. A. (2014). What is a barrier to entry? *The American Economic Review*.

Reuber, A. R. and Fischer, E. (2005). The company you keep: How young firms in different competitive contexts signal reputation through their customers. *Entrepreneurship Theory and Practice*.

Reynolds, P. D. (1993). High performance entrepreneurship: What makes it different? *Babson Entrepreneurial Conference*.

Ries, E. (2011). *The Lean Startup*. Penguin Books Ltd, 1st edition.

Rijksoverheid. Rijksoverheid stimuleert duurzame energie. `https://www.rijksoverheid.nl/onderwerpen/duurzame-energie/meer-duurzame-energie-in-de-toekomst`.

Roberts, C. (2015). Why startups are better innovators than big companies. `http://svicenter.com/businessstartups-better-innovators-big-companies/`.

Robinson, K. C. and McDougall, P. P. (2001). Entry barriers and new venture performance: A comparison of universal and contingency approaches. *Strategic Management Journal*.

Safran. Does the future of the aerospace belong to startups? `https://www.safran-group.com/media/does-future-aerospace-belong-startups-20170621`.

Salop, S. C. (1979). Strategic entry deterrence. *The American Economic Review*.

Scherer, F. M. and Ross, D. (1990). *Industrial Market Structure and Economic Performance*. Houghton Mifflin Company, 3th edition.

Schilling, M. A. (2013). *Strategic Management of Technological Innovation*. McGraw-hill, 4th edition.

Schmid, G. (2017). 17 statistics every business owner needs to be well aware of. `https://www.fundera.com/blog/small-business-statistics`.

Seed-DB (2017). Seed accelerators. `http://www.seed-db.com/accelerators`.

Sekaran, U. and Bougie, R. (2014). *Research Methods for Business*. Wiley, 6th edition.

Spreen, W. E. (2007). *Marketing in the International Aerospace Industry*. Taylor & Francis Ltd, 1st edition.

Stagars, M. (2015). *University Startups and Spin-Offs; Guide for Entrepreneurs in Academia*. Apress, 1st edition.

Starr, R. and Adams, J. (2015). 2015 aerospace and defense trends. http://www.strategyand.pwc.com/trends/2015-aerospace-defense-trends.

Storey, D. J. (2016). *Understanding The Small Business Sector*. Routledge, 17th edition.

Stringer, R. (2000). How to manage radical innovation. *California Management Review*.

Studdard, N. (2006). The effectiveness of entrepreneurial firm's knowledge acquisition from a business incubator. *International Entrepreneurship and Management Journal*.

Tamasy, C. (2007). Rethinking technology-oriented business incubators: Developing a robust policy instrument for entrepreneurship, innovation, and regional development? authors. *Growth and change*.

Tolsma, A. (2017a). Focus is bad for early stage startups. https://www.yesdelft.com/single-post/stop-focusing.

Tolsma, A. (2017b). (the nuance of) focus is essential for all startups. https://www.yesdelft.com/single-post/the-nuance-of-focus.

Treehouse Blog (2011). Let's mug a startup founder. http://blog.teamtreehouse.com/lets-mug-a-startup-founder.

Trott, P., Scholten, V. E., and Hartman (2008). How university incubators may be overprotective and hindering the success of the young firm: Findings from a preliminary study. *IEEE International Engineering Management Conference*.

van Essen, B. (2016). Innovatiedirecteur klm: startups essentieel voor onze r&d. http://cxo.nl/outsourcing/85024-innovatiedirecteur-klm-startups-essentieel-voor-onze-r-d.

van Geenhuizen, M. and Soetanto, D. P. (2009). Academic spin-offs at different ages: A case study in search of key obstacles to growth. *Elsevier*.

van Niekerk, R. (2016). Exploring commercial success factors at start-ups. Msc thesis, Delft University of Technology.

Variyam, J. N. and Kraybill, D. S. Empirical evidence on determinants of firm growth, journal = Economic Letters 38, year = 1992,.

Warwick, G. (2015). Airbus ceo: Aerospace must embrace startup tech, culture. *Aviation Daily*.

West, J. (2007). Competition and barriers to entry. *OECD Policy Brief*.

Yang, H., Zheng, Y., and Zhao, X. (2013). Exploration or exploitation? small firms' alliance strategies with large firms. *Strategic Management Journal*.

Yin, R. K. (2014). *Case study research : design and methods*. Sage Publications Inc, 5th edition.

Zahra, S. A., Zheng, C., and Yuu, J. (2017). Learning advantages of newness: A reconceptualization and contingent framework. *Journal of International Entrepreneurship*.

Zhou, L. and Wu, A. (2014). Earliness of internationalization and performance outcomes: Exploring the moderating effects of venture age and international commitment. *Journal of World Business*.