Arranged Marriages -
A study on knowledge transfer through offsets in the defense industry

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Kenneth Li
Ted Löndahl
Supervisor: Susanne Åberg
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Kenneth Li

Ted Löndahl

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Abstract

In order to sell products in the defense industry it is often demanded of the seller to reinvest capital and collaborate with companies in the buying country, with the buyer hoping to establish a defense industry of their own. These so called offset demands are seen as an industry standard and forces the sellers to open up their supply chain and educate and develop the industry in the buying country. This “forced” knowledge transfer is an interesting topic and have been the focus point of this thesis. How can firms conduct successful knowledge transfer and develop the foreign industry and at the same time protects its own products and competitive advantage?

This qualitative study has been done through interviews with four people having senior positions and a vast knowledge and background in working with offsets, combined with secondary data from previous studies and articles.

The study showed that the most important factor for a successful knowledge transfer is the absorptive capacity of the partner and buying country. Furthermore, the success also lies in the offset regulations of the buyer, if you ask for the wrong things or in the wrong way, the industrial effects will be very limited. The Swedish firms were not afraid of sharing their knowledge since they had the confidence that they would keep to stay ahead of any new upcoming competitor, therefore a minor factor to consider. Lastly offsets have often been portrayed negatively. However, if successfully conducted, several positive effects of offsets have been identified by the authors. Showing that even though partnerships may an “arranged marriage” it can still become successful.
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1. Introduction

In the late 1990’s Saab and the South African government signed a deal that Saab were to deliver 28 Gripen fighters to South Africa for 1.5 billion USD (Peterssohn & Pettersson 1998). However, what Saab also agreed to deliver was investments in South African industries. Some within defense and aerospace, and around 40 investments in non-related industries such as gold and platinum beneficiation, automotive component manufacturing, timber product exports, tourism development, biotechnology, medical research, commercial marine engineering and ship repair, power-generation, componentry, mining equipment manufacture, and wine exports (Wagermark, 2008). These types of deals are called offsets; where the seller agrees to invest money in the buyer.

Offsets are not something rare that only has occurred during this deal, neither was this the first example of offsets being used. It is said that the first clear case of offsets being used was when Dwight Eisenhower in the 1950’s forced West Germany to buy American defense products as a compensation for having American troops stationed in Europe (The Economist, 2013). From 1960 to 2000 more and more buying countries began to demand offsets when purchasing defense materiel, and after 2000 it became more common in European countries. This led to the EU in 2004 and 2009 passed directives dictating rules around offsets (Carnie, Hoyos & Pearson, 2013). In Council Directive 2009/81/EC it is stated that offsets are against basic principles of the Treaty, since they hinder the free movement of goods and services. However, because they violate basic rules and principles of primary EU law the directive cannot allow, tolerate or regulate them. Despite this, offsets still exist on the European defense market, and some member states are actively trying to prevent a ban on offsets.

Today the defense industry is more or less the only industry that actively uses offsets.

1.1 Problem formulation

In many offset arrangements, developed countries prefer direct offsets whilst less economically developed countries tend to prefer indirect offsets, hoping it will lead to general benefits for the national economy as a whole (Welt & Wilson 1998). Both indirect and direct offsets are perceived as market distorting and in many cases frowned upon. Anti-corruption organizations see offsets as a clever way to disguise bribery despite many offsets conducted in a clean fashion (The Economist, 2013). Further complaints expressed concerning offsets are that (1) they cost jobs in the selling country, when the offsets involve placing parts of the production in the buying country. (2) There is a risk of new competitors being created mainly
due to knowledge transfer from the seller to the buyer (Welt & Wilson 1998; U.S. Department of Commerce 2007). However, today the indirect offsets are becoming less common, since they are harder to motivate due to the lack of connection to the actual deal and the seller. The reason that direct offsets still exist is simple, the buying countries want to gain access to knowledge in order to be able to build up their own defense industry base over time to gain leverage and security of supply.

The defense industry has accepted offsets and sees it as a norm and something they have to offer to be able to sell (U.S. Department of Commerce 2007). However, the buying party seems to see offsets as positive and something they can benefit greatly from. Taylor (2003) argues that factors such as value, technology transferred and jobs created are used to measure the success of an offset, the higher extent these factors are reached the more political points collected by the government. For these reasons there is a tendency among purchasing governments to overstate the benefits of an offset agreement (Taylor 2003). This may lead to the buyer having to pay higher prices as a consequence of the seller being aware of the big amount of money that need to be invested in the buyer. This might be acceptable if the buyer in return gains access to advanced technology and long-lasting relationships with large defense corporations. However, in the four examples studied by Axelson and Lundmark (2009) almost none of the companies continue their business in that country after the deal was completed.

Furthermore, the sellers put themselves at the risk of creating a competitor and potentially losing competitive advantage. Which raises the question of how willing the selling company really is to transfer knowledge in a direct offset arrangement. It has to invest in a local company, and it is expected of them to develop and transfer knowledge to that new business partner. However, this also means that in the long run this will create a potential competitor. The risk and possibilities of new competitors caused by knowledge transfer through offset arrangements and how the seller copes with these risks will be investigated in this master thesis. Knowledge transfer is hard to implement as it is and a topic that becomes more important in organizations and those that are able to transfer knowledge in an effective way are more likely to survive (Argote et. al 2000). The fact that Knowledge transfer is difficult to begin with, combined with the tension that might occur in a direct offset deal, the probability of success should be rather low.
1.1.1 Research Purpose
Due to the special setting that offsets provide and the lack of research done on the knowledge transfer process in offset arrangements, it would be highly interesting to further investigate this. Thus, the purpose of this thesis is to explore how knowledge transfer is conducted successfully in an offset setting. Based on this purpose the research question of this thesis is:

1.1.2 Research Questions
What are the barriers for a successful knowledge transfer and what possible implications might occur when conducting knowledge transfer in an offset setting?

How does the seller conduct successful knowledge transfer, and both protect its own competitive advantage and develop the buying industry?

1.1.3 Contribution
Through this thesis the authors hope to contribute the current offset discussion in the industry, on a domestic, EU and global level. It is also the ambition to contribute to the academic literature on offsets. This research will primarily focus on investigating the implications of direct offsets in terms of knowledge transfer, not the phenomena offsets as a whole.
2. Introducing Offsets

2.1 What are Offsets?
As mentioned in the introduction, offsets are a sort of countertrade arrangement where the seller agrees to invest in the buyer. In the defense industry this means that the buyer, almost exclusively a nation, demands the selling company, often a private firm or consortium, to invest a certain percentage of the value of the deal back to the buyer. According to Axelson and Lundmark (2009) the offset demand can vary largely but is quite often around 160-200% of the value on the deal. However, Furter (2014) claims that in Europe, which is the market that has the largest offset demand, demands are on average 98.4%. Offsets can vary in form; it can be in forms of subcontracting, technology transfer, foreign investment, countertrade, training, co-production, marketing assistance and licensed production (Taylor 2003).

Offsets are expected to yield technological or industrial benefits for the purchasing party, often resulting in countertrade, technology transfer or additional jobs in the buying country (Markowski & Hall 2014). Offsets are conducted in hopes of generating knowledge spillover, functioning as a catalyst for development of new industries (Eliasson 2010). Offsets can generally be divided in two categories, direct and indirect or a combination of both (Offsets in defense trade 1996). Direct offsets are arrangements that are directly connected to the product or the defense industry; it could be allocating parts of the production to the buying country for instance. Indirect offsets are investments in products or the industry of the buying country that are non-related to the defense industry (O'Doherty 2011). In some cases the reasons behind demanding a direct offset, are to build up their own defense industry in the long-term (Hoyos 2013). The buyer is hoping to gain technology from the seller through these industry co-operations. Kogut and Zander (1992) argue that knowledge is transferred more effective through firms than through the market. Hence, industry co-operations should be more effective than just hoping to gain knowledge naturally from the market. According to Axelson and Lundmark (2009) the outcome of a direct offset, in many cases only leads to comprehensive cooperation between the involved parties during a limited period of time.

More countries are beginning to demand offsets in procurements of defense material and many developing countries are increasingly discovering the benefits of offsets (O'Doherty 2011). Buying countries sometimes justifies their demands for offset deals by arguing that a purchase of military equipment from abroad deprives the local industry, and therefore has to
compensated in some way (Markowski & Hall 2014). Furthermore, offsets can be a way to justify the large government spending required for military upgrade (Dehoff et al. 2014). Offsets can also be a tool for western companies to tap into new markets that otherwise would be hard to access (Dehoff et al. 2014). However, there is now also a counter trend to reduce offsets, critical voices claim offsets make buying countries make deals they cannot afford in hopes of the benefits. Issues have also been raised over the secrecy surrounding these kinds of deals that creates optimal conditions for corruption and bribery (O’Doherty 2011). Comprehensive data for offset deals are not collected, adding to the secrecy surrounding offset deals (Petersen 2011). Offsets could be of great value, more jobs created and more technology transferred results in political points for the government. Therefore, there is a tendency among purchasing governments to overstate the benefits of an offset agreement (Taylor 2003).

Findings from Offsets in defense trade (1996) show indications to why offsets are able to exist, in the selling country some subcontractors reported loss of business from the prime contractor after refusal to participate in an offset deal, a deal which would have lead to transfer of proprietary knowledge. The sellers and their government are fully aware of potential loss of competitive advantages caused by an offset agreement, which ultimately may lead to loss of market share in the future. This might lead to the seller guarding its core competence, thus affecting the knowledge transfer (Taylor 2003).

2.2 The procurement process

To better grasp the phenomenon of offset, and how it works in practice, it is necessary to understand how the procurement process works in the defense industry. This is a rather unique process since the buyer almost exclusively is a nation. Axelson and Lundmark (2009) give a good overall view on the procurement process and the role offsets play. The process contains three phases, (1) procurement, (2) choice of seller, and (3) realization of the export deal.

In the first step a country addresses that they are looking to buy a new defense system. Then either the buyer contacts potential candidates or vice versa. During the next couple of years the various companies try to develop and adapt their product to suit the buyers demands. Usually a smaller number of candidates are selected and get the chance to further market their product. The buyer also states what conditions in terms of direct offsets and delivery time.
Quite commonly the buyer requires the product to be customized to fit and work with their already existing military systems. It is in this stage the seller finds potential partners related to the defense industry in the buying country and sign collaboration agreements with them. During the second step political aspects play a larger role in the decision making process. Furthermore, the sellers battle to show which one can present a better offer in terms of product, various forms of offsets, development of the buying country’s defense industry companies, defense collaborations between states etc. Up to this phase the time that has passed is usually 2-10 years.

When the buyer finally has made its choice, the company can begin to develop and customize the product and together with the buyer plan for delivery etc. It is often a department in the buying country that monitor and approves finished offset commitments. This phase alone takes about 5-10 years (Axelson & Lundmark, 2009).

2.3 Political aspects of Offsets
Military offset deals are conducted between the governments in respective involved country and are a part of government procurement. Political variables (bureaucrat maximization and national security consideration) and aspects tend to influence the offset selection process in addition to economical variables (transaction cost, price and quality) (Taylor 2003). Findings suggest the importance of political variables, in some occasions the form of the offset may even reflect political priorities (Taylor 2003).

Markowski & Hall (2014) argue that governments conduct offset arrangements in order to compensate the loss of business caused by purchase of military equipment abroad. However, Taylor (2003) argues that perceiving offset deals as a compensatory measure is incorrect, because in normal cases governments are likely to import goods not available on the domestic market or not competitive price or quality wise. This traditional kind of international trade does not cause any harm to the domestic market and therefore demanding a compensation package from the seller because of this is neither justifiable nor correct (Taylor 2003).

2.4 Offsets & Knowledge Transfer
As mentioned earlier, little work have been done on knowledge transfer in an offset setting. Knowledge transfer as a phenomenon within offsets has been mentioned briefly by some scholars (Butler, C. Kenny, B. & Anchor, J. 2000; Jones 2002; Petty 1999). However, very
few have studied the actual knowledge transfer in offset co-operations and how it is conducted.

Petty (1999) claimed that knowledge transfer is one of the most highly valued offset demands a nation can make. Furthermore, approximately $\frac{1}{4}$ of all offsets involve knowledge transfer. Butler et al. (2000) stressed the problem of knowledge transfer in strategic alliances (something the authors argue that offset co-operations can be seen as) in the European defense industry. Lastly Jones (2002) investigated the values of offsets where knowledge transfer were one variable.
3. Theoretical framework

For the theoretical framework of this thesis theory on knowledge- and technology transfer have been selected. More precisely the authors have looked at potential barriers and key success factors stressed in previous research.

3.1 Knowledge transfer

Before theory on knowledge transfer is presented it is important to define knowledge. In this thesis the definition used by Kogut and Zander (1992) has been adopted. They define knowledge as both the practical skills and expertise that allow you to conduct something smoothly and effectively (know how) and information (know what). Moreover, the term knowledge is sometimes divided in “explicit” and “tacit”. Explicit knowledge consists of transmittable knowledge through machinery, blueprints, technical manuals and technical specifications. Tacit knowledge is instead often referred to as practical knowledge and consists of know-how and embodied knowledge in people’s mind, not easily formalized or transferred to others (Sönmez 2013; Garavelli et. al 2002). Further, knowledge transfer is the sharing of useful knowledge, which translates into accelerated individual and organizational learning and innovation. This leads to better products through development, which ultimately results in enhanced market performance (Riege 2005). In cases where knowledge is transferred to developing countries, there are three main ways of doing so, direct investment abroad, sales of turnkey factories and international subcontracting (Sabolo 1983).

Some scholars consider the two concepts: knowledge transfer and technology transfer as interchangeable. Knowledge transfer most commonly describes knowledge of tacit kind while technology transfer covers explicit knowledge (Sönmez 2013). Gibson et al. (2001) refer to technology as essentially being knowledge and that transfer is defined as the movement of technology and transfer. The term “knowledge transfer” will hereinafter be used to describe both knowledge and technology transfer and both the explicit and tacit knowledge.

3.2 Knowledge Barriers and Key Success Factors

After scanning the existing literature, five areas have been identified as relevant barriers and key success factors for knowledge transfer in an offset setting. The chosen areas are, (1) the “tacitness” of the knowledge, (2) the cultural- and organizational aspect, (3) trust, (4) communication, and lastly (5) the absorptive capacity of the receiver. These five parts of knowledge transfer theory have been chosen due to factors described below.
Axelson and Lundmark (2009) found that offset co-operations usually did not last longer than the contract period. When the seller had fulfilled its offset obligations it left. At the same time, several scholars stress that time and extensive communication are very important factors for successful knowledge transfer, especially when it comes to tacit knowledge (Bresman 1999; Park, Vertinsky, & Becerra 2015; Riege 2005; Yih-Tong Sun & Scott 2005). Thus, this is a valid reason for further exploring both the time aspect and the tacitness of the knowledge.

In the FOI report by Axelson and Lundmark (2009) offset arrangements are described in detail, examples involved cross-border co-production shows the selling company has educated the staff of the buying company. Hence, one could argue that culture and the absorptive capacity of the receiver could have significant impact on the knowledge transfer in offset co-operations.

Several scholars have stressed the risk with the creation of new competitor when participating in offset co-operations, due to knowledge transfer (Welt & Wilson 1998; U.S. Department of Commerce 2007). This highlights the importance of trust in the receiver. If the seller does not trust the receiver, why should it actively share knowledge? The trust factor is something that occurs rather frequently in the knowledge transfer literature, and is described as a key facilitator for knowledge transfer (Fang, Yang, & Hsu, 2013; Riege, 2005; Yih-Tong Sun & Scott, 2005).

### 3.2.1 Tacitness

As mentioned before, knowledge could vary from tacit to explicit. Several scholars stressed the difficulties that could arise when trying to transfer tacit knowledge (Forsgren, Holm, & Johanson, 2005; Simonin, 1999; Sun & Lui, 2013). Tacit knowledge can be hard to codify or express, be very personal and content dependent. Hence, it is not easy to communicate and/or transfer this type of knowledge. To be able to transfer tacit knowledge scholars points out factors like time and communication (Bresman, Birkinshaw, & Nobel, 1999; Park et al. 2015; Sun & Lui, 2013), two aspects that will be further discussed later on in this thesis.

Explicit knowledge, on the other hand, can much easier be expressed in and spread through texts, media, images, sounds, quantifiable technologies and processes (Sun & Lui, 2013; Dhanaraj Lyles, Steensma & Tihanyi 2004) and can be seen as building blocks of knowledge.
acquired easily but also exploited quickly. Therefore explicit knowledge can be considered less valuable than tacit (Dhanaraj et al. 2004). For instance, Park et al. (2015) show that transfer of explicit knowledge only has a significant effect on the performance of mature international joint ventures. In contrast to tacit, which showed to have significant impact on the performance of all international joint ventures.

Transferring explicit knowledge requires less intense socialization than tacit knowledge, because it can be learned relatively easy. Despite being easier to transfer compared to tacit knowledge, there are always risks of misinterpretations and misunderstandings during the learning process (Dhanaraj et al. 2004). Sun and Lui (2013) argues that the more tacit the knowledge is the larger the transfer effort must be, which might include transferring the actual people who possess the knowledge. Furthermore, scholars argue that more tacit knowledge leads to limited knowledge transfer and thus less cooperation (Loebecke, 1999; Madhok, 1997). Even though explicit knowledge might be easier to transfer, it does not mean that the receiver can use that knowledge and obtain the same output as the sender.

According to Jasimuddin (2008) there are no specific mechanisms that guarantee effective knowledge transfer in all situations. However, a hybrid strategy is to be preferred, where a people-focused mechanism (tacit) is followed by technology-assisted (explicit) mechanism (Jasimuddin 2008). Sönmez (2013) also points out important factors for an effective realization of knowledge transfer. (1) The recipient of the knowledge needs to have certain basis of knowledge, and (2) there needs to be intensity of the effort to develop the existing knowledge base.

3.2.2 National culture- and organizational culture barrier
Cultural knowledge transfer barriers are generally divided into national culture and organizational culture. Knowledge transfer tends to fail when the existing organizational culture is adjusted to fit the knowledge transfer strategy and goals received, instead of adjusting the knowledge transfer goals to already existing organizational culture (Riege 2005). Therefore clear guidelines when conducting knowledge transfer seem to be essential for effective sharing (Riege 2005).

Knowledge barriers caused by national culture are exemplified by Michailova and Husted (2003), which investigated Russian companies and found forms of knowledge hoarding.
Cultural aspects explain this behavior, where the norm is to answer a question with a question (Michailova & Husted 2003). Their study showed signs of recurring behavior of Russian manager not transferring knowledge transferred from western managers, further down in the own organization, due to not understanding or realizing the mutual advantage of knowledge transfer across levels (Michailova & Husted 2003). When national borders are crossed knowledge transfer becomes harder to accomplish (Blomkvist 2012). Overcoming national culture barriers to sharing knowledge has more to do with the design and implement of the knowledge effort than changing the culture (McDermott & O'Dell 2001).

When it comes to national culture several scholars claim that the individualism/collectivism dimension from Hofstede’s study is the major dimension that has an effect on how we process and analyze new information (Bhagat, Kedia, Harvesston & Triandis 2002). People’s beliefs, attitudes, norms values are all combined into that dimension. Furthermore, Bhagat et al. (2002) claim that organizations from individualistic cultures are better to absorb and transfer explicit knowledge, while collectivistic organizations are better at absorbing and transferring tacit knowledge. Moreover, knowledge is best transferred between cultures that rank similarly on the individualism/collectivism scale.

Values and norms are also something that is discussed at an organizational level. De Long and Fahey (2000) state that organizations themselves often have values and norms of how to do certain things and what to strive towards. These values could often be hard to articulate and change and have a large impact on the knowledge creation and use. Norms on the other hand are easier to identify and therefore easier to change. Differences in organization culture between two firms can be large; one could have a flatter organization where it is OK to challenge your superior and at another firm it would be totally unacceptable (ibid). This shows that knowledge transfer works better or different in different organization. Failure in knowledge transfer can be explained by an error in the interpretation or codification process (Garavelli et. al 2002). The effectiveness of the transfer process is determined by the interaction between interpretation and codification, which is affected by culture, values, beliefs, education etc. (ibid).

3.2.3 Trust

Several scholars claim trust between the sender and receiver to be a large barrier to knowledge transfer (Riege, 2005; Yih-Tong Sun & Scott, 2005). Yih-Tong Sun and Scott
(2005) claim that organizations often were uncertain if it could trust the team and use the information constructively and with confidence. If this were the case, only a small amount, if any, knowledge would be shared. Moreover, the same thing could be said if the organization did not fully accept the team. It could either be because the team did not contribute much to the organization, or that the team caused more problems with their questions and behavior. Organizations also questioned the receivers skills and that they could not handle and learn from such information (ibid). Yih-Tong Sun and Scott (2005) argues further that there is a question of benefit maximization from the organization, would they benefit from sharing this information? Especially in co-opetition (co-operations between two potential competitors) knowledge transfer could put the organization in a disadvantage and it could expose its weaknesses. Hence, knowledge transfer will not occur if one of the actors feels that they might lose its competitive advantage (Fang, et al. 2013).

One could say that “time heals everything”. Bresman (1999) argues that through time, tensions between the acquirer and acquired will be reduced through people leaving and new people with a clean slate will join the firm. Hence, the new people will not see the former boundaries between entities and a larger trust will emerge. Even though, as described earlier, management can actively try to stimulate and encourage knowledge transfer, the more time that have elapsed between the acquisition and present time, the more likely it is that knowledge is transferred between the entities. However, support for this hypothesis varied in significance depending on what type of knowledge was transferred (Bresman, 1999). The time factor is something that also Riege (2005) stresses. However, they focus on the employees’ lack of time to share knowledge. Managers struggle to find time to actively stimulate knowledge transfer, and at an individual level it could be seen as a cost to take time of your day-to-day work to share knowledge with colleagues. This was also discussed by Yih-Tong Sun and Scott (2005), however in terms of a lack of good systems to share knowledge through, and the present ones took up to much time and effort. If the employees feel a lack of time or trust in sharing knowledge it could potentially lead to knowledge hoarding (Riege, 2005).

Time and trust are in many ways interconnected with communication. To create a long lasting trustful relationship communication between the parties is needed. Besides this, trust is essential in order to achieve true and effective communication. For trust to be built, communication over a longer period of time is needed.
3.2.4 Communication

Bresman et al. (1999) argues that the more frequent the communication between individuals in the acquirer and acquired units, the greater the knowledge transfer process. Furthermore, there are two overlapping processes in which communication occurs, the post-acquisition integration process, and a direct process at work. During the post-acquisition integration process extensive and intensive communication is crucial to effectively integrate the acquired firm. Effective communication will help to reduce the anxiety caused by misinformation, facilitate interaction between individuals of both parties, and it will make the decision making process during the integration explicit and transparent. If successful this will most likely lead to a “social community” which facilitates knowledge transfer (Bresman et al., 1999; Kogut & Zander, 1992). The second process occurs at the workplace, where it is possible to transfer more tacit knowledge. To do so extensive and intense communication over a long period of time is needed. Bresman et al. (1999) found significant correlation between the frequency of communication and knowledge transfer.

As stated above, communication between individuals is crucial to facilitate knowledge transfer. Another important factor is to establish a good relationship between acquirer and acquired. This can be initiated through for instance visits and meetings. It could for instance be technical meetings, extended visits and joint training programs (Bresman et al., 1999). These type of actions are more especially important in the integration process, since it will lead to a more effective integration, and the more effective the integration process is, the higher the level of knowledge transfer (ibid).

As stated earlier, certain types of knowledge are harder to transfer than other. Tacit knowledge might be harder to transfer since it for instance, cannot be codified, whilst explicit knowledge is easier to transfer (Bresman et al., 1999; Grant, 1996; Kogut & Zander, 1992). According to Bresman et al. (1999) the “solution” to the problem of transferring knowledge lies in the socialization between the parties through the creation of so called “social communities”. On the contrary, Forsgren et al. (2005) argue that tacit knowledge cannot be transferred. In fact, Bresman et al. (1999) could not show significant correlation for this hypothesis since the knowledge that was being transferred varied between the investigated cases.
Successful communication does not necessarily lead to successful knowledge transfer, unless the receiver is able to absorb the knowledge being transferred. Below the implications of absorptive capacity will be presented.

3.2.5 Absorptive capacity
Absorptive capacity has its origin from Cohen and Levinthal (1990), which discussed the matter of a receiver absorptive capacity. Something also elaborated by Zahra and George (2002), who described it as an organization's routines and processes when acquiring, assimilating, transforming and exploiting knowledge. Even if the sender wants to transfer and does it will not mean that the receiver will be able to utilize the new knowledge. Cohen and Levinthal (1990) argue that the prior skills and knowledge level of the receiver is crucial for the amount of knowledge possible to utilize. Absorptive capacity exists on both an individual level and on an organizational level. The absorptive capacity of the organization is not solely based on the aggregated knowledge of the individuals. It also covers the ability to utilize and transfer the new knowledge across the organization (ibid). If the prior knowledge level is too low it will not matter how much knowledge is being transferred, since the receiver cannot make effective use of the information. Connected to the knowledge level is the motivation of the receiving entity's employees. If they are not motivated to be innovative and learn, the knowledge that is being transferred will only be a waste of effort and resources (Minbaeva, Pedersen, Björkman, Fey & Park, 2003).

Forsgren et al. (2005) assume that knowledge transfer is not something that occurs automatically, because of too many internal hinders for the process. It could either be a lack of willingness (from both sender and receiver) to engage in knowledge transfer, or a lack of willingness to implement new knowledge, the so-called “not invented here syndrome” (NIH). This means that external knowledge is rejected because knowledge invented externally is seen less prestigious. This is also stressed by Yih-Tong Sun and Scott (2005) who identified a lack of willingness to learn as one of the major barriers to knowledge transfer. Problems with trusting the external knowledge are also a reason behind the occurrence of NIH (Michailova & Husted 2003).

3.3 Knowledge Transfer Model
An existing theoretical model has not been used due to the qualitative research approach chosen for this thesis. The aim is to gain a deeper understanding and find potentially unknown factors since knowledge transfer in offsets is a rather un-researched topic. Hence, if an
existing model were to be used the research would be locked in to that, and would most certainly miss out on important findings. In other words, the model needs to be adjusted to fit in an offset context. This is why a model has been derived from the theoretical framework presented above. It describes the knowledge transfer process based on findings from different theories.

The variables of culture, trust, communication, and “tacitness” are seen as areas that affect the knowledge transfer. The first three are variables that are affected by both parties and it is some sort of interaction between the parties. However, the “tacitness” of the knowledge that is being transferred is almost exclusively determined by the seller, which is symbolized with a one-way arrow. Furthermore, to what extent this knowledge can be utilized depends on the receiver’s absorptive capacity of the knowledge being transferred. The receiver’s absorptive capacity determinates the extent of usable knowledge.

![Figure 1](image-url) – Model on knowledge transfer in offset co-operations
4. Method

4.1 Research approach
Due to lack of studies examining knowledge transfer in offset arrangements, a qualitative study is to be preferred since it allows a deeper understanding of the phenomenon. Although knowledge transfer in itself has been explored rather extensively, offsets provide a rather unique setting, which raises suspicions of potentially other underlying factors traditional theory might miss. The focal point of a qualitative approach is providing rich and detailed information based on small number of respondents (Jacobsen 2002). Furthermore, Jacobsen (2002) argues that a qualitative approach is preferred when the approach of the study is in need of an open mind. Due to the lack of research in this area it is of utter importance that the aim of this study searches for a deeper understanding to fully grasp knowledge transfer in an offset setting, rather than pursuing generalizing conclusions.

As mentioned above, there is already a rather extensive research base within knowledge transfer. Hence, it could be argued for the use of a deductive approach. However, there are a rather limited scientific base on offsets and especially knowledge transfer in offset arrangements. This is why an abductive approach will be used. Harman (1965) states that when using an abductive reasoning one infers, based on the fact that a hypothesis would explain the evidence, that the given hypothesis is true. For instance, if you look outside and see that the street is wet (evidence), you might infer that it has been raining (hypothesis). There could be several explanations for the street being wet. However, based on your knowledge from theory, the best explanation is that it has been raining. Hence, the conclusion is that the hypothesis is true. This type of reasoning is commonly applied for explaining a phenomenon, which in this study relates to the occurrence of knowledge transfer in offset deals. Therefore the existing literature will act as a base and will also be tested through the gathering of primary qualitative data, but at the same time the authors will be open to new discoveries that might lead to new theory. Lastly it is important to stress that with abductive reasoning it is implausible for the premises to be true if the conclusion is false (Walton 2013).

4.2 Research design
This study has been conducted with an exploratory purpose. Even though there is a rather large literature base on knowledge transfer, there have only been a limited number of studies conducted on the phenomena of knowledge transfer in an offset setting. Hence, there might be
several aspects in an offset setting that the traditional literature on knowledge transfer might have missed. Thus, the aim is to shed new light on an existing phenomenon (knowledge transfer), in accordance with an exploratory study (Saunders et al. 2009). This study can roughly be explained as the authors taking on the role of an explorer, using an existing map (existing literature) and trying to find and explore new things.

For this thesis a case study has been chosen as the strategy. This is because it is necessary to gain a deeper understanding of the firm and its values to better grasp what could be firm specific or what phenomenon could be applicable elsewhere. Furthermore, a single case study will be used, also this to get a deeper understanding. Only one data collecting method (qualitative) will be used, hence, making it a mono-method study.

Due to the limited time period for this master thesis a cross-sectional study has been conducted, which is studying a specific phenomena at a particular time. Furthermore, the aim is for instance not to study a process or change over time, which are the largest strengths of a longitudinal study (Saunders et al. 2009).

4.3 Case selection
As mentioned before a single case study will be conducted. The case that has been chosen is the Swedish defense industry. Hence, this will effect the focus point of this thesis which will limit it the results to potentially only be representing for Swedish defense material providers. The case the will consist of the voices and opinions of four individuals rather than the companies they are representing. Thus, the answers from the respondents represent the chosen case. Furthermore, secondary data will be used to strengthen and support the primary data from the four respondents. By having four respondents and secondary data will allow the use of triangulation where answers and secondary data are compared with each other in order to identify common denominators, rather than comparing the differences between them. The case selection has been done with a non-probability technique, because the probability of the sample is not known. Furthermore, the aim of the thesis is not to draw generalizing conclusions. Hence, there is no need for a probability selection. A self-selection sampling has been utilized where the cases identify their desire to participate (Saunders et al. 2009). The authors have contacted relevant people (people in charge of or have working operative with offsets) and the sample is selected based on which respondents that agreed to participate.
The respondents chosen for this thesis are all people working in the Swedish defense industry. Three of the respondents were contacted since they work with offsets operatively, in firms who are large enough to have an offset department and people who worked with offsets and industry co-operations on a daily basis. The fourth respondent was selected based on the large overarching knowledge of offsets the respondent possesses from working at an industry association representing defense companies. Since the defense industry in Sweden is consolidated to only a few larger players and a large number of SME’s who lack an offset department there are only a few potential respondents to contact. Furthermore, offsets are often only demanded when it concerns larger defense procurement. For instance, Denmark state in their offset regulations that offsets will only be demanded on procurements over DKK50 million (Danish Business Authority 2014), for Norway on procurements over NOK500 million (Norwegian Ministry of Defense 2008), and often countries have a threshold value of around $10 million. Hence, only companies selling larger more expensive weapon platforms are affected with offsets. Hence, there are only a few Swedish providers that would be potential candidates, and they have been covered in this thesis.

4.3.1 Choice of respondents
Three of the chosen respondents are exclusively people holding senior positions within the industry and in the industry co-operation departments of their respective companies. The fourth respondent representing industry association holding a senior position and have worked extensively with offset questions. They all have comprehensive knowledge in the field and represent the larger players within the Swedish defense industry. Their expertise and opinions could therefore considered to be representable for the Swedish defense industry. They were chosen in order to shed a new light of the phenomena and get insightful information that may not appear in traditional theory sources. Only respondents the authors believed could contribute with relevant data was selected for an interview. Following is a table of the respondents interviewed for this thesis.

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1 Respondent B. 2015. E-mail 14-april.
2 Respondent D. 2015. E-mail 15-april
Table 1 – List of respondents

<table>
<thead>
<tr>
<th>Type of interview</th>
<th>Name of respondent</th>
<th>Company</th>
<th>Position</th>
<th>Year(s) in the company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face</td>
<td>A</td>
<td>Alfa</td>
<td>VP Industrial co-operations (Baltics and Nordics region)</td>
<td>7 years (Offset: 7)</td>
</tr>
<tr>
<td>Face-to-face</td>
<td>B</td>
<td>Alfa</td>
<td>Head of Industrial co-operations</td>
<td>24 years (Offset: 12)</td>
</tr>
<tr>
<td>Telephone</td>
<td>C</td>
<td>Bravo</td>
<td>Head of Industrial co-operations</td>
<td>10 years (Offset: 5)</td>
</tr>
<tr>
<td>Face-to-face</td>
<td>D</td>
<td>Charlie</td>
<td>Deputy Secretary General</td>
<td>3 years (Offset: 10)</td>
</tr>
</tbody>
</table>

4.4 Data Collection

This section on how the data will be collected is described in accordance with Saunders et al. (2009) statues for data collection. The way of which the collection of data will be undertaken is described in this section. The primary data will mainly be collected through interviews with carefully selected respondents with acknowledged experience and expertise within the field of offsets. A semi-structured interview style of approach has been chosen for this study in order to not interrupt the flow of the conversation. Furthermore, a semi-structured style of interview is quite often used when taking an exploratory approach (Saunders 2009), which is suitable when studying a phenomenon that may not be known by the general public. When formulating questions Saunders et al. (2009) instructions of asking concise and unambiguous questions was taken in consideration due to the occasional secrecy surrounding offsets. In accordance with guidelines presented by Ghauri and Gronhaug (2010) questions are formulated with precise wording, since small change in wording might cause large differences in meaning and ultimately in response. Furthermore, the questions are formulated in polite and soft language in order to not provoke due to the sensitive nature of the topic.

The authors also try to avoid questions of suggestive nature and questions that can be answered with “yes” or “no” (Ghauri & Gronhaug 2010). Following Saunders et al. (2009)
the build-up of a semi structured interview contained key questions rather than fixed questions. These key questions were divided and sorted based on themes. The order of the questions was also varied and decided by the flow of the conversation (Saunders et al. 2009) in order to let the respondent answer more freely and not led by the questions, this approach is believed to maximize the outflow of expertise, insight and experience of the respondents.

4.4.1 Interview process
Three of the interviews have been conducted face-to-face, and one was conducted over the phone due to long distance between the authors and respondent but also due to time limitations of this thesis. No matching occasion was found where the authors and respondent could meet face-to-face. Furthermore, the interviews have been recorded, later transcribed and also concluded in order to easier follow the red thread and occurring theme of the interview. This have been done to both get more accurate quotes and to help in the analysis process.

The face-to-face interviews took place at the headquarters at a private room of each respective company, and lasted between 30-60 minutes. During the interviews the respondents were also given the possibilities to speak “off the record” and these conversation was of course not recorded nor will they appear or used as data. Although not contributing anything to the data collection of the thesis, these “off the record” discussions lead to the authors gaining more insight and understanding in the matter researched. One of the respondent requested to receive the prepared questions beforehand, thus creating a possibility of strategically and planned answers an issue the authors are aware of and tried to ask additional spontaneous questions, the potential implications of planned answers will also be taking into consideration when analyzing the collected data from this specific interview.

The phone interview was conducted in a quiet and calm room in order to guarantee any sort of disturbance might affect the quality of the interview. This interview lasted around 30 minutes and the date and time for it was determined beforehand, however the questions were not sent to the respondent prior to the telephone interview.

4.4.2 Ethical Aspects of Interviews
In studies where sensitive information is gathered, concerns regarding potential ethical issues should be considered especially if using a qualitative study (Hedin 1996). In this study a few respondents are contributing with a large amount of information of sensitive and important kind. Therefore the authors guaranteed the respondents would stay anonymous and thus
avoiding any potential consequences as a result of their answer. All in line with Hedin (1996), which brings up the importance of respecting the wishes of the respondents and avoiding the situation of a respondent who regrets an answer or unwillingness of something to be published. Following these guidelines presented by Hedin (1996) will hopefully favor the challenge of getting access to sensitive information. It also decreases the risk of misunderstandings about the study or potential suspicions surrounding the treatment of the sensitive information.

4.5 Secondary data
The conducted interviews consist of representatives from companies or the industry association mainly taking on the role as sellers in offset deals, thus answering the questions from a seller’s perspective. In order to offer a wider spectrum and foundation to build the analyze part of this thesis, secondary data will be gathered as well and consists of reports, publications, newspaper articles etc. The secondary data will be based on and presented through four examples of previous Swedish offset deals.

4.6 Data analysis
When analyzing the data the patterns and process described by Miles and Huberman (1994) will be followed where the first process is a data reduction, where the authors will read through all the transcripts and try to identify categories and patterns. The reduced and categorized data will then be presented individually in a narrative manner. Lastly conclusions will be drawn derived from the data. Furthermore, this single case study consists of four voices in terms of four respondents, but also of secondary data. All this data will be analyzed as a whole in order to try to look for similarities and differences, to see if there are some common denominators between gathered data.

4.7 Trustworthiness
In this thesis the authors have through previous experience and knowledge chosen respondent who all have extensive knowledge and experience with offsets and have worked in their respective companies for a long time. Thus, having a good knowledge of the company and its previous co-operations. One of the authors of this thesis has previous experience and knowledge of the industry through an internship at the Swedish Security and Defense Industry Association (SOFF). This experience helped in both the theory selection process, selection of respondents and in the case selection. In the theory selection process this experience have given the authors a rather good idea of what areas would be relevant and what would not be.
Furthermore, in the case selection this experience and industry knowledge was helpful in selecting both the relevant cases and trustworthy respondents. By ensuring high quality and trustworthiness of a qualitative study one can show a high reliability (Seale 1999). Traditionally in quantitative studies reliability concerns if the study could be repeated and get the same results (Ghauri and Gronhaug 2010). However, in a qualitative study the replication factor becomes less important, if not even irrelevant (Stenbacka 2001). It will not matter if another scholar interviews the same people and ask the same questions, the end result might not be the same.

In this study validity is fulfilled through exclusively interviewing respondents that are either head of an offset/industry cooperation department or have extensive experience from offset deals. Thus, ensuring the access to relevant and insightful information, this is further confirmed by Jacobsen (2002) who stresses relevance and applicability as key points in order to raise the validity of a research. Furthermore, to challenge the validity the question “How can I trust you?” could be asked (Ghauri & Gronhaug, 2010). This issue is tackled by also using reports written by research institutes in the areas of defense industry and well articles from renowned newspapers to confirm or contradict the answers of the respondents. The low number of interviews may affect the validity of the study, however the authors still believe in overall high validity due to the quality of the interviews achieved thanks to the wide knowledge, expertise and experience of the respondents.

According to Whittemore (2001) the risk of a qualitative study containing assumptions makes scholar feel the validity criteria of the quantitative perspective as not applicable for a quality study. Despite difference of validity in a qualitative- and quantitative research, validity in a qualitative research can be translated to transferability, thus becoming a useful criterion when demonstrating the legitimacy of a qualitative research (Whittemore 2001). Furthermore, by using a single case study consisting of four different voices the findings, if showing the same, the probability of transferability will be higher. By combining it with secondary data the risk of unwillingly studying an anomaly will be reduced. Hence, it is more likely that the results derived in this thesis could act as a foundation for another study.
4.8 Limitations

Due to a single case study with a qualitative approach has been chosen for this study, gathered data will be based on a small number of respondents, thus making it impossible to draw a general conclusion of our research question. Furthermore, it was not easy to find respondent willing to appear due to both the limited number of relevant people and the secrecy surrounding the defense industry as a whole. However, it is believed the gathered data remain a sufficient level of validity because due to the stature of the respondents. This study also contains potentially sensitive information, which may have impacted the answers from the respondents. There is also a risk of the respondents being reluctant to criticize offsets due to the general demand of offset amongst buyers. Thus, risking a reputation of reluctance towards offsets, that in the long-term could potentially result in a loss of business. Therefore the authors are aware of the risk of withholding information or distort the truth, something that has been taken into consideration when formulating interview questions. This study fulfills the requirements in terms of validity thanks to access to prominent respondents in the field.

Since the case in this study is on Swedish security and defense industry the answers and conclusions might be shaped by Swedish organizational climate and culture. Hence, the conclusions might only be applicable in a Swedish setting. Furthermore, this thesis has been conducted from the seller’s perspective. Hence, there is a risk of the collected data only showing one side of the coin.
5. Empirical data

In 5.1 a short summary of four examples of previous Swedish offset deals will be presented, which intends to further help the reader to fully grasp the complexity of the phenomena known as offset, but also the authors’ reasoning of offsets through a knowledge transfer perspective. These examples will later (5.2-5.6) be combined with the primary data gathered from interviews with Respondents A, B, C, and D, and presented as an offset deal, from beginning to end.

5.1 Previous Swedish offset examples

The common denominators for the four examples presented are that they are (1) direct offsets between a seller and a foreign buyer, and (2) the knowledge level has been quite similar between the partners, enabling the partnership to help both parties to develop (Axelson & Lundmark 2009).

Example 1: In 1999 Saab and South Africa agreed in a deal where 28 Gripen fighters were to be sold through an offset deal. The construction of the offset package involved both indirect- and direct investment in South Africa (Axelson & Lundmark 2009). The indirect investment required by South Africa in accordance with the deal, were larger than the direct. The offset agreement was set to cover a time span of eleven years (Pettersson 2000). The reasons behind the offset demands from the buyer’s perspective was to enhance its own defense industry, create new job opportunities in specific parts of the country and favor minority groups. For instance, this offset deal has meant that the middle- and rear parts of Saab’s Gripen fighters were manufactured in South Africa. This specific offset has resulted in Saab owning parts of several South African companies and had 2009 up to 1400 employees allocated in the country. Overall the co-operation between the two parties was relatively successful and resulted in Saab allocated part of their production of other products to South Africa (Axelson & Lundmark 2009).

Example 2: Between 1995 and 2005 BAE Systems Hägglunds (Hereinafter referred to as BAE) had offset arrangement with Norway, Finland, Switzerland, Holland and Denmark, selling one of their combat vehicles. All of these deals were conducted in similar manner and are therefore described as one example. The offset demands involved direct investment and was mainly conducted in order to create job opportunities. Due to the number of offset deals concerning the same product BAE has decided to allocate the production of a specific part of
the product in the partnership country. This means that knowledge transfer was conducted in terms of sharing of blueprints for the specific product. This was to enable the partner to gain knowledge of parts of the production process, however BAE still holds the blueprints and knowledge needed to complete the whole combat vehicle, meaning that BAE maintained their role as unthreatened manufacturer of this specific product. Offsets has led to BAE realizing flaws in their own production through feedback from partners, thus developing thanks to offsets.

**Example 3:** In 1987 Kockums sold submarines to Australia and were manufactured at a factory in Adelaide, half owned by Kockums (Pettersson 2000). This offset deal was at the time the largest ever done by both Kockums and Australia (Axelson & Lundmark 2009). The construction of this offset arrangement included a creation of a new company partially owned by Kockums, Australian defense industry and other parties. The development of the submarine mainly took place in Sweden by Kockums (Axelson & Lundmark 2009). This partnership was possible due to previously strong relationship between Sweden and Australia based on common values and strategic interests. This deal was a big part of that relationship and enabled the possibility for future deals between the countries (Regeringen 2013). Kockums’ contractual commitments ended in 2004, but have continued to offer technical support, the company that was created in connection with this offset deal still exists and builds destroyers (military ships) and are responsible for the development of next generation submarines intended for the Australian defense (Axelson & Lundmark 2009).

**Example 4:** Kockums also sold submarines to Singapore in 1995; the order consisted of 5 used submarines that went through a modernization and modification. A similar deal was yet again conducted in 2005. The main reason behind this deal was Singapore’s eagerness to create its own submarines from scratch. However, the submarines were built in Sweden. This deal had no direct offset requirement from the buyer, instead Singapore expected Kockums to partner up with a local producer STM. The eagerness to develop and technical level of the STM put high demands on Kockum, leading to them having to develop more rapidly. The relations with STM has continued and rendered in several latter co-operations concerning ships and development of submarines (Axelson & Lundmark 2009).
5.2 Aim with the partnership

One can wonder why offsets are conducted. “Respondent A” sees it as a bit odd and an old remnant within the defense industry, which over time will disappear due to disapproval from the EU for instance. However, all respondents more or less consider offsets as something positive and something they are good at, which in turn becomes a competitive advantage (Respondent A; B; C). Offsets can even be considered as an industry requirement in order to receive contract offers from buyers (Respondent C). This is understandable since all collaborations in the four previously presented examples were all motivated by the buyers (Axelson & Lundmark 2009). From the buyers perspective there are three major goals for these collaborations. Firstly, to create jobs in the buying country through, for instance placing part of the production in the buying country. Secondly, to develop the national industry competence. Not only is the idea to strengthen the companies within defense products and also raise the overall local industrial competence (Axelson & Lundmark 2009). For instance, both the Danish and Norwegian defense industries are almost entirely built on offsets (Respondent D). Lastly, the third goal is to develop and raise the national defense competence to be able to keep, use, and maintain the bought weapon system over time and improve the military’s competence to use the weapon system (Axelson & Lundmark 2009). “Respondent D” also stresses the importance of security of supply; you do not want to be too dependent on another country in the case of a crisis. If a crisis were to break out, you want to be as self sufficient as possible in order to ensure your defense to work to its full potential. The demands of the buyers have to be complied with by the seller, so as a company you have to play by the rules in order to sell products (Respondent B). However, all offset still has to be financially beneficial, which becomes difficult when the receiver of knowledge are not able to handle or absorb the knowledge shared, who also describes it as “You cannot teach elephants to dance”. Therefore matching becomes essential (Respondent A). Furthermore, if you as a nation demand offset the end price of the product goes up. At the Swedish Defense Material Administration they generally say that if you demand offsets the end price increases with 20% (Respondent D).

The three major goals presented earlier are the overarching goals. The general approach is to identify what opportunities a country has. In conclusion, offset deals are seen as very complex and the challenge lies in finding co-operations that lead to substance and fulfilling the goals of the contract (Respondent C). This was the case of the Gripen deal to South Africa, which differs a bit by focusing more on favoring previously unfavoured population groups (Axelson
& Lundmark 2009). This was because the deal was made shortly after abolishment of apartheid in South Africa. “Respondent D” sometimes feels like offsets are conducted due to political reasons. Where large investment with tax money is excused by creation of new job opportunities, the people involved with defense materiel procurements are less interest in these kinds of deals compared to politicians (Respondent D).

5.3 The arrangement of the offset (Strategy/Implementation)

The length of offset contracts varies greatly and can be somewhere between 1-15 years. The contract lengths for Alfa is usually between 3-15 years (Respondent A; B) and for Bravo it is generally 1-10 years (Respondent C). This is seen as a rather ideal time frame (Respondent A; B; C). The factor that affects the length is what type of order and product it is. If it is a wider offset demand it usually means a shorter contract length (Respondent C). There are usually two contracts, one on the procurement itself and one offset contract. The offset, or industry co-operation, contract is usually much longer, and sometimes it does not have a time limit, but instead it is the value that needs to be fulfilled (Respondent D). The fulfillment of offset contracts quite often can become unnecessary bureaucracy, where the actual outcome comes second as long as the contract value is fulfilled (Respondent D). In general the attitude from the partner towards the seller is good, and they are happy to collaborate and learn (Respondent A; B; C). Of course complications surrounding the wish to work with “old friends” have occurred, but a problem that disappears over time and therefore not affecting the partnership itself (Respondent B).

The seller’s strategy and organization in offset deals are almost always based on the legalization and regulations in the country of the buyer (Axelson & Lundmark 2009). “Respondent A” stresses the local laws and regulations as important factors. It is these offset regulations that act as a foundation and the strategy is formed around that in the best possible way in order to meet the demands most effectively (Respondent B). Generally Alfa look at what kind of country it is, if they have been there before, what are the buying country looking to gain from their offset regulations, and how can we best cope and fulfill that (Respondent B). Implications concerning offset deals are highly impacted by the local laws and regulations, which in some cases might be very strict and hinder for instance re-negotiations. It is the ambitions, requirements and demands of the buyer’s offset regulations that affect the strategy of how for instance the knowledge- and technology transfer will be conducted.
(Axelson & Lundmark 2009). Furthermore, there is a trend, especially in emerging economies that countries increase, develop and fine-tune their offset regulations in order to more effectively gain the desired outcomes (Respondent B). The offset demands vary rather largely between the different examples presented above, therefore Axelson and Lundmark (2009) could not find any clear pattern or a standard offset strategy. Neither could they find any connections between action and the size of the deal or the complexity of the weapon system. Even though the offset regulations of the buyer dictate quite a lot it is also of great importance for the seller not to blindly follow every wish of the buyer. The seller needs to look at the larger picture and see what partners they can gain the largest effect from in terms of generating offsets effects (Respondent B). Furthermore, the seller needs to find a partner it can trust. Without trust the knowledge transfer will be limited since the partner will not have the authority to handle sensitive information. To make sure that the partner is someone who can be trusted to handle these types of information the sellers have departments whose purpose is to make sure that the potential partner is trustworthy (Respondent A). Once cleared, the trust in the partners is generally high (Respondents A; B; C). The firms are not afraid of sharing sensitive information, with the exception of national defense secrets (Respondent A; B). Having a mutual trust between the seller and partner is crucial in order to complete the deal with a positive result for both parties (Respondent C).

The communication between the seller and partner is something that varies from case to case (Respondent A; B; C). However, it is always important to structure and set up rules for communication in the beginning, who contacts whom and about what, and how often will you have formal meetings etc. (Respondent B). Moreover, “Respondent B” sees communication as one of the most important factors for a successful collaboration. It is often misunderstandings that break collaborations, so it is important to ask one question too many than one too few. It lies in the interest of the seller to keep a good communication over time in order to be able fully honor the contract (Respondent C). Furthermore, it is important to have the right people in the project management. People who are interested in how other people feel in order have a more effective project group (Respondent B). Despite the great variation of strategy from one offset deal to another, Axelson and Lundmark (2009) were able to find one common denominator, and that was how the collaboration was carried out. There were three types of actions to promote knowledge transfer. (1) Expatriates in both directions, (2) development of local operation (e.g. production), and (3) educating local suppliers. What is essential in all three is the knowledge transfer, which is one of the main aims of an offset deal.
Expatriates are used to transfer more complex technical knowledge; either through people from the seller working for shorter period of times at the partner company or through employees from the partner come and work at the seller's facilities in Sweden (Axelson & Lundmark 2009; Respondent A; B; C). For instance, South African engineers were stationed at Saab in Linköping for periods of 6 months to 2 years (Eliasson 2010). To be able to operate and maintain the aircraft both ground personnel and pilots need a basic understanding of the technologies integrated in the Gripen system (ibid). In some cases, personnel from the seller go to the partner to educate and support in the startup process of production, and after that communication between the seller and partner occurs on a regular basis (Respondent C).

The development of local operation is done to meet the production demands. It could be either building new production facilities or invest and develop an existing one to be able to build their products (Axelson & Lundmark 2009).

The third alternative is closely connected to the second alternative. However, by using this alternative the seller have a lower level of commitment and intensity. The purpose is to develop a new supply chain and the seller often just makes sure that the partner is on the right technical level and is able to deliver the products (Axelson & Lundmark 2009). "Respondent B" states that a lot of the offset co-operations often lead to a longer relationship, either as a regular supplier or as a more passive partner with who contact is kept in case of any future offset commitments in that country. However, it is not only on a product and technical level that the focus lies in offset remainds, for instance in South Africa one of the main wishes was to raise the general management competence (Axelson & Lundmark 2009).

**5.4 Technical and knowledge aspects of an offset**

The type of knowledge being transferred in offsets varies from case to case, it can consists of either knowledge of the weapon system itself and how to maintain it, it can also be methods connected to the development process, methods connected to the production, or methods possible to learn at university but fine-tuned to fit a specific product etc. (Respondent B). Axelson and Lundmark (2009) also mention the variation in collaborations and what phase in the lifecycle of the product is a deciding factor, determining the technical design of the offset deal. If the product is in more of a development phase, the product is adapted to the demands of the buyer but development takes place in Sweden. For example, the Collin submarines delivered to Australia were all produced locally, while the submarines sold to Singapore had a
very limited local participation (Axelson & Lundmark 2009). Transferring knowledge from seller to buyer is a very complex, expensive- and time-consuming process (Axelson & Lundmark 2009). One deciding factor whether knowledge transfer between the parties will take place or not is the buyer's ability to absorb the knowledge. In those cases where parts of production for example a fighter, is placed abroad it is of importance that experience in building airplanes already exists, which basically means the need for the seller to identify in what sector they are able to contribute instead of blindly listen to what the seller wants- or wish to learn (Respondent A). Furthermore, “Respondent D” states that offsets shall not be conducted just for the sake of it, offset deals are quite tricky therefore it is important for the buying country to identify what activities will render in long-term development rather than considering offset as a temporary help. A known example of this is when Egypt demanded the American tanks they bought to be produced locally. What the American company then did was to build a brand new factory specialized to produce the M1A1 tank. This created many new job opportunities but after the production was finished, local engineers lacked the knowledge to utilize it effectively, and all they got out of it was a factory built to produce M1A1 tanks (Respondent D).

What determines the buyer's ability to absorb knowledge varies a lot, but in general deciding parameters are; size of the receiving company, the knowledge and educational level of the employees of the company, but also the age level. Newly graduated and younger engineers tend to have larger ability to learn and adapt to new processes (Respondent B).

However, in the four examples studied by Axelson and Lundmark (2009) the products that were sold were all products already in use or used by the Swedish Armed Forces. Hence, the development process mainly consisted of adaptation and further development of the product. However, this means that there will be no significant participation from the buyer, which in turn will lead to no knowledge transfer. Despite this there are still demands of basic knowledge from the buyers part because defense products often have a long lifecycle. Thus, the products need to be maintained and upgraded over time. This is an essential question in defense co-operations, and it is often put on the local partner that for instance did the end assembly to be responsible of the maintenance (Axelson & Lundmark 2009). Furthermore, since the products often are large, high-tech and expensive it is of high importance for the seller that the end user knows how to use and maintain the product. Otherwise it could lead to mishaps and accidents, which in return would tarnish the company’s brand largely. For
instance, if the South African air force and partners did not know how to use the Gripen fighter an accident is highly plausible, and this would be fatal for Saab, its brand and would hamper the possibility to sell Gripen to other countries (Eliasson 2010).

As mentioned earlier in the section describing the arrangement of offsets, trust is a major factor in an offset relationship. The seller considers trust between the partners as something that has to be mutual (Respondent C). Even though unusual and something not personally encountered, “Respondent A; B” acknowledge the risk of technology emulated by the partner connected to knowledge transfer and states that it has occurred previously. “Respondent A” mentions a case involving another Swedish company, where the partner turned into a rival by emulating a component for a weapon system, which they later became very good at manufacturing and now has that as a niche. Despite this occurrence, the respondents highlights the difficulty in conducting successful emulation of products, firstly these are very complex products with 10-15 years of development, skipping steps and shortening the development time span and process is not possible (Respondent A; C). Furthermore, extensive resources are invested in research and development making the emulated product less relevant, since the original producer will maintain a step ahead (Respondent C). “Respondent D” made a comparison to other Swedish industries where large Swedish firms entered the Chinese market early despite knowing that their products would be copied and technology stolen. They could do this since they had the confidence that their products would still be of a higher quality and be more innovative that the Chinese “replicas”.

Moreover, the overarching knowledge about the production of the entire product is not something that the seller wants and can transfer to the buyer (Axelson & Lundmark 2009). It is the composition of the weapon system that makes the Swedish companies unique. Hence, it does not matter if the give away knowledge about one part of the system (Respondent D). For instance, the parts for the Gripen fighter comes from all over the world, these parts are not something that Saab produces themselves, their strength lies in combining these parts into a high quality product (Respondent A; D). Furthermore, the fact that Swedish firms are more open and are have basically no demands from their own state, in difference to for instance France, where the French state demands their defense companies that certain components have to come from French suppliers. This means that the Swedish industry can be more competitive both on the price of the product and being good at industry co-operations (Respondent D).
The organizational culture, the way a company is organized and staff are elements that cannot be emulated by any potential rival (Respondent B). This is something that is deeply rooted in the company and its employees. “Respondent B” stresses that they have engineers who have worked for the company for 10-20 years, who in many ways are the company. In order to be a rival to Alfa they need people like this.

5.5 Cultural implications in offset deals
When implementing the offset strategy, some collaborations seem to have a larger cultural impact than others. The cultural values, traditions and access to engineers are factors affecting the outcome of the offset deal, rather than laws and regulations (Respondent D). It seems like in co-operations between a Swedish firm and a partner in a Nordic and Baltic country the national culture only plays a smaller role, if any (Respondent A; C). However, in other co-operations with countries outside northern Europe it seems to have a larger effect (Respondent B). It takes time and effort to cope and adapt to these differences, however it is a great learning for the company and previous experiences have been beneficial in later co-operations even when working with new cultures (Respondent B). Furthermore, companies are nowadays quite aware of that there are going to be national cultural differences. Hence, they often do their homework and adapt to the foreign culture. Almost to the extent that the roles become turned and the two partners act as they expect the other one to do.

One factor that seems to have a larger effect is the organization culture where conflicts and misunderstandings often can occur with organizations with a more hierarchical structure. It is often a question of who can talk to whom and that the more hierarchical company did not understand that one particular person had the authority to make that decision and vice versa. These types of misunderstandings are costly in terms of effectiveness (Respondent B). However, one of the best co-operations “Respondent B” has experienced was one with a French partner. Which might contradict the previous statement since they have a rather hierarchical organization, but for some unknown reason this co-operation went very smoothly.

5.6 Long-term industrial effects from the co-operation
Before discussing the long-term effects of offsets it is important to stress the difficulty to measure the impact of an offset arrangement in a precise way, due to the varying, quantitative
and complex nature of these kind of deals (U.S. Department of Commerce 2012). One way of measuring the success could be by looking at the industrial co-operations that have continued after the contract period’s end. In the four examples presented earlier, no clear pattern between the four examples’ continuous industrial co-operation could be found. Again, the outcomes vary from case to case. In Singapore the co-operation lead to new export deals, in Norway and Australia it lead to potentially new deals, and in South Africa the outcome was a greater engagement (Axelson & Lundmark 2009). The direct offset was delivered a head of schedule and former members of parliament have expressed their satisfaction with what Saab delivered and that it had positive effects for the South African industry (Saab 2011).

If the co-operation works smoothly and both the seller and partner feel like they could benefit from each other it is quite common that the relationship is kept (Respondent A; B; C), not necessarily as an offset co-operation (Respondent A). For instance, Kockums’ collaboration with STM has later developed into a JVC called Fortis Marine Solutions where Kockums own 49% and STM 51% (STE 2012). Another case of continued partnership occurred when the American defense producer Lockheed Martin according to the construction of an agreement was forced to co-operate with a Swedish supplier. This supplier proved to be better than the American counterpart and the deal resulted in that this Swedish supplier’s product was being used in Lockheed Martin’s end product permanently (Respondent D). When the offset co-operation does not lead to a continued relationship Axelson and Lundmark (2009) argue that this could be due to two factors. One being that other companies has won later defense procurements in that country. Hence, giving the Swedish firms no reason to stay due to lack of business. The second factor could be that defense material is expensive and has a long lifecycle, which would mean that a nation would not buy larger defense platforms on a regular basis. For example, if you procure new fighter jets, you wont have a need to replace them for up to 50 years (Eliasson 2010). Furthermore, it is unusual within the defense industry to look for cheaper supplier in order to cut costs, when existing suppliers already works fine (Respondent D). The offset deal between Saab and South Africa also resulted in long term, development of a pool of more experienced and skilled workers (Eliasson 2010). U.S. Department of Commerce (2004) have found that American suppliers that have been involved in offset deals have increased their number of employees with 19,5% between 1998 and 2002 compared to an increase of 2,4% for subcontractors not involved in offset deals.
Since 2009 the EU commission have banned the concept of offset since it is market distorting and is against the free market principle. They did this in an attempt to open up the European market and allow the smaller nations to compete with the large five defense industries (England, France, Germany, Italy, and Spain). However, this had an opposite effect. Since the big five European industries buy 90% of their products from their own country it is hard as a smaller actor to penetrate those markets. Furthermore, since the small and medium sized countries are not allowed to demand offsets they will not gain access to the same amount of new technology and business opportunities which they would have otherwise, which will also lead to a less competitive industry (Respondent D).

When a buyer's defense industry is built up by using offsets, there is a risk of building up an industrial base that is not competitive due to the fact that it has been created with help of instruments comparable to subventions. In other words the selected suppliers would never had been picked if competing with other suppliers on equal terms, creating a situation where partners being selected based on who can offer the best deal and not the best product (Respondent D). Thus, potentially creating weaker products and systems. There is a risk with a defense industry to become too dependent on offsets (Respondent D). On the other hand, there are examples of defense industries successfully built up using offsets, Denmark and Norway being two of them. As mentioned earlier the importance lies in identifying what sector that is possible to build on and develop and then requesting it from the seller in the offset deal. This is difficult to achieve without an already existing industrial base (Respondent D).

Offset has sometimes been portrayed negatively but is overall something positive, because it opens doors to new market which would not have been possible or occurred without offsets demanding these “forced partnership” creating successful relationship originated from offsets. This is especially applicable for smaller countries that are getting access to markets in bigger countries (Respondent D).
6. Analysis

The analysis will be conducted based on the five variables presented earlier in the theoretical framework. The data collected will be compiled and connected to theory in order to shed a new light on offset from a knowledge transfer perspective.

6.1 Tacitness

The type of knowledge that is being transferred in an offset deal differs from case to case. It depends on the product, offset regulations, type of partner etc. (Respondent A; B; C; D). It can be how to maintain a system, build a certain part, or methods connected to the development process. Processes and knowledge like this, transferred by both Alfa and Bravo, could generally be considered as explicit knowledge. For instance, how to maintain or build a system is something that could rather easily be codified, something that is characteristic for explicit knowledge (Sun & Lui, 2013; Dhanaraj et. al 2004; Grant 1996). Another clear example of explicit knowledge being transferred is the BAE-example where blueprints for a specific part of the CV90 were sent to their partner (Axelson & Lundmark 2009). The reason behind that is more or less only explicit knowledge that is being transferred could be that explicit knowledge is much easier to transfer, absorb and learn and it is less valuable than more tacit knowledge (Dhanaraj et. al 2004; Park et al. 2015; Sun & Lui, 2013). However, in some cases expatriates were used to transfer more complex technical knowledge (Axelson & Lundmark 2009). Since there is a need to transfer people to be able to learn one could argue that there are tendencies of tacit knowledge (Sun & Lui 2013). For instance, both pilots and ground personnel spend somewhere between 6 months and 2 years at Saab in Linköping in order to gain a deeper understanding of the Gripen system (Axelson & Lundmark 2009). This type of strategy could be seen as mixture of explicit and tacit knowledge transfer, according to Jasimuddin (2008) this type of hybrid strategy is to be preferred. At the same time, if a product was in a development phase there was little to none participation from partners in the buying country since it would take up too much time and money to try to incorporate them (ibid). This could be an indicator that the type of knowledge in this phase is of a more tacit nature. Loebecke (1999) and Madhok (1997) argue that the more tacit knowledge there is, the less knowledge transfer and co-operation there will be.

One of the downsides of knowledge transfer is the potential risk of the receiving part copying products. However, processes such as the way an organization operates or its culture is deeply rooted in the organization itself and its employees, making it difficult to copy (Respondent B;
D). “Respondent B” uses senior engineers as an example, some of them with 10-20 years faithfully serving Alfa and considered in many ways as being the company. In order to become Alfa, the copying party needs that kind of people. This implies that tacit knowledge such as organizational culture cannot be transferred to other companies. It is neither possible to “copy” employees (Respondent B). This is confirmed by several scholars, who claim that tacit knowledge can be very personal and content dependent, thus making it difficult to transfer (Forsgren, Holm, & Johanson, 2005; Simonin, 1999; Sun & Lui, 2013). Furthermore, “Respondent A” describes the issue of copying products as something that takes time and is highly complicated, hence often not doable to first emulate and develop an existing technology further. If you were able to develop a new product from knowledge gained through offsets it is likely for the receiver to have an even newer product. Thus, making your product out of date (Respondent B; C; D). Furthermore, you cannot jump over steps in the learning curve. You need to learn how to crawl before you learn to walk (Respondent B; C).

One of the fundamental arguments for nations to use offsets are to gain access to knowledge in order to be able to build up their own industry. However, it is more or less only explicit knowledge that are being transfer due to the difficulties to transfer tacit knowledge in the amount of time that an offset co-operation lasts. Scholars argue that explicit knowledge are less valuable and only have a small effect on the receiving company performance (Dhanaraj et. al 2004; Park et al. 2015; Sun & Lui, 2013). Hence, one could question whether or not knowledge transfer through offsets is the way to go to develop your domestic industry.

6.2 Culture

In most cases, offsets are conducted across borders and between different companies, making both differences in cultural- and organizational a factor. The biggest factor that needs to be taken into consideration is the local laws and regulations, which sometimes can be very strict concerning co-operations of this kind. Previous experience with this kind of arrangement is also a factor (Respondent A). Differences in culture are considered having less of an impact than laws, regulations but also individuals involved in the partnership (Respondent A). “Respondent D” on the other hand, considers cultural values, traditions and access to engineers as factors affecting the result of the offset arrangement, rather than laws and regulations. “Respondent C” has not experienced any major implications caused by cultural difference, which is believed by the fact that previous partners have had similar culture. This is also aligned with the thoughts of Bhagat et al. (2002) that argue for the connection between
similarities in culture and effective knowledge transfer. Sometimes offset deals are made possible due to previously strong relationships, like in the case concerning submarines from Kockums between Sweden and Australia, were the foundation of the partnership was based on common strategic interests and values (Regeringen 2013).

However, “Respondent B” has experienced problems related to differences in national culture and has put a lot of time and effort to diminish them and through this smoothening the differences in future projects in order to ensure a successful partnership. Thus, “Respondent B” recognizes coping with cultural differences as a key success factor. According to McDermott & O’Dell (2001) there are ways to overcome cultural barriers. In a knowledge transfer setting emphasis should be on the design and implementation of the knowledge transferred rather than changing culture (McDermott & O’Dell 2001). Furthermore, Garavelli et. al (2002) also brings up the importance of interpretation or codification process of the transfer process, which in turn are affected by culture, values, beliefs, education etc.

Moreover, “Respondent B” and Alfa have encountered issues surrounding differences in organizational culture. Problems have been especially clear when co-operating with companies with more hierarchal structure, leading to misunderstandings affecting the effectiveness of the partnership (Respondent B). De long and Fahey (2000) explain the occurrence of organizational differences with values and norms of how things are generally done. Due to differences in organization the knowledge transfer will work different depending on what organization. Something “Respondent B” and Alfa are aware of by “doing their homework” and adjusting to the organizational culture of the partner, thus reducing potential implications caused by this.

6.3 Trust

The length of an offset deal varies and depends on what type of order and product it is. But the general timespan is usually somewhere between 3-15 for Alfa and 1-10 for Bravo (Respondent A; B; C). According to scholars, in order to be able to successfully transfer knowledge you need time (Bressman 1999). However, one could ask the question of what is enough time. Time is a relative concept, thus in order to decide whether 15 years is enough time to transfer knowledge one have to look and analyze specific offset cases over a longer period of time. Either way time or trust is of essence according to Riege (2005) who claims a feeling amongst employees when sharing knowledge might cause a case of knowledge
hoarding. All respondents felt like the duration of an offset deal seems like a relevant and ideal timeframe (Respondent A; B; C).

When the contract period ends it is not uncommon for both Alfa and Bravo to keep the relationship with the offset partner alive. Sometimes as an active partner and supplier, and sometimes as a more passive partner, where only a dialogue is kept in the case of other future offset commitments in that country (Respondent B; C; D). This is something Kockums did, which continued their partnership with their Singaporean partner STM, involving development of future submarines (Axelson & Lundmark 2009), which later evolved into the JVC Fortis Marine Solutions (STM 2012). Furthermore, “Respondent D” claims that Lockheed Martin through offset have been forced to open up their supply chain, which lead to them finding a better and cheaper partner in Sweden, compared to their original domestic sub-supplier. When it comes to trust there was not any sense of distrust from any of the respondents. For instance, Alfa has employees that carefully assess potential partners in order to secure that this is a reliable partner (Respondent B). Furthermore, there is no real fear of that the transferred knowledge will be copied and used against Alfa or Bravo. “Respondent A” described Alfa’s openness and how they are not afraid to share information. The only thing that is not being shared is of course national defense secrets (Respondent A; B). This can be compared to other Swedish industries who entered the Chinese market despite knowing the risk of copied product and stolen technology, they did this confident enough that their product still would be of better quality than the copied ones (Respondent D). When trusting the other partner “Respondent A” follows the motto of trusted until proven otherwise. Moreover, “Respondent B” has not personally experienced any partner becoming a rival and has high trust in the partners of Alfa. Trust has to be mutual in offsets because the partners have to do the job together (Respondent C). This openness and willingness to share according to theory mean that there is a good climate and conditions for a successful knowledge transfer (Riege, 2005; Yih-Tong Sun & Scott, 2005). Moreover, Fang et al. (2013) argues that if there is a fear of losing competitive advantage, no knowledge transfer will occur. In the cases of both Alfa and Bravo it is apparent that there is a confidence that the receiver will not be able to utilize the information and become a competitor, since it take a lot of time to develop a product and by just knowing a fraction of it, it will take time to develop a product of your own. Hence, your products will most likely continue to stay behind (Respondent A; B; C; D).
6.4 Communication

The communication in an offset deal does not differ from any other corporate co-operation (Respondent A) but it varies greatly between different offset arrangements (Axelson & Lundmark 2009; Respondent A; B). Except regular communication in terms of meetings, phone and email conversations etc. it is quite common to use expatriates, both from the seller and partner (Axelson & Lundmark 2009; Respondent A; B; C). By using for instance visits, the tension between the parties can effectively be reduced. Hence, facilitating a good knowledge transfer (Bressman 1999). Furthermore, this can also be seen as an attempt to create what Bressman (1999) calls a “social community” where the people from the seller work together and socialize with employees from the partner company. This is the most effective way of transferring tacit knowledge, however you have to do this constantly over time for it to be successful (Bressman 1999). Which again raises the question whether or not the offset contract period is long enough to fully facilitate the desired knowledge transfer.

By having an effective an extensive communication risk of miscommunication and tensions are reduced (Bresman et al., 1999; Kogut & Zander, 1992). A detail that “Respondent B” also stressed, where B claimed that communication is the most important factor for a good collaboration and that it is often bad communication that lead to misunderstanding, which in return have a tendency to break collaborations. Furthermore, it can be said that all communication is the most important factor for a successful knowledge transfer (Respondent A; B; C).

One interesting factor that can be seen in the data is the respondents focus on having “the right people” (Respondent A; B); People that are interested in people and how they think and work etc. If you as an employee do not feel comfortable or are unsatisfied with the collaboration then it will not work out very well, and this might also lead to less knowledge being transferred. So you need to have project managers (or similar) who have understanding and interest in people to be able to put in action where it is needed to better foster a good working climate. To connect this to the previous mentioned social community, one could argue that if the employees do not feel good, then a social community will probable not be created. Bressman (1999) stressed the importance of interaction between the employees from both parties, and that people felt comfortable for a social community to be created.
6.5 Absorptive capacity

Absorptive capacity is the ability, processes and routines of an organization to acquire, assimilate, transform and exploit knowledge (Zahra and George 2002). The other party’s ability to absorb knowledge is generally an important factor in an offset deal (Respondent A; D). In the cases where production is placed in a foreign country, previous relevant experience is essential in order to avoid long and complicated processes, as well as existing relevant knowledge is required by the partner (Respondent A; D). Having an existing industrial base is of high importance to be able to utilize the knowledge gained from offsets (Respondent D). This is in line with Minbaeva et al. (2003) and Sönmez (2013), who stress the fact that amount of knowledge transferred becomes irrelevant when the existing knowledge level of the receiver is to low, since the receiver are unable to comprehend the knowledge anyways. If this situation arises the offset becomes not financially beneficial, which an offset deal has to be (Respondent A). Even if the sender wants to transfer knowledge and does it well it does not necessarily mean that the receiver will be able to utilize the new knowledge (Zahra & George 2002). Thus, highlighting the importance in matching expressed by ”Respondent A”, meaning the seller’s ability to identify what sector they are realistically able to make a contribution, rather than blindly listening to the demands of the buyer. The same goes for the buyer not to demand offset for the sake of it, and identify the activities that will result in long-term development (Respondent D). Another example is the Egyptian demand for their newly acquired tanks to be produced locally, the only thing the Egyptian industry got out of this was a new factory built to produce M1A1 tanks (Respondent D). It is also the receiver's responsibility to sense their own capacity in order to achieve successful knowledge transfer (Respondent B). The level of existing knowledge amongst receiver differs from case to case, the optimal condition when both parties having similar level in order to learn from each other (Respondent C). In general determining factors are size of the company, knowledge- and educational level of the employees, with recently graduated engineers often having greater ability to adapt and learn new processes (Respondent B). With a partner with high technical knowledge there is an increased risk of development of similar products. Something “Respondent C” acknowledges but does not consider an issue. Steps in the developing process cannot be skipped and is a process that takes 10-15 years and by then Bravo already has had time to evolve and therefore still be ahead.

There are also documented cases of high absorptive capacity amongst the partner. When Kockums entered a partnership with STM in connection with the offset deal with Singapore,
the eagerness to develop and existing technical level of STM put high demands on Kockums and resulted in Kockums gaining knowledge as well, and rendered in future cooperation between the parties (Axelson & Lundmark 2009) In Kockums example there was no resistance from STM in willingness to learn, it was rather the opposite, thus eliminating one of the barriers to knowledge transfer stated by Yih-Tong Sun and Scott (2005). Overall, the attitude from the partner towards the seller is in general good, and they are happy to collaborate and learn (Respondent A; B; C). Hence, there are no clear indicator of any presence of “not invented here” syndrome. Thus, contradicting the issues raised by Forsgren et al. (2005), Michailova and Husted (2003), and Yih-Tong Sun and Scott (2005), describing the potential unwillingness to embrace new ideas from partners due to them not being invented regionally. 

Absorptive capacity also exists on an individual level as well as organizational level (Cohen & Levinthal 1990). Hence, partially explaining why the offset deal involving Saab and South Africa where South African engineers were stationed at Saab in Linköping receiving training for a period of 6 months to 2 years. This was necessary in order to understand the complex technologies integrated in the system of the fighter (Eliasson 2010). Due to the complexity of the products involved, knowledge transfer concerning usage and maintaining of the product is equally important in order to avoid accidents and mishaps. Incidents of this kind might fall on the manufacturer and tarnish the brand image of the company and in the long-term affect future deals (Eliasson 2010).

6.7 Analysis summary

**Tacitness:**
The type of knowledge being transferred in offset deals varies greatly and depends on product, regulations and type of partner (Respondent A; B; C; D). Something that is impossible to copy is the corporate culture and how an organization operated (Respondent A), so called tacit knowledge. Which is the most valuable kind of knowledge (Dhanaraj et. al 2004; Park et al. 2015; Sun & Lui, 2013). One of the main reasons of wanting an offset in order to gain knowledge is to build or develop the own defense industry.
**Culture:**
The biggest factor determining the structure of the offset deal is local laws and regulations, the fact that because offsets almost exclusively are conducted cross-borders, differences and management of cultural and organizational culture becomes a factor. Implications of this sort is acknowledged by “Respondent B” which mentions his company putting a lot of time and effort to diminish them and through this smoothening the differences in future projects in order to ensure a successful partnership. These implications can be minimized by doing your homework and by the other party having previous experience with this kind of arrangement (Respondent A). Some of the respondents have experienced problems related to differences in national culture and while others have not experienced any major problems caused by this but acknowledges cases of misunderstandings and difference in hierarchy.

**Time & trust:**
The timespan for an offset varies and depends on what product is ordered and the order itself, usually it lasts between 1-15 years (Respondent A; B; C) According to (Bressman 1999) successful knowledge transfer takes time, all respondents considers the length of previous offsets to be ideal. There have been cases of co-operations so successful it has lead to further partnership between the seller and the buyer, even after the offset period has passed (Axelson & Lundmark 2009). The risk of emulated products caused by knowledge transfer is downplayed by all respondents, who to begin with are highly aware of the risk but are confident enough that their product still is better than the copied one. It take a lot of time to develop a product and by just knowing a fraction of it will take time to develop a product of your own. Hence, your products will most likely continue to stay behind (Respondent A; B; C; D). However, there are cases of companies in the industry having their products copied by their partner and later becoming a competitor (Respondent B). In a offset partnership trust shall be mutual and is essential as they have to do the job together, trust in the partners is intact until proven otherwise (Respondent A). Openness and willingness to share makes good conditions for successful knowledge transfer (Riege, 2005; Yih-Tong Sun & Scott, 2005), which makes trust instrumental in order to achieve successful knowledge transfer.

**Communication:**
The communication in an offset deal does not differ from any other corporate co-operation (Respondent A) but it varies greatly between different offset arrangements (Axelson & Lundmark 2009; Respondent A; B). By having an effective an extensive communication risk of miscommunication and tensions are reduced (Bresman et al., 1999; Kogut & Zander,
A detail that “Respondent B” also stressed, where B claimed that communication is of importance and misunderstanding often is the consequence of bad communication. Communication is essential in order to achieve successful knowledge transfer (Respondent A; B; C). Furthermore, it is important to have right people involved in the partnership, ideally people who are interested in other people, understanding, able to put in action (Respondent A; B). This creates a social community, fostering a good climate for knowledge transfer (Bresman 1999).

**Absorptive capacity:**

Absorptive capacity is the ability, processes and routines of an organization to acquire, assimilate, transform and exploit knowledge (Zahra and George 2002). The other party’s ability to absorb knowledge is generally an important factor in an offset deal (Respondent A; D). Being able to utilize the knowledge gained is essential (Respondent A; D) Otherwise knowledge transferred becomes irrelevant when the existing knowledge level of the receiver is to low. This makes the offset deal not financially beneficial. In order to avoid this, matching becomes essential, identifying what the buyer want and actually are able to handle thus conducting an offset that contributes to something (Respondent A). The optimal situation is when the partner is on the same level in order to be able to handle the knowledge but also learn from each other. Factors determining a sides absorptive capacity are size of the company, knowledge- and educational level of the employees, with recently graduated engineers often having greater ability to adapt and learn new processes (Respondent B)
7. Conclusion

In this section the concluding thoughts of the authors are presented in order to answer the research question, which is as follows: What are the barriers for a successful knowledge transfer and what possible implications might occur when conducting knowledge transfer in an offset setting? And how does the seller conduct successful knowledge transfer, and both protect its own competitive advantage and develop the buying industry?

The key factor for a successful knowledge transfer in offset co-operations is the absorptive capacity. All respondents stressed that it does not matter how much, or what knowledge you share if the receiver are not able to absorb and utilize it. The failing absorptive capacity often lies in the receiver (either the government or partner) not knowing its own ability and limitations and asks for more than they can chew. For instance, it will be quite hard to establish and build a domestic defense industry when you do not have an industrial base to begin with. Offsets are complicated and tricky and it is difficult to identify what activities to demand. An existing industrial base in terms of existing knowledge is needed in order to do so. Successful knowledge transfer in an offset deals are basically a case of successful matching between existing knowledge and development possibilities, however the matching are affected by what demands of the buying country, these demands can be affected by political forces. Hence, offsets differ from other forms of trade due to political factors. Due to offsets generally increasing the cost with around 20 %, it is important that an offset deal leads to long term effects rather than just a temporary boost in terms of new job opportunities. Some defense systems have 20 years of R&D behind them and if you as a nation do not have some sort of tradition and industrial base it will not matter if you learn how to build a part of the system. Steps in the process cannot be skipped. If you want to build up an industry you need to learn how to crawl before you can walk. Due to this, all interviewed respondents downplay the believed fear of emulated products and stolen technology in connection with knowledge transfer. Because the original producer will always be a step ahead and therefore always offer better products than the copied product. Hence, there does not seem to be any problems regarding trust from the Swedish firms towards its partners.

One new finding that was made in this study was the importance of regulation when it comes to knowledge transfer. All respondents stressed the factor and importance of laws and regulations in offset deals (Respondent A; B; C; D). Extensive knowledge in local regulations
and laws are required to determine the shape of the offset arrangement. Sometimes these regulations might be very strict and cause implications by hindering possibilities such as re-negotiation (Respondent A). Furthermore, the seller’s offset strategy is formed based on the laws and regulations. “Respondent B” has noticed a trend in emerging economies, that these countries are refining and developing their offset-regulations to be more effective. Based on these statements made by the respondents, it proves the important impact laws and regulations have on offset deals compared to maybe ordinary partnerships. The authors believe offsets conducted based on the terms of laws and regulations might affect the effectiveness of knowledge transfer. All offsets have to be financially beneficial, therefore matching becomes essential (Respondent A). Moreover, “Respondent B” highlights the importance of the partner not demand or wish to learn something outside of their knowledge- and capability level. Based on this, laws and regulations might lead to receivers to demand something above their level, thus hindering optimal matching, creating a situation where partnership is not completely voluntarily selected but instead affected by political factors, ruling laws and regulations. Hence, the knowledge transfer might not live up to the full possible potential, and the outcome might not be as large as the buyer might have wished for.

Offset arrangements are almost always conducted cross-borders making difference in laws and regulations a factor impacting the success of the offset deal. Sometimes laws and regulations might hamper or lead to restriction of the arrangement of the offset deal. Besides this differences in cultural also plays a part. Culture, tradition and the availability of engineers for example are determining factors of success, however it is important to note that these factors mentioned are not only applicable exclusively on offset settings, but in other cross-border deals or partnerships as well.

Another important factor is the communication. It is often misunderstandings that lead to unsuccessful co-operations, and unsuccessful co-operations will mean limited to no knowledge transfer. Furthermore, the companies have realized that in order for the buyer to fully and successfully use the product (larger defense systems) you need to use expatriates and bring people from the buyer to the seller for them to observe and fully learn. It also lies heavily in the seller’s interest for the buyer to not have any mishaps when using the product since this could harm the brand and tarnish potential future sales. With this being said, no clear evidence of communication working differently in offset co-operations has been found.
In terms of contribution, this thesis has shown the importance of well-designed offset regulations and the importance the receiver plays in the knowledge transfer process in offset co-operations. Of course these co-operations have two parties and both need to be committed for the knowledge transfer to take place. However, the evidence in this thesis show that the selling companies strategies and action should, according to literature, provide a fostering environment for knowledge transfer. This means that if the buyer is not satisfied with the amount or type of knowledge that has been transferred the reason for this most likely lies in the offset regulations and the receiver's ability to absorb the knowledge.

With some final words the authors would like to say that offsets quite often have been portrayed negatively. It is something the seller needs to do in order to sell. It is forced to co-operate with companies just like an arranged marriage. In the same way arranged marriages are often seen as something bad and unfair, but there are exceptions. Even in arranged marriages there is a possibility of finding your soul mate. Offsets force the firms to open up their supply chains and collaborate with others, and sometimes this leads to the seller finding a better and cheaper partner that will continue as a supplier even after the contract have ended. Just like arranged marriages offset co-operations can become successful and have a positive outcome.

7.1 Limitations & Further research

This study was conducted with the expertise and answers from only four respondents. The defense industry is an industry that is characterized by extensive secrecy, which hinders potential full accessibility. This is something that the authors have experienced and that have affected the data gathering and pursuit of respondents. However, to get more generalizing results one could try broaden the research either with more respondents or by doing a quantitative study. Moreover, the case used in this thesis was the case of the Swedish defense industry. The authors feel like it would be interesting to look at other foreign defense industries to see if the results of this thesis are generic or if they are only applicable and representative for the Swedish industry.

This thesis has been from a seller’s perspective. Hence, it could be interesting to look at both knowledge transfer and offsets from a buyer/partner’s perspective. The sellers might color the results in this thesis in an attempt, consciously or unconsciously, to make themselves look...
better. Thus, by investigating from the buyer one could get a more nuanced picture when combining the two studies.

Another interesting aspects that the authors were limited to investigate were the long-term industrial effects. Are offsets truly beneficial for the buying country or does it only lead to the buyer having to pay a higher price?

Lastly, this thesis brought the discovery of the importance of regulations when it comes to knowledge transfer in offset arrangements. Hence, it could be of interest to further explore this by focusing more on the regulation factor when studying knowledge transfer in an offset setting.
List of references


Appendixes

Appendix 1 - Interview Guide 1

Introduction
Qi: Name and position?
Qii: How long have you worked in this company/position/with offsets?
Qiii: Could you please briefly describe a typical workday?
Qiv: What is your general attitude towards offset collaborations?
Qv: What is your company’s general attitude towards offsets?

Justification: All these questions are asked to both validate the respondents experience and expertise within the field and to loosen him/her up in order to get more open and honest answers. Furthermore, the last two questions are asked to find out the standpoint of the respondent in regards to offsets, to be able to take this into consideration when analyzing the data, since respondent’s values might influence the answers

Culture
Q1: In which countries have you had industry cooperations?
Q2: How would you describe the impact of cultural aspect of these cooperations?
National
Organizational
Q3: Have some worked better than others?
Why is that?

Justification: Q1 is asked to both get a overall view of where the company have been involved in offset deals, and to later be able to see where these countries compare to Sweden on the individualistic scale. Q2 is asked to get an open and free answer on the cultural aspect of the collaborations. Hopefully the respondent will answer on both organizational and national culture, otherwise we will try to ask followup questions to cover both aspects. Q3 is asked to see later see if there was a connection between similar scores on the individualistic dimension and a good collaboration. Furthermore, this question also provides an opportunity for the respondent to answer freely about why some collaborations worked better than others.

Time & Trust
Q4: On average, how long does these collaborations last?
Would you or they want it to last longer?
Q5: How many of these partners are still in your network/company after the contract period have ended?

Q6: How would you describe your trust in your partners?
Is it the same day 1 as day X

Q7: Please describe your view on the potential risk of sharing knowledge?
Loss of competitive advantage

**Justification:** Q4 and Q5 are asked to get a sense on how long the collaborations last, and through this see if there were any long-term commitments or if there only were short-term. Q6 is asked to see if the trust changed over time, or if it always was the same. Q7 is asked to see if there were any friction and an unwillingness to transfer knowledge based on the fear of losing competitive advantage.

**Communication**

Q8: Please describe the communication with the partner company?
Frequency, type of communication
Visits - frequency
Expatriates - people at the partner, partner employees in Sweden etc

Q9: How important would you say that communication is when sharing knowledge?

**Justification:** Q8 is asked openly to hopefully get the respondent to talk freely about communication without any interference from the authors. However, if the respondent do not cover all aspects follow-up questions are prepared. The ambition is to see if how active and what actions the company have taken in terms of communication. Q9 is asked in order to investigate the importance of communication, it might be more important than initially expected or vice versa.

**Tacitness**

Q10: What type of information do you share to your partner?
People, know-how, blueprints etc..

Q11: Have you experienced/noticed any difference in the receiver's absorptive ability depending on the type of knowledge being sent?

**Justification:** Q10 is asked to get a sense of what type of information are shared from the seller to the buyer. For instance, if they are very restrictive, it could be a sign that they do not have any ambition of collaborating and transferring knowledge. Q11 is asked to identify if some types of knowledge are more difficult to send/absorb than others.

**Absorptive capacity**
Q12: Please describe the partner’s attitude towards you?
Q13: Please describe how you feel that the partner’s willingness to learn?
Q14: Please describe the skill level of your partners
Do you feel that they in most cases are on your technical level?
Do you feel confident that they can handle information and knowledge that you share?
Q15: Do you ever feel that the collaboration is hampered due to the receiver is missing some form of knowledge? If yes, what type of knowledge, examples?

**Justification:** Q12 is asked to get a sense if the receiver was keen on collaborating or if it was reluctant. Q13 is asked on the same manner but connected more to the willingness to learn and adapt to the new processed from the sender. Q14 is asked to see if the receiver even was able to absorb and utilize the new information. Finally Q15 is asked to find out more precisely what the receiver was missing in terms of knowledge.

**General Finishing Questions**
Q16: Please describe your “strategy” when entering a collaboration
Q17: Please give examples of how an offset deal is conducted practically?
What kind of activities are done to enhance knowledge transfer
Q18: Do you have anything else to add that you feel we have missed or overlooked?

**Justification:** Questions asked in this section are meant to open the respondent up in hopes of getting data we have not thought about or covered previously
Appendix 2 - Interview guide 2

Introduction

Q1: Name and position?
Q1i: How long have you worked in this organization/position/with offsets?
Q1ii: What are your main responsibilities?
Q1v: What is your general attitude towards offsets?
Q1v: What is your organization’s general attitude towards offsets?

Justification: All these questions are asked to both validate the respondents experience and expertise within the field and to loosen him/her up in order to get more open and honest answers. Furthermore, the last two questions are asked to find out the standpoint of the respondent in regards to offsets, to be able to take this into consideration when analyzing the data, since respondent’s values might influence the answers.

Culture

Q1: From your experience, How would you describe the impact of cultural aspect of these cooperations? Have you heard of any complication due to culture?
National
Organizational
Q2: Have some worked better than others?
Why is that?

Justification: Q1 is asked to get an open and free answer on the cultural aspect of the collaborations. Hopefully the respondent will answer on both organizational and national culture, otherwise we will try to ask followup questions to cover both aspects. Q2 is asked to see later see if there was a connection between similar scores on the individualistic dimension and a good collaboration. Furthermore, this question also provides an opportunity for the respondent to answer freely about why some collaborations worked better than others.

Time & Trust

Q3: On average, how long does these collaborations last?
Q4 What would you say are the companies general opinion, Would the seller or partner want it to last longer?
Q5: How many of these partners are still in your network/company after the contract period have ended?
Q6: How would you describe the sellers trust in their partners?
Is it the same day 1 as day X

Q7: Please describe your view on the potential risk of sharing knowledge?

Loss of competitive advantage

**Justification:** Q3, Q4 and Q5 are asked to get a sense on how long the collaborations last, and through this see if there were any long-term commitments or if there only where short-term. Q6 is asked to see if the trust changed over time, or if it always was the same. Q7 is asked to see if there were any friction and an unwillingness to transfer knowledge based on the fear of losing competitive advantage.

**Communication**

Q8: Please describe the communication with the partner company?

Frequency, type of communication

Visits - frequency

Expatriates - people at the partner, partner employees in sweden etc

**Justification:** Q8 is asked openly to hopefully get the respondent to talk freely about communication without any interference from the authors. However, if the respondent do not cover all aspects follow-up questions are prepared. The ambition is to see if how active and what actions the company have taken in terms of communication.

**Tacitness**

Q9: What type of information does the seller usually share to its partner?

People, know-how, blueprints etc..

**Justification:** Q9 is asked to get a sense of what type of information are shared from the seller to the buyer. For instance, if they are very restrictive, it could be a sign that they do not have any ambition of collaborating and transferring knowledge.

**Absorptive capacity**

Q10: How would you describe the partner’s attitude towards working with the seller?

Q11: How would you describe the partner’s willingness to learn?

Q12: Please describe the skill level of the partners

Do you feel that they in most cases are on the same technical level as the seller?

Do you feel that the seller feels confident that they can handle information and knowledge that the seller shares?

Q13: Have you any examples of when a collaboration have been hampered due to the receiver is missing some form of knowledge?
**Justification:** Q10 is asked to get a sense if the receiver was keen on collaborating or if it was reluctant. Q11 is asked on the same manner but connected more to the willingness to learn and adapt to the new processed from the sender. Q12 is asked to see if the receiver even was able to absorb and utilize the new information. Finally Q13 is asked to find out more precisely what the receiver was missing in terms of knowledge.

**Long-term Industrial effects**
Q14: Is it common that an offset co-operation evolves to a longer relationship once the contract period has ended?  
Examples?  
Q15: How would you describe the long-term industrial effects from offsets in the buying country?

**General Finishing Questions**
Q16: How would you describe the seller’s general strategy when entering a collaboration?  
Q17: Please give examples of how an offset deal is conducted practically?  
Q18: Do you have anything else to add that you feel we have missed or overlooked?  
Justification: Questions asked in this section are meant to open the respondent up in hopes of getting data we have not thought about or covered previously.