University Internationalization Through Collaboration with Industry

The case of Linköping University internationalization with Brazil through collaboration with Saab

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Abstract

With increased globalization and change in the educational structure, university internationalization has increased with the aim to better serve the society and connect institutions. Collaborations between universities and businesses have also become more common due to globalization and the shift in educational structure to serve society not only on an academic level. However, as internationalization is mostly regarded as an activities’ based approach, apparently there has been no theoretical or empirically explored propositions about the possibility of university internationalization through collaboration with industry.

Therefore, this thesis’ purpose is to identify the set of factors that differentiate a regular internationalization approach from the one through collaboration with industry and thereby showing the relationship between university internationalization and university-business collaboration. A qualitative and inductive research approach was used through adopting a single case study of Linköping University’s internationalization in Brazil through its collaboration with Saab as an industry, which was done through collecting data from semi-structured interviews. The empirical findings confirmed that university internationalization through collaboration with industry is possible. Consequently, a model was developed that identified the differences between the two approaches and concludes by showing how university internationalization and university-business collaboration are linked.

*Keywords:* university internationalization, university-business collaboration, university internationalization through collaboration with industry
Acknowledgements

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Because we are living in a globalized society, the world has become more connected. This is very visible in higher education that has significantly changed over the past years of the 21st century (Ashwin, 2015). Universities want to be “globally networked universities” building campuses on foreign soil and providing diverse educational environments and opportunities for students (Fiske, 2012). The number of students traveling to study abroad has sharply increased, the student learning experience has evolved, as well as the quality of teaching, and research projects at universities now benefit the society by knowledge contribution (Ashwin, 2015).

In 2017, the British Council released a report highlighting the most significant trends emerging as a result of a global higher education that can affect the future of internationalization (Weimer, 2017). Some of these trends are national governments building strategies focused on the internationalization of higher education, universities competing for funding to establish a higher rate of student mobility, and more cooperation between universities and industry, thus having graduates with more workforce-competent skills (Weimer, 2017). Although globalization and internationalization might mean the same for some, they are defined differently. While globalization assumes that country borders and national systems disappear, university internationalization works on increasing cross-border activities among national systems of higher education (Teichler, 2004). Therefore, globalization is a process that affects internationalization (Knight, 2004). It is the economic, societal, and political powers driving higher education in the 21st century towards better involvement on an international scale (Altbach and Knight, 2007), whereas “internationalization is a strategic response to global competitive challenges” (Minola, Donina, and Meoli, 2016, p.566).
1.1 Background

The past two decades have created cumulative pressures on universities to respond and adapt to the changing environment socially, technologically, economically, and politically (Bartell, 2003). Due to these environmental factors, the education structure has shifted towards an industry-related one, providing students with the needed know-how to later be successful in the job market (Bartell, 2003). Universities have to teach students the entrepreneurial way of thinking to be successful and prepared to manage new projects in a very dynamic labor market (Minola, Donina, and Meoli, 2016). These environmental forces, characterized by a high degree of competitiveness and globalization (Bartell, 2003), have led to the increase of university internationalization with the aim of better connecting institutions to dynamic environments and being of service to society (Hudzik, 2011). Based on our thesis context, "internationalization at the national, sector, and institutional levels is defined as the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of postsecondary education." (Knight, 2003, p.2). For instance, universities in North America that have not been involved in internationalization processes in the past, have now internationalization on their top priority list due to increased communication as well as transportation changes, which have escalated the need for “intercultural and international understanding and knowledge” (Bartell, 2003, p.49).

Aside from internationalization, and because, in the past decades, there has been pressure on society to have the research carried out by universities generate perceptible results for society not only on the academic level, the collaboration between universities and the private sector has become more common (Hanel & St-Pierre, 2006). The relationship between universities and companies has been recognized as one way to bring the research generated in the university environment closer to the demands of society (Davey et al., 2011). Several countries have been applying practices that develop university-industry partnerships since the early 1980s (Fiaz and Rizran, 2011). Since universities are an important source of knowledge (Fiaz and Rizran, 2011), together with the industry, they can positively contribute to a country’s economic growth and improve education, jobs, and research (Davey et al., 2011).
1.2 Problem Statement

André Carvalho Bittencourt, the former coordinator for collaborations with Brazil at Linköping University (LiU), brought up to his colleagues’ attention the following. On the one hand, internationalization could be driven by internal, individual demands, for instance, based on specific research groups interests, where it is mainly based on activities such as student exchange and research projects. On the other hand, internationalization could be driven by collaboration with external partners, where it is based on relationships, for example between local and international partners with the university acting as a mediator between them. LiU has implemented several internationalized activities that are aligned with local industry and other institutional collaborations, most importantly with Saab, towards an approximation with Brazil.

University internationalization through collaboration with industry is a phenomenon that has caught our attention. While LiU is at its early stages of developing a strategy to take advantage of this, very few universities seem to be applying this approach to expand their activity scope and to become more internationalized. Therefore, it is intriguing to explore how this approach could be theoretically explained and what possible practical results could be generated.

1.3 Research Gap

As aforementioned, universities are relying on internationalization to connect and better serve the society (Hudzik, 2011), as well as to expand their borders and support student and staff mobility (Altbach and Teichler 2001). Universities are also collaborating with industry to be able to achieve their goal of being able to produce knowledge and bring it closer to society’s demands (Davey et al., 2011).

Knight (2004) focuses on rationales for university internationalization and mentions strategic alliances between universities as one of the emerging drivers for increased university internationalization. She emphasizes on building networks to have clear strategic objectives (Knight, 2004). In addition, Heitor (2015) seems to be the first author to suggest a new role
for universities in international affairs, where they act in partnership with industry and government creating links abroad in a structured way.

Even with these contributions, to the best of our knowledge, we found no articles that further discuss specifically how a university can internationalize through having a collaboration with industry. The two concepts have always been discussed separately. For that reason, we identified a theoretical gap that fails to discuss the relationship between university internationalization (UI) and university-business collaboration (UBC). Our empirical case study demonstrates this relation and shows readers LiU’s internationalization activities thereby fulfilling the practical gap that this research is motivated to fill.

1.4 Research Purpose and Question

The purpose of this study is to identify the set of factors that make a university internationalization in collaboration with industry approach different than a regular internationalization approach and thereby show the link between university internationalization and university-business collaboration. The main focus will be on LiU’s internationalization based on its collaboration with Saab towards Brazil because this is currently a trending topic at the university that is of great interest to all parties involved. The study comes at a time of intense, high-level academic discussion about the university role within society. Therefore, it is essential to understand all aspects of LiU’s current internationalization process while scrutinizing it through certain university internationalization concepts, as well as university-business collaboration concepts, and triple helix. We will analyze the internationalization activities, how they emerged, who was involved, as well as the benefits and obstacles to LiU.

Moreover, this thesis aspires to provide useful contributions to academia and practitioners. For instance, universities that will consider applying internationalization activities based on collaboration will be able to use this thesis as a reference and study how these activities were done at LiU. Furthermore, businesses interested in expanding the global presence will be able to use the results to understand this context and identify insights that would support it. To achieve the above-stated purpose, this thesis tackles the following question: How does a university internationalize through collaboration with a high technological industry?
2 Literature Review

This chapter expands on the related concepts needed to build a theoretical framework that will facilitate the analysis of the empirical findings and consequently provide an answer to our research question. Therefore, this chapter explains the concepts of university internationalization, university-business collaboration, and the Triple Helix that are needed for this thesis.

2.1 University Internationalization

Researchers have been trying to find a suitable definition for internationalization for over twenty years due to the constant change in several aspects of higher education (Knight, 2003). It can be viewed in different ways and therefore, can mean something different to different people (Teferra and Knight, 2008). Internationalization has been divided into being “at home” or as “crossborder education” (Knight, 2012). The “at home” concept refers to “campus-based strategies” such as including a diverse and global aspect into the teaching learning process, research, and integrating foreign students and academics into the campus life, while “crossborder education” refers to movements across national borders such as student mobility, academic partnerships, and collaborative projects (Knight, 2012), in addition to education exchange between countries through developing offices abroad and building additional branch campuses in different countries to coordinate and reach out to the maximum number of potential students (Youtie, Rogers and Shapira, 2017).

The different views about internationalization activities have resulted in a state of confusion (Teferra and Knight, 2008). In light of this, efforts have been made to develop an
understandable definition that can help reduce the existing confusions (Teferra and Knight, 2008). Although it is difficult to establish a universally applicable definition, there should be a common understanding when parties are discussing to be standing on a common ground (Teferra and Knight, 2008). After many years of having the definition of internationalization evolve among different researchers, the current working definition, as proposed by Knight (2003, p.2) is:

"Internationalization at the national, sector, and institutional levels is defined as the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of postsecondary education."
To further elaborate this definition, each of the concepts are explained in the table below as per Knight (2004).

<table>
<thead>
<tr>
<th>Concept or Term</th>
<th>Explanation (Knight, 2004, pp. 11-12)</th>
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<tbody>
<tr>
<td>Process</td>
<td>&quot;...is deliberately used to convey that internationalization is an ongoing and continuing effort...it denotes an evolutionary or developmental quality to the concept.&quot;</td>
</tr>
<tr>
<td>International, intercultural, and global dimension</td>
<td>&quot;...are intentionally used as a triad, as together they reflect the breadth of internationalization.&quot; &quot;[...] &quot;These three concepts complement each other and together give richness both in breadth and depth to the process of internationalization.&quot;</td>
</tr>
<tr>
<td>International</td>
<td>&quot;...is used in the sense of relationships between and among nations, cultures, or countries... is also about relating to the diversity of cultures that exists within countries, communities, and institutions.&quot;</td>
</tr>
<tr>
<td>Intercultural</td>
<td>&quot;...is used to address the aspects of internationalization at home.&quot;</td>
</tr>
<tr>
<td>Global</td>
<td>&quot;... is included to provide the sense of world view scope.&quot;</td>
</tr>
<tr>
<td>Integrating</td>
<td>&quot;...used to denote the process of infusing or embedding the international and intercultural dimension into policies and programs to ensure the international dimension remains central, not marginal, and is sustainable.&quot;</td>
</tr>
<tr>
<td>Purpose, function, and delivery</td>
<td>These three concepts have been chosen carefully and are meant to be used together.</td>
</tr>
<tr>
<td>Purpose</td>
<td>&quot;...refers to the overall role and objectives that postsecondary education has for a country/region or, more specifically, the mission or mandate of an individual institution.&quot;</td>
</tr>
<tr>
<td>Function</td>
<td>&quot;...refers to the primary elements or tasks that characterize a national postsecondary system and also an individual institution. Usually these include teaching/training, research and scholarly activities, and service to the society at large.&quot;</td>
</tr>
<tr>
<td>Delivery</td>
<td>&quot;...is a narrower concept. It refers to the offering of education courses and programs either domestically or in other countries. This includes delivery by traditional higher education institution but also includes new providers.&quot;</td>
</tr>
</tbody>
</table>

Table 1 - Terms and concepts of Knight's (2004) definition of internationalization. (Lizarraga, 2011, p.30).

Internationalization activities can be funded by international students studying abroad (Altbach and Knight, 2007). Students themselves decide whether they want to go abroad and whether they want to enroll in a program offered by a foreign university (Altbach and Knight, 2007). Therefore, their mobility is self-funded where their families pay for the education and where they are considered as the “the largest source of funds for international education” (Altbach and Knight, 2007, p.294). Public funding, as well as institutional funding, are also
another source of funding for internationalization although it differs between different areas such as Europe and the US (Matei, Iwinska, and Crăciun, 2015). At some times, universities search to build collaborations to increase the chance of obtaining domestic and international resources (Castro, Jonkers, and Sanz-Menendez, 2015).

It is important to note that hierarchical functioning universities do not make a significant effort towards internationalization, whereas universities that are more open, “outward looking,” and innovative are more effective in internationalizing (Bartell, 2003, p.66).

Universities follow different routes to internationalization according to what their goals are (Hudzik, 2011). “So, not only is internationalization a means rather than an end,” but the corresponding internationalization approach is chosen according to the end being pursued, which is different between various HEIs (Hudzik, 2011, p.8). To measure how far along the process of internationalization is, there are several indicators that could be applied such as the number of exchange students on a university campus, the number of international partnerships among universities, the number of research projects the university is involved in, and the number of university-business partnerships with international objectives (Bartell, 2003). According to Altbach and Knight (2007), internationalization will continue to be an important driving force in higher education, but it is unclear how.

2.1.1 Rationales Behind Internationalization

A rationale is “the driving force to explain why a country, sector, or institution wants to address and invest in internationalization” (Knight, 2008, p.24). It shows the expected results and benefits of internationalization, and it is “reflected in the policies, and programs that are developed and eventually implemented” (Knight, 2005, p.14). The internationalization process needs clear rationales to be able to organize the international opportunities arising (Knight, 2005). Rationales are divided into four categories being “social/cultural, political, academic, and economic” (Knight, 2004, p.21). Knight (2007) mentions that preparing students with adequate skills and knowledge to use when communicating and building relations with individuals from different cultures is considered as one of the rationales for internationalizing the entire student experience. This explains that social and cultural rationales focus on the fact that understanding foreign cultures is essential and focus on a country’s position in its own culture and language (Qiang, 2003). The political rationale is
concerned with certain country matters such as stability and security and how this places a country with respect to other nations of the world (Qiang, 2003). To elaborate, students who have a potential of being good future leaders are given scholarships from foreign countries to maintain close ties with the other country, which could prove beneficial in future diplomatic matters (Knight, 2007). The academic rationale focuses on the goals and activities of higher education (Qiang, 2003). This is explained by the fact that one of the reasons behind university internationalization is improving the academic standing of research and teaching (Qiang, 2003). Lastly, the economic rationale is related to economic benefits or long-term effects where, for instance, university internationalization contributes to a country’s international competitiveness by providing the needed skilled human resources (Qiang, 2003).

However, there are new emerging rationales that are difficult to place under the four mentioned categories (Knight, 2015a), such as strategic alliances on a national and institutional level. On a national level, student and researcher mobility, in addition to collaborative research and education activities, present fruitful efforts for establishing solid geopolitical bonds and economic relations (Knight, 2015a). On an institutional level, relations are built for “academic mobility, benchmarking, joint curriculum or program development, seminars and conferences, and joint research initiatives” (Knight, 2015a, p.4).

The four mentioned categories of rationales, as well as the emergent ones, are shown in the figure below.
It is important to note that there is “no single, absolute rationale,” because sometimes different rationales from different categories might overlap due to “differences in the hierarchy of priorities and interpretations of internationalization, and changes over time” (Jiang, 2008, p.351).

2.1.2 Benefits of Internationalization

Some of the positive outcomes of internationalization include the improved quality of ongoing academic activities such as research and education, and international citizenship for those coming from less developed countries (Jibeen and Khan, 2015). Internationalization is also “beneficial for institutional cooperation” (Minola, Donina, and Meoli, 2016, p.569), as it allows the collaboration of researchers as well as the exchange of knowledge and experience (Bladh, 2018), which renders research activities stronger and free from the limitations of
local resources and allows for the exchange of knowledge (Minola, Donina, and Meoli, 2016). Therefore, the “increased commercialization of research and the creation of knowledge-based firms” (Minola, Donina, and Meoli, 2016, p. 569) with international networks contributes to financial success (Minola, Donina, and Meoli, 2016). Financial success or revenue generation, along with brain gain are also benefits for developed countries since these countries benefit from the number of foreign students traveling to them and also from franchising academic programs to international providers (Jibeen and Khan, 2015).

Internationalization has also been found to be beneficial for students’ entrepreneurial commitment since it affects students’ positions on the entrepreneurial ladder (Minola, Donina, and Meoli, 2016). Internationalized universities provide a high chance for students to have a successful career worldwide and train their students to work and deal with a culturally diverse and globalized society (Minola, Donina, and Meoli, 2016). Students get the chance to learn in a diversified environment due to student mobility, which leads to graduates “who are internationally knowledgeable and cross-culturally sensitive” (Jibeen and Khan, 2015, p.197). In addition, students gain some “international characteristics” such as learning a second language, being more open-minded, flexible in thinking and being more tolerant towards others (Jibeen and Khan, 2015).

2.1.3 Consequences of Internationalization

While internationalization holds many different benefits, there are also some unexpected repercussions following it (Knight, 2012). First, internationalization leads to brain drain because of the increased mobility of students, professors, and researchers (Teferra and Knight, 2008). This international academic mobility has grown to become a “competitive international recruitment business” (Knight, 2012, p.39). Marketing campaigns are being held in some countries as a race to attract students and academics to come, which would enhance the brain power for innovation and innovation in these countries. Therefore, the initial purpose of providing opportunities for students from developing countries to study in highly developed ones is dissolving fast and turning into a competition among nations to acquire human capital (Teferra and Knight, 2008; Knight, 2015).
There is also an intense growing competition among universities concerning world rankings, which presents the second consequence (Knight, 2012; Knight, 2015). Universities believe that internationalization is their way of maintaining a high ranking and good profile and prestige, which leads to question whether this is really about internationalization or is it only “international marketing and branding” (Knight, 2012, p.40).

Third is the fact that universities are struggling with “the quality of the academic offerings, the integrity of the new providers, and the recognition of credentials” (Knight, 2012, p.39). International education is facing serious issues when it comes to fake degrees, unrecognized academic credentials, and institutions that are not recognized by the authorities (Knight, 2012; Knight, 2015).

Fourth is the homogenization of cultures (Knight, 2012; Knight, 2015). On the one hand, some believe that international mobility of people, culture, and ideas, as well as modern information and communication technologies, promote cultural diversity where new cultures are presented to other countries and increase the chance of culture “hybridization” (Teferra and Knight, 2008). However, on the other hand, some perceive this mobility as alarming because they believe that these factors are destroying national and cultural identities and homogenizing them or becoming “Westernized” (Teferra and Knight, 2008; Knight, 2015) instead of “creating new hybrid cultures” (Knight, 2012).

Fifth is commodification and commercialization (Knight, 2012). The transformation of universities into “an international tradable service” (Teferra and Knight, 2008, p.36) has resulted in questioning their role, social commitment, and purpose (Knight, 2012).

2.2 University-Business Collaboration

University-business collaboration (UBC) has greatly increased over the past years (Hanel and St. Pierre, 2006; Valentín, 2000) due to increased awareness on generating research that attends to society’s demands and links industrial innovation with academic research (Guldbrandsen, Mowery, and Feldman, 2011). The European Commission previously stated that the European industry was encountering difficulties in turning “scientific breakthroughs
and technological achievements into commercial success” (Valentín, 2000, p.165), which is why policymakers all around are now more concerned in improving technology transfer to reduce the gap between academia, industry, and the commercial world (Valentín, 2000). Therefore, a collaboration between a university and industry that knows the fundamentals of technology ensures a smooth knowledge transfer (Watanabe, 2009) and fuels the innovative process (Hanel and St. Pierre, 2006).

Because UBC is a complex process, it remains a fragmented and unclear field of research where all its specific elements need to be connected (Galan-Muros and Davey, 2017). Galan-Muros and Davey (2017) propose what they call a “UBC Ecosystem Framework” that maps the factors that belong to the UBC phenomenon. This framework includes a process model to show how UBC creates impact and classifies external factors affecting UBC into three categories being supportive mechanisms for UBC development, temporary factors that motivate or inhibit the UBC process, and permanent factors influencing the UBC process (Galan-Muros and Davey, 2017). The UBC Ecosystem Framework is shown in figure 3 below and will be used to explain UBC in this section of the thesis.

![UBC Ecosystem Framework](Galan-Muros and Davey, 2017)
2.2.1 UBC Process

2.2.1.1 UBC Inputs

Financial, human, and physical resources are what enable a successful UBC process (Galan-Muros and Davey, 2017). The availability of financial resources or funding is crucial for UBC because it is what triggers the formation of the collaboration (Thune, 2007). For instance, businesses looking to increase their R&D funding collaborate with universities since the government provides funding for firms conducting research activities in collaboration with universities (Perkmann, Neely, and Walsh, 2011). If the funding stops, then normally there are no plans to continue working on a project (Thune, 2007). As for human resources, the involvement of people from Higher Education Institutions (HEI), like researchers and lecturers, contributes to UBC’s success since their skills and knowledge are what develop the university-business relationship (Galan-Muros and Davey, 2017). For example, researchers attract private funding through their work (Galan-Muros and Davey, 2017). Physical resources as well, such as access to material and equipment, could be one of the reasons behind a UBC (Galan-Muros and Davey, 2017).

2.2.1.2 UBC Activities

“UBC activities can be defined as collaborative interactions and cooperative efforts to transfer or exchange knowledge, technology or other properties between a HEI academic or manager and a member of any public or private external organisation” while covering HEIs’ mission of education, research and valorization (Galan-Muros and Davey, 2017, p.7). Activities in UBC are connected to each other where collaboration in one UBC activity leads to an opportunity of collaborating in another that is different in nature (Galan-Muros and Davey, 2017). This develops because of lowered barriers when UBC takes place and gaining more information and a better understanding of the two collaborating actors (Galan-Muros and Davey, 2017). Activities that fall under the educational mission are those such as joint programs or course development (Davey et al., 2011), which enhance students’ learning and prepare them with the skills needed for future employment (Gunasekara, 2006). Activities that fall under the research domain are related to employee mobility between a university and business for work reasons and collaborative R&D where a university and industry collaborate to achieve common research goals (Galan-Muros and Davey, 2017). As for the valorization
domain, Galan-Muros and Davey (2017) identify commercialization of R&D results as one of the activities related. According to Perkmann and Walsh (2009), commercialization is one of the essential activities behind a UBC where research and technology are introduced to the market.

### 2.2.1.3 UBC Outputs, Outcomes, and Impacts

As a result of the above mentioned UBC activities, different results are delivered to universities and businesses (Galan-Muros and Davey, 2017). For instance, a university is able to reach new findings in its research with industry (Debackere and Veugelers, 2005) as well as establish new courses and seminars (Galan-Muros and Davey, 2017). Researchers within the university have the opportunity to generate important research results (Carayol, 2003) and students can have better opportunities at internships and thesis writing because of a more accessible connection to an industry (Galan-Muros and Davey, 2017). These outputs provide several outcomes for universities, academics, and students where universities have better access to funding (Ankrah and Al-Tabbaa, 2015), research costs are reduced (Hanel and St.Pierre, 2006), students acquire skills that make them ready for the work environment, and academics might receive new business opportunities (Galan-Muros and Davey, 2017). Consequently, students become more valued in the job market because of their acquired skills (van der Sijde, 2012), universities are able to fulfill their three missions (Galan-Muros and Davey, 2017), and researchers gain a good reputation due to their publications and productivity (Davey et al., 2011). Businesses, on the other hand, are able to complete their projects, which allows them to gain insight into new developing technology (Perkmann, Neely, and Walsh, 2011) and improve the quality of their work (Galan-Muros and Davey, 2017).

### 2.2.2 UBC Circumstances

#### 2.2.2.1 UBC Drivers

Galan-Muros and Davey (2017) characterize the availability of resources as a UBC driver where the two actors can access each other’s resources and gain competitive advantage and support the community. For instance, industries gain access to competent people from universities that they can employ or use for their benefit to “reach the very edge of
contemporary technology” (Hanel and St. Pierre, p.496, 2006). In addition, they benefit from solutions to technical issues (Valentín, 2000) and support in scientific progress (Schartinger, Schibany, and Gassler, 2001). From a university’s perspective, it becomes an appealing place to work at while drawing in the best professors and students and benefits from industry funding (Valentín, 2000). Galan-Muros and Davey (2017) also refer to personal relationships as another driver for UBC. To create a solid bond in this collaborative relationship, mutual trust, commitment, shared goals, understanding, and familiarity are required (Thune, 2007; Davey et al., 2011). Moreover, knowledge transfer could be another driver since collaborating with another actor signifies that the other actor has useful knowledge (Inkpen, 1998). For instance, a university that collaborates with industry or government has access to more knowledge because of its relation to a “large range of knowledgeable institutions” (Heitor, 2015, p. 290).

In addition to the above, López-Martinez et al. (1994) identify three categories for UBC motivation: structural, institutional and individual. Structural motivations are when considering political, economic, and technological aspects (Valentín, 2000) that affect institutions and individuals and thus motivate or hinder UBC (López-Martinez et al., 1994). Structural motivations differ from one country to another, but no matter where, they are not sensitive to change and crisis (López-Martinez et al., 1994). For instance, the economic crisis led businesses to seek collaborations with universities in Mexico (López-Martinez et al., 1994). Institutional motivations come from the institutional characteristics of the industry or university involved (Valentín, 2000). For instance, “the need to diversify university funding sources due to shrinkage of research budgets” is one institutional stimulus, in addition to industry lacking R&D capabilities (López-Martinez et al., 1994, p.19). Moreover, institutional motivations come from an industry’s desire to improve its image through partnering with a university, and from a university’s need to prove itself relevant to society (López-Martinez et al., 1994). Individual motivations relate to “the personal characteristics of the individual researchers” (Valentín, 2000, p.166). To elaborate, researchers strive for an increased personal income through their participation in collaborative projects (López-Martinez et al., 1994).
2.2.2.2 UBC Barriers

Establishing contact at the start of collaboration can be a barrier because the university and industry are still not aware of each other (Galan-Muros and Davey, 2017), which can create communication problems (Valentín, 2000). Funding is another barrier (Davey et al., 2011) especially in times of crisis (Galan-Muros and Davey, 2017). The difference in organizational culture could be another obstacle where a university and business can have different objectives (Perkmann, Neely, and Walsh, 2011) and bureaucracy levels (Davey et al., 2011). Lastly, the difference in organization characteristics presents itself as a barrier, for instance, “through problems relating to the ownership of intellectual property” and “restrictions imposed by industry on the university (Valentín, 2000, p.168). It is important to emphasize that the problems or barriers found in one collaboration do not have to apply to all other cases (Valentin, 2000).

2.2.3 UBC Supporting Mechanisms

Galan-Muros and Davey (2017) define these mechanisms as measures needed to create an environment in which UBC can develop by reducing barriers and benefit society. Policy mechanisms are the rules a government sets to enhance economic performance or other policy objectives targeting the stimulation of UBC (Galan-Muros and Davey, 2017). Strategic mechanisms can be documented mechanisms showing the goals, strategy, mission, and vision that aim to emphasize UBC (Galan-Muros and Davey, 2017). They can also be implementation mechanisms that work their way through to universities and try to fix the UBC concept within them through providing universities with incentive and funding (D'Este and Perkmann, 2011). Structural mechanisms can be people-based, center-based and program-based and operational mechanisms, which are the initiatives taken by a university to create a university-industry activity, target students, academics, business and others (Galan-Muros and Davey, 2017).

2.2.4 UBC Context

UBC is also affected by some factors on an individual, organizational, and environmental level that are fixed and cannot be modified by managerial activities (Galan-Muros and Davey, 2017). On an individual level, factors such as gender and academics’ business
experience influence the extent of UBC activities and the involvement of academics in UBC (Galan-Muros and Davey, 2017) where males tend to engage with businesses more than females (Boardman and Ponomariov, 2009), and academics with more experience in business increase academic engagement in UBC (Galan-Muros and Davey, 2017). On an organizational level, the type and size of the university influence the extent of UBC (Galan-Muros and Davey, 2017). Universities that are more into applied sciences and developed technology transfer policies tend to be more involved with businesses (Perkmann and Salter, 2012) and universities that are small in size tend to cooperate more with industry on a domestic level (Katz, 2000). Finally, on an environmental level, the different economic, technological, political, environmental, and legal characteristics found in each location or country either improve or hinder UBC (Galan-Muros and Davey, 2017).

2.3 The Triple Helix Model

The Triple Helix is a model used to denominate university-industry-government relationships (Etzkowitz and Leydesdorff, 1995) and to illustrate the transition from a strong industry-government relationship in an industrial-based society to a university-industry-government one in a knowledge-based society (Ranga and Etzkowitz, 2013). The Triple Helix acts as the source of enhancing innovation in a knowledge-based society (Etzkowitz, 2003) through the changing role of the university and the incorporation of different factors from university, industry, and government to achieve a “production, transfer, and application of knowledge” (Ranga and Etzkowitz, 2013, p.238). The government and industry have always been major players in society, but in a knowledge-based society, the university has an equal role to the other two actors rather than being secondary (Etzkowitz, 2003). In the Triple Helix, the industry is the place of production, the university is where new knowledge and technology originate from, and the government is where contractual relations occur ensuring stability in society (Etzkowitz, 2003).
“A Triple Helix regime” starts as its three factors - university, industry, and government - move into a reciprocal relationship with each other in an attempt at each trying to improve the other’s work (Etzkowitz, 2008). Collaborative relationships are formed among the three institutional spheres where each of them also “takes the role of the other” beside their regular roles (Etzkowitz and Klofsten, 2005). Also, some internal transformations occur within the institutional spheres (Etzkowitz and Leydesdorff, 2000). For instance, the university changes from being solely a teaching institution and starts working on putting its knowledge to use (Etzkowitz, 2003), which leads it to overtake the industry’s role and become the ground for the formation of new firms (Etzkowitz, 2008).

Taking each others’ roles is important because it contributes to a more developed model where there is a set of “knowledge, consensus, and innovation spaces” (Svensson, Klofsten, and Etzkowitz, 2012, p.522). Having this space increases the chances of engaging a maximum number of actors, which contribute to the implementation of a successful strategy (Svensson, Klofsten, and Etzkowitz, 2012). Thus, academia contributes to regional development, firm-formation, and provides trained knowledgeable people, the industry plays the university’s roles in expanding the research and training field, and the government embraces new advancements for the public (Etzkowitz and Klofsten, 2005). Nevertheless, each of the three institutional spheres keeps its main role and clear identity (Etzkowitz, 2008).

2.3.1 Triple Helix Origin

Etzkowitz (2008, p.8) claims that “the Triple Helix captures this transformation of roles and relationships as intertwined spirals with different relations to each other.” However, these spirals are rarely found to be equal to each other because there is usually one driving force around which the others rotate until comes a time where the core spiral changes and another one becomes the motive force (Etzkowitz, 2008).

Therefore, “the path to the Triple Helix has different starting points” being a statist model or a laissez-faire model (Etzkowitz, 2003. p. 302). In a statist regime, shown as Triple Helix I in figure 4, the interaction between academia and industry is directed by the government, restricting bottom-up initiatives and discouraging innovation (Etzkowitz and Leydesdorff, 2000). This regime shows how the government leads and supplies the resources needed for new initiatives while the industry and university are driven by it and play a secondary role
In a laissez-faire model, shown as Triple Helix II in figure 4, there are independent organizational spheres with clear boundaries and delineated linkages (Etzkowitz and Leydesdorff, 2000). However, the state participation is reduced (Etzkowitz and Leydesdorff, 2000), and the industry is playing the driving force (Etzkowitz, 2008). These two standpoints show that there is a shift in university and industry away from the government and towards independence from one side, and growing interdependence between the three institutions from the other side (Etzkowitz, 2008).

The different institutional adjustments to university-industry-government relations show the changing innovation systems and the conflicted choice of direction that should be taken in university-industry relations (Etzkowitz and Leydesdorff, 2000). Innovation’s meaning changes as the Triple Helix spirals merge while cooperating and improving each other’s role (Etzkowitz, 2003). Hybrid organizations emerge in the balanced configuration, shown as Triple Helix III in figure 4, where the institutional boundaries overlap with each other (Etzkowitz and Leydesdorff, 2000). This balanced configuration is the model that most countries and regions intend to follow to create an innovative environment (Etzkowitz and Leydesdorff, 2000) seeing that innovation strategies and practices are at the center of the intersection of the spheres (Etzkowitz, 2003). With this environment, there is more room for things such as strategic alliances among firms and academic research teams (Etzkowitz and Leydesdorff, 2000). Furthermore, the government’s role in this formation is less focused on controlling the relations and more focused on fostering them (Etzkowitz and Leydesdorff, 2000). It is important to note that the dynamic characteristic of the Triple Helix makes it not stable when compared to double helix (Etzkowitz and Leydesdorff, 2000).

Figure 2 - Triple Helix I, II and III. Adapted from Etzkowitz and Leydesdorff (2000)
2.3.2 The Entrepreneurial University

During the 19th century, the ideal university was one that was after the pursuit of knowledge (Klofsten and Jones-Evans, 2000). However, this has greatly changed because universities today are no longer “institutions of higher learning,” but rather supporters of technological development and economic growth (Klofsten and Jones-Evans, 2000). The nature of the university-industry-government relationship has transformed over time with the change in “the institutional structures of contemporary societies” (Etzkowitz and Leydesdorff, 2000, p.109). These institutions want to promote change through “knowledge-based international cooperation,” which has led to the university being a valuable player in establishing international relationships with industry, government, and other academic institutions, leading in its turn to the emergence of a new university internationalization pattern (Heitor, 2015, p.276). Therefore, this has lead to question and reevaluate what exactly is the role of the university (Etzkowitz and Leydesdorff, 2000).

Based on the Triple Helix views, the university plays an entrepreneurial role in society and acts as a source of technology (Etzkowitz, 2003; Etzkowitz, 2008). It maintains its traditional role of knowledge transfer and social reproduction but expands on it since its new role consists of promoting innovation (Etzkowitz, 2003). Activities such as firm liaison offices that support university-industry relations, the development of science parks, and university spin-off firms support an entrepreneurship culture within the university (Klofsten and Jones-Evans, 2000). This new role in the economy has given birth “to a new kind of university: the entrepreneurial university” (Guerrero et al., 2016).

An entrepreneurial university is defined as one that actively contributes to economic and social development, not only providing research resources and human capital (Etzkowitz and Klofsten, 2005). By doing so it becomes recognized as an important actor in the Triple Helix because it take a proactive position in making sure that the developed knowledge within its walls is put to use through technology transfer, commercialization of research, or through collaborating to create and implement a strategy for knowledge-based regional economic development (Etzkowitz and Klofsten, 2005). In addition, an entrepreneurial university stands independent of the government and industry but is still involved with them from its “independent standpoint” (Etzkowitz and Klofsten, 2005). So the two requisites for an
entrepreneurial university is exercising control over its strategic direction and maintaining its interaction with the other helix actors (Etzkowitz, 2003). Of course, many academics do not agree to the university being an entrepreneurial one that contributes to the social and economic development and should keep to its mission of education and research (Etzkowitz, 2003).

Thus, this chapter has built the theoretical framework needed in this thesis through explaining the concepts of university internationalization, university-business collaboration, and the Triple Helix, which will be used for the discussion.
3 Methodology

This chapter introduces the methodological approach used throughout the thesis. It specifies how and why this study has been conducted to attain the thesis’ purpose and answer the research question. The section begins by identifying the research approach followed by the research design, which further explains the type of study adopted, the unit of analysis and observation, and the research model. Furthermore, this chapter presents the research process and explains how the sample was selected as well as how the data collection, process, and analysis went. The last part explains the research quality and clarifies the reliability and validity of the thesis.

3.1 Research Approach

3.1.1 Type of Research Approach

The research approach adopted in this thesis is qualitative. Bryman and Bell (2015) explain that qualitative research allows researchers to build theory from their empirical findings and obtain a deep understanding of the subject being researched. It allows researchers to understand how a specific unique process is taking place and the interactions occurring from the participants’ point of view; how they see it, describe it, and interpret it (Merriam, 2009). Therefore, our empirical findings aim to construct the grounds for a new theory linking university internationalization and university-business collaboration together and allow us to have a clear picture of LiU’s internationalization through its collaboration with Saab based on the data gathered.
Data collected through a qualitative approach and used to construct a theory for a phenomenon that has not been properly explained is done through an inductive approach (Merriam, 2009). In an inductive approach, researchers start by looking at a specific organizational problem and strive to come up with new theory through explicit research (Greener, 2008). Our thesis adopts an inductive approach with a few deductive elements. It is inductive because university internationalization through collaboration with industry is a new subject that was empirically studied by us with a goal of building ground for new theoretical advances (Babbie, 2013). The deductive elements were used to deduce the research gap as well as the research question by reading literature and recognizing theories about university internationalization and university-business collaboration (Saunders, Lewis, and Thornhill, 2016).

The inductive approach falls in line with the exploratory nature of this study. It is because this research intends to uncover events and acquire insight into an intended study topic (Saunders, Lewis, and Thornhill, 2016), being university internationalization through collaboration with industry in this case.

### 3.1.2 Philosophical Perspective

It is important to “philosophically position qualitative research” since it reflects “what one believes about the nature of reality and the nature of knowledge” (Merriam, 2009, p.8). It is also recommended for the researcher to understand the significance of choosing any philosophy of science because it helps in "any reflective and responsible scientific inquiry" (Van de Ven, 2007, p.37). This thesis follows "critical realist," resulted from a combination of different philosophies (Van de Ven, 2007). This perspective assumes the nature of the phenomenon examined, or ontology, as objective, considering that the reality of the world is placed separated of our awareness (Van de Ven, 2007). In addition, it also considers methods for understanding the phenomenon, also known as epistemology, as subjective, once there is no value-free or impartial analysis relying on the researcher ability (Van de Ven, 2007).

### 3.2 Research Design

The research design describes the steps taken starting from the research questions and going through data collection and analysis in a method that permits to come up with conclusions (Yin, 2009). It is "an action plan for getting from here to there" (Yin, 2009, p. 10), where
"here" refers to the questions guiding the research and "there" means the answers to the questions or the conclusion. An appropriate research design assures the match of the found evidence with the initial research intention (Yin, 2009). The research design section includes an explanation about our choice of a process study and adopting a case study.

3.2.1 Research Model

When a research question focuses on how an issue emerges, develops, grows, and ends with time, a process study approach is the most appropriate to be used (Van de Ven, 2007). It is mainly concerned with how entities that are being studied change over time, more specifically a developmental event sequence (Van de Ven, 2007). This relates to our research study where we show the readers how Linköping University has conducted its internationalization activities with Brazil through its collaboration with Saab. We focus on how the collaboration started, how it developed and grew, and what have been the results in the university’s internationalization status.

The unit of analysis in our process study is defined as the set of internationalization activities performed by Linköping University in cooperation with Saab focusing on Brazil. A unit of analysis is the entity, who or what, which is being analyzed in research (Van de Ven, 2007) and it is crucial to have it defined in a case study (Van de Ven, 2007; Yin, 2009). Several discussions were done between us and with colleagues and professors during seminars to clearly define the unit of analysis, following the suggestions from Yin (2009) that recognize the importance of such procedure during the definition to avoid misinterpretations and confusion.

Since our study focuses on the organizational level to obtain information, specifically the university’s perspective, the unit of observation is different from the unit of analysis (Van de Ven, 2007). The data was collected from individuals involved in the specific LiU’s internationalization activities, which were our unit of observation, and then compiled together to provide a deep understanding of the university’s internationalization activities (Van de Ven, 2007).
3.2.2 Case Study

We chose to conduct a case study because it investigates real-life events, which determine how a phenomenon occurred, the reasons behind it, and the effects and implications of such a phenomenon (Saunders, Lewis, and Thornhill, 2016). A case study is suitable when exploring new territory, in our case university internationalization based on collaboration with industry, and gradually building theory (Eisenhardt, 1989). More specifically, a case study, together with an inductive approach, is suitable to use when there is a limited theoretical background, which then develops from the data collected (Siggelkow, 2007). The above stated applies to the subject of university internationalization based on collaboration with industry where the purpose of the thesis is to generate new theory based on the empirical findings. In addition, since a case study is adequate and extensively used for researching universities (Tight, 2003), it contributed to our decision for adopting it. Because our research question aims to explore how Linköping University has been able to internationalize with Brazil through its collaboration with Saab, this phenomenon was chosen as the case subject with several mini-cases embedded within it, which make it substantial (Dyer and Wilkins, 1991).

More specifically, this research is a qualitative case study research where there is “an in-depth description and analysis of a bounded system” (Merriam, 2009, p. 40). A bounded system represents a single unit, which has boundaries around it, and a case represents “a phenomenon of some sort occurring in a bounded context” (Merriam, 2009, p. 40). Having the case in a bounded context ensures that the “study remains reasonable in scope” (Baxter and Jack, 2008, p. 546). Time, space, (Yin, 2009) activity, (Stake, 1995) definition and context (Miles and Huberman, 1994) boundaries are used to describe the case objectively and to guide the data collection and analysis (Yin, 2009). In our study, our bounded system is Linköping University’s internationalization activities performed in collaboration with Saab targeting Brazil between 2011 and 2018. This time interval chosen will be presented more precisely in the results section.

While multiple case studies are believed to be better in building theory and in having a convincing empirical ground rather than single case studies (Eisenhardt, 1989), it is not right to conclude that a generalization cannot be reached from a single case study; “it depends on the case one is speaking of and how it is chosen” (Flyvbjerg, 2006, 225). Even if a
generalization cannot be reached, that does not mean that the collected knowledge cannot be part of the “collective process of knowledge accumulation in a given field or society” (Flyvbjerg, 2006, p.227). Due to this reason, we believe that the choice of a single case study provides enough knowledge and detail for future research to be based upon.

3.3 Research Process

At the starting phase of our study, a document from a former employee at LiU was brought up to our attention in which it was mentioned that there is a new context of university internationalization and that is through collaboration with industry. Therefore, we started looking for numerous academic articles, books, and documents to develop a deep understanding of the subjects concerning this phenomenon as well as to identify the research gap. Our literature review consisted of careful readings about the Triple Helix concept, university-industry collaboration phenomenon, and internationalization in higher education. Reviewing literature is important because it helps shape the theoretical framework for the research problem chosen and it helps the reader identify which issues have already been studied and which have not (Merriam, 2009). Through our reading, we found out that many sources discuss university internationalization and university-industry collaboration separately, but there were no articles that discussed university internationalization through collaboration with industry. Therefore, we decided to focus on the phenomenon that was brought up to our attention from the start, where this activity is currently taking place, and connect the different theories we read to the case study and provide a basis for theoretical advances as well as a deep understanding of our chosen topic.

After establishing the theoretical framework, people involved in the chosen case study were approached for semi-structured interviews. After the interviews, the data collected from individuals was transcribed, compared, and analyzed to be able to develop the empirical findings, combined with document data. As a final step, the empirical findings were critically compared with the previously established frame of reference to answer the research question and come up with the conclusion. These different steps will be further discussed below to provide a greater understanding of the process.
3.4 Literature Review

Secondary data was collected through reading various academic articles and books. We worked in parallel by reading articles and books by different authors about university-business cooperation and university internationalization at the same time. This was done to deepen our understanding of the subject and learn about the activities done in such cooperation as well as the drivers, benefits, and disadvantages that come along with it. During our reading of the two topics, the Triple Helix concept came to our attention where we found out that it constituted an important part of what we wanted to write about. So taking these three subjects together, we built our theoretical frame of reference.

3.5 Research Data

3.5.1 Participant Selection

Our study followed a purposeful snowball sampling approach where some participants are generally located at the beginning of the study and as the interviews progress, these participants are asked to refer the interviewers to other interviewees who would be valuable for the study (Merriam, 2009; Bryman and Bell, 2015). “By asking a number of people who else to talk with, the snowball gets bigger and bigger as you accumulate new information-rich cases” (Patton, 1987, p. 56).

As our study focuses on the links between individuals, tracing them through the snowball approach was the most suitable (Bryman and Bell, 2015). The participants selected at the beginning were ones on a high-level strategic position whose experience provided us with valuable information and insight. As our research progressed and new information and questions came to light during the data collection process, new participants were added (Merriam, 2009; Bryman and Bell, 2015). The majority of the participants chosen in this phase of the study were more on the operational level, which provided us with more practical information from a different perspective. The decision on the total number of participants was made when we reached a point of saturation in the information gathered, as no new information was forthcoming to answer our research question (Merriam, 2009).
3.5.2 Data Collection

The section below describes the data collection method in addition to the data collection process. To collect the needed primary data we relied on documents and conducted interviews.

3.5.2.1 Data Collection Method

Documents written by first-hand experience were used because they are objective and stable and do not change in the presence of the researcher (Merriam, 2009). In addition, they help find a paper trail that reveals more about the process being studied (Merriam, 2009). The documents we referred to helped us gain more insight into our case study by providing us with dates, names, and activities that were relevant to our case. The documents’ authenticity was determined by checking the settings of the writing as well as the documents’ authors (Merriam 2009).

We also conducted semi-structured interviews since this type of interviews has proven to be efficient in qualitative and inductive research (Saunders, Lewis, and Thornhill, 2016) same as our thesis. The aim of the interviews was to uncover feelings, behaviors, and thoughts that cannot be observed and to find out more about previous events that cannot be replicated (Merriam, 2009). Semi-structured interviews allow more flexibility during the conversations as “neither the wording nor the order of the questions is determined ahead of time” (Merriam, 2009, p.90). Since our thesis aims to provide new insight into a university’s internationalization through collaboration with industry, a subject that apparently has not been researched yet, the flexibility was the primary reason behind why we chose this type of interview. When researching a subject that has not been previously explored, there are many uncertainties and new information that appear during the interviews that demand further questioning. Furthermore, semi-structured interviews allow more open discussions where the interviewer can complement what is being said and ask additional questions according to the responses given to obtain a more extensive set of data (Bryman and Bell, 2015). For instance, factors such as the interviewees’ positions and activities influenced the responses we got with every interview, and so an open discussion within a semi-structured interview helped us in gaining a broader perspective for our study.
3.5.2.2 Data Collection Process

Afore going to the interviews, we prepared an interview guide that would help direct the interview to ensure that we got all the information we needed to answer our research question and attain our research purpose. The interview guide was prepared in English, which was the common language used for communication among each other and the interviewees considering the fact that each came from a different country. However, we avoided using complicated theoretical terms and theories to avoid any confusion and to ensure that the interviewees understood the questions correctly (Bryman and Bell, 2015).

As mentioned in the previous section, the interview guide was flexible, given that the interviews were semi-structured, and the questions’ nature was open-ended in order to leave the space open for more discussion and complementary questions to gain further insight into a topic while maintaining a flow through the questions being asked (Bryman and Bell, 2015). In addition, we made sure that the questions asked were neutrally structured as to not initiate any bias from our point of view (Merriam, 2009).

The interview guide included different types of questions to stimulate the desired answers from the participants, and that would help us cover all aspects of the case. The questions varied between being related to experience, opinion, knowledge, and background (Merriam, 2009). The guide started with general questions related to the participant’s background, which allowed us to know the participants better and make the interview smooth. We then moved on to more specific questions revealing the interviewee’s opinion, experience, and knowledge regarding specific issues. Since we interviewed people from different university departments and different positions as well as participants from Saab, the questions had to be slightly modified from one interview to fit with the participants’ area of work and expertise while making sure that the questions would still provide suitable answers for our research question (see Appendix 1, 2 and 3). The first two questions in the interview guide were always consistent with all participants, asking them about their educational background, current job position, and the department they work in. The questions after that focused on subjects related to university internationalization and university-business cooperation, but were slightly modified according to whether the participant’s position was more related to university internationalization or university-business cooperation.
Before proceeding with our set interview guide, we conducted a pilot interview with one of the interviewees to test the questions we had prepared. Pilot interviews help interviewers practice their questions, determine which questions need rephrasing, learn which questions do not provide any useful data and get suggestions for some additional questions that could be included (Merriam, 2009). The pilot interview was conducted with a person working in a senior position in the university’s collaboration department overseeing the university’s strategic partnerships on a national and international level, which helped us refine some of the questions before we went on to conduct the rest of our interviews.

Each of the interviews was conducted with both of us being present with the interviewer where one of us focused on guiding the conversation, and the other was more focused on taking notes as an additional source of information. Some of the interviews were conducted face-to-face while a few others were done via Skype calling due to the interviewee being located in a different country. The interviews were conducted in English because it was the universal language that could be used for communication among the presence of different nationalities. There was no limited time interval for the interviews, but each of them lasted for 45 minutes on average.

All the interviews were recorded, after permission from the interviewee, “to ensure that everything said is preserved for analysis” (Merriam, 2009, p. 109), and in order not to have to rely on our memories (Bernard, 2006). In addition, recording the interviews allowed us a more profound and repeated examination of the participants’ responses and protected us in case there were any risks of being biased (Bryman and Bell, 2015). After each interview, the data gathered was transcribed and coded to make us more attentive to new themes that might be important to ask about in other interviews (Bryman and Bell, 2015). The following table presents data regarding the interviews with codified names. Eleven participants were interviewed in total by following the interview guide, while the last participant, P12, was interviewed in the end for data check without reference to the interview guide.
3.5.3 Data Analysis

Qualitative data analysis is the process of establishing meaning from the data collected by interpreting what has been said by the interviewees and what has been observed and read by the researcher (Merriam, 2009; Miles and Huberman, 1994). We followed Miles and Huberman’s (1994) three steps for qualitative data analysis: data reduction, data display, and conclusion drawing and verification. As a first step, each interview was transcribed and coded after it had been conducted to avoid the complexity of a large volume of data collected with no apparent structure due to using semi-structured interviews. This helped in organizing, categorizing, and assembling the data (Bryman and Bell, 2015) as well as gaining deep insight to form our study findings (Merriam, 2009). Throughout this process, we highlighted significant statements as well as important keywords that would make our analysis correspond to the research question and then categorized these keywords to recognize them easily. This was important as it helped us relate to the theory section of our thesis and to the terms and concepts mentioned in it. It was also important because each set of data collected from a different person focused either on university internationalization or university-business collaboration from a different perspective.

<table>
<thead>
<tr>
<th>Person</th>
<th>Adm/ Acad</th>
<th>Interview time</th>
<th>When</th>
<th>Method/ Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>P01</td>
<td>Adm, strategy.</td>
<td>28:41:00</td>
<td>14/feb/18</td>
<td>Presential (Pilot)</td>
</tr>
<tr>
<td>P02</td>
<td>Adm, strategy</td>
<td>01:13:11</td>
<td>03/mar/18</td>
<td>Skype</td>
</tr>
<tr>
<td>P03</td>
<td>Adm, strategy</td>
<td>58:32:00</td>
<td>05/mar/18</td>
<td>Presential</td>
</tr>
<tr>
<td>P04</td>
<td>Adm, strategy</td>
<td>01:31:51</td>
<td>06/mar/18</td>
<td>Presential</td>
</tr>
<tr>
<td>P05</td>
<td>Adm, strategy</td>
<td>21:28</td>
<td>14/mar/18</td>
<td>Skype</td>
</tr>
<tr>
<td>P06</td>
<td>Adm, strategy, academia</td>
<td>43:38:00</td>
<td>21/mar/18</td>
<td>Presential</td>
</tr>
<tr>
<td>P07</td>
<td>Adm, academia</td>
<td>51:48:00</td>
<td>22/mar/18</td>
<td>Presential</td>
</tr>
<tr>
<td>P08</td>
<td>Adm, strategy</td>
<td>34:26:00</td>
<td>23/mar/18</td>
<td>Presential</td>
</tr>
<tr>
<td>P09</td>
<td>Adm, academia</td>
<td>25:25:00</td>
<td>23/mar/18</td>
<td>Presential</td>
</tr>
<tr>
<td>P10</td>
<td>Adm, academia</td>
<td>34:22:00</td>
<td>23/mar/18</td>
<td>Presential</td>
</tr>
<tr>
<td>P11</td>
<td>Adm, strategy</td>
<td>38:30:00</td>
<td>26/mar/18</td>
<td>Presential</td>
</tr>
<tr>
<td>P12</td>
<td>Adm, strategy</td>
<td>12/apr/18</td>
<td>Presential (Data Check)</td>
<td></td>
</tr>
</tbody>
</table>
Data display consisted of grouping the codified data in an organized way through text tables and graphics that permitted conclusion drawing (Miles and Huberman, 1994). Therefore, we created a table that included different pieces of codified information such as some internationalization activities that took place, how they emerged, and the reasons behind them. We also designed a visual map that showed different internationalization activities that took place, crossing them with the individuals and organizations involved, and matching them with the correct time. Contextual information about governmental and institutional agreements complemented the map (see map in Appendix 5). The display of data in an organized structure made it easier for us, in the end, to draw conclusions from the gathered information and refer back to it for verification (Miles and Huberman, 1994).

3.6 Research Quality

Research quality ensures that research results are trustful for the use of practice and theory and that they follow proper logic procedures (Merriam, 2009). It can be assessed by looking at different factors (Saunders, Lewis, and Thornhill, 2016). In our thesis, the criteria of credibility, transferability, and reliability were used to evaluate the research quality.

3.6.1 Internal Validity

Internal validity refers to the compatibility of the research findings with the reality (Merriam, 2009). Qualitative research is highly dependent on a researcher’s interpretations, which is why several methods can be used to increase the findings’ credibility (Merriam, 2009). The methods used in our thesis are described below.

3.6.1.1 Triangulation

We applied triangulation strategies as a way to increase trustworthiness (Denzin, 1978). Data collection was performed through the use of multiple methods that originated from multiple sources by employing more than one investigator and with the adoption of multiple theories to confirm what was found (Denzin, 1978). Our research data was collected through two different methods interviews, whether video call or presentational, and documents and what was said in the interviews could be checked against what was written in the documents and vice versa (Merriam, 2009). This is where triangulation was applied by matching the information
obtained from interviews with what was acquired from the documents analyzed, in addition to information checking with other informants (Merriam, 2009).

Since triangulation also means using multiple sources of data (Denzin, 1978), our study encompassed several actors related to the case, from diverse professional positions and educational backgrounds, belonging to two distinct organizations. We started by focusing on interviewing participants on a strategic level. However, as our study progressed, and after reflections and third actors’ feedback (Merriam, 2009), we added interviewees that were more on an academic and operational level. By doing so, we not only increased the number of sources but also brought in new perspectives to our research, which enriched the triangulation process (Merriam, 2009).

Because we were two students writing this thesis, we applied “investigator triangulation” where active participation from both of us was employed during data collection and analysis (Merriam, 2009). We both tried to come up with independent analysis continually and later compare the findings and integrate them together (Patton, 1987). This reduced the chances of mistaken individual interpretations.

Triangulation was also addressed through the use of different theories to confirm the findings (Denzin, 1978), as this research made use of a set of them, being UBC, UI and Triple Helix. It is important to emphasize that the theories originate from various authors, which also contributes to increased validity in our study.

3.6.1.2 Respondent Validation

We concentrated on interpreting the case information as accurately as possible through efforts to reduce the risk of misinterpreting the data collected (Merriam, 2009). Therefore, we double checked with our respondents, looking for feedback concerning the information that we collected and interpreted (Merriam, 2009). By doing so, Maxwell (2005) recognizes the learning contribution for the researcher, as one can identify the own limitations, such as bias and misunderstanding.
3.6.1.3 Adequate Engagement in Data Collection

Throughout the data collection process, we made sure to get close to our interviewees’ understanding of different topics asked (Merriam, 2009). The decision to stop collecting data was reached when we realized that we had reached a point of saturation where no new information and no new emergent findings were being uncovered (Merriam, 2009).

3.6.1.4 Peer Review

Peer review is an additional strategy applied to mitigate the risks of wrong data interpretations by the researchers (Merriam, 2009). Throughout our thesis writing process, this was done through several seminars with our colleagues and advisor, where presentations and discussions were held resulting in feedback and critique that provoked reflection and ways to improve our research. Other sources, such as senior researchers, doctors, and expert practitioners, provided frequent advice and input that were valuable to test the stability of our research construction method. This follows Van de Ven (2007), who recognizes the importance of academics and practitioners’ active engagement throughout the research period.

3.6.2 External Validity

External validity or transferability is the possibility of applying the results obtained from one study to other cases, or in other words, “how generalizable are the results of a research study?” (Merriam, 2009, p.223). Therefore, to be able to achieve transferability in a qualitative study, “rich, thick descriptions” should be provided about the case that explain the context, people, and background information of the case study (Lincoln and Guba, 1985, p.316) as well as the presentation of the results grounded in evidences extracted from interviews, documents or observations (Merriam, 2009).

Our research seems to provides sufficient case context information to the readers by elaborating on the organizations involved, the participants, and the timeframe. In addition, we tried to detail the empirical findings with many quotes from the interviews to provide further evidence. We also used purposeful sampling because it is another way of ensuring the thesis’ transferability (Bitsch, 2005). Purposeful sampling provided a more significant set of diverse
participants with different backgrounds and positions that allowed us to distinguish common patterns across this diversity (Patton, 2015).

3.6.3 Reliability

“Reliability refers to the extent to which research findings can be replicated” (Merriam, 2009, p. 220). Nonetheless, qualitative research “is not conducted so that the laws of human behavior can be isolated" (Merriam, 2009, p. 220). This affects our qualitative study because people’s behaviors and opinions change, which affects the results and analysis that were built from interviewing these people (Merriam and Tisdell, 2015). For instance, the restructuring of LiU’s departments and the changing of personnel that works there might yield to different results than the ones we found. This agrees with Tracy (2013) who expresses that, “because socially constructed understandings are always in process and necessarily partial, even if the study were repeated, by the same researcher, in the same manner, in the same context, and with the same participants, the context and participants would have necessarily transformed over time—through aging, learning, or moving on” (p. 229).

Therefore, to evaluate reliability in qualitative research, it is important to make sure that the conclusions reached make sense and match the data collected, and not if the same results can be found again (Merriam, 2009). “Replication of a qualitative study will not yield the same results, but this does not discredit the results of any particular study” (Merriam, 2009, p.221).

We documented the research process through an audit trail, by detailing how the study had been made and the decisions taken throughout the study (Lincoln and Guba, 1985). Another strategy adopted to promote reliability was having a diverse sample selection, which was shown when new participants were added to be interviewed (Merriam, 2009).

3.6.4 Ethical Considerations

For research to be credible, the researchers themselves have to be honest and have integrity with how to conduct their study (Patton, 2015). For this reason, we informed all interviewees of the purpose of our research ahead of time, promised anonymity, and informed them of how the data will be used. We also told them that any quotes used from their interviews would be sent to them so that they can see the context where their quote was used and provide their approval on it before submitting the final version of the study. In addition, at the start of each
interview, we restated our purpose and asked for the participants’ approval to be recorded while explaining that it will be easier for us when coding and analyzing the data. Moreover, our methodology section which provides a detailed description of the entire research process aims to show transparency and reduces readers’ doubt and skepticism about our conclusions.

Therefore, this chapter has shown the methods used to conduct the study aiming to answer the research question. It included an explanation of the reasons behind the adopted study approach, the research process undergone, data collection, and the research quality.
4 Empirical Findings

This chapter presents the results found throughout the thesis aiming to achieve the thesis’ purpose and answer the research question. It starts by detailing Linköping University’s background and how internationalization and collaboration happen within it. Then it moves on presenting Saab and the partnership between it and the university. After establishing this context, the chapter proceeds in informing the reader about all the events that led to LiU’s internationalization activities through its collaboration with Saab in Brazil. It is important to note that when we refer to the findings as LiU and Saab, we are referring to the group of people we interviewed for this case.

4.1 Organizational Background

Before we begin by describing LiU’s internationalization activities performed through the collaboration with Saab, it is important to introduce the organizations that are involved in it. Since our thesis has been focusing on matters from a university internationalization perspective, our empirical findings target LiU and its activities.

4.1.1 The University: Linköping University

Linköping University (LiU) was officially founded in 1975, the sixth Swedish university at that time, where it currently holds 27,000 students and 4,000 employees (LiU, 2018). It started out as a college, in 1967, with a few courses in humanities, social sciences, and natural sciences and two years later the technical and medical college were added (LiU, 2018). Due to its good standing in international rankings, there is a high demand for its students in the labor market (LiU, 2018). Being situated in Sweden, one of the most innovative countries in
the world (Cornell University, INSEAD, and WIPO, 2017), it is only natural that the university offers a wide variety of innovative courses and is engaged in top cross-border research (LiU, 2018).

**4.1.1.1 LiU Structure**

The university is considered as a decentralized organization. The lack of centralization in LiU makes it difficult for external partners to understand how to maneuver in the organization and whom to talk to. In addition, the directors act more like coaches to get everyone walking in the same direction. However, the university management does not believe that making LiU a centralized one would benefit it. P03 from the university expresses the following:

"There is a challenge at LiU that is the decentralized organization. [...] there are different groups working with different issues."

The decentralized structure supports the way internationalization activities are happening within LiU. The activities implemented by any academic or student are independent of any central decision.

**4.1.1.2 Internationalization within LiU**

To be able to understand internationalization within LiU, it is important to know how the university defines it. P03 cited De Wit and Hunter (2015) and stated that the definition below is the one applied by LiU.

"The intentional process of integrating an international, intercultural, or global dimension into the purpose, functions, and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society."

The International Office at LiU is mainly concerned with traditional international issues where it focuses on educational support, internationalization of education, and mobility. For instance, it administers the Erasmus+ applications, it helps international students with finding accommodation, it organizes reception activities, it ensures communication with potential or accepted students and provides them with all the needed information, and it is concerned with staff mobility.
However, as the internationalization activities that LiU is doing at the moment are decided in a decentralized manner, participants recognize that there is no formalized strategy. Members of the university who are in charge of internationalization activities agree that they have common goals, such as the importance of increasing internationalization engagement, but they argue that these goals need to be made clear, detailed, and explicit. At present, LiU is only working on getting people from one place to another without having a substantial reason for why it is choosing one country over another. Therefore, it is merely following the trend in what country to go to. As a result, the university management thinks that a strategy is beneficial to avoid confusion when the university wants to take on a larger internationalization project where sensitive decisions need to be taken. With this, it could set priorities for what needs to be done. In addition, it seems that having a formalized strategy could also help decrease the disadvantage of lacking resources. P03 affirms the following by saying:

"We would need to have a strategy where we state which countries we will focus on, goals that are specific enough for us to know how to make our priorities, to go in one direction as one university and to know what to choose and to choose not to do."

As much as LiU is recognized internationally, there remains internal questions within the university where internationalization is seen as separate from the rest of the university activities.

4.1.1.3 Collaboration within LiU

This section informs the readers how collaboration within LiU happens and what are some of the perceived benefits and barriers that collaborative activities have for LiU.

“Swedish universities by law have three responsibilities. They should educate people, they should do research, and they should valorize their knowledge” (P11).

As LiU is a Swedish university, it works on fulfilling these three responsibilities and so, this is what drives it to be involved in collaborative activities, while not forgetting to mention that collaboration is part of the Swedish HEI mission (UKÄ, 2017). By participating in collaborative activities, LiU is expected to improve the quality of its education and research and provide better opportunities for students and researchers around the world, and with that
valorize its knowledge. LiU is one of the universities in Sweden that are considered as being relevant to the industry as it has worked on building relations with several strategic partners such as Saab, ABB, and Ericsson over the years. Its collaborations have also helped it in acquiring more research funds together with industry. Based on the above, P11 informs that Linköping University defines collaboration as follows:

“Collaboration is the relations we have and the activities we carry out together with actors from the surrounding community [...] The aim is to actively spread and utilise knowledge and to enhance each other’s development and attractiveness and consequently to increase the quality of our education and research.”

However, it is important to note that without researchers interested in being involved in collaborative activities, there would be no collaboration. The university management mainly suggests a particular activity. The researchers then check the situation and whether it would be beneficial for them to develop their research there. However, if no researcher is willing to participate, then the university management cannot decide that the researchers should go, and thus there is no collaboration. P06 explains that by mentioning the following:

“It’s the research groups and the professors that are the collaborations because the collaboration is within research. So the management part is kind of infrastructure, making it happen, and making sure that the right topics are being collaborated”

P08 confirms that as well by saying:

“We have done trips, such we had this big delegation going to Brazil, with a lot of researchers from LiU participating. I guess you know about it. It was part of a national STINT project, to promote Swedish higher education abroad. The idea was to organize matching activities between researcher’s – but the outcome was relatively limited. At the end, it is up to the researcher’s, the university management can only try to stimulate, in this case by organizing this kind of matching event.”

What could also hinder LiU’s chances of successful collaborations is mainly resources because if there is no money than the university cannot start any collaboration. Furthermore, the university needs to know what is precisely its mission and where its limits are aside from taking the knowledge and utilizing it and contributing to society. It needs direction and steps
that it can follow so that it knows how to proceed with its activities and how to sort things out instead of running in entirely different directions. P11 expresses these concerns below:

“What could you expect from a university? How far in this process should we go? […] To which length in this process should we go in valorizing the knowledge? Should we be responsible for the innovation and commercialization of certain knowledge? Should we be responsible in taking the knowledge all away and into practice? where does our mission stop?”

4.1.1.4 LiU’s Internationalization and Collaboration: Two Related Concepts

The many internationalization and collaborative activities that LiU has been involved in over the years have revealed that both concepts come hand in hand, that they could be driven by each other, and that the university can maybe benefit from that to reach its goals in education and research excellence. P03 expresses this by saying the following:

“All the motives that you come up with for internationalization, you come up with for external collaboration as well and vice versa.”

In addition, LiU’s involvement in collaborative activities has led it to expand the network and contributed to its international standing. The university and the other company involved use each other for each one of them to get what it needs, which seems to increase the university’s relevance in teaching, education, and research as well as work quality. This kind of cluster could benefit LiU more when it brings the two aspects together. P11 gives the below example to support this:

“There are many companies getting in contact with us and they say “Hey do you have students from Chile [...] because we are thinking of starting a cooperation. We want to send our products there, we want to establish us there [...] and we’re not very sure about the culture and the business life [...]in Chile. Do you have a student from there that could help us a little bit with what’s going on?” And we have helped some companies in that way also and I think that’s a good part about internationalization also. We can help our business life actually to get established in other countries because our students they are an asset[...]”
LiU’s management interviewees view collaboration and internationalization as two subjects connected to each other. The two departments were spontaneously merged along with the grants office and contracting office because of overlapping issues, creating what is called the IFSA division. Different people have been working with projects for the university in relation to industry, municipalities, and civil society, which brought to light the fact that these projects were not purely collaboration, but included internationalization, which emphasized more that these two aspects should be combined. P03 expresses the thoughts behind this by saying:

“I thought this was an opportunity to put emphasis and give some more strength and power to do this work of combining internationalization and collaboration to make use of these internationalization and collaboration efforts and vice versa. [...] I saw and see a strong potential in working hand in hand, not only in parallel, and making use of each other’s contacts, structures, processes so that we can achieve larger goals.”

4.1.2 The Industry: Saab

With over 16,000 employees, Saab is a Swedish-based company operating on all continents providing “the global market with world-leading products, services and solutions from military defense to civil security” (Saab, 2018). A significant portion of Saab’s operations is concentrated in Linköping. The purpose of an international market area presence is to strengthen its local position in different areas and focus more on the customer (Saab, 2018). The company works in different business areas such as “aeronautics, dynamics, surveillance, support and services, industrial products and services and kockums” (Saab, 2018).

4.2 Partnership Between LiU and Saab

As background information about LiU and Saab has been provided, the following section focuses on explaining of how these two organizations are connected.

Linköping University and Saab have been strongly connected since the very beginning. Interviews revealed that LiU’s establishment was closely related to Saab’s needs for educated engineers. According to P04 and P11 respectively,
“The industry made the growth of the university in a way”

“It was driven kind of by the needs of the society, the becoming of our university.”

Saab is considered as a high technology company with high technology need. It works on maintaining strategic partnerships with some of Sweden’s universities such as KTH, Chalmers, Lund, Stockholm, and Linköping University. The fact that Saab and LiU are situated in the same city makes them more dependent on each other. Therefore, there is a significant number of students going to work in Saab right after graduation where the majority of Saab’s employees are academics coming from LiU. This flow implies that the two organizations are working together on research, education, recruitment and also sharing resources. P04 supports this by stating the below:

“We are more into dependence between Saab and LiU because we’re in a small city, [...] we’re dependent on each other and we realize that.”

As the collaboration already existed along the history between LiU and Saab aeronautics, the people responsible took the initiative to formalize it in the early 2000s. Consequently, in 2004, a strategic agreement was signed that served as an umbrella for all research and operations that was being done between the two organizations. The agreement was updated in 2009 to include all of Saab and LiU and not only the aeronautics department. In 2014, the strategic agreement was elevated and signed by the vice chancellor of the university, Helen Dannetun, and Saab’s CEO, Håkan Buskhe and thus recognized on a different level. The following timeline illustrates the formalized institutional agreements.

![Timeline of institutional agreements](image-url)
However, there is still some tension surrounding the LiU-Saab collaboration where people with different views believe that LiU has lost its identity in this collaboration and is sometimes not regarded as an individual entity. This is due to the fact that Saab is bigger and is most of the times initiating the activities and providing funding. In accordance with the mentioned, P04 says the following:

“[...] there are a lot of stakeholders that don’t like collaborating with industry. They think it’s wrong. So when they want to achieve something there are some guys saying why are you working with Saab? They make defense equipment, it is an industry. We do research, we find new findings for the society.”

4.3 External Context

In order to properly frame the case, it is important to mention external occurrences related to Saab and the Swedish Government that influenced LiU’s internationalization through its collaboration with Saab.

4.3.1 Brazil and Sweden

In October 2014, the Brazilian Air Force bought 36 Gripen NG aircraft from Saab (Deiaco, Ek, and Román, 2016). This deal, which had a total value of 39 billion SEK, is considered the most significant Swedish export deal of all times, which has opened up many other opportunities, including spillover effects, not limited to the aeronautical sector, including the development of technological capabilities in Brazil (Deiaco, Ek, and Román, 2016). The acquisition of the airplanes was the result of a long-term relationship between Saab and Brazil, and this is recognized as the catalyst of an "emerging strategic industrial relationship between Sweden and Brazil" (Deiaco, Ek, and Román, p. 16, 2016). Thus, “the Gripen project has influenced the more formalized bilateral relations between Sweden and Brazil” (Deiaco, Ek, and Román, p. 20, 2016).
On a governmental level, Brazil and Sweden have established several formal agreements regarding "trade and investment, defence, science, technology and innovation, sustainable energy, climate change and sustainable development, and cultural exchange" (Brazilian Ministry, 2015). The number of agreements signed has increased during the last decade. While two bilateral agreements were found between 1984 and 2007, the number grew 250%, from 2009 to 2015 where a total of seven bilateral agreements were signed (Brazilian Ministry, 2015). Figure 6 below demonstrates an overview of these findings. The timeline shows what governmental agreements had been done in which year until the signing of the Gripen deal contract in late 2014.

![Graph showing agreements between Brazil and Sweden from 1984 to 2015.]

**4.3.2 Swedish Governmental Support for UI and UBC**

Before presenting our empirical findings of LiU’s internationalization through its collaboration with Saab, it is important to mention two governmental organizations that are supportive mechanisms to collaborative initiatives between the university and industry and to university internationalization. STINT, the Swedish Foundation for International Cooperation in Research and Higher Education, was created by the government where its mission is to increase the internationalization of Swedish Higher Education Institutions (HEI) (STINT, 2018). In our case study, STINT was responsible for funding an internationalization project called SACF, which will follow in the case below. Vinnova is a governmental agency focused on university-industry collaboration and improving the conditions for innovation in Sweden through the stimulation of collaborative projects between HEIs and the surrounding
society (Vinnova, 2017). Vinnova also supports international collaboration initiatives (Vinnova, 2017) and is jointly funding bilateral research projects with Brazilian agencies.

4.4 LiU, Saab, and Brazil

The partnership between LiU and Saab has allowed both organizations to think more internationally. As they have been involved in previous partnerships, it is natural that LiU and Saab decide to go international with their collaboration where they can also support each other. LiU’s managers argue that the university intends to be a global university and Saab’s managers also express that the company is expected to go beyond its focus on the Swedish customer. Therefore, there is a joint interest for LiU and Saab to go international where one of the countries they share a common interest in is Brazil. P06 supports this by saying:

“There is a Swedish-Brazilian ambition to strengthen the innovation, collaboration between Sweden and the Brazilians in several areas”.

Saab saw an opportunity in Brazil to build good relations in connecting academia and industry. It wanted to build a strong bond that went beyond the Gripen deal. P04 explains this below:

“By sincerely doing, opposing, and pushing we show we’re there to stay, we’re not here just to sell, we want to be around, we want to be friends, and we do things beyond the “deal”.

For Saab to develop its business in Brazil, LiU endorses this by collaborating with the university networks in Brazil. So, LiU backs Saab in its mission, and Saab backs LiU in its mission. Saab supports LiU in conducting relevant research and getting a focus on Brazil, and LiU supports Saab by following it abroad. P08 elaborates on this matter:

“So since Saab is our strategic partner and Brazil is very important for Saab, why can't we try also to find win-win collaborations which also includes partners in Brazil? That was the idea. We already had a lot of collaboration with Brazil, but could we take another step and further develop and strengthen our strategic collaboration with Saab, that would help both LiU and Saab – and of course, the partners in Brazil as well.”

Even with the apparent benefits of LiU’s internationalization through collaboration with Saab in Brazil, there is no unanimity. Some still believe that the university should be purely based
on independent research and its internationalization should be focused on students and academics mobility. They do not perceive how an industry collaboration could benefit the university internationally.

The university can work on gaining more benefits from this opportunity it has to collaborate with industry in order to expand its international horizon. P11 confirms this:

“So this is something else that is on a higher level. It’s not just about mobility here and there. It’s about education, we can educate staff for instance from a Brazilian Army in innovation management and that will be used kind of in Saab’s deal with them, development of their products, and production of things and stuff like that […] primary objective of the internationalization strategy is getting students here and there basically. And […] this is developing together with international actors, knowledge, developing knowledge, utilizing knowledge, getting skillworkers, and so forth.”

4.5 University Internationalization Activities Through Collaboration

To explain university internationalization through collaboration with industry, the joint activities performed by LiU and Saab were identified as they constitute the core of our research. Different university internationalization activities were found connecting LiU and Saab through Brazil, consisting of professor and student exchange, joint research initiatives, contract training, knowledge transfer, joint education, international matchmaking event, and hosting delegations of interested people. These activities listed below comprise a time interval starting 2011 until the present because these were the ones identified related to our study.
4.5.1 Contract Training

The Executive Innovation Management Course (EIMC) was an exclusively designed training program that aimed to improve the Brazilian Army R&D organization's capabilities (CISB, LIU, and SAF, 2013). The first edition of the course was designed through a joint initiative between Saab and researchers from LiU when a Saab employee member, who is also a former LiU professor, and a LiU professor planned it. The next editions were created by a new team.
involving a triple helix formation with industry, academia, and government involved. The team was led by three individuals coming from Linköping University, Saab, and the Swedish Armed Forces. P07 confirms the story by saying:

"A person from the industry and a professor at the university designed the first version of the EIMC course, so that became the first one. And then, I think he wanted to move on, and I was asked to come from the university, the university perspective. [...] We became simply a new team. So, we took the experiences from the first course and my role, together with these other towards the triple helix construct, was to redesign the course and to have it presented to the Brazilians and so that they would adopt and run it. And that was very successful, I would say. So then, we ran it in 3 times."

The course was managed by individuals belonging to four distinct organizations, in a triple helix concept, which were the Swedish-Brazilian Research and Innovation Centre (CISB), LiU, Saab and Swedish Armed Forces (SAF) (CISB, LIU and SAF, 2013). The lecturers were from the institutions mentioned above, except CISB, as well as from other Swedish and Brazilian universities, defence agencies and institutions (CISB, LIU and SAF, 2013). P02 talks about the EIMC course below:

"One activity that I mentioned before was contract training. This relates to a course that was prepared in Sweden [...] by innovation agencies, industry and university [...] it was designed in a triple helix sense. The course focused on innovation management and was offered to key people from Brazil, including decision makers in high to mid-management position levels from the military, government and academy [...] Besides the formal course content, the attendees would learn about the innovation culture of Sweden and the about the possibilities of partnership so they could go back to Brazil and start to influence key organizations in the country to try to further develop their national innovation culture. A side effect was the promotion by the attendees of the collaboration with Sweden. So this was a very important initiative to try to develop a culture of triple helix way of working in Brazil, and LiU was involved in that from the beginning, from day one."

The course consisted of ten full-time week modules, where nine of them were located in Sweden and one in Brazil. The course, given in English, focused on interactive teaching through holding different workshops and live cases, which enforced discussions and
reflections (CISB, LIU and SAF, 2013). The course topics covered consisted of innovation and R&D, innovation and technology strategy, contemporary trends in technology strategy, leading innovation, science parks with creativity in focus, organizational design and management innovation, engineering systems design, and concept development and experiments (CISB, LIU and SAF, 2013).

The commercial, economic, and legal aspect of the course was conducted by SPETSA, a company owned by LiU through LiU Holding, which takes responsibility for selling LiU’s knowledge through services to the surrounding society. P07 provides a brief explanation of the importance of SPETSA:

"Today the university has a couple of formal organizational bodies who help us with these arrangements. For example, SPETSA. They are very instrumentally in making this work. [...] SPETSA is a business arm of the university. One of the most important ones [...] They organize and administer, so that money flows in some sort ordered, well-organized flow, between the university and the people who work for this project and so on."

4.5.2 Professor and Student Exchange

A LiU professor, supported by CISB and Saab, went to Brazil in early 2011, followed by three other visits, while being supported by different sources (CISB, 2018). This professor was able to expand the network in Brazil through the establishment of contacts with key researchers, universities, and industries (CISB, 2018). Consequently, a number of exchanges took place between LiU and Brazil. Linköping University had the opportunity to host a guest researcher from Brazil in late 2012. The LiU professor presented lectures in Brazil and joined several academic workshops and conferences through Brazil. A Ph.D. student and a postdoc from LiU presented papers in important conferences, three LiU Ph.D. students traveled to Brazil for three months for exchange and a Brazilian professor was appointed keynote speaker in a conference in Sweden (CISB, 2018). As a consequence, in 2015, the professor was awarded the Swedish Endowed Professor Chair in Honour of Petter Wallenberg Sr, through which he was expected to perform three main tasks, bilateral research project, promote long term collaboration, and joint education (CISB, 2018). The initial focus is with aeronautics, and the expectation is the expansion to other areas such as sustainable energy,
environmental technology, defence and security, transport and logistics, and urban development (CISB, 2018).

As a consequence of the EIMC courses held by LiU and other partners, three Ph.D. students from the Brazilian Army Technological Center had the opportunity to conduct research regarding innovation topics at LiU by joining the Department of Management and Engineering, Division of Project Innovation and Entrepreneurship. The advising of the Ph.D. students was held by a university researcher and professor from the division. P09 explains:

"[...] this agreement between the army and LiU to get master students and Ph.D. students [...] One of the reasons was that a lot of the interest, lots about innovation management,[...] but then, after a couple of months he (colleague) left and I got the main advisorship of this Ph.D. student and he has been here for 3 years, and he[...] now just recently [...] moved back to Brazil in December last year [...] to get two additional Ph.D. students here [...] who are working here at the division with the project [...] we have been talking about additional Ph.D. students."

This initiative, in addition to the EIMC courses, apparently has contributed to the Brazilian Army transformation process that aims to become a drive for innovation in Brazil.

According to data gathered from CISB, a total number of 21 Brazilian researchers and professors came to LiU since 2013 and conducted joint research through CISB scholarships, divided in postdoctoral, sandwich Ph.D., international mission, and senior internship abroad.

**4.5.3 Bilateral Research Projects**

Four bilateral research projects were found connected with the scope of this study. A bilateral research project called FADEMO emerged as a consequence of the professor exchange activity mentioned above (CISB, 2018). It connects Sweden and Brazil through LiU and Saab in Sweden and Aeronautical Technological Institute (ITA), São Paulo University (USP) and FT Sistemas in Brazil (CISB, 2018). This project was initiated with Swedish financial funding by the National Program for Aeronautics Research (NFFP/ Innovair), and by Brazilian economic funding (CISB, 2018). Lately, the initiative evolved to bilateral financial funding joining agencies from both sites, Vinnova from Sweden and Finep from Brazil (CISB, 2018). Another research project related to a digital hydraulic actuator is being
conducted connecting Flumes, a department from LiU, and Laship, a department from Federal University of Santa Catarina (UFSC) in Brazil (CISB, 2018). This project is also funded in a bilateral arrangement including Finep and Vinnova (CISB, 2018). A research project focused in calculating supersonic aerodynamics coefficients also belongs to the list and connects both countries with universities such as LiU, USP, ITA, and companies such as Saab and Embraer (CISB, 2018). A project that makes use of 3D augmented reality for turbine assembly process also is performed and connects LiU with State University of Campinas (UNICAMP) (CISB, 2018).

4.5.4 CDIO Knowledge Transfer

The EIMC course held at LiU brought people from the Brazilian Army to Linköping and provided the opportunity for the contact between the Brazilian Army and a LiU professor with experience in engineering education. The professor, who is part of the Department of Electrical Engineering at LiU, knew about the educational framework called CDIO (Conceive, Design, Implement, Operate). The framework attracted a leader from the Brazilian Army Engineering University and is now being spread among other institutions around the country, as mentioned by P10:

"It started, say, late 2014, when the rector or commander at the IME in Rio, the University of the Brazilian Army, visited our university and by that time he was very concerned about engineering education at their institution. He felt they needed to develop that. And then he heard about this CDIO framework [...] I was asked to give a presentation about this. [...] next step [...] I was invited to [...] give a workshop about this framework and how it can be used to develop engineering education."

4.5.5 International Events and Visits

Several international events occurred between Sweden and Brazil. In May 2016, LiU joined the Brazilian-Swedish Excellence seminar in Brazil. The event was considered as the "largest-ever Swedish-Brazilian research seminar" (LiU, 2016) and was organized by the Swedish Academic Collaboration Forum (SACF), which was a composition of six Swedish universities focusing on internationalization activities (LiU, 2016).
Almost 20 researchers and university administrators, including the vice-chancellor, attended this seminar from LiU (LiU, 2016), in addition to other institutions, universities, companies, and researchers from Sweden and Brazil, including CAPES, FINEP, CNPQ, Vinnova, Vetenskapsrådet, Innovair, STINT, CISB, Saab, and Embraer. Saab was invited by LiU to attend this seminar in Brazil. Including Brazil as a focus region for the SACF initiative seems to be related to the existent collaboration between LiU and Saab, as apparently, LiU together with other universities suggested Brazil as one of five focus regions for SACF.

LiU also took part in other events, such as the Brazilian-Swedish Workshops in Aeronautics, organized by the Brazilian-Swedish Aeronautical Innovation Cooperation (Bittencourt, 2017). These events included discussions in multi-governance level, bilaterally between Sweden and Brazil. LiU took part in the high-level group on aeronautics, as well as the executive committee, composed of ministries, funding agencies, and other universities (Bittencourt, 2017). This organization opened three project calls for research in 2017 (Bittencourt, 2017).

A workshop called "Digitalization of the Amazon" was also organized in collaboration between a LiU professor and the Swedish Embassy in Brasilia. It connected professors from LiU, Unicamp, ITA and UFABC (CISB, 2018). Visits were made to the Federal University of Amazon (UFAM), Amazon State University (UEA) and Superintendence of the Manaus Free Trade Zone (SUFRAMA) (CISB, 2018). Moreover, there are intentions to hold a summer school in Manaus in 2019 (CISB, 2018).

### 4.5.6 Hosting Official Visits

Hosting delegations seems to be a common university internationalization activity for LiU and it is performed by several people as recognized by P08, one of the employees:

"Internationalization [...] there are so many delegations things like that. This is more spread among several people"

Since 2014, the number of official visits involving Brazilians to LiU has increased with the demand originating from the industry, which was inviting those participants to learn about the Swedish innovation system. Within this context, LiU hired an employee to handle these visits and also become the point of contact for the external partner, Saab. The employee was
representing LiU at dinners and supporting the creation of relationships for the company and the university.

### 4.5.7 Joint Education

The relationship established in Brazil by one of the LiU professors together with a professor from Federal University of ABC (UFABC) led to the creation of a new masters program in Brazil focused on engineering and innovation management (CISB, 2018). This connects LiU’s Department of Management and Engineering with UFABC and opens up possibilities for future joint student projects (CISB, 2018).

### 4.5.8 Student Recruitment and Marketing

Within the context of the collaboration, LiU joined recruitment activities held in Brazil to attract students. This also included the development of special marketing materials and events with a focus on the Brazilian people. In 2016, a big event took place on LiU premises called LiU Brazilian Open Day.

Hence, this chapter has covered the factors necessary for the reader to understand the university more as well as its relation with Saab. It shows how activities flow within LiU and what it has been able to accomplish through its partnership with Saab. It is important to note that the emergence of some of the listed activities was mainly because of Saab’s initiative such as the EIMC course and professor exchange. LiU took initiative when it invited Saab to take part in the Swedish Academic Excellence forum. However, other activities emerged as a consequence of previous ones as an effect of the LiU-Saab relationship established, without direct influence from the industry. For instance, the CDIO activity and the Brazilian Army Ph.D. exchange, which emerged because of the contacts from the EIMC course. It can be said that the activities’ funding changed over time. It started by being more privately funded by the industry and then shifted to more public funding from Sweden and Brazil.
Discussion

This chapter discusses the empirical findings in relation to the literature previously covered by comparing a regular university internationalization approach to a university internationalization through collaboration with industry approach through a developed model and then shows the relation between university internationalization and university-business collaboration.

The introduction presents the idea that university internationalization could be driven by collaboration with external partners rather than only by internal demands. Our empirical findings confirm this idea and expand on the initial assumptions. Therefore, we recognize the existence of what we refer to as a University Internationalization Based on Collaboration (UIBC) context and compare some of its characteristics to a University Internationalization Regular (UIR) context through a model presented in figure 9 below.
Figure 6 - UIR and UIBC model developed by the authors

The following discussion sections are structured in accordance to the figure 10 scheme.

Figure 7 - UIR and UIBC model with discussion structure
5.1 Difference in Demand Origin

The main difference between UIR when compared to UIBC refers to where the activities’ demands originate from. In the former context, the demand origin comes from the inside, as a result of academic and students’ intentions (Altbach and Teichler, 2001). While in the latter context, the demand originates from the relationship with an external actor, being the industry in this study. For LiU in a UIR context, the UI activities’ demands come from its students and academics. LiU has partnerships with foreign universities which, for example, allows and encourages its students to go for exchange abroad and for foreign students to come to LiU as well. This is visible, for instance, through LiU’s participation in the Erasmus program. For LiU in a UIBC context, the activities’ demand stems from the university-industry relationships it has, such as with Saab in this case. To elaborate, this was shown through the empirical findings where one of the interviewees mentioned that Saab is mostly the one that takes initiative in internationalization activities and invites LiU to participate. The difference in demand origin has consequently led to other differences between the two mentioned contexts.

5.1.1 Existing UBC

LiU and Saab have a strong existent UBC relationship that was built several years ago and is driven by structural, institutional, and individual motivations (Lopez-Martinez et al., 1994). Structural motivations, such as certain political or economic aspects (Valentín, 2000), are shown in the empirical findings where it is mentioned that Swedish government policies support universities’ collaborations with private and public organizations. This is elaborated by one of the interviewees who mentions that collaboration with society is recognized as the universities’ third mission by the Swedish government. In addition to the funding agency Vinnova that supports collaborative research projects between LiU and other organizations and provides funding for these projects (Vinnova, 2017).

Institutional motivations that are related to the institutions’ characteristics (Valentín, 2000), are visible through the fact that LiU is traditionally a technical university attending to the society’s demands through technology development and skilled personnel and needs funding to be able to continue with its activities, while Saab produces complex technological products
that demand highly specialized employees and relies on intensive research and development. Due to these institutional motivations, LiU and Saab are closely related to each other because Saab is able to absorb a high number of students from the university and LiU is able to benefit from the funding it receives from Saab. For instance, one of the interviewees mentions that a significant number of students are given job offers at Saab right after graduation, and another interviewee mentions LiU has the chance to participate in some internationalization activities due to funding from Saab. These institutional motivations support the formally signed agreement between LiU and Saab as strategic partners.

Individual motivations, which are related to the researchers’ characteristics (Valentín, 2000), are there through the researchers’ interests in being involved in collaborative initiatives and being satisfied in working together with Saab because of academic and personal benefits. The interviews from the empirical findings revealed that the researchers are the ones who decide whether they want to be involved in a collaborative activity and determine how this activity might benefit them. The existence of such a UBC relationship, supported by the mentioned structural, institutional, and individual motivations, may be considered as one of the factors that stimulate both, the university and the industry to continue the engagement in new ventures, such as the studied case of joint activities performed targeting a specific country.

Other factors such as mutual trust, commitment, shared goals, understanding and familiarity (Thune, 2007; Davey et al., 2011) also emphasize the strong bond between LiU and Saab. Our empirical findings confirm the existence of mutual trust, commitment, and familiarity when some of the academic participants were questioned about how they became engaged in the UBC mentioned above. They all pointed out that their previous work experience in relationship to Saab was built on these factors. In addition, one of the interviewees mentioned that his engagement in collaborative activities was because he was already acquainted with another colleague that was strongly connected to a member from Saab. Once previous experiences of collaboration already existed, then commitment was a reality, as projects were performed together. Concerning shared goals and understanding between the university’s and the industry’s members, interviews revealed that one is constructed as a consequence of the interactions between the individuals involved, mainly through informal and formal meetings.
The established UBC relationship found in our case study agrees with Gulbrandsen, Mowery, and Feldman (2011), who refer to this relationship as the increased awareness on generating research that attends to society’s demands and links industrial innovation with academic research. We identified elements that seem to confirm such an awareness. First, the university has a department focused on collaboration with the society called Samverkanshenheten with staff dedicated on working with collaborative activities, which agrees with Gulbrandsen, Mowery, and Feldman (2011) of research generation to serve society’s demands. Second, our empirical findings show that the university is traditionally engaged with the surrounding society actors including industries, which is a way of linking industrial innovation to academic research (Gulbrandsen, Mowery, and Feldman, 2011). The opinion is shared not only by the unanimity of the university administrative and academic members but also by the industry participants. Third, the existence of explicit documents available at LiU confirms this awareness for instance, through the university strategic map (see Appendix 4). Moreover, by the university’s involvement in international innovative universities’ alliances, as “University-Industry Innovation Network (UIIN)” and “Swedish Brazilian Research Center (CISB)”. Since society has evolved from being industrial based into being knowledge-based moving from an industry-government relationship to a university-industry-government one (Ranga and Etzkowitz, 2013), the LiU-Saab relationship in an internationalization context shows that LiU is internationalizing within a Triple Helix context. The fact that Saab wanted to maintain the connection it had with Brazil beyond the Gripen deal led to LiU being involved in the picture. Thus, this bond evolved to include LiU where there became a strong collaborative relationship between all three spheres: LiU, Saab, and the Swedish government. Even if the government’s presence is not strongly perceived in the operation of these activities, it acted through support mechanisms such as policies and regulations, which encouraged LiU’s active engagement in collaboration with the society (Galan-Muros and Davey, 2017) as well as internationalization (Knight, 2004). This explains the university’s modified role within internationalization where it has become a central actor for the establishment of international relationships with university, industry, and government (Heitor, 2015). This is also in line
with Etzkowitz and Leydesdorff (1995), Altbach and Treichler (2001), and Etzkowitz (1993) who suggest universities as a central element in the economic future of a knowledge-based economy. The need for such an adaptation is stated by Altbach and Treichler (2001) as there is a risk of universities being placed behind if there is no adaptation to the changed context.

Therefore, LiU could be referred to as an entrepreneurial university because it is making use of the developed knowledge inside it and using it for commercialization, technology transfer, and economic development (Etzkowitz and Klofsten, 2005). This is confirmed through the empirics where one interviewee mentions SPETSA, for instance, which is considered the business arm of the university. SPETSA was directly involved in the administrative arrangements for the EIMC course, making its commercialization possible by the university.

The fact that the university itself is positioned as an entrepreneurial university and generates knowledge linked to the society’s demands seems also to explain and support the existence of the international activities in conjunction with industry. It goes in line with Heitor (2015), who argues for the universities’ role being modified, becoming crucial for the establishment of international relationships with university, industry and government.

Hence, one can argue that emergent collaborative initiatives may become fruitful due to the circumstances above. First, structural, institutional, and individual motivations illustrate the solid UBC relationship (Valentin, 2000). Second, factors such as mutual trust and commitment (Thune, 2007; Davey et al., 2011) build on these motivations and further prove the bond between LiU and Saab. Third, this bond does contribute to research to attend to society’s demands (Guldbrandsen, Mowery, and Feldman, 2011), which shows in turn that LiU could be classified as an entrepreneurial university (Etzkowitz and Klofsten, 2005).

5.2 Difference in Internationalization Activities

Through UIBC, the university engaged in UI activities that would not have been possible without the existent UBC relationship. Since we have already explained that the demand for UIR activities stems from internal demands, this means that the internationalization activities within this context are related mainly to student and staff mobility between universities (Knight, 2012). As the demand for internationalization activities in a UIBC context comes from relationships with external actors, the internationalization activities in this case expand
beyond the common activities. The empirical findings reveal the internationalization activities in a UIBC context that are different from that in a UIR context. For instance, the contract training activity, mentioned by one of the academics interviewed, was only possible for LiU because of its relationship with Saab. Had there not been a LiU-Saab relationship, researchers from LiU might not have been able to execute this initiative and teach a course to the Brazilian Army. Another different type of activity is the bilateral research projects explained by CISB (2018), which expand beyond regular academic research and connect educational departments at LiU to other ones in different universities in Brazil as well as different companies. These research projects were also made possible for LiU because of the relationship with Saab and as a consequence of previous activities. This sequence of activities seems to mimic itself from UBC activities with UBC reflecting itself onto the UIBC context. According to Galan-Muros and Davey (2017), the collaboration in one activity opens up opportunities for other collaborations that are distinct in nature. This is due to the fact that barriers are lowered once UBC starts and more information is gathered about the collaborators (Galan-Muros and Davey, 2017).

In addition, the activities in the UIBC context are being initiated not only by the university itself but also by the industry. This is explained in the empirical findings where one of the interviewees mentions that Saab takes the initiative for some internationalization activities due to the collaboration with LiU such as contract training. This difference in activity initiators can be explained through the Triple Helix model where two helix actors integrate their borders and purposefully act together and demonstrate a reciprocal relationship within a common space (Etzkowitz, 2008).

The empirical findings show that LiU defines university internationalization as one that aims at enhancing the quality of education and research as well as positively contributing to society, which follows De Wit and Hunter (2015) definition. Due to this definition, the empirics show that this goal is more attainable through internationalization activities in a UIBC context since the international exposure of LiU contributes to its goal of improving quality of research and education. Academics who were interviewed confirmed that engaging in such kind of projects increased their relevance in education and that they are free to choose
what activities they want to engage in but within a context where the society need is part of the process, in LiU’s case represented by Saab’s demand. In addition, activities such as the CDIO, EIMC, and Ph.D. exchange are developing capabilities in Brazil, which also agree with De Wit and Hunter (2015) that internationalization aims to make a meaningful contribution to society. However, internationalization activities in a UIR context are not necessarily connected with the society’s demands since they originate based on individual and internal demands where these individuals are free to choose where they want to establish links and the reason behind that decision, and not be tied down by society’s demands.

5.3 Difference in Foreign Partners

In a UIBC context, the university is able to establish contact with foreign universities, government, and industry while in a UIR context, the university tends to establish contact only with other universities. Interviews in the empirical findings reveal that in a UIR context the International Office at LiU is mostly focused on activities such as student and staff mobility between LiU and other universities. This goes in line with Knight (2012) who states that internationalization focuses on activities with other universities such as student mobility, collaborative projects, and academic partnerships.

However, within the UIBC context, LiU was able to establish links with other Triple Helix actors not limited to universities. This goes in line with Heitor (2015, p.276) who argues that with this shift where various institutions want to promote change through “knowledge-based international cooperation”, the university’s role has now changed into being an important factor in establishing international relationships with another university, industry, or government. This argument is confirmed by our empirical findings as the university was able to develop its foreign network of universities and research institutes, government agencies, and industries in Brazil.

Having different partners or alliances could foster the spread of knowledge, and this is due to the fact that having alliances with another actor means that this actor has useful knowledge (Inkpen, 1998). Therefore, a university that has an alliance with industry or government has access to more knowledge due to its relation to a “large range of knowledgeable institutions”
The empirics confirm this. For example, the CDIO framework mentioned by one of the academics interviewed shows the transfer of knowledge between a LiU academic and the Brazilian Army that was given education about this framework.

While LiU expands the scope of its international partners and gets involved in activities that are not only connected to partnerships with other universities, it is able to expand its knowledge beyond the university and thus contributing to its role as an entrepreneurial university.

5.4 Difference in Funding

The UIBC context allows the university to expand the sources of its academic funding. This is due to the fact that universities seek relationships with industry to decrease the burden of not having enough funding that helps them keep up with all subject areas (Ankrah and Al-Tabaa, 2015). With collaborations, a university can also rely on funding from the foreign country that it is engaged in internationalization activities with and thus increase the number of possible sources. This goes in line with Castro, Jonkers, and Sanz-Menendez (2015) who mention that sometimes universities establish collaborations in order to gain more resources on a domestic and international level. This is valid through the empirical findings that show that LiU was receiving funding for its activities from Saab and that some internationalization activities, such as bilateral research projects, were funded by Brazilian agencies such as Finep. Therefore, a university internationalization through collaboration with industry allows university access to diversified funding sourcing, both private and public, domestic and international. In the UIR context, however, the activities seem to be funded mainly by the domestic government and by the individuals engaged. For instance, international students are considered to be “the largest source of funds for international education”, even more than the government, since they are self-funded where they and their families pay for education (Altbach and Knight, 2007, p.294).

5.5 Availability of Favorable Contextual Factors

The given case of LiU shows that there are two contextual factors indirectly related to the LiU-Saab relationship and that play a role in favor of LiU’s internationalization. The first one is the Gripen deal between Saab and the Brazilian government. The second one is the
intensified diplomatic relations between the Brazilian and the Swedish government during the last years due to an increased number of bilateral agreements signed as mentioned in the empirical findings. They could be considered as national level rationales as per Knight (2004), and classified into political and economic sections.

Political rationales seem to stem from three factors. First is foreign policy (Knight, 2004) where empirical findings show that there is a clear intention between both nations in strengthening the bilateral relations which is described, for instance, in the Brazil-Sweden strategic agreement signed in 2015. Second is national security (Knight, 2004) where the industry deal refers to defense equipment, which is highly regulated and influenced by the government. This deal is not only a matter of business relationship, validated by the existence of the bilateral defense agreement signed in 2014. Third, peace and mutual understanding (Knight, 2004) as shown by the findings of citations referring to it in the last bilateral agreement signed between Sweden and Brazil in 2015. With respect to economic rationales, economic growth and competitiveness were identified (Knight, 2004). This is apparent through the fact that the Gripen deal is considered as the biggest Swedish export of all times and is connected to the labor market as it supports the demand for new job development, as found in Deiaco, Ek and Román (2016).

The circumstances mentioned above, in addition to the strong dependence and already existing bond already between LiU and SAAB, seem to favorably enframe the UIBC model, which represents several external incentives for university internationalization activities targeting the specific country. It seems to create a fertile environment for the emergence and development of the activities.

5.6 UBC Impacts UI

Based on our case study, LiU’s internationalization has evolved through its collaboration with Saab, which shows that university-business collaboration and internationalization are two concepts connected to each other. What makes a university’s internationalization through a UIBC context more significant than the one within a UIR is because it takes internationalization to another level. Therefore, it can be said that university-business
collaboration impacts university internationalization through complementing some of its aspects. This stems from Knight (2004) who mentions that strategic alliances are one of the emerging reasons behind university internationalization and Heitor (2015) who discusses how a new era of international affairs is changing international academic relationships where industry and government are involved.

First, UBC expands on universities’ internationalization activities. Our empirical findings show how due to its collaboration with Saab, LiU has been able to participate in internationalization activities that are more than academic mobility and research such as contract training through the EIMC course and bilateral research projects. UBC initially focuses on activities related to education, research and valorization domains such as joint curriculum designs (Davey et al., 2011), student mobility, research and development projects (Galan-Muros and Davey, 2017), and commercialization of research and development results (Perkmann and Walsh, 2009). At the same time, universities aim for internationalization activities such as academic mobility, joint program development, collaborative projects, and seminars and conferences (Knight, 2004). The empirical data shows that LiU was involved, for instance, in the largest Swedish-Brazilian research seminar, the Brazilian-Swedish Workshops in Aeronautics, a joint master’s program in Brazil focused on innovation and engineering management, and Ph.D. and professor exchange. LiU was able to participate in its desired internationalization activities due to its collaboration with Saab, which is itself involved with Brazil, which opened up many opportunities for it. In addition, these internationalization activities developed as a consequence of another as one activity led to the emergence of yet another activity that was not necessarily previously planned by LiU. For example, the EIMC course held by LiU to the Brazilian Army resulted in three Ph.D. students from the Brazilian Army Technological Center coming to LiU and joining the department of management and engineering and department of project innovation and entrepreneurship to conduct research regarding innovation topics at LiU. Since UBC activities are connected with one activity opening up opportunities for other UBC activities that are different in nature (Galan-Muros and Davey, 2017), this reflected on the pattern of LiU’s internationalization activities. Moreover, since a university’s collaboration with other actors signifies a change in the university’s role from one that is more concerned with knowledge transfer to one that is
more entrepreneurial (Etzkowitz and Klofsten, 2005), this changed role has led to the expansion in the nature of university internationalization activities.

Second, UBC allows university internationalization activities to flourish due to resource availability. Universities are being exposed to problems in funding, which is why these resource burdens have led them to collaborate more with businesses in order to keep them afloat in their activities (Ankrah and Tabbaa, 2015). When universities and businesses collaborate, they help each other with funding since governments provide firms with the needed fundings for research activities done in collaboration with universities (Perkmann, Neely, and Walsh, 2011), and researchers from universities coming to work at a company attract private funding through their work (Galan-Muros and Davey, 2017). This is valid through the empirical findings, which mention that Saab provides the funding for LiU in order for the university to be able to be involved in a certain activity. Moreover, Vinnova supports university-business collaborations and has been funding research projects with Brazil and supporting international collaborative activities (Vinnova, 2017). Therefore, having such funding supports due to a collaboration helps a university overcome its funding troubles and be able to continue in its internationalization activities.

Third, UBC increases a university’s international presence. On the one hand, universities participate in internationalization activities for several purposes that allow them to become better recognized internationally such as improving their profile, improving their international academic standards, and having an international perspective to teaching and research (Knight, 2004). This is reflected, for instance, in the empirical findings through the definition that LiU follows for university internationalization, which emphasizes that internationalization is “the intentional process of integrating an international, intercultural, or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society” (De Wit and Hunter, 2015). The findings also show that LiU’s collaborations improve its international standing. For example, one of the interviewees mentioned that through its collaborations, LiU helps companies with the contacts it needs abroad while benefiting itself at the same time through establishing its business life there. In addition, the collaboration with Saab has allowed LiU to expand its international presence and become more engaged in Brazil. To elaborate, LiU was able to join recruitment activities in Brazil to
attract students to come study on its campus as well as teach members of the Brazilian Army the CDIO educational framework, which was then spread among other institutions around Brazil.

Hence, this chapter has been able to provide a comparison between UIR and UIBC contexts while showing how a UIBC context could be beneficial for a university’s internationalization. Due to this, we show that university-business collaboration and university internationalization are linked where the former impacts the latter since UBC plays a role in positively complimenting internationalization activities in three suggested aspects.
The UIBC context represents a potential internationalization approach for universities interested in expanding their international presence. This thesis deals with the question “How does a university internationalize through collaboration with a high technological industry?” To answer this question, we conducted a case study to investigate this context and collect data on LiU’s internationalization activities. By analyzing the empirical findings, a discussion was initiated that addresses this thesis’ purpose of identifying the set of factors that differentiate a university internationalization in collaboration with industry approach from a regular internationalization approach and consequently showing the relation between university internationalization and university-business collaboration.

The findings allowed to perceive that there are two contexts for university internationalization. The two contexts were compared where differences in internationalization activities, internationalization partners, funding, contextual factors, and drive for activity demand were identified. Through this comparison, it was identified that aside from there being two different contexts for internationalization, the second context, which we identified as UIBC, paved way to conclude that UBC can play in role in impacting university internationalization. It is based on three factors, which are that UBC expands a university’s international presence, diversifies university internationalization activities, and increases the possible sources for funding internationalization activities.
6.1 Theoretical Contribution

This study mainly contributes to the research field of university internationalization and, to a lesser extent, to the field of university-industry collaboration. Departing from Knight (2004) who mentions strategic alliances between universities as a rationale for internationalization, and connecting with Heitor’s (2015) idea regarding the possible different role for universities in international affairs involving government and industry, this thesis further develops these ideas as it explores a context for university internationalization through collaboration with industry. From this context, we deduce that university-industry collaboration could be a possible rationale for university internationalization due to the fact that having such collaborations decreases funding issues, expands university internationalization activities, and increases a university’s international presence.

6.2 Practical Implications

We believe that this study has fulfilled the practical gap mentioned in the introduction where we stated that, according to the research we have done, no empirical study has been previously done to demonstrate the relation between university internationalization and university-industry collaboration. Universities and academics can obtain information about the UIBC context from this thesis and use it to apply this context to their own environment and activities. In addition, businesses who are thinking of collaborating with universities can get insight from this thesis about a university’s aspirations, needs, and goals.

After our interpretation of the empirical findings, we noticed two main ideas that could be improved within LiU and that any university should take into consideration in order to have more order within the UIBC context. First, a university should always make sure to identify the reason behind why it wants to internationalize in a certain country or why it wants to be involved in a certain project. It should always study the situation and think about how the university will benefit and what will the university’s participation lead to whether affecting it positively or negatively. Even if the university is in collaboration with industry or any other external partner, it should be able to not get itself involved in an activity that it does not believe will benefit it or be of any added value.

Second, the university should keep track of its researchers, where they are traveling to, and the activities they are involved in. This allows the university to stay in the loop of what is
happening within its walls at all times and be able to record the advantages and disadvantages resulting towards the university. If a university applies the two above mentioned points, then this might be able to decrease its funding troubles since it will be able to organize and develop a budget plan where it can anticipate how much resources it needs to the projects or activities it is participating in and be able to go through with them until the end and not get in the middle because of lack of resource availability. In addition, being in the loop about its researchers can allow it to count researchers’ activities within its plan and maybe supply them with funding to carry out important projects that will benefit the university in the future.

6.3 Study Limitations

A few limitations have been identified throughout our study. The first limitation concerns our previous knowledge about university internationalization and university-business collaboration. The subject was new for both authors and the knowledge about it was developed during the study period. In addition, we found limited theory connecting both study areas. The combination of these two factors could affect the outcomes of this research.

The second limitation was the fact the interviewees might have held back some information due to political reasons. Our data collection process included interviewing people on a top strategic level with some sensitive questions that they might have found inconvenient to answer directly, which even with triangulation strategies used to minimize the risks, could have affected our empirical findings.

The third limitation is also related to our empirical findings. We mention that the contextual factors, which are the Gripen deal between Saab and Brazil and the relation between Sweden and Brazil, contributed to LiU’s ability to internationalize through a collaboration with Saab in Brazil. However, due to time constraint, we were not able to identify whether the absence of such contextual factors would have had the same effect.

6.4 Future Research

At the end of this research, unanswered questions remained about the studied subject. We believe that this topic represents a potential area for academic exploration and practical relevance because it connects two university activities, university internationalization and university-business collaboration, that are growing and finds alignment with the
knowledge-based society challenges of our time. Therefore, we suggest some future research studies dealing in the following topics.

Further studies should be conducted to identify whether the absence of the existing contextual factors in our case study, the Saab-Brazil Gripen deal and the relation between Sweden and Brazil, would affect a university while testing if it is possible for a UIBC context to exist without these contextual factors. They should investigate if such a context works without having already existing relations between two countries, and whether it also works without having an important agreement such as the Gripen deal signed between a company and another country.

In addition, since this study was limited to a single case analysis (LiU-Saab-Brazil), it would be proper to execute a multiple case study. It could be done by identifying other university internationalization activities cases performed in a business-relationship context similar to the one found at LiU. Despite the previously identified characteristics of UIBC described in this study, we would suggest comparing how different strengths of existent UBC would affect the UIBC context. By doing so, it would permit to increase the confidence through the confirmation or refusal of the UIBC suggested factors, as well as the possible identification of new patterns. The UIBC model proposed here would be put to the test with chances of improvement.

Furthermore, the business perspective could be developed, as the focus applied to this thesis relied solely on the university’s. From the empirical findings, it seems that this university partnership model employed was crucial for the establishment of relevant international university networks for the industry. Future investigations could identify the impact of such a model when applied to other cases of high technology companies intending to create links with the academia outside the origin country.

Finally, since the UIBC context has collaborative arrangements at its core, future research should also address the context but from a perspective where the university collaborates with other actors, such as the government or civil society. It would be possible to identify whether a collaboration from this aspect also contributes to a university’s internationalization. The model could be tested and evaluated through the inclusion of these different actors. Such a study could be initially performed using LiU’s cases, as it is collaborating with the previously
mentioned actors. As the present UIBC model focuses on UBC, by applying it to other circumstances, it would contribute to building a general model for university internationalization based on collaboration.
Reference List


Appendices

Appendix 1

INTERVIEW GUIDE MODEL 1 - LIU STRATEGIC

INTRODUCTION: The purpose of our research is to understand how a university (Linköping University) performed internationalization activities based on the collaboration with industry (Saab) targeting a specific country (Brazil).

1. Can you describe your position and what do you do?
2. Can you describe what your department is and what it does for the university?
3. What is LiU’s definition of internationalization? (or collaboration)
   - Is there a vision or strategy for internationalization (or collaboration) at LiU? Could you please tell/describe us about it?
   - What do you think LiU lacks when it comes to internationalizing (or collaborating)?
4. What are the steps taken before deciding to implement an action/activity?
5. What are some of the activities that it has done/doing at the moment?
6. What are some obstacles you face when implementing a strategy?
7. Would you describe internationalization and collaboration as two concepts related to each other? How so?
8. How is LiU collaborating with other organizations specifically Saab?
9. How has LiU’s collaboration with Saab affected the university’s status?
10. How is the university taking advantage of this collaboration?
11. We came across IFSA. Can you tell us more about it? Why was IFSA created? In what way does IFSA contribute to LiU?
Appendix 2

INTERVIEW GUIDE MODEL 2 - ACADEMICS

INTRODUCTION: The purpose of our research is to understand how a university (Linköping University) performed internationalization activities based on the collaboration with industry (Saab) targeting a specific country (Brazil).

1. Can you describe your position and what do you do?
2. In which international collaboration activities (LIU - Saab - Brazil) have you been engaged?
3. How did the opportunities emerge?
   - How did you become involved in these activities?
4. What are the steps taken to implement such activities?
5. What do you think is the difference between regular collaboration activities (in a regional/national context) when compared to international collaboration activities? (such as the ones LIU - Saab - Brazil)
6. What is the value generated from these specific activities for you? How do these activities generate value for you?
7. Have you faced obstacles when performing such activities?
8. Do you perceive these joint activities as positive or negative for you as a professional? And for your organization? Why?
9. Are you used to collaborating with external partners (industry/government)?
10. What do you think LiU lacks when it comes to internationalization activities?
11. How could the university take the maximum advantage of this opportunity?
12. How do you perceive the university management support for these activities?
Appendix 3

INTERVIEW GUIDE 3 - Saab

INTRODUCTION: The purpose of our research is to understand how a university (Linköping University) performed internationalization activities based on the collaboration with industry (Saab) targeting a specific country (Brazil).

1. Can you describe what your department/division is and what it does for the whole company?
2. Can you describe your position and what do you do?
3. How did Saab decide to start a collaboration with LiU? When did it start? What was the aim behind it?
4. Why did the company think that collaborating would be a good idea?
5. Why do you think companies would be attracted to this idea?
6. How has Saab’s collaboration with LiU affected the company’s status?
7. How is the company taking advantage of this collaboration?
8. How do collaborative activities between Saab and LiU emerge?
9. What are some obstacles the company faces in its collaboration with LiU?
10. Is Saab similarly collaborating with universities other than LiU? How? What are the activities being done?
11. What do you believe is essential to nurture this kind of relationship for the long term?
Appendix 4

Linköping University Strategic Map
Appendix 5

Map created by the authors to analyze activities and relationships