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Offset Management
A Case Study of Saab AB

Master of Science Thesis in the Master Degree Programme, Management and Economics of Innovation

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Abstract

The purpose of this thesis is to improve Saab's offset management and develop suggestions for an improved offset process in order to minimize negative effects of offset on Saab's core business.

Offset constitute a range of industrial compensation activities often required in international governmental procurements of a large technical systems.

The thesis has been conducted as a case study at Saab, defining the offset phenomenon and describing the present offset process. A large set of interviews has been conducted at Saab together with a review of internal documents and processes. This empirical data has been compared to current offset management literature and has formed a set of recommendations.

Key findings include 14 areas of improvement for offset management at Saab. These areas cover offset strategy, education and communication. Through offset Saab gains an additional dimension to elevate their offer to their potential customers. Furthermore, offset affects several parts of the organization.

The worldwide spending on arms is shifting towards emerging markets. In these countries there is a trend towards increased direct offset demands and stricter rules for its implementation. Offset as a component in an arms trade will therefore become even more important. In conclusion, the pressure is increasing on Saab's Business Areas to handle more offset obligations of a more complex nature.

Recommendations for Saab include: update processes to support offset activities, connect offset with long term strategies, map offset costs, describe offset in the organization and educate staff.

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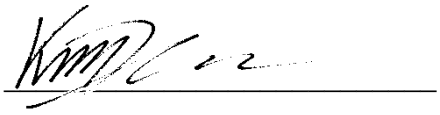

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1 Introduction

Offset constitute a range of industrial compensation activities often required in international governmental procurements of a large technical systems. The activities involve generation of business value in the buying country and/or transfer of resources back to the buying country from the seller. These activities are usually, but not necessary, for the use, handling and immediate maintenance of the technical system procured.

For defense firms, offset frequently involve transfer of sensitive technology and know-how to the buying country, local production and sourcing. It is also common with commitments to increase the buying nations' GDP through joint ventures, venture capital and aiding local industries. Activities like these are no minor undertakings and for defense firms to fulfill offset obligations while still maintaining a competitive edge, being profitable and ensuring future survival is a true endeavor. To further complicate the matter, the offset arrangements are primarily stated on the buyer's terms.

Offset arrangements often constitute a prerequisite for attaining defense contracts of high value in government sales. It is also considered as an important selling argument and differentiator in negotiations (Ahlström, 2000). With the competition in the international defense market being fierce, offset provides the actors with another tool for competition, but it certainly comes with a price.

The annual worldwide turnover of offset obligations is 230 billion SEK and it is estimated to grow with 42% until 2016. This is a strong argument for examing the offset issue closer. (Avascent, 2012)

The effects of offset on national economy, industries and local development have been extensively discussed in economics literature (see e.g. Eliasson 2010; Brauer & Dunne, 2011) and in governmental reviews (see e.g. Committee of Review of Australian Offsets, 1985; Riksrevisionsverket, 1994; GAO; 1996, 1998, 2004). Offset has also been studied as a management genre e.g. for large systems (Ahlström, 2000). It is, however, only vaguely studied on an organizational, group and individual level. The intent of this study is to further contribute to the levels of analysis connected to how firms manage offset through a case study on Saab.

Saab is a Swedish company active on the defense and civil security market. Saab is an export intensive company with 63 % of its sales being abroad in 2011. The primary markets today are Europe, South Africa, Australia and the US and they all utilize offset to various extend. All Saab's military products and services are sold only directly to governments in accordance with Swedish law. Therefore Saab is engaged in several offset arrangements around the world.

Poor managing of offset activities can ultimately damage a defense firms brand and result in heavy fines. Offset is not Saab's core business but it is a necessity for international sales and consequently it needs to be managed in an efficient manner. As of today, offset is believed to affect several parts of the organization. Even though Saab has been successful in its offset handling so far, Saab stress that it can be improved and wants to know how. This study shows that management theory can be applied to structure the complex connections and impacts that offset form.

The purpose of this thesis is to analyze how offset affects Saab and map the present offset process. It is also to develop suggestions for an improved offset process in order to minimize negative effects of offset on Saab's core business.

The following research questions are derived to fulfill the purpose:

RQ1. How does offset affect Saab?

RQ2. How can the offset process at Saab be described?

RQ3. What are the most critical aspects of offset at Saab and how can they be managed?

The thesis is conducted at the Business Area (BA) Electronic Defense systems (EDS) in the purchase department and at the corporate function Industrial Co-operation (IC). Data is also collected from other Business Areas at Saab in order to improve corporate applicability.

For research question one, offset is considered as a whole i.e. including indirect-, semi-direct and direct offset in order to assess how it affects Saab. Research question 2 and 3, focus is only on semi-direct and direct offset which is handled by Saab's various business areas. This delimitation is motivated via the indirect offset being handled by IC and to a large extend separated from the business areas.

The structure of the thesis is as follows:

Saab: The purpose of the chapter is to give the reader an understanding of in which context the offset phenomenon is studied.

Theoretical framework and empirical phenomenon: In this chapter offset is presented, defined and explained. After that, the current offset management literature is reviewed. Ending the chapter is a presentation of a set of management tools for external and internal analysis of companies and industries.

Execution and Methodology: Here the research questions are elaborated upon and the research design and strategy is presented. The data collection methods are described. Rounding of the chapter is a discussion of the validity of the study and its results.

Empirical Findings: In this chapter the most important findings are presented. It starts with an external analysis of how offset affects the company. After this, the offset process is presented. Focus is then shifted towards procurements involvement in the offset process. Ending the chapter, a set of factors that affect the "easiness" of performing efficient offset management are mapped and explained.

Analysis – How should offset be managed at Saab? : The empirical findings are analyzed with the use of the theoretical framework.

Discussion: The entire thesis is discussed, as a whole and part by part. Aspects related to the study, that have not already been elaborated upon in the *Empirical findings* or *Analysis* are also discussed. Furthermore, feasibility of the suggestions is also discussed.

Conclusion: The answers to the research questions are summarized.

2 Saab

This chapter gives a short description of the studied company, Saab. The purpose chapter is also to give the reader an understanding of the context in which the offset phenomenon has been studied.

2.1 The history of Saab

In 1937, on the brink of World War II, Saab was founded with the intention to build up an independent airplane industry in Sweden. Some of the early initiators were Wallenberg who were starting to build their corporate empire. The name stands for Svenska Aeroplan AB (translated: Swedish Airplanes Limited) (Ny Teknik, 2012). Two years later Saab acquired the competitor ASJA and the military airplane construction was now consolidated in Sweden (Gunston, 2006). After World War II the military expenditure slowed down in Sweden. In a response, Saab diversified into car manufacturing (Nationalencyklopedin, 1999; Ny Teknik, 2012). The first car rolled off the production line in 1949 (Reuters, 2012). At this time, the Cold war had begun (Ball, 2009).

Sweden's official policy throughout the Cold War remained neutral (SOU, 2002). One implication of this was that the domestic defense industry was deemed to be crucial in order to avoid being dependent on another nations for arms. Sweden exports arms to be able to finance the defense industry (SOU, 2002).

For Saab this meant large orders from the Swedish Air Force. Notable products were the Draken and Viggen. Both of these were produced in great numbers. For a period during the Cold War Sweden maintained the fourth largest air force in the world (The Baltic Initiative and Network, n.d.).

In 1990 Saab sold the car company Saab. Hereafter the car company and defense group remained two different companies even though they shared the same brand and logo.

On the product side, one major event was the introduction of a fourth generation fighter, the Saab 39 Gripen. It became fully operational 1993 (Saab, 2012a). The Gripen has so far been exported to five countries (Saab, 2012b).

In 2000 Saab bought Celsius who owned Bofors and in 2006 Saab bought Ericsson Microwave Systems, which is now called Electronic Defense Systems. These are examples of Saab's strategy of growth through acquisitions. Up till 5 years ago the general management philosophy was laissez-faire (interview: 3 – Saab, 2012). Since then, Saab has restructured its organization to become one unified company with 5 main BA's.

Sweden's defense expenditure has steadily gone down since 1990 (SIPRI, 2012). This has forced Saab to rely more and more on export. This decrease of order value from Saabs main customer (Sweden) has significantly increased the importance of offset for Saab.

2.2 Key economic facts

Saab is a comparatively large firm in Sweden with 13 000 employees and an annual turnover of $3.5 billion (Saab, 2012c). The industry magazine Flight International

(2012) ranks Saab as 33 of the top 100 aerospace companies in the world. Despite this, if compared to the competitors, Saab is a small company. Lockheed Martin, for example, has 123 000 employees and an annual turnover of $46.5 billion (Lockheed Martin, 2012). This makes Saab roughly equal to a subdivision of Lockheed Martin in size. There is a general attitude at Saab that the small size of the company makes it important to achieve high customer satisfaction and to be seen as a reliable player (Interview: 8, 13, 26 and more - Saab, 2012).

Rank 2011	Country	Exported value $million in constant 1990 prices
1.	USA	9984
2.	Russia	7874
3.	France	2437
4.	China	1356
5.	Germany	1206
6.	UK	1070
7.	Italy	1046
8.	Spain	927
9.	Sweden	686
10.	Netherlands	538
	Others	2830
	Total	**29954**

Table 1 - Top ten Arms exporters. Figures are SIPRI Trend Indicator Values (TIVs) expressed in US$ m. at constant (1990) prices (SIPRI, 2012)

According to Saab, 63% of sales are to customers outside Sweden. This means that in over half of the sales made, offset could become a requirement. Furthermore, table 1 shows that Sweden is one of the top ten arms exporters according to SIPRI (2012). It should also be noted that last year (2011) Sweden was the largest exporter of arms per capita in the world.

Year 2011 **Business Area**	Aeronautics	Dynamics	Electronic Defense Systems	Security and Defense Systems	Support and Services
Sales (Billion SEK)	6,351	4,335	4,561	5,704	3,428
Adjusted operating margin (%)	5,2	11,2	6,5	6,9	12,4
Share of sales (%)	25	17	18	22	14
Employees	2 748	1 475	2 557	2 994	1 742

Table 2 - The overall economic situation and the different Business Areas contribution and margin (Saab AB Annual report 2011 (2012).

The margin for Saab has ranged from 7-11 % during the last 7 years (Saab, 2012c). In 2011 Saab had an operating margin of 12,5 %. This can be compared to the rest of the industry, which had a margin of 7,2 (Yahoo Finance, 2012). Furthermore, R&D as a percentage of sales is 20 % for Saab (Military Technology, 2012). This can be compared to the rest of industry which is 4.8% (Schilling, 2010). More important figures can be seen in Table 2 above.

2.3 Organization

Saab is organized in five different Business Areas (BA) which all have a profit and loss responsibility. The BA's are organized as matrix organizations. There are however variations between them, ranging from almost functional to pure matrix organizations. The purchasing departments are primarily a part of the line organization.

The BA's have their own product portfolio and are all specialized in their field. Table 3 is an organizational chart over Saab with the different BA's listed.

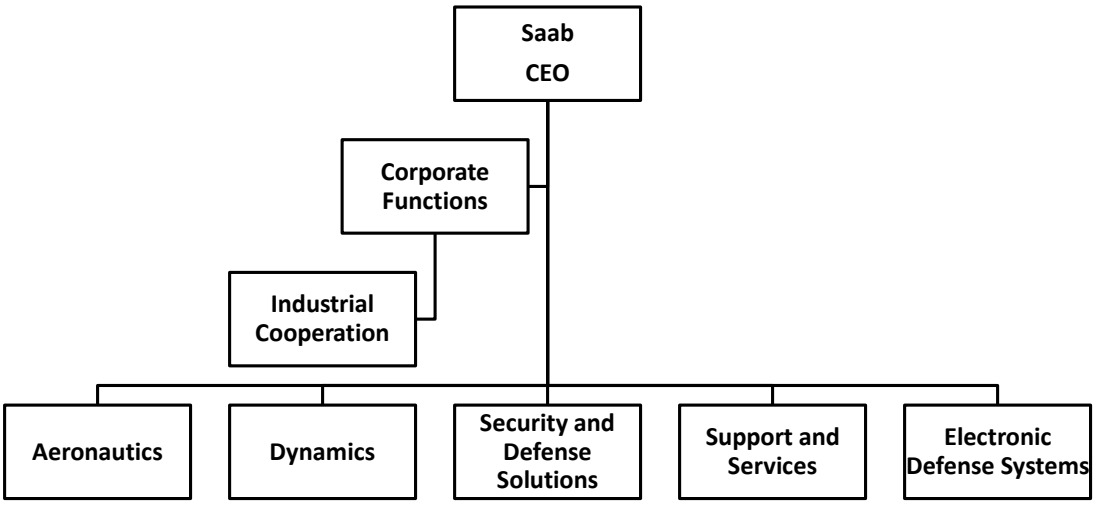

Table 3 - Saab's organization

Apart from the BA's there are corporate functions such as: human resources, legal and finance. A corporate function of special importance to offset is IC, see table 3. They have the overall responsibility to coordinate offset activities within the whole of Saab. They are, however, not responsible for generating the *direct offset* credits. This is the BA's responsibility. Their tasks in the organization are stated as: "*Manage Saabs risk exposure generated from offset by the implementation of offset programs that are in accordance with obligations connected to secured contracts*" and "*Increase the Saab group's profitability by cost efficient implementation of offset- and IC programs*".

2.4 Market and products

The market that Saab is acting in is usually classified as the aerospace and defense market (A&D market). In this section a few characteristics of this market are presented, as well as Saab's part in the market today.

The A&D market is special in the way that it is closely connected to security and defense policies in the countries involved. A country may wish to have an independent defense industry in the case of a crisis or war, when supplies of foreign arms may be restricted. Notably, this was the case when Saab was founded in Sweden. At this market, the domestic manufactures are often supported by the governments which askew the power balance in competition for contracts.

The A&D market is ranked at 4th place in the industrial goods sector based on the market cap by Yahoo Finance (2012). (Note, this ranking does not include big conglomerates that could be a part of the A&D market.)

Growth in the A&D market is low, it might even have stagnated (SIPRI, 2012). According to the Q2 Saab interim report (2012e) this is very much the case, although it varies by region, see figure 4 below. For instance the spending in real terms decreases in Central Europe and the US but increases in Africa, Asia, Eastern Europe and the Middle East. It should be noted that Saab's most important markets today are Europe, South Africa, Australia and the US (Saab, 2012d).

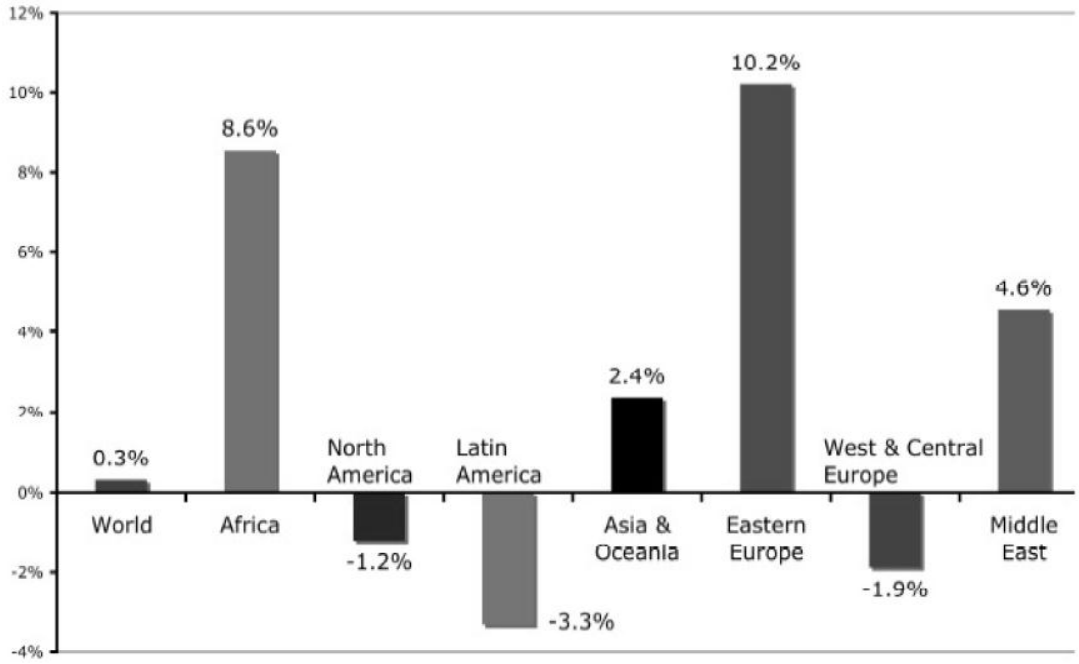

Table 4 - Changes in military spending by region

This could further be supported with a report by McKinsey (2012) who points out that in just 13 years the developing markets will be almost on par with the developed markets in terms of private consumption. Even though private consumption is far from the A&D market this would imply that the country is getting richer and hence more willing to invest in its defense.

Due to the inherent nature of the products, there are usually strict regulations on what can be exported to other nations. Sweden has in comparison to other countries strict regulations for this (ISP, 2012). This limits the total market that Saab can sell their products to. Permission by the Swedish ISP is required for all exports and also all offers made to potential customers.

The development of the products Saab offers was traditionally paid for by the Swedish armed forces procurement agency, FMV. Products that were later exported were all existing products that had already been sold to the Swedish armed forces. However, in recent years, this has started to change, as governments want to buy the latest and cheapest systems on the market. This means that more and more R&D has to be financed by the industry itself (Saab, 2012c).

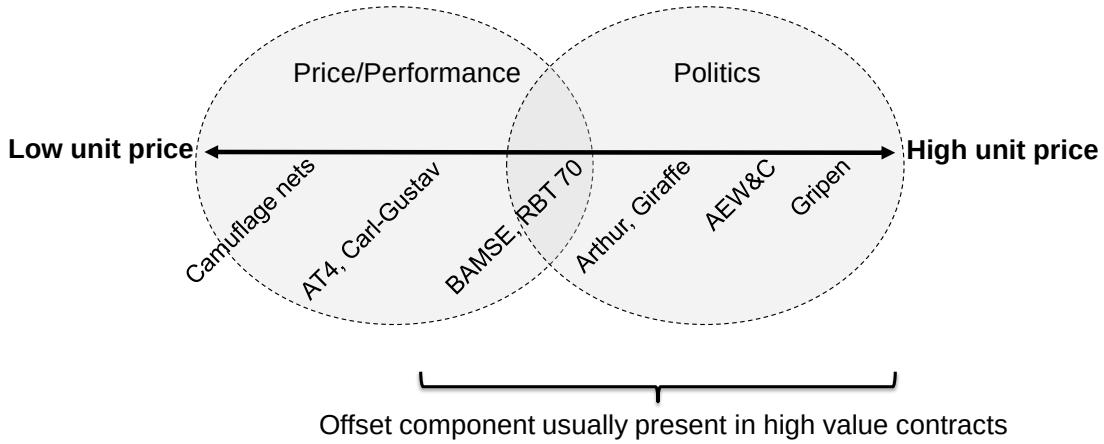

Figure 1 - Classification of products and services, relative importance of factors for buyers

Saab manufactures and sells a variety of products as can be seen in figure 1. Weapons and military systems can be segmented depending on how complex and expensive they are. The costlier a product, the higher up the decision is taken. For a fighter jet such as Gripen, this means that the decision is normally taken by the government, sometimes even with a general poll taking place. (Defense Industry Daily, 2012) On the other hand, the recoilless rifle Carl-Gustaf can usually be purchased directly by the military.

Figure 2 - Top: Camouflage, AT4 and Robot 15, Bottom: Arthur, AEW&C (Erieye) and Gripen

The following is a short description of some of Saab's products as seen in figure 2:

- Camouflage nets and suits are used for making military units less detectable. Saab offers a range of these products, both for ground personal use and for vehicles.
- The AT4 and Carl-Gustaf are two types of recoilless anti-tank and anti-personnel weapons. They can be carried and operated by a single person. They are two of the most common anti-tank weapons in the world.

- RBS 15 is a heavy missile initially intended to be used as one of the main weapon systems on ships but have been developed into land based and air based versions as well.
- Arthur is a radar system specialized in detecting incoming artillery fire, missiles and rockets. It tracks the projectile in the air and then computes both where it came from and where it will land. This information is relayed to a friendly artillery battery that can fire at the enemy artillery or rocket launchers. In ideal cases it can also signal to friendly units who are at risk of being bombarded to duck for cover.
- An airborne early warning and control system AEW&C is made up of two parts. First there is an aircraft carrying a powerful radar. The information is then relayed to the ground where it is analyzed and sent to fighter aircraft. Saab's Erieye system can detect objects up to a range of 450 km.
- The Gripen is a multirole fighter aircraft capable of interception, attack and reconnaissance. It was developed during the 1980's and has since been heavily upgraded. It has been sold to four countries apart from Sweden.

3 The offset phenomenon and theoretical framework

This chapter presents and explains offset as an empirical phenomenon. After this, literature on offset management for companies is reviewed. Furthermore a set of selected theories and frameworks are presented that are later used for analyzing the findings.

3.1 Offset – What is it?

This section introduces the offset phenomenon and its characteristics based on literature, and findings from Saab. This multisource compilation made by the authors constitutes a new contribution to the offset field.

First, the development of offset through history and the rationale behind it are presented then the offset is defined by the authours. After this, the offset terminology is described and elaborated on. Here, important parts of the offset in defense trades are also presented. Where and how these parts become important for firms delivering offset will be further discussed in later sections of this report.

3.1.1 The origins of offset

Barter and other forms of traditional countertrade have been around for a long time. *Offset*, on the other hand, is a type of countertrade that only developed into its modern form in the 1970's. According to Ahlström (2000) a few trend-setting agreements where made in the defense industry during the mid-70's. In 1975, Australia and a group of European countries bought F-16's from US firms and General Dynamics (US) sold F-5's to Switzerland in 1976. These deals included a commitment from the seller to improve exports and local industry (even guaranteed by the US government). They also included demands that local industry participated in the bought systems. These two commitments are what later became known as *indirect offset* (unrelated to the system sold and the defense industry) and *direct offset* (related to the system sold). A third term for offset was also introduced later, namely *semi-direct offset* (related to the defense industry but not to the system sold). It was with these agreements that offset as a concept was born. Since then, most large value defense trades have involved offset.

Offset agreements are always associated to a system or product sold and could be compared to, for example, integrated logistic supports (ILS) agreements or repair and support contracts (Interview: 7 - Saab, 2012). In this sense, offset is always an addition to a sold product or system. In practice, offset agreements contain the activities that go beyond the off-the-shelf specifications of a product or service for example, local production, transfer of technology and increased exports (Eriksson et al. 2007; Ahlström, 2000).

Offset arrangements also often involve different forms of traditional countertrade, which is mainly seen as a tool for fulfilling indirect offset. Traditional countertrade can be defined as a collective word for buy-back, barter, counter-purchase and similar

activities. Buy-back is when a firm is paid with what the buyers produce for what they buy from the firm. Barter is when the buyer pays with goods or services instead of money. Counter-purchase is when the seller is obliged to buy products from the buyers' country for equal or similar value. Nowadays, buy-back and barter is seldom used in offset arrangements. Counter-purchase on the other hand still constitutes an essential part of offset arrangements.

Even though offset utilizes forms of traditional countertrade in its execution, one can differentiate between the traditional forms of countertrade and offset, through the rationale behind them. Countertrade usually have a short term "financial" purpose, while the offset arrangements often have a more long term "industrial" purpose (Ahlström, 2000). Offset arrangements are also motivated by national security reasons for the buying country. That is, the buyer does not want to be dependent on the selling country in the event of a war or risk national security due to political disputes. The, buyer, therefore, wants to be able to maintain and repair the equipment. The buyer also wants to be able to produce and develop new equipment in order to improve their independence.

Beside offset being motivated from a national security standpoint, the local participation can benefit many stakeholders. For instance, offset arrangements are often used by politicians as a tool to 'convince voters of the value of a large investment. It also works in reverse where promoting the benefits for the local industry, which could enhance the sellers' position in an arms trade.

The concept of offset also spread into other governmental procurements and also into the civil sector. Examples of civil offset are during large infrastructure investments such as telecom or the power generation industry. Ahlström (2000) states that at times, some countries even required offset in all international procurements, for example, Israel and Austria in the 80's and 90's. For these civil offsets, the circumstances are similar to what that in defense; the buyer wants to be able to maintain and handle the system purchased. Hence, local industry participation (direct offset) is often required.

Over time, governments have found that the arrangements have not always been successful and not as beneficial for the country as initially intended (Riksrevisionsverket, 1994; Committee of Review of Australian Offsets, 1985). Because of this, offset arrangements have become more sophisticated over time. However, as of today, there exists no international standard for what offset is and how it should be handled. Essentially every country has unique offset requirements, offset legislation and intentions with offset. There is, however, a clear trend towards increased complexity with longer strategic purposes and more rigorous control of the implementation (Deloitte, 2012; Avascent, 2012; Workshop held at Saab, 2012).

Normally, companies are reluctant to use the term offset, but are happy to discuss offset under the headings of *Industrial Participation, industrial cooperation* or *Business Value Development* (Ahlström 2000). For instance, Saab prefers to call offset *Industrial Co-operation* as well as *offset* depending on situation.

3.1.2 Definition, terminology and cornerstones of the offset phenomenon

The definition and terminology of offset vary through the literature (e.g. Ahlström, 2000; Eriksson et al, 2010; Brauer and Dunne, 2011). There also exist several definitions from different government agencies, international collaborations and trade

associations (see e.g. the European Defense Agency (EDA) and the U.S. Bureau of Industry and Security (BIS)). Based on these, a working definition of offset was developed by the authors and read as follows:

Offset constitute a range of industrial compensation activities often required in international governmental procurements of large technical systems. The activities involve generation of business value in the buying country and/or transfer of resources back to the buying country from the seller. These activities are usually, but not necessary, for the use, handling and immediate maintenance of the technical system procured.

The offset arrangements are, in general, stipulated in a separate contract to the defense contract. This contract specifies the offset package, through deliverables, preferred activities, time table and multipliers (if used) (Eriksson et al, 2007). These agreements are often under negotiation for a long period of time, from well before an actual contract to beyond the finished delivery of the sold products or services (Interview: 26 at Saab, 2012).

Offset can be divided into three main types (indirect, semi-direct and direct) with several sub-categories each. It is important to notice that the different types of activities are considered part of a particular offset type depending on the setting. Hence, the same type of activity can be used for more than one type of offset (Eriksson et al, 2007).

Normally offset has a long-term purpose; for example, to foster selected industries or support development of certain regions in the buyer country. Offset also has elements of traditional countertrade imbedded (Ahlström 2000). These countertrade parts of offset often have a more short-term financial purpose.

Direct offset is defined as activities that are directly related to the defense products or services sold (Eriksson, 2010). It should be noted that there is a disagreement as to whether the activities should or should not be strictly limited to being only product related (Ahlström, 2000). In this study, direct offset is narrowly defined, that is, only activities directly related to the defense items or services that are sold.

Direct offset normally encompass activities that enhance the buyers ability to be independent of the seller (i.e. for national security reasons). It can also involve intentions of promoting particular domestic industries or competences. Therefore all direct offset activities conducted by the seller (fulfiller) constitute various elements of local content. Examples of this are licensed production, local assembly or procurement of materials from the buyer country. Some activities involve different kinds of transfer of technology (ToT) from the seller to the buying country (i.e. knowhow, training and various education packages) (Eriksson et al, 2007).

A common approach to fulfilling direct offset is through setting up joint ventures, use of subcontractors, domestic sourcing (Interviews Saab, 2012), create subsidiaries' in the buyer country or having a local company as prime contractor for the arms trade(Ahlström, 2000).

Semi-direct offset is used for the activities being related to the defense industry in the buyer country but not to the defense products or services sold (Eriksson et al, 2007). Semi-direct offset is often conducted in the same way and with the same intentions as direct offset.

Indirect offset are activities that are not related to the defense industry in the buyer country and not related to the defense items or services sold (Eriksson, 2010). Indirect offset is often aimed at generating jobs or promoting a particular industry or competence in the buying country. Activities that are considered indirect, include purchases (non-defense), local investments, international marketing and exporting assistance, transfer of technology, co-production (civil), venture capital, joint ventures and more.

Examples of indirect offset could be financing the building of a new hospital, assisting a government with the purchase of an icebreaker, promoting tourism or connecting local firms to the international market.

3.1.3 Offset as a component of an arms trade

The evaluation of a tender for an arms trade is normally balanced between different components: a technical, a commercial and an offset component (Ahlström, 2000; Interview: 17 - Saab, 2012). The higher the value of a contract, the more important offset becomes in the tendering process, according to interview 17 at Saab (2012) and Avascent (2012). Furthermore, the high value arms trades are nearly always dependent on a business network and surrounded by a political sphere (Ahlström, 2000), see figure 3.

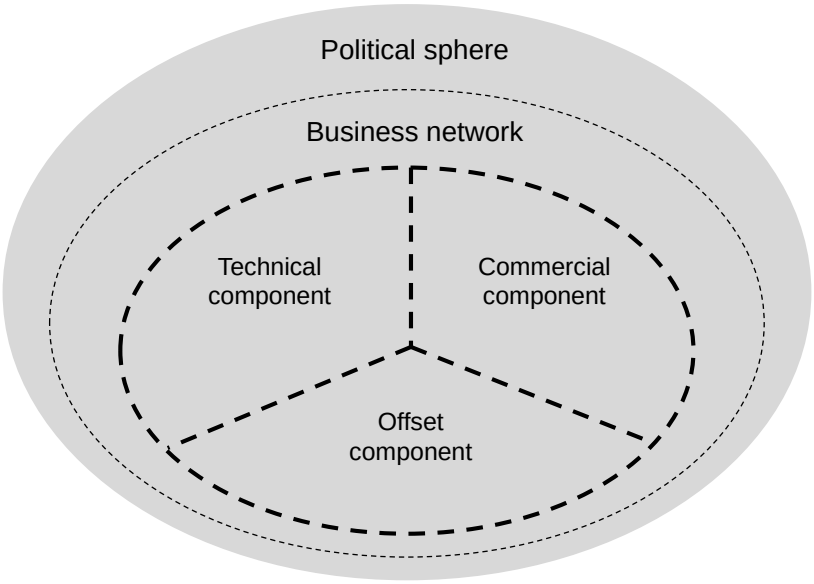

Figure 3 – Offset as a component in an arms trade, adapted from Ahlström (2000) p. 52

In the tender process there are different ways of considering offset (Eriksson et al, 2007). One is to utilize offset as an award criteria, that is, offset stands for one of the parameters in the bid. Here, offset is normally measured against price and performance in terms of economic advantage. Another way to consider offset is as a condition for participation, in that either failing to include or fulfilling certain criteria with the offset bid can disqualify the bid. Some countries accept offset without it being either of the two.

3.1.4 The value of offset, offset credits and multipliers, banking of credits

The offset contract is linked to the main contract through stating that the offset contract should be a certain percentage of the main contract, usually 100 % or more. This, however, is measured in offset credits, which normally differ from the actual value of an activity or transaction. What determines the credit value for a particular activity is stipulated through the use of multipliers. (Eriksson et al, 2007) points out that an offset commitment of 56 % could be the same as a commitment of 267 % in real terms because of the multipliers.

Through the use of multipliers, the buyer can steer the offset tenders and thus the future activities by a fulfiller. For example, if the buyer values high technology it may state that an investment in high tech in its country by the fulfiller should be multiplied with 10. Thus, a 1M SEK investment can be claimed as 10M SEK in offset credits. Multipliers are normally provided by the buyer, but can be negotiated. How they are designed and what values they have are crucial for an offset agreement to be attractive for the seller (Interview: 16 Saab, 2012).

The value of the multiplier is often decided by the level of the technology. Low tech products, such as metal works and mechanical components, often award low multipliers. High tech products or technological transfer usually award high multipliers. There could also be other factors directing multiplier values, such as political agendas in the buying country (Interview: 11, 13, 25 - Saab, 2012). For instance, country X had an outspoken wish to become more environmentally friendly. Therefore, offset offers with a large portion of green initiatives where favored in the bidding and granted premium multipliers (workshop held at Saab, 2012).

In the event of the seller wanting to do investments before a contract is signed (or between contracts), buyers normally allow *credit banking*. With credit banking, sellers are allowed to store offset credits which potentially could be part of fulfilling a future offset obligation. These pre-contract activities are motivated by several reasons. It could be a requirement to have a local presence to be allowed to participate in the bidding of the contract. The seller could want to be proactive and scan the country for potential partners, suppliers and subcontractors and so on. The local investments can also be seen as a sign of commitment which could enhance a seller's position in the negotiations. However, credit banking can also affect the seller's position negatively; if a seller has made investments "free of charge", why select that seller and not another that can deliver even more?

Depending on the buying country's legislation, offset can involve the engagement of a seller's business network in order to fulfill an offset obligation. The following is an example from Saab's official webpage for when banking is used as well as the importance for a wide business network for the fulfillment of offset. It also exemplifies an indirect offset activity.

"In Hungary, for instance, Saab and other Swedish companies in the Saab network made large offset investments. Even years before Hungary signed up for its new Gripen fighters. One of the companies was Electrolux who made Hungary a production hub for Europe, resulting in thousands of new jobs and increased export revenues." (Saab, 2012b)

3.1.5 Incentives for fulfilling offset obligations and consequences of failing

In most cases penalties are used if suppliers do not fulfill their offset obligations within the timeframe allotted by the agreement. One approach is that the failing supplier has to pay a percentage of the unfulfilled offset activities. The percentages differ widely, but 10 % is a good reference (EDA, 2011; Interview: 23 - Saab, 2012).

Another form of penalty in cases of failed fulfillment is to extend the term and increase the volume of the obligation. Some countries utilize a mix of the two, with both an increased offset obligation and a financial penalty.

Instead of penalties there can be "best efforts" clauses, meaning that the incentive to fulfill offset obligations is reputation-based (Eriksson et al, 2007). What is meant by "best effort" varies. For example, for some countries this means that the effort goes as far as the brink of bankruptcy, while other countries are less demanding (Interview: 2 - Saab, 2012).

One more incentive for fulfilling the offset obligations is the risk of damaging the brand or company image on the international market (Eriksson et al, 2007). For small defense companies, reputation is often believed to be the most important incentive (Interview: 1, 3, 4 Saab, 2012).

One interesting aspect, which could also be seen as an incentive to fulfill the offset obligations, is the link between a defense firm and the image of the origin country. That is, the international business reputation partly reflects upon the contractors believed ability to fulfill offset obligations (Interview: 2 - Saab, 2012). As an example, according to interview 2 at Saab (2012), Sweden has a good international reputation, which is positive for their trustworthiness in the tendering process.

In the end, failing to fulfill ones offset obligations could lead to blacklisting and potential loss of future sales in new countries. On the other hand, satisfactory fulfilled offset obligations can lead to the generation of future sales. It can also create sustained value for the defense contractor. That is, the initiation of a new supplier or entrance to a new market can be beneficial in the long run (Interview: 1, 2 - Saab, 2012).

3.1.6 The bureaucracy behind offset: Additionality, causality and sequence

Not all of the activities that a defense contractor performs in a buyer country are automatically accredited as part of fulfilling an offset obligation (Interview: 31 Saab, 2012). Usually there are requirements of *causality* (i.e. that the activity is a direct consequence of the deal) and *additionality* (i.e. the activity shall add new value to the buying country) (Eriksson et al. 2007; Ahlström, 2000).

The most common way of handling the offset credit validation by buying countries enforces *sequence*. That is, the fulfiller must first inform and get an approval for an activity before initiating the action. Furthermore, if the approved action is later executed, it must be validated by the buying country before the offset credits gets validated (Interview: 6 - Saab, 2012).

As an example, if the arrangement contains demands of procurement of parts for the bought system in the buyer country, the new domestic supplier and the potential purchases must be approved before an actual order is put through. After delivery,

billings together with financial transactions must be provided to the buying country as proof. When the buying country has confirmed these and checked with the supplier, the offset credits are approved. It should also be noted that the government agencies that monitor offset are almost always separated from the agencies that are buying the system.

3.1.7 Offset practices varies from country to country

The intentions with offset vary significantly from country to country according to Avascent (2012): "*Brazil is highly focused on technology transfer, while neighboring Colombia is focused on jobs and developing indigenous industries."* Despite this, there is movement towards unification between offset policies and development objectives.

The type of offset required by a country is normally linked to economic development. Based on this, the countries can be roughly divided into three types: Non-developed, Developing and Developed countries. Non-developed countries want indirect offset (e.g. increased export and creation of new jobs). The developing countries want a balance of indirect and direct offset (e.g. transfer of technology, training and increased export). The developed countries are the most sophisticated and want mostly direct offset (e.g. transfer of technology and local production of the bought system(s)).

3.1.8 The offset market today and tomorrow

The size of the offset market is estimated to 230 billion SEK each year (Avascent, 2012). The value is the size of the obligations in offset credits that companies are required to carry out. This value has been fairly constant the last three years.

Since US is the biggest arms exporter, US firms are the ones most involved in offset activities. But Swedish firms are also subjected to offset obligations and Saab is one of these. Other companies in Sweden who may need to engage in offset activities are ABB, BAE Hägglunds, BAE Bofors, Ericsson and Vattenfall.

There are two main trends appearing in the offset field. In emerging markets, offset is becoming more frequently applied (Deloitte 2012). Furthermore, these emerging markets have begun to develop increasingly complex and rigorous rules for engaging in offset. They have also begun to enforce old rules in a stricter way than previously (Avascent 2012; CTO, 2012a; CTO 2012b; Interview: 3 - Saab, 2012).

In Europe, the EU is attempting to reduce offset through regulation (Ericsson et. al., 2007). A new rule, article 346, limits the amount of offset to 100% of the arms deal (European Commission, 2009). This rule also stipulates that there must not be any indirect offset. There has been much discussion as to whether this will have any effect, since member states can still require offset due to of national security interests (CTO, 2012c).

In all markets, steps have been taken to reduce the risk of corruption that has often been associated with offset practices in the past. Less involvement of middle men and consultants and less use of indirect offset are two key actions to increase transparency.

Defense companies are divided as to whether offset is good for them or not. On the one hand, there is a cost involved, while on the other, it can be used as a marketing tool. The developing countries usually see offset as a positive phenomenon, used to increase wealth and knowledge. (Ahlström, 2000, Interview: 2, 11 – Saab, 2012).

3.2 Management regarding offset

A recent study from Avascent, a management consultancy firm specialized in the A&D market, highlights some of the issues that A&D companies are experiencing because of offset. They first analyze recent changes in offset regulations and the effects it will have on the A&D industry. A short summary is that increasing numbers of countries are actively pursuing offset. Countries are also becoming stricter in their follow-up of the implementation of offset projects. On the other hand, A&D companies are not well suited or prepared for handling offset projects.

Avascent summarize their recommendation in six statements (Avascent, 2012):

1. *Develop an offset strategy for global, regional and country-specific sales strategies; take a proactive (vice reactive) approach.*

2. *Create metrics for offset performance and focus on developing internal capacity for efficiently discharging offset obligations globally; the offset strategy should guide areas of internal capacity development.*

3. *Educate internal stakeholders early on offsets and the benefits of a successful and proactive strategy as part of the sales capture effort. At the same time, broaden the set of stakeholders involved in offset discussions to include corporate strategy, corporate development, and finance, particularly in strategically important countries.*

4. *Understand your company's offset approach prior to each sale. Integrating offsets into the capture stage will have a major impact on the profitability of a contract after award and can even increase the chance of winning a contract in certain countries.*

5. *Increase the implementation of business fundamentals (financial metrics and planning) when developing offset concepts.*

6. *Become more strategic about partnership. Consider a broader range of partners and create a robust network of partners and advisors. Developing a strategy for offset related partnering is a prudent first step.*

A dissertation by Ahlström (2000) explores the offset component in the total offer on an arms trade. He is mostly concerned with the market part of the offset process and not so much with the actual execution of the projects. The dissertation can be summarized in two parts. First the general insights of offset impact on the buying-selling process and second on the managerial implications that this has.

Offset cannot be regarded separately from the total offer. The buyer uses a big defense order for many purposes and offset is a tool for realizing these purposes. These might be to bolster certain industries in the buying country. Sometimes offset might be the real prize for the buyer and the defense material is seen more as a bonus.

Pre offset activities are sometimes required by the buyer so that the offset process starts before the main deal is finished. It also extends beyond the delivery of the defense material. This means that the time horizon is extended for the project.

The customer consists of several organizations, the end user (military), leadership (politicians) and the industry. This paves the way for very complex stakeholder analysis and interaction between the seller and the buyer.

Offset creates both pros and cons for the seller. Through offset the seller adds an option to customize and differentiate itself from the competition. But it also demands a highly flexible sourcing and production structure.

Ahlström (2000) points to the importance of social exchange and the possible difficulties in cooperating with another culture when transferring technology and outsourcing production.

It is imperative to have a holistic view of the whole deal with so many aspects to consider apart from simply delivering product X and be paid amount Y. Ahlström also argues that it is important to always have a focus on the total revenue to avoid sub optimization. He argues that a consequence to have a separate project team managing the whole offer, including the offset part.

The timing of when to engage in offset activities is paramount, in order to avoid unnecessary activities that do not lead to a deal. Examples of this are the campaigns in both Country X and Country Y for Gripen. In both cases, costly offset activities were started without contract being won. These activities also had long time implications, in promises to local industry that could not be cancelled.

Even if an offset activity is a single commitment with a specified end date, it can have strategic implications. Outsourcing and shifting of suppliers are not easily reversed once the project is finished. This means that a strategic plan, with a long time horizon is needed when engaging in deals involving offset. It is also important for the marketing functions to closely cooperate with the business management, in order to coordinate marketing activities to the overall strategy. This is also much in line with what Avascent suggested 12 years later.

These findings and recommendations will be compared and expand with the findings and facts this thesis has generated.

3.3 Tools for analyzing the importance and the external effects of offset

In order to asses a firm's current market position there are a selection of standard tools available. The most commonly used tool for external analysis of a firm is *Porter's five forces*. Furthermore, for internal analysis, one of the most common is *Porter's value chain* (Schilling, 2010). These analyses are important to perform in order to assess the importance and the effect offset have on Saab. While none of these tools are specialized in offset *per se*, they provide an important context and define in what environment offset is an active component. The models and theories also shed some light on the impact of offset on "standard" practices, which is the effect on supply chain management, industries and companies value chains and so on.

3.3.1 Porter's five forces

In *Competitive Strategy* (1980) Michel Porter presents a set of five forces that defines an industry's structure and how that shapes the nature of competitive interaction within an industry.

"*As different from one another as industries might appear on the surface, the underlying drivers of profitability are the same.*" (Porter, 2008)

In essence, the model intends to help firms find a profitable and sustainable position through analyzing the context of the firm (industry structure). It should be noted that the implicit assumptions are relative stability in technologies, market and competitors (Jacobsson, 2010).

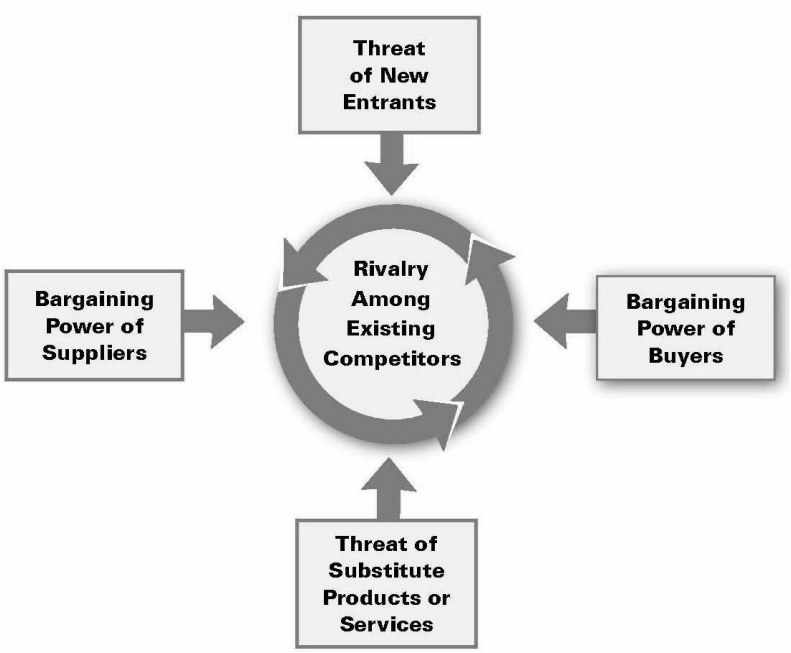

Figure 4 - Porter's five forces that shape industry competition

Porter (2008) argues that managers generally define competition too narrowly, as if it only occurred between a firm's direct competitors. In truth, competition goes far beyond the established industry rivals and should include four more competitive forces as well: suppliers, customers, potential entrants, and substitute products. These forces together makes up Porters five forces, see figure 4. Furthermore, Porter states that not all forces are equal in power and one should be careful of treating them as such (i.e. the model works best if one focuses on the strongest force(s) for the particular industry).

3.3.1.1 **Rivalry among existing competitors**

The competition here takes on many familiar forms, new product introductions, advertising campaigns, price discounting, service improvements and so on. Porter argues that a high degree of rivalry restricts profitability in an industry. Furthermore, the degree that the rivalry reduces profit potential depends firstly on the intensity at which the companies compete and secondly on the basis on which they compete.

Factors that generally increase intensity are:

- The number of actors; a large number of actors of similar size and power corresponds to a highly competitive environment (Porter, 2008). There are however exceptions to this, such as oligopolistic industries (highly consolidated industries with a few large competitors) which could be both fiercely competitive or not, depending on if the rivals compete on the same factors or not (e.g. price) (Schilling, 2010).

- Slow industry growth; which precipitates fight over market share.
- High exit barriers; often occur due to highly specialized assets or management devotion to a particular business. Even though companies may have low earnings or even making a loss, exit barriers keep the companies in the market. Healthy and profitable competitors usually suffer from the "sick ones" hanging on.
- Rivals highly committed to the business with have aspirations to leadership (especially if they have goals that go beyond economic performance in a particular industry). This can occur for several different reasons according to Porter (2008). For example, large companies may enter a specific industry for image reasons (i.e. providing a complete service to its customers). State-owned companies may have goals that involve prestige and employment.

There are several dimensions on which competition can be based. For instance, if the rivals converge to compete on the same dimensions or not, can have a major influence on profitability (Porter 2008). An example where this is recognized and utilized is in *Blue ocean strategy* by Kim & Mauborgne (2004) which aims at avoiding head-on competition. Rivalry could be especially destructive if it focuses solely on price, since sustained price competition trains the customers into wanting to pay less for the product and ignoring other attributes, such as product features and service. Porter states that price competition is most likely to occur if:

- Products or services are almost identical between competitors and that there is few switching cost for buyers.
- Fixed cost is high and marginal costs low.

3.3.1.2 **Threat of new entrants**

New entrants brings more capacity to the industry and a desire to gain market share This puts pressure on prices and costs in the industry which increases the rate of investments necessary to compete. New entrants could include the startup of new companies and spinoffs. However, a common type is diversification of established companies into a new industry. According to Porter (2008), this is particularly worrisome since they can often leverage their current capabilities and compete for market share with more power.

The threat of entry depends on magnitude of the entry barriers and what reaction new entrants could expect from the incumbents in the industry. However, Porter (2008), argues that it is the actual threat of entry that could hold down profitability, regardless of whether it occurs or not. Factors that generally increase entry barriers are: supply-side economics of scale, demand-side benefits of scale (network effects), customer switching costs, large capital requirements, incumbency advantages independent of size, unequal access to distribution channels, restrictive government policy and expected retaliation.

3.3.1.3 **Bargaining power of suppliers**

In general, Porter (2008) states that powerful suppliers could capture more value for themselves through charging higher prices, limiting services or quality, or shifting costs to industry participants. But it could also be the other way around. For instance, when the switching cost for the customer is low, the suppliers have limited freedom to raise their prices.

A supplier group is, according to Porter (2008), powerful if there are: switching costs, suppliers have differentiated products (e.g. relative unique or patented) and there is no substitute for what the suppliers provide. The bargaining power of suppliers is also strengthened if it is more concentrated then the industry it sells to, (i.e. few suppliers and many customers) especially if they supply several different industries., If an industry accounts for a large proportion of a supplier group's profit however, then that industry has the advantage.

3.3.1.4 **Bargaining power of customers**

This is the same as bargaining power of supplier, but the industry is now the supplier (i.e. the buyers capture more value by demanding better quality and service), forcing down prices and playing industry participants against each other. Porter (2008) states that there are distinct groups of customers who differ in bargaining power and they have increased leverage if:

- There are few customers, alternatively if the customers purchases volumes that are large relative to the size of the vendor. This pressure is intensified in industries with large fixed costs.
- The industry's products are standardized and undifferentiated, which often leads to customers leveraging suppliers against each other's.
- Customers can credibly threaten to integrate backwards if their suppliers business is too profitable. (The actual threat has an effect regardless if they diversify or not.)

Another factor affecting bargaining power is if customers are price sensitive. This could be due to the industry representing a large proportion of the procurement budget, the buyers group earning low profits or the quality of the product having little effect on the customers' end product. This generally increases their "shopping around and bargaining hard" activities, according to Porter (2008).

3.3.1.5 **Threat of substitute products or services**

A substitute performs a similar (or even the same) function but through different means. For example, videoconference could substitute travel, plastics can substitute aluminum and so forth. Substitutes limit an industry's profit potential by putting a ceiling on prices. The threat of substitutes is high if: it offers good price-performance trade-off and switching cost are low.

3.3.2 Porter's value chain

Porter argues that the source of a competitive advantage cannot be solely understood from looking at a company as a whole (Barnes, 2001). Therefore, an external analysis of the setting is not enough. In this way, Michael Porter's value chain complements the five forces. The model intends to help companies identify their internal strengths and weaknesses and in the continuation; which strength(s) that could be a source of a competitive advantage (Schilling, 2010).

The value chain disaggregates a firm's activities in order to find a systematic way to examine what is strategically important. By doing so one can understand what drives cost and the behavior of existing and potential sources of differentiation. Porter argues that companies gain a competitive advantage through performing these activities cheaper and more efficiently than their competitors.

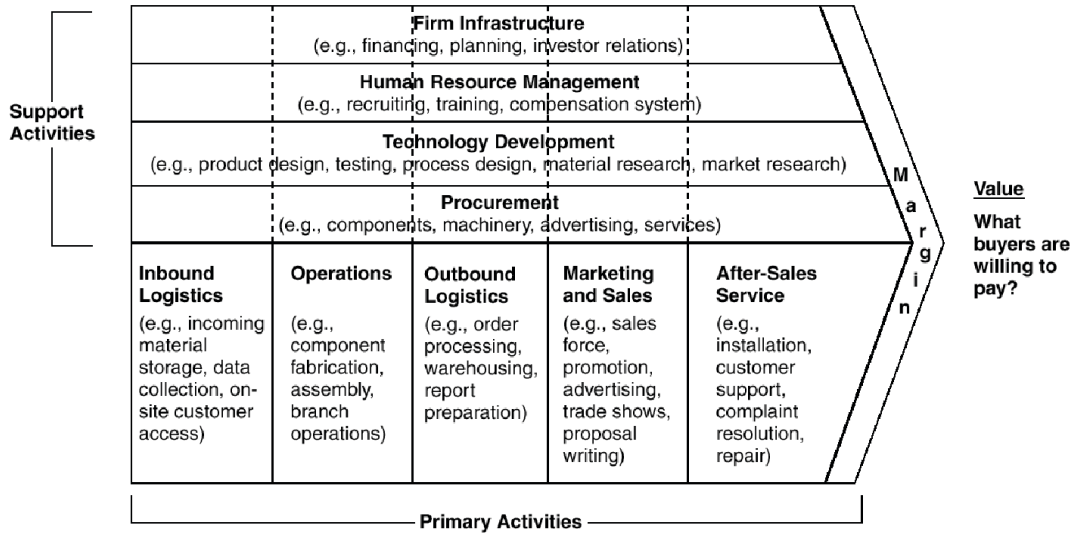

Figure 5 - Michel E. Porter's Value chain (Porter, 1998)

The value chain illustrated in figure 5 displays the total value and consists of margin and value adding activities. Margin is the difference between the total value and the combined cost of performing the value adding activities. The value adding activities are the technically and physically distinct activities that a firm performs. Porter argues that every firm has nine generic categories, which are linked together in characteristics ways (Barnes, 2001). Porter divides these categories into primary and support activities, based on how they contribute to the overall value produced by the firm (see figure 5). However, what are considered support or primary activities can differ from firm to firm and the model should be adapted accordingly (Porter, 1998).

In general the categories of the value chain can be sorted in three main stages:

- The supply process (i.e. inbound logistics, operations, outbound logistics, marketing and sales) and after sales service.
- The transformation process of the input to output (i.e. production, logistics, quality and continuous improvement processes).
- The support services from the firm (i.e. strategic planning, human resource management, technology development and procurement)

Porter states that firms should compare these discrete activities with its competitors. This exposes differences and determines the competitive advantage. Once the strength and weaknesses has been identified, Porter suggests using the knowledge to leverage resources and improve core competencies and capabilities of strategic importance. In the end, it is the value perceived by the buyer that differentiates the firms.

This model contains substantially more, but for the purposes of this thesis, it will be used to show that some activities potentially conflict with what premiers offset. In this notion, leveraging resources towards one objective could create sub optimization against offset and ultimately counteract the original intention.

4 Execution and Methodology

In this chapter, the research design and strategy of the thesis are presented together with the data collection methods. The execution process is also outlined. Validity and repeatability of the findings are discussed at the end of the chapter.

The research questions guided the selection of research design and strategy:

RQ1. How does offset affect Saab?
RQ2. How can the offset process at Saab be described?
RQ3. What are the most critical aspects of offset at Saab and how can they be managed?

RQ2 is answered with an extensive description based primarily on interviews (Bryman & Bell, 2007). RQ1 and RQ3 are answered through a combination of; an extensive description, a comparison of current practices with offset management literature and a set of management connected tools for internal and external analysis. It should be noted that the part of the study related to RQ3 only briefly looks into how to improve one selected area of interest, even though recommendations are given for all critical aspects.

This thesis is primarily a pilot study of offset management. A majority of the effort is devoted to describing what offset is, how it is managed at Saab and gaining a holistic view of the phenomenon. The mass of knowledge resulting from the pilot study provides input for answering RQ2 and identifying the internal company forces related to RQ1. It is also used for selecting aspects of interest for RQ3.

4.1 Case study as research design

A case study research design is selected for this thesis based on the research questions, the complexity of offset and the defense industry at large. Furthermore, Bryman and Bell (2007) support the case study approach as appropriate for studies of an explorative nature.

According to Bryman & Bell (2011), a case study entails a detailed and intensive analysis of a single case. This approach is popular and widely used as a research design in business research (Eisenhardt & Graebner, 2007). In a case study the case is considered an object of interest in its own right and used when the researcher strives to provide an in-depth elucidation of the complexity and the particular nature of the case in question (Bryman & Bell 2011).

A case could be a *single organization, a single location, a person or a single event*. What distinguishes a case study from other research designs is the focus on a bounded system or situation (Bryman & Bell 2011). For this study Saab as an organization is the bounded system and offset the phenomenon of study.

For this thesis, an inductive research approach to the relationship between research and theory is used. For case studies with predominantly qualitative research, this is a common approach (Bryman & Bell 2011).

4.2 Research strategy

The strategy is designed to be independent from the empirical findings. This strategy is determined to be necessary because the research questions require flexibility in

order to handle the exploratory nature of the study. For instance, the unforeseeable outcome from the third research question requires the research strategy to be able to adapt according to the findings. Furthermore, Eisenhardt (1989) stresses the fact that for an unknown subject, it is crucial to retain theoretical flexibility in case study research. It is also beneficial to have multiple investigators, since it fosters divergent perspectives and strengthens grounding.

Below is an overview of the three phases and the research strategy. It should be noted that the two first phases do not have a clear separation. This is to enable a more iterative process.

- Phase 1
    - Literature studies
    - Internal documents
    - Interviews
    - Participant observation
- Phase 2
    - Analysis of the collected data
    - Identification of the most critical aspects
    - Selection of a critical aspect for further studies
    - Evaluation of processes and responsibilities (selected as critical aspects)
    - Workshop
- Phase 3
    - Post Workshop dialogue
    - Communicate results
    - Next steps

The first phase consists of literature studies, open interview, participant observation (attending internal meetings and workshops on related topics) and analyzes of internal documents and processes. The data collection methods are further elaborated on in the next section.

Several arms sales at Saab were also investigated contributing to the internal analysis of how offset affects Saab and for exemplifying the offset process. From these sales, strength, weaknesses and commonness of certain activities were clarified.

Open interviews and attendance at meetings and workshops were used to identify what offset is and how it is managed at Saab. The literature studies were performed in order to introduce the authors into the topic as well as to establish a deeper understanding of previously studies (Bryman & Bell, 2011). The literature studies together with other publications also provided essential input for the external analysis of Saab. According to Eisenhardt (1989), comparing the results to similar literature sharpens the generalizability and comparison of results to conflicting literature builds internal validity. Furthermore, both comparisons raise theoretical level and sharpen construct definitions.

The analysis of internal documents and processes were performed both in phase one and two. Here, the emphasis was on validating what have previously been expressed in interviews with Saab employees.

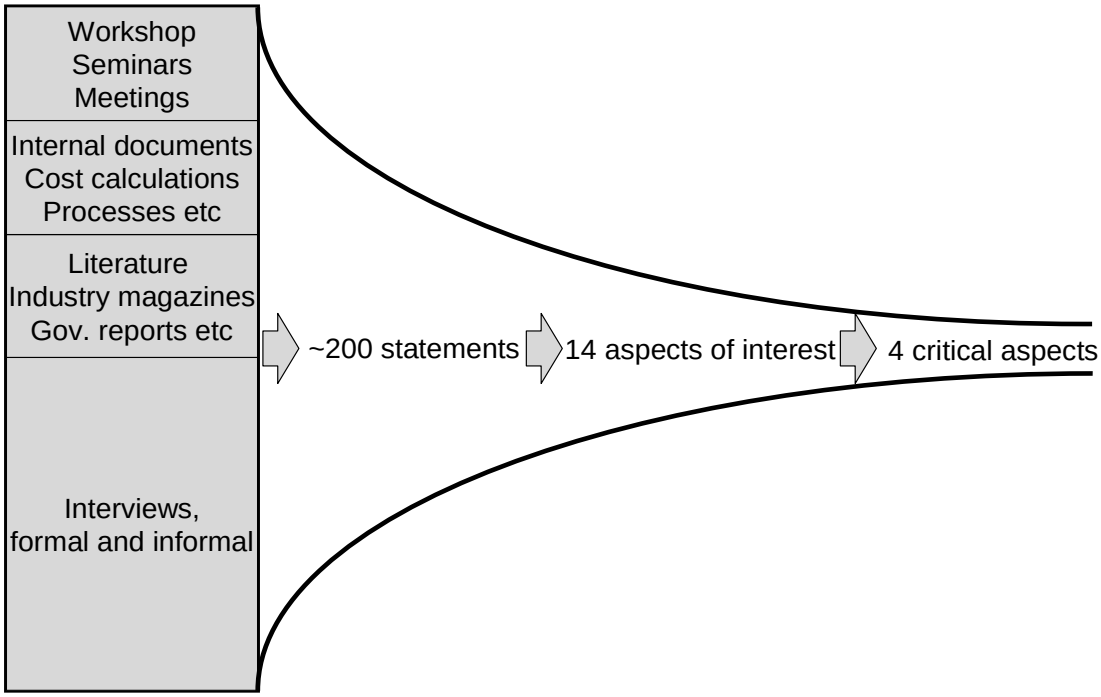

Figure 6 - Process for structuring the data

Interviews and other forms of data collection resulted in a "mass of knowledge" containing roughly 200 statements about aspects of interest and potential improvement areas (see figure 6). At this stage, it was concluded that a satisfactory number of aspects of interest had been identified, that is, new discoveries became marginal (Eisenhardt, 1989). A more narrow selection of focus could now be made. The statements were sorted by the authors, generating 14 clusters of statements with common denominators. These 14 clusters, or aspects of interest, were then grouped again to form the four critical aspects for the third research question.

For the selection process of the "most critical aspects" for research question three, a set of parameters were developed and considered. The aspects deemed most critical were the organizational structure and the changing responsibilities during the offset process. This selection was made because it could be connected to management literature and thereby linked to Saab's ambition to connect the offset issue to academic theories. The availability of data was also an important factor, especially due to the fact that most of the data from interviews where connected to these issues. It was also concluded that more research here would be most beneficial for Saab.

This analysis of the processes and responsibilities outlined interesting discrepancies between the formal and the informal. What was done was not always in line with the internal processes and guidelines stated. This analysis also provided the answer to research question two.

How Saab is affected by offset from external forces is analyzed using Porter's (2008) *five forces*. To further improve the understanding of how external sources affect offset management, a set of factors are identified based on the interviews. The internal analysis of offset management is done mainly with offset management literature. As a set, these external and internal analyses answer the first research question and parts of the second.

A workshop was held in the end of phase two with the intent to validate the findings thus far and develop a deeper understanding of the aspect of interest. This workshop

also aimed at utilizing the competences of Saab employees' in order to develop improvements to the offset process. As it turned out, the workshop was utilized as a tool for improving the internal interaction processes during the fulfillment of an offset obligation. It also generated a method for consolidating offset objectives with long term procurement strategies.

The third and last phase existed of a post workshop dialogue, suggesting next-steps and communicating the results. In the post workshop dialogue the findings, conclusions drawn and the suggested recommendations were communicated back to the original workshop attendees. This was done in order to evaluate the feasibility of the suggested improvements.

With the aspects of offset identified, the intent was to capture those aspects that the thesis did not cover and highlight areas of importance that need improvement. Being a pilot study, a distinct part of the entire thesis has been to formulate the problem(s) rather than the usual thesis procedure where the problem is given beforehand.

4.3 Data collection and analysis

This section describes the data collection methods in detail and how the raw data was structured and analyzed. The collection of data was ongoing throughout the entire thesis. A majority of the data collection was focused in the beginning and middle. This was partly due to the fact that the research initially required a broad approach in order to sift out areas of critical importance but also due to summer holidays restricting access for the later part of the thesis.

4.3.1 Empirical data collected through interviews and analysis

The intention with the interviews was to create an overall picture of the offset phenomenon throughout Saab. Furthermore, it was used as a tool to identify problem areas and to widen the understanding of offset for the authors. Therefore, open and semi-structured interviews where selected as the most appropriate type of interview for this study (Bryman & Bell, 2011).

33 interviews were conducted in one to two hour sessions with the interviewee(s) and the two authors. The majority of the interviews were conducted at the business area of Electronic Defense Systems (EDS) and the corporate function Industrial Co-operation (IC). This was because EDS initiated the thesis and IC coordinates the offset at Saab. It was concluded that EDS could be used as a reference for Saab, as long as the interviews were balanced with other BA's.

The interviewees were all Saab employees and selected carefully in order to obtain representation from all BA's. They were mostly key personnel in the organization affected by, or affecting, the offset process. Other employees were also interviewed in order to capture the general picture and attitude towards offset, especially from the various procurement divisions. During these interviews, the day to day handling of offset and local issues was partly uncovered as well.

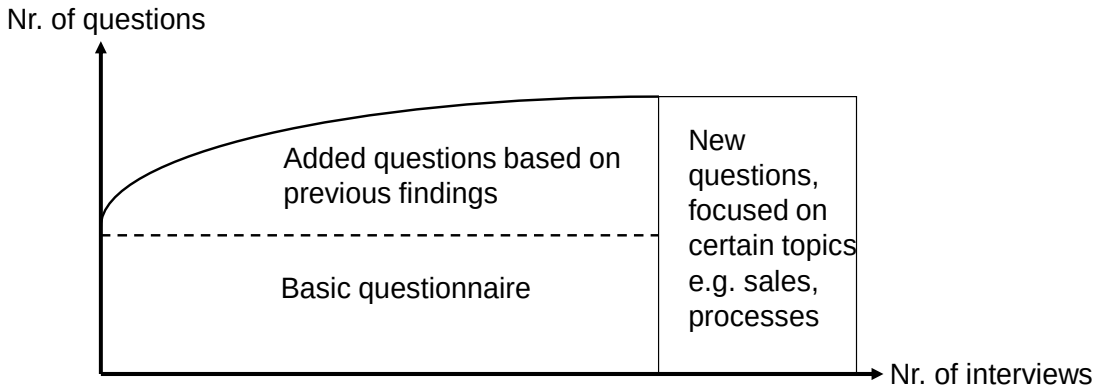

Figure 7 - The interview development process

The initial questionnaire started with a set of topics. It was then continuously extended with questions based on previous findings as the interview progressed (figure 7). After 20 interviews had been conducted, analysis of the results was begun. To further explain interesting topics a set of new questions were created. These were specific to each interviewee in order to attain more information in aspects of interest. During these interviews the researcher's current comprehension of the offset management at Saab were stated and compared to the interviewee's perception. In most cases, the perceptions matched satisfactory. Eisenhardt (1989) states that this overlap in data collection and analysis, speeds up the analysis and reveals helpful adjustments to the data collection.

All interviews were conducted in Swedish, with the exception of three that were held in English. Below is the basic template used by the authors for the open interviews (translated to English). Note that it does not contain finished questions, rather a set of topics the authors wanted the interviewee to talk freely about. According to Bryman and Bell (2007) this is recommended for unstructured (open) interviews, especially when the intent is to discover areas unknown to the authors.

- Present the researchers, the thesis and the intention with the interview
- Questions about the interviewee:
    - Personal history (short)
    - Current position and what it entails
    - Who does the interviewee report to?
    - Who does the interviewee communicate with in daily work
- What is the interviewee's department's task and responsibility in the organization?
- Offset related topics:
    - How does the interviewee work with offset?
    - Where and when in the offset process is the interviewee involved?
    - Which offset projects is the interviewee currently involved in?
    - Who at Saab does the interviewee collaborate with for offset?
    - Does the interviewee have any guidelines for offset?

The questions, or topics, were designed and used for two purposes. First, to ascertain (in general terms) the interviewee's position, work tasks and experience. Bryman and Bell (2007) state this is necessary in order to facilitate proper evaluation of the interviewees answers. Thereafter, the focus was steered towards the offset phenomenon. The intention was to get the interviewee to speak freely about offset. This was deemed critical in order to use the interviews as an explorative tool. Follow-

up questions were continuously used to attain more details and knowledge about topics considered interesting by the researchers during the interview. Bryman and Bell (2007) recommended this approach for open interviews.

Notes were taken during each interview with the permission of the interviewee. Ideally, interviews should be recorded, according to Bryman and Bell (2007). However, Saab deemed this too sensitive for confidentiality reasons. After each interview (or the next day at the latest) the statements or findings from interview notes considered important by the authors were identified and saved into a "mass of knowledge". Data and statements from the interviews were continuously checked against internal documents as well as other interviewees. According to Eisenhardt (1989) this is advisable because looking beyond the initial impressions enables the authors to see evidence through multiple lenses.

The interviewees were sometimes uncertain about the security privileges that the authors had. This was generally solved by seeking data after the interview(s), with approval from an appropriate supervisor. Some data and statements were made available during interviews with the explicit prohibition of further distribution. Although this information cannot be referred to, it has been vital for understanding the inner workings of offset at Saab.

Several informal interviews were also conducted, which involved asking employees questions on specific topics without having a formal interview. Examples were asking employees in the near vicinity if they are aware of, for example, guidelines, certain procedures or attitudes.

4.3.2 Data collected from other internal sources at Saab and analysis

Apart from interviews, several other sources of data were used. The intent of each method varied. By the examination of policy documents, process descriptions, routines and organizational charts, an understanding of the offset management at Saab was formed. This allowed the authors to relate the offset activities to the ordinary business activities. Furthermore, this analysis revealed discrepancies between the formal and informal data (found from interviews).

In order to assess how offset affects Saab, the offset cost estimation process and project cost calculations (from actual sales) were briefly reviewed. This was identified as an improvement area, but was not investigated further.

Another source of data was various internal documents, including everything from minutes of meetings, improvement project proposals, education material, lists and tables. These files provided the authors with an overall picture and contributed to the general knowledge of the offset process.

Participant observation (Bryman and Bell, 2007) through attendance in meetings and seminars were also used for the collection of data. The participation was either active or passive. For some meetings, especially late in the process, the authors were able to discuss and actively contribute to, offset management issues. Eisenhardt (1989) state that this is an opportunistic data collection method and it allows the investigators to take advantage of emergent themes and unique case features.

4.3.3 Offset management workshop

As mention in a precious section, a workshop was arranged and held at EDS at the end of the thesis process. According to the organization *Citizen Participation in Science and Technology* (CIPAST) (2012?) "*The general aim of a workshop method is to prepare an action proposal and to enter into a dialogue with those people who are directly affected by the technology or the technological problem. It is these people who are to play a part in the technological assessment and the preparation of action proposals and, with the help of these players, the workshop method seeks to carry out a closer study of reality and expose barriers*."

At this workshop representatives attended from EDS management, commercial, market & sales, procurement, the secretary of the Category Account Management (CAM) and the process manager from IC. It was identified that these departments were crucial to the offset process. (One can argue that this can be extended with project management, production, R&D and more but it was concluded that this was a suitable delimitation.)

The workshop in the offset process was held in order for Saab representatives to provide input and to create solutions to the problems identified. The aspect focused on in research question 3 and the data collected was used to facilitate the workshop. The findings to that time were presented together with an analysis of offset in current processes and routines. The analysis was limited to the "offset coverage" in the processes connected to an arms trade i.e. where offset is mentioned in the processes.

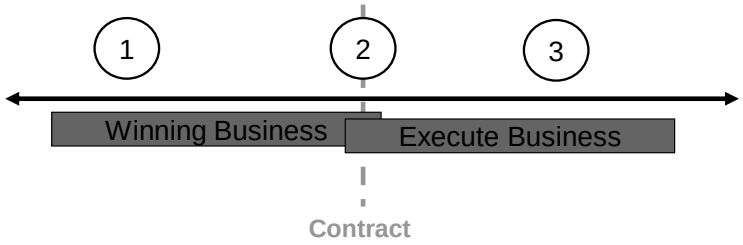

Figure 8 - Simplification of an arms trade used in the workshop

CIPAST (2012?) suggest a workshop procedure with a number of phases: "*generally workshops start with a critical analysis phase based on people's own experiences of the subject. Following this phase, participants are asked to be visionary in seeking possible solutions to the problems. The final phase involves the preparation of an action proposal*."

Based on the analysis of the processes and the responsibilities, the attendees were asked to discuss the interaction between their respective departments during three specific stages in an arms trade (see figure 8). The attendees were asked to state what is done today at each step and then how they would prefer it to be done. If there was a difference between the two, suggestions for improvement were discussed. Directly following the workshop, a meeting was held discussing the link between offset and procurement strategy. As a result from this meeting, a method for how to link offset with CAM work was devised.

4.4 Validity

How well a case study fares with respect to the different aspects of validity (measurement validity, internal validity, external validity, ecological validity, reliability and replicability) mainly depends on how far the researchers feel that these

are appropriate for the evaluation of the research (Bryman & Bell, 2011). Focus for this thesis is on internal validity and reliability.

This thesis data comes primarily from qualitative methods, which Bryman & Bell (2011) state could negatively affect the validity. However, Knights and McCabe (1997) suggest avoiding too great a reliance on a single approach, while and Bryman & Bell (2011) suggest triangulation of results to counteract this. Therefore, this thesis relies primarily on qualitative research from multiple approaches and triangulation is used to ensure high validity. According to Eisenhardt (1989) this triangulation also strengthens the grounding of the theories (conclusions) drawn. For instance, utilizing a large set of interviews allows for patterns to emerge which promotes internal validity. Further promoting the validity of the interviews is the constant checking of statements against other interviewees or sources. As an example of this, in one case, false information was given by an interviewee. Based on the interviewee's current position and length of time in the organization, the authors had no reason to disbelieve the information at the time. However, when this was compared to other interviewees and sources, the statement was concluded to be false and discarded. (It was later explained as a misunderstanding, which supports the conclusion that there are deficiencies in offset knowledge at Saab.)

Findings about offset management have also constantly been compared to literature as well as official views from government agencies and trade associations. This was, however, complicated by the fact that the focus of the thesis has not been extensively researched and relevant literature is scarce. Nevertheless, the literature in this field and the findings of this thesis are in concordance, which arguably promotes the validity of the conclusions drawn. According to Bryman and Bell (2007), the fact that the results from this thesis correspond well to previous studies, promotes reliability and external validity. However, being based primarily on qualitative research, replicability of the results will be an issue.

An important question for Saab has been transferability of the results. Based on the execution of the thesis, with focus primarily on one business area, this is a legitimate concern. It is the authors' view that the aggregated level of analysis, together with the suitable spread of interviews, argues that the recommendations should be partially viable for all business areas. However, more research is required for the findings to be fully transferable. Since the future trends of offset are based primarily on the external analysis, it could be argued that it would have been beneficial to use more models. But in light of the research focus, the authors' believe that one is sufficient.

Another important question is whether the information, and in turn the results, are biased because of the high internal focus at Saab. Ahlström (2000) also discusses this and comes to the conclusion that it is, but only to a reasonable extent. Ahlström (2000) argues that as long as the authors are aware of the potential risk of being biased, towards the Host Company and country, the level of bias by the authors could be kept at a reasonable level. Hopefully, this holds true for this study.

On the topic of bias, the literature sources for the study have been limited, which could affect the results. These sources are mainly various government agencies (such as US, EDA and FOI.), a Swedish dissertation (Ahlström 2000), a number of peer reviewed articles and a set of industry journals. It is clear that the majority of these are written with an agenda (presumably not only for contributing to knowledge of the field). A step towards minimizing the effect of this type of bias has been to critically review each source. As an example, an article from a consultancy firm (Avascent

2012) could contain statements that can be assumed to be angled toward the best interests of the firm itself. In conclusion, it is hard to completely protect the research from this.

5 Empirical findings

This chapter starts with a broad perspective which is narrowed step by step. Furthermore, an outside-in approach is utilized, starting with external forces and then showing how they propagate internally. The dominating part of the offset process is demonstrated with an arms trade, where offset is generated and delivered. After that, other important details in the offset process are described.

5.1 The importance of offset

The following section covers the importance of offset in a competitive environment through identifying external factors and how these affect Saab's potential to successfully deliver offset. In order to be able to asses these factors or forces, Michel Porter's framework *five forces* will be used to both present the findings and to analyze their effects. However, it should be noted that this will be done mostly through an offset perspective. Thus, one of the five powers (threat of substitutes), is not applicable in this context. The empirical data in this section is primarily from interviews but also other sources in order to improve validity.

5.1.1 Rivalry among existing competitors

According to globalEDGE (2011), the A&D industry is highly concentrated. Production in this industry is dominated by a small number of large firms that are able to shape the industry's direction and price levels. As mentioned in the description of Saab, Saab is a relatively small company in the A&D industry. Also as previously mentioned, the A&D industry is closely connected to national security policies and domestic investments in arms manufactures. According to Brauer and Dunne (2011) this connection creates high exit barriers for the industry. This connection also skews the competitive environment in favor of domestic manufactures.

The characteristics and the number of competitors vary depending on which segment of the defense material one refers to, as well as when offset is present in the arms trade (see the chapter *Saab products* (Interview: 8, 20, 31 - Saab, 2012)). There are roughly ten competitors in the fighter aircraft market. In the missile sector there are 23 competitors and in the military electronics sector there are 47 competitors (above the size of 4 billion SEK in annual defense sales) (SIPRI, 2012).

The worldwide expenditure in military equipment has stagnated (SIPRI, 2012). The largest purchaser of military equipment is the US and they are decreasing their spending. Therefore both Deloitte (2012) and Avascent (2012) foresee that US firms will begin to rely more on exports.

Saab considers that on average they are about equal to most of their competitors in terms of price and performance. Saab do, however, stress that they have low running cost for their fighter airplanes, which is also confirmed buy a report from HIS Jane's (2012) (Saab Interim Report, 2012).

5.1.2 Threat of new entrants

The numbers of new entrants in the A&D market is dependent on region. For instance, Japan recently withdrew from the fighter market (SVD, 2012) while some

countries are putting a lot of effort into establishing domestic defense industries. According to a report from Deloitte (2012) some of the new entrants to the A&D market are government founded. Globalization and relaxation of export and import rules for defense equipment can also be a source of new competitors (Interviews Saab, 2012).

Saab (Interviews: 22, 27, 2012) considers that offset, if applied correctly from the buyer's perspective, can promote new entrants and future competitors. For example, in sales to Country X in the late 1980's and early 1990's, offset was required in the form of transfer of technology for a certain set of capabilities. In later sales to the country X, they had built up these capabilities and now wanted to perform that work themselves as well as demanding offset focused on other areas. Hence, what can be offered as offset and what cannot is a delicate question and constantly discussed.

Offset could also provide an entry barrier for small entrants who do not have the resources to perform offset in a foreign country. It is, however, uncertain as to which of these two forces is stronger.

5.1.3 Bargaining power of suppliers

Offset often requires a broad network of partners and a flexibility in the supply chain i.e. strength to switch suppliers from country to country or start up a new production plant. According to interview 11, 12, 13 and 33 at Saab (2012) the suppliers' ability to deliver offset is important.

Saab has extensively outsourced some systems and products, in some cases ranging all the way to development of the product. The cost of switching from a supplier of this type is estimated to be high.

Saab only sells defense material directly to governments and there is strict legislation to control what they are allowed to export and to whom. There are also limitations enforced by international suppliers on where Saab's technology can be exported. This also limits the Saab's freedom in what it can offer in terms of offset.

5.1.4 Bargaining power of customers

The customers are sovereign states, often with large resources. The customer is both the buyer and the legislator in the country. Since major arms deals are done rarely and since the deals are large, competition is fierce.

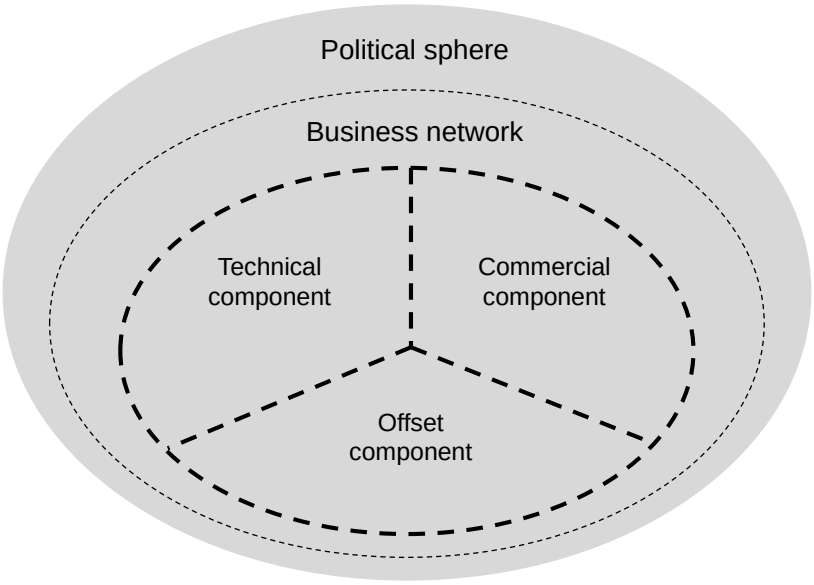

Figure 9 – How offset as component of an arms trade, adapted from Ahlström (2000) p. 52

Apart from the normal considerations regarding price and performance of the product, the customer is also considering national security policies (Interview: 13 - Saab 2012; Brauer and Dunne, 2011). In figure 9, the offset component is also linked to the business network and the political sphere (Ahlström, 2000). For Saab's ability to deliver offset, it is considered vital to have a wide business network and in many cases having a presence in the buying country. This could be done in several ways, for example, with partnerships and strategic suppliers. This adds another layer of complexity and expenses for all companies wanting to sell defense equipment where offset is present (Interview: 8, 13 - Saab, 2012). In some cases, this type of presence is a prerequisite in order to even compete for a contract.

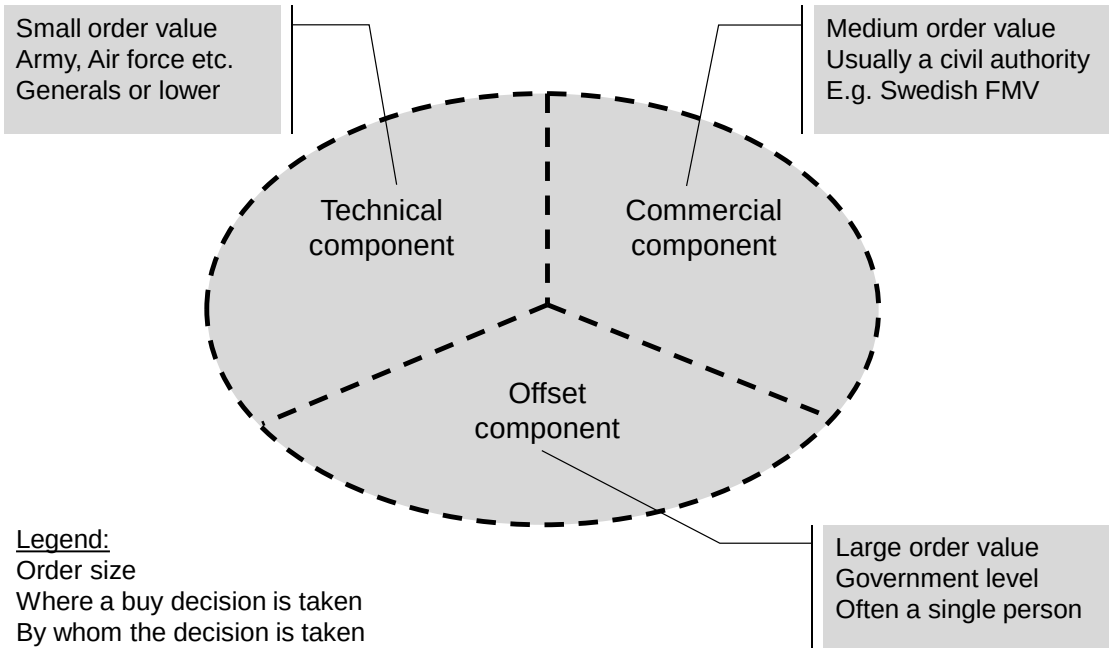

Figure 10 - The offer is usually evaluated in several instances

The figure 10 illustrates the point when the different components of a bid reach importance and where it is evaluated. The different branches of a military normally have the authority to purchase equipment when the order value is small. According to interview 17 at Saab (2012) the customer then puts most weight in the technical specification. As the order value increases, more actors become involved, for instance a government procurement agency (e.g. Swedish FMV). At this stage the commercial aspect becomes important and there is a balance between price and performance. It should be noted that offset sometimes is present at this level, but in these cases the focus is often on gaining more value for their investment. In country X, this was the case for a large purchase of RB70, where the offset was fulfilled simply by adding more RB70 to the offer "free of charge".

For the large value contracts, offset is almost always present and often of critical importance. The stakeholders drastically increase (see figure 10) to include politics, local industries and almost the entire population. Here, the offset component is evaluated and used for several purposes by both seller and buyer.

5.2 Offset at Saab

On the topic of offset, Saab is not unified internally between different business areas and departments (Saab Industrial Co-operation, 2011; Interview: 3, 7, 19, 32 – Saab, 2012). Furthermore there is no clear offset strategy at Saab (Interview: 3 – Saab, 2012). There are however various mission statements such as *"Identify and deliver Industrial Cooperation to further our business and minimize risk due to offset"* from the corporate function Global Markets. Another statement is that *"offset is not part of our core business"*. To conclude, Saab's offset strategy appears to:

- Provide offset if necessary, either because it is mandatory by law or because it is a requisite to win the deal.
- Handle offset projects as cost efficient as possible, minimize risk and negative impact on core business.
- Strive towards offset activities with both short and long term benefits for Saab
- Offset activities shall promote future sales

The attitude towards offset from Saab employees varies, from highly positive to clearly negative. For some, offset is seen as an essential marketing tool and good for business and hence, good for the employee. For others, offset is seen as a burden and some even perceive offset as a threat. They are afraid that offset activities such as ToT can damage Saab in the long term (e.g. through selling core competence). Others were also afraid that offset activities could outsource their jobs to foreign countries. Another frequent opinion among interviewees is that offset is not bad *per se* but rather that the management of offset could be drastically improved.

These perceptions of offset also connect to the level of knowledge about how offset is handled at Saab. The more familiar the interviewees are with the offset process, the less skeptical towards offset they seem to be.

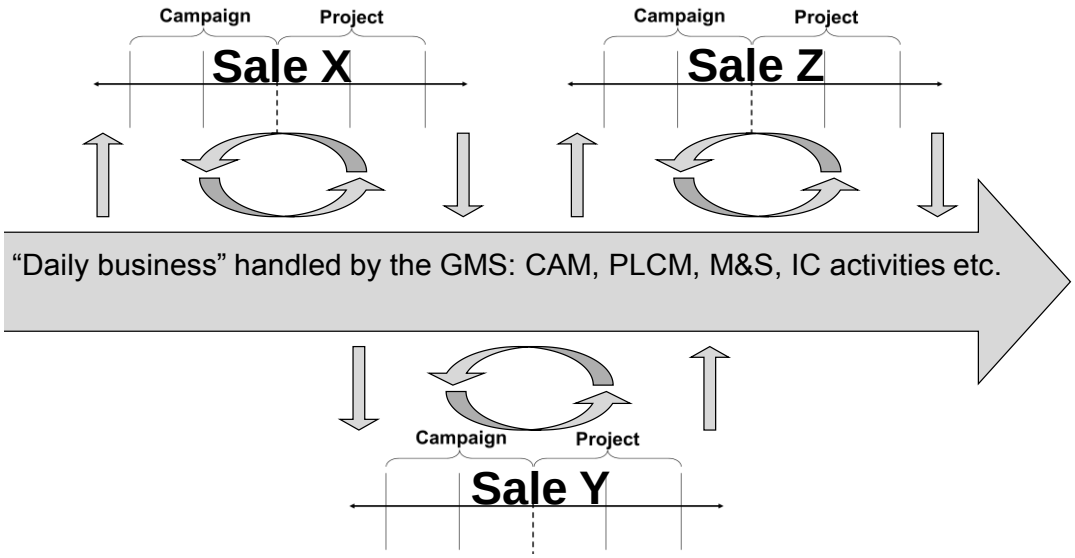

Figure 11 - Illustration of sales in relation to the ongoing daily work with offset

Nearly everything Saab does today is handled by a global management system (GMS). The GMS contains policies, routines, processes, organization and rules, requirements, instructions, handbooks and methods. In short, the GMS elements describes the what, the why, the who and the how of the daily business (see figure 11). As an example, all sales are governed by a project management process, which in turn contains various action points and instructions. It should be noted that the processes are handled on an aggregated management level and all possible actions do not have their own process but are instead incorporated in others. This is the case for offset which does not have its own process in the GMS.

The reason for not having a separate process to govern offset is unclear. Many interviewees question this. As interviewee 18 at Saab (2012) state it *"perhaps offset should have its own process*" and conclude "*[offset management] is nearly impossible to improve if one can't relate to a process of some kind*".

Offset arrangements are normally handled as projects internally at Saab for each sale. It is in these sales that the offset credits are created and delivered. The offset work that is not handled in the sales, are part of other GMS processes. This relation can be illustrated in figure 11, where the sale projects run alongside the daily business. The arrows between the "daily business" and the sales represent the exchange of information.

5.3 Offset during an arms trade

Figure 12 illustrates the whole arms trade process from the early handshakes at market fairs to the final delivery of the last offset projects

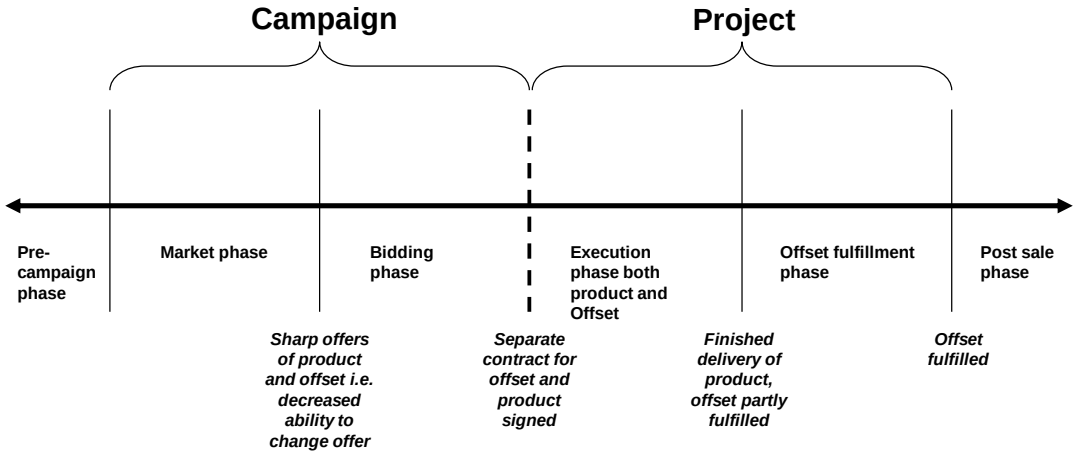

Figure 12 - An arms trade at Saab

Figure 12 has been worked out in collaboration with persons involved in process management at Saab. All interviewees that were familiar with the offset process agreed that offset was an issue that was active during both campaign and project phase. Furthermore, the offset related projects are active longer than the actual product project. Therefore the authors' interpretation of an arms trade differs from the official process charts at Saab, since it stretches the project phase until all the offset projects are finished. This is because Saab's processes more or less stops when the product or system is delivered. This view is much in line with the work of Ahlström (2000).

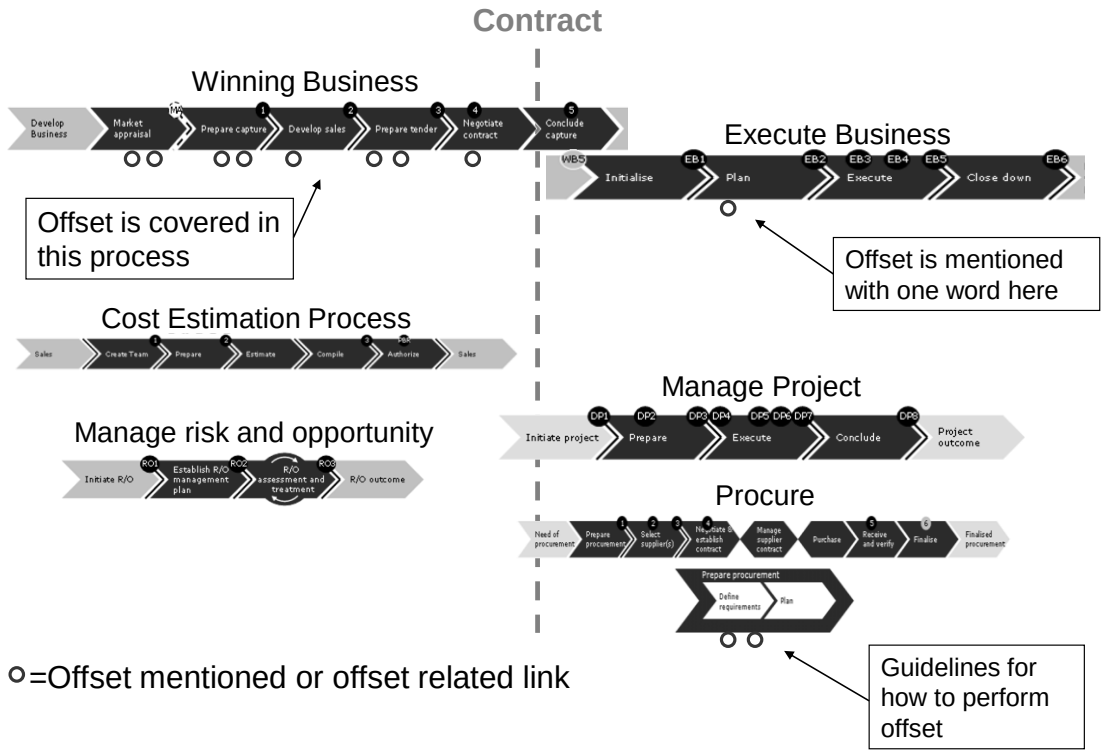

Figure 13 - Official processes during an arms

Figure 13 shows the official processes during an arms trade in relation to the signing of a contract. The time span and number of processes varies and this should only be seen as a general example. In the figure, the grey rings demonstrate when offset is covered by the processes, meaning that offset is either mentioned in an action point, referred to or links are provided to instructions. Notice that offset is only "well covered" in Winning Business. In the other processes linked to an arms trade offset is either only sparsely covered or not mentioned at all.

Five different stakeholders are identified in the offset process as key players. These are the affected BA, Sales, Procurement, Commercial and IC. The affected BA's management teams are almost always involved in projects that are large enough to require offset. They also have the final say in the technologies that can be transferred or what work that can be outsourced (interviews and workshop, Saab, 2012). The Sales department use offset as a tool to differentiate the offer. They sometimes see offset as an additional product or service to convince the buyer of the deal (Interviews, workshop). Procurement is affected when the offset obligations are to be carried out. They sometimes need to alter their strategies to better align them with offset commitments. Commercial is putting the whole offer together making sure that the deal is commercially viable. They are also responsible for setting up the actual direct offset packages. Ideally this is done together with the affected functions such as procurement and production. IC's role is to oversee and coordinate the different offset activities throughout Saab. They are also responsible for securing indirect offset deals.

5.3.1 Market phase

The market phase starts the whole sales process. During the market phase IC is working to find offset deals that will suit the potential buyer (Internal documents Saab, 2012; Interview: 8 - Saab, 2012: Saab Industrial Co-operation, 2012). Together with IC, Commercial develops an offer to the customer where the cost for offset has been calculated. The cost is divided into direct offset and indirect offset where the direct offset cost is calculated by the respective BA and the indirect offset cost is given by IC. This is presented as a percentage of the whole deal in the cost calculations. Through interviews with people involved in the cost calculations it was concluded that the BA's were usually quite conservative in their cost estimates for offset. It was speculated that this could stem from the fact that offset costs are generally hard to calculate. Sometimes in the larger deals as for Gripen or an AEW&C system, offset activities are started even before the contract is signed. A current example of this is country X where Saab is starting to probe for business partners and suppliers. The reason for this is the banking of offset credits to be used in a deal later. It could also be a marketing tool to show that Saab is being serious about its intentions and ability to deliver offset. The use of banking is very individual to the deal, since not all countries allow this practice.

The offset that is offered differs from country to country (Countertrade and Offset No 18, 2012). The offset package is tailored to fit the customers' needs, their laws and regulations as well as Saab's interests (Saab Industrial Co-operation, 2012; Interview: 3 – Saab, 2012).

The campaign ends with a bidding phase. In many cases military procurement is an open contest (SIPRI, 2012) where several competitors try to win the contract. This was the case in recent procurement of fighter aircraft by Switzerland. This process can at times be lengthy. According to interview 17 with Saab (2012) this could become problematic since some offset packages that were promised early in the market

process cannot be executed when the deal is actually signed. There are many reasons for this but one can be that Saab has already done what was promised as a work package themselves because other customers where demanding it. Another reason could be that co-development of new technology is no longer relevant since the technology has already been developed and may even be obsolete. In short, interviewee 19 at Saab (2012) concludes that "*It is a long time between when we promise things and the signing of the contract, so it automatically becomes problematic*".

If Saab wins the bidding phase then the contract for the product is signed. Usually at the same time a separate offset contract is signed.

5.3.2 Execution phase

When the contract is signed, responsibility is transferred from the campaign manager of the market phase to a contract owner. The contract owner then appoints a team that is responsible to carry out the project. The project manager (PM) is responsible for securing the materials, manufacturing and delivery of the product or system. The PM can also be responsible for carrying out the direct offset package of the deal (Interview: 31 Saab, 2012). This is also specified in the Execute Business process. There is, however, no guidance in the process charts for how these offset packages should be carried out. The interviews also showed that there are some uncertainties about who is ultimately responsible for the offset commitments.

The offset commitments are generally longer lived than the project for the product that initially spawned the offset. This was recognized as a problem since responsibility was even less clear when the initial project was finished.

There is an incentive system that promotes value creation at Saab. One example is called the Cost Saving Tracker. This system tracks cost savings based on business cases submitted to an IT-system. This does not, however, consider offset credits lost by sourcing from a cheaper supplier. This creates a conflict of interest between the common good and the local good.

5.3.3 Procurements role in the offset handling

At different BA's the procurement departments are involved in the offset process at different times. In general though, the procurement department is involved after the contract is signed and the projects are started (interview: 16, 28 and 32 at Saab 2012), with the exception of Aeronautics (Interview: 17 – Saab, 2012). In some cases procurement is not affected to any greater extent than having to report on where they have bought their material, products and systems. They report this to IC who then make appropriate editing before submitting the numbers to the buying country's appropriate department. This is a tedious and time consuming activity for the personal involved but also very important, since it is the only way to get the customer's approval for the performed offset activities.

There are guidelines for purchasing regarding offset (Internal documents at Saab, 2012). These guidelines stress that purchases must be made with the offset requirements in mind. IC offers suggestions for in which country to put new purchases according to the overall offset situation at Saab. However, offset requirements are partly contradictory to other purchase directives. For instance, offset promote a high price for maximizing the offset credits, while the "standard" purchase directives state that low price is a priority. It can also be contradictory to cost savings,

procurement strategy and quality directives to buy from a specified country. Sometimes, there is even a single pre-specified supplier. The procurement guidelines state that cost connected to offset should be covered by an offset budget incorporated in each project. The finance department interview: 15, 23 at Saab (2012) confirm that there is an offset budget incorporated in the cost calculations for each project. Despite it turned out during interviews and informal interviews at Saab (2012) that these guidelines were rarely read and the information is not common among the purchasers at EDS. Furthermore, how to connect cost to offset activities and who to report to is unclear in the procurement department at EDS. During the workshop held at Saab (2012) it was concluded that procurement needs to develop a system for handling offset cost, partly to counteract the misalignment in purchase directives but also to enable increased generation of offset credits.

For some projects, usually the larger projects, procurement might be required to change the supplier to better support offset activities (interview: 32 - Saab, 2012). This makes strategic planning complicated and is seen as a problem. In certain countries it might even be impossible to find a supplier with the right competencies.

IC has expressed that offset commitments should be shared between Saab and their suppliers, meaning that the suppliers should also help Saab to deliver offset. This is, however, not often done at EDS. There are clauses in the contracts that tell the supplier to help Saab deliver offset but according to interviews at EDS, these are rarely used. According to one purchaser at EDS, these clauses are never used and often the first thing to be cut in negotiations with new suppliers. It should also be noted that a small supplier stated that they didn't really know about the offset clause, but that they would be happy to engage in offset activities to ensure Saab as a continued customer.

Procurement has started to work with Category Account Managers (CAM). These persons are responsible for all of Saab purchases of a certain category of material products; for example, electronics. The purpose is to achieve synergies for Saab. This should be done by creating long term procurement strategies and downsizing their supplier base. In one category Saab has gone from 240 suppliers to 70. Offset has not yet however, been fully integrated in this work. As of today, offset is seen as disturbing the strategies by suddenly demanding a change in suppliers to a new country (Interviews at Saab and workshop, 2012).

5.4 The BA's perform differently even though the basis for their offset processes are the same

At the BA Aeronautics, the general impression was that offset was not a problem of great magnitude. This was surprising when compared to the attitude at EDS which is towards the opposite. To understand why there was such a difference, it was concluded, in consensus with members of the procurement department of both EDS and Aeronautics, that there must be external factors that influence how easy it is to have an efficient offset process. This was part of understanding both how offset affects Saab and what recommendations can be given to the different BA's. These factors are presented in table 5. The factors and the conclusions are confirmed by key personnel involved in offset issues.

Area of influence	Nr	Factors	Assumed best	EDS	Aero
General for the offset process	1.	Time from offset tender to contract	Short	Medium	Long
	2.	Production time	Long	Medium	Long
	3.	Number of customers	Few	Medium	Few
	4.	Customer turnover rate	Low	Medium	Low
	5.	Geographical closeness to IC	Close	Far	Close
	6.	Number of active projects at any point in time	Few	Several	Few
	7.	Number of products	Low	medium	Low
Procurements ability to deliver offset credits	8.	Procurements cost of the total cost base	High	Low	High
	9.	Size of the majority of the suppliers	Large	Small	Large

Table 5 - Factors influencing offset management

1. **Time from offset tender to contract**
   As discussed in the market phase, the longer it takes from promising offset to signing the actual contract, the more uncertain the promises become. This sometimes creates difficulties in fulfilling the promised offset projects and may lead to undesired changes in what Saab offers as offset. Aeronautics has significantly longer campaigns then any of the other BA's.
2. **Production time**
   How fast the products are built are of interest, as it can be time consuming to set up training and new facilities in foreign countries. This is especially true when considering direct offset, which is dependent on the product project. Indirect offset is not dependent on the sold product and gives the seller more time to execute and deliver the offset project. At EDS the production time can be as little as a few months for a system. A Gripen fighter has a 2 year production time (Ny Teknik, 2011).
3. **Number of customers**
   Aeronautics has relatively few customers, since the deals are so large and time consuming. EDS has in comparison very many customers. The more customers a BA has, the harder it is to find suitable offset projects for all of them (Interview: 14, 23 - Saab, 2012). This was further confirmed at the workshop held at EDS.
4. **Customer turnover rate**
   Not only is the absolute number of customers a factor, but also the turnover of customer. Aeronautics' customers do not change over long periods of time. The number of new potential customers is also low. At EDS the projects are shorter and products are less costly. This means that they have a higher turnover of customers. Therefore it is easier for Aeronautics to create a more strategic plan for their offset projects.
5. **Geographical closeness to IC**
   IC is situated close to the purchasing department at Saab in Linköping. Strong interpersonal connections with personal at IC made decisions easy and quick. At EDS, IC is not well known, even by senior staff in some cases.
6. **Number of active projects at any point in time**

As with customers, the more projects a BA has, the more complex the handling becomes. With each new project that demands offset the more complicated it becomes to coordinate the offset projects. A BA cannot outsource a special process or work package to two customers at the same time. EDS has significantly more projects running than Aeronautics.

7. **Number of products**
   Aeronautics has only one product, the Gripen fighter. EDS has in comparison large number of products. This means that potential offset projects can differ more in nature. More diverse offset projects make it harder to systematize the offset work at EDS.
8. **Procurements cost of the total cost base**
   According to calculations done with classified numbers about the total value purchased by each BA there are big differences in how large the procurements part of the total cost is. Aeronautics' procurement costs are higher than any of the other BA's. Because of procurements more prominent role at Aeronautics, they are involved in the offset process earlier and can easier plan and support offset activities. By having early knowledge about what is being promised to the customer in terms of direct offset, they can avoid being surprised by this later on.
9. **Size of the majority of the suppliers**
   Small suppliers can usually not help Saab to deliver offset as well as a large supplier. A big supplier with lots of experience in the A&D market also has an understanding and knowledge about offset requirements that a small local supplier might lack. Aeronautics' suppliers are mostly large A&D contractors such as Boeing. EDS uses many small suppliers who have almost no knowledge about offset.

5.5 Aspects identified in Saab's offset management

Rounding off the empirical chapter, several aspects of offset management have been found to be of interest. In total 14 aspects has been derived from the 200 statements that was gathered during the interviews. These were found during the wide exploring of the offset topic at Saab. All of these aspects show a need for improvement. Each aspect is explained and the problems are pinpointed. All of these will not be further studied on but as part of the thesis deliverables they will still be stated here.

- **IC's internal organization and their interface towards Saab**
  IC's role in the organization is perceived unclear by many actors. There have been changes in IC's organization and how IC interacts with other functions at Saab. According to interview: 2, 3 (Saab, 2012) IC is still working on improving their internal organization. Furthermore, interview: 4, 5, 7, 32 and others (Saab, 2012) indicate that there are frustrations towards IC from BA's and that the interface between them is fuzzy as are their responsibilities. Since IC has a central function for the offset issue, this is an aspect of interest.

- **Responsibilities in the offset process**
  Many interviewees express confusion as to who is responsible for the offset issue during different steps of the offset process. As one interviewee expressed *"Shared responsibility, is no responsibility"* (Interview: 32 - Saab, 2012). It should be noted that this aspect is affected by where one looks in the organization. Despite this, an increased level of awareness among the

employees would probably be beneficial for Saab. This information is also wanted according to interview: 33 (Saab 2012).

- **Conflicting interests for procurement**
  The procurement department is uncertain how to prioritize offset issues when they are procuring goods and systems. Traditional guidelines focus on the lowest possible price and the highest possible quality. Offset, on the other hand, benefits from a high price since offset credits are calculated from the price sum. This means that offset-generating buys are often not the cheapest alternative. According to interview 7 and 8 (Saab, 2012) as well as the procurement process, there are measures taken to counteract this (offset cost budgeted etc.). But the presence of these measures and knowledge about them is generally deficient, according to interviews 10 and 32 (Saab, 2012) and informally asked purchasers.

  Another issue highlighted by purchasers is an uncertainty between the priority of projects. "*Today, the project that screams the most gets the attention. That doesn't necessarily mean it should be like that*" - purchaser Saab EDS.

- **Connect costs to offset**
  The cost for direct offset handled by the BA's is not completely known. The individual cost for outsourcing and even the cost for ToT are known (Interview: 15, 16, 23 - Saab, 2012). The indirect cost which is handled by IC is also well known (Interview: 2, 3, 22 - Saab, 2012).

  There are costs connected to offset activities that are not well recorded, for instance supplier switching cost (Interview: 2, 17 - Saab, 2012). Another factor that can obscure the total cost is when there are projects with several BA's involved. The transactions between them make it hard to gain an overview of the cost and hence they become unknown (Interview: 15, 16 - Saab, 2012). Not having total control over cost associated with offset can and does restrict the improvement potential significantly.

- **Pre calculate the offset commitment**
  Offset commitments are not always pre calculated. This creates confusion about the amount of resources available to fulfill offset commitments. It was noted that there was sometimes a resistance towards pre calculating the offset commitment. One interviewee said there was an attitude that *"pre calculating the offset commitment is money down the drain if the deal is not won"* (Interview: 31 - Saab, 2012). This was seen as making it harder to plan the offset activities in the deals that were eventually won. Interviewee: 2 (Saab, 2012) describes it as *"[we] throw in the yeast after the dough and hopes it comes out alright*".

- **Offset portfolio**
  By creating an offset portfolio consisting of technologies that can be transferred and work packages that can be outsourced, would reduce the preparation time for an offset package. It would also reduce risk, since there would be more time to analyze which technologies can or cannot be transferred and which work packages are feasible to outsource. There is ongoing work with this as IC drives an improvement program (internal document Saab, 2012). Connected to this improvement program are also initiatives from various BA's (Interview: 5, 9, 32 – Saab, 2012).

Interviewee 17 (Saab, 2012) states that General Dynamics has customized some of their products for local production. The interviewee suggests that this might be a natural development in order to improve offset fulfillment capabilities. The question of "designing for offset" was also raised by other interviewees at Saab. For instance, incorporate modular architecture, open standards and more to facilitate easy transfer of technology or outsourcing of production.

- **Establish a dedicated ToT project team**
  ToT projects at EDS are often handled by the production department together with the commercial department that have to plan and implement the projects. Production does not feel that they have the skills and resources to handle ToT calculations, planning and execution. They also realize that there is a lack of continuity in the ToT process for production. (Interview: 4 – Saab, 2012).

  The ToT also creates demands on the other product and production related issues. For instance, it requires the instructions to be in English as well as to the standard desired by the customer. Interview: 4 (Saab, 2012) said that "*we work in another way then the customer does* ... but … *we are a minority, we need to work like them*".

- **Communication between all actors involved in the offset activities**
  Because of the many actors involved in the offset activities, often involving almost all functions, there are sometimes problems with communication. There are unnecessary information gaps since employees do not communicate across the different BA's and corporate functions (Interview: 18 – Saab, 2012). This also became apparent when interviewing across all BA's and over hierarchical levels.

- **IT solutions and system support for offset**
  Today there are many different ERPs (enterprise resource planning systems) working in parallel at Saab. This affects two different topics. First it makes the reporting of offset credits very time consuming and tedious (Interview: 6, 11 – Saab, 2012). Also, There are indications that because of a complicated IT-structure, offset credit are not reported to IC (Interview: 4, 18 – Saab, 2012). Secondly, IT systems could be improved to better support purchasers in their daily work (Seminar: interface between Purchase and IC – Saab, 2012). The authors did, however, notice during a workshop that they held, that significant improvement in the IT area is being implemented and more improvements are planned.

- **Contract and clauses**
  Contract and clauses are central both for sales and procurement. From a sales perspective it can be a skewed power balance when dealing with countries, since each country is simultaneously a customer, legislator and judge. This makes it important to be very precise when designing the contracts (Interview: 17, 24, 26 – Saab, 2012). Here, it was also noticed that it is critical to monitor signed contracts in order to assure they are being conducted as agreed (Interview: 25, 27 – Saab, 2012).

  Procurement has a clause in their contracts stating that the supplier should assist Saab in generating offset credits. This is, however, not always done. For instance, EDS never does this (Internal documents, interview: 6, 8 – Saab, 2012). Aeronautics on the other hand relies heavily on flowing down offset commitments to suppliers (Interview: 17 – Saab, 2012). It is evident that there exists a large potential for improvement in this area, especially for some BA's.

- **Offset from a sales perspective**
  Offset can be a tool for winning business. By adding an offset package to the deal, Saab can differentiate its offer. However, there are various opinions about how this should or should not be done (Interview: 3, 7, 11, 14, 19 – Saab, 2012).

  The often extensive time between presentation of an offset package to a customer and signing of a contract can create serious problems (Interview: 8, 25 – Saab, 2012). As illustrated by interview 17 (Saab, 2012) "*Well, this is what we agreed on X years ago, but as you know, we have already developed this technology and therefore this is no longer an option*"

- **Education and definitions**
  There are significant differences in the knowledge among employees about offset and why it occurs. There are also discrepancies in the definitions. This can create tensions when offset is discussed.

- **Attitudes towards offset**
  This is closely connected to the level of knowledge about offset that one has. The general trend for the interviewees is that the more they know about offset the more they understand the value it could bring. There are also interviewees that have expressed a feeling that ToT projects will sell out Saab's core competence.

- **Strategy for offset**
  As of today the strategy for offset is not well known by many of the interviewees. This creates confusion as to what Saab wants with offset. This makes it hard (for purchasers, for example) to make quick proactive decisions about offset related issues. In general, the lack of a clear strategy (or at least a strategy at par with other strategies of similar importance) is demonstrated with comments such as "*There is too much ad-hoc*", and "*we are a quite immature business*" (Interview: 33, 8 - Saab, 2012).

6 Analysis - How should offset be managed at Saab?

In this chapter the empirical findings are analyzed in regards to the literature review in order to answer the research questions. New contributions to the offset management field are also developed here.

6.1 Critical aspects identified in Saab's offset management

The 14 aspects presented in the empirical chapter have been aggregated further into four critical aspects, according to the process described in the methodology and execution chapter. These four contain several of the 14 aspects. Of these four, *organization and responsibilities during the offset process* was selected by the authors as the "most" critical aspect. The critical aspects are:

- Organization and responsibilities during the offset process
- The cost of offset and how it is calculated
- Communication and system support
- Education and definitions

Research question three stipulates a selection of the most critical aspect. For this, a set of criteria has been developed. The criteria are:

- The aspects' importance to Saab
    - What is currently being done concerning this aspect at Saab?
    - Are there any possibilities for synergy effects with other ongoing projects?
- Feasibility for successful study
    - Is it possible to collect necessary data within the time constraints?
    - Sufficient relevance of already collected data?

The aspect deemed most critical was the *organization and responsibilities during the offset process*. This selection was made because it was concluded that more research here would be most beneficial for Saab. Furthermore, most of the data from interviews are connected to these issues.

The selection of this aspect was also due to the discovery of interesting discrepancies. In one end of the organization the perception was "*there are clear rules and processes concerning offset, so this should not be the problem*" (Interview: 3 - Saab, 2012) but at the other end, the expressions were the opposite: "*There is too much ad-hoc*" (Interview: 18 - Saab, 2012).

The descriptions "*it is in the walls*" and "*offset is an art*" provided by interviewee 19 and 30 at Saab (2012) when asked how offset is handled, demonstrate a significant potential for improvement. This is a textbook case of perceptions in organizations that lack standardization and processes (Jonsson & Mattsson, 2009). For Saab, which has an outspoken goal of becoming *Lean*, this is something of great interest. Furthermore, there is a perception that every deal is so special that offset cannot be handled with a long term perspective. This is used as a strong argument for not standardizing the offset process.

6.1.1 Organization and responsibilities during the offset process

The offset process at Saab contains both gaps and overlaps, which makes responsibility unclear. Every deal is unique (as described in the market chapter) and the offset commitment can differ substantively. Ranging from small commitments involving indirect offset to very large ones where the buying country is entitled to producing the very products they are buying. There exists an attitude at Saab towards offset being so unique that it cannot be standardized. But as demonstrated by the offset process there is, in fact, similarities that would enable some standardization.

Organizational ambiguities do exist even though there are processes and directives in place. As stated in the offset process earlier, there are directives both in the market phase and in Execute Business. These are not complete and they could be clarified and extended but mostly they must be better communicated. This could be linked to what Avascent (2012) argues for, in having a clear strategy for offset. Saab's offset strategy (presented at the beginning of the empirical findings) is disputed and not communicated. It is the perceived strategy by the authors. That would imply that offset as a whole is not viewed as importantly as, for example, procurement. There are, however, ongoing activities that will have a strategic impact; one such being the traffic light system. This is a system to prioritize which activities and technologies can be used in offset activities.

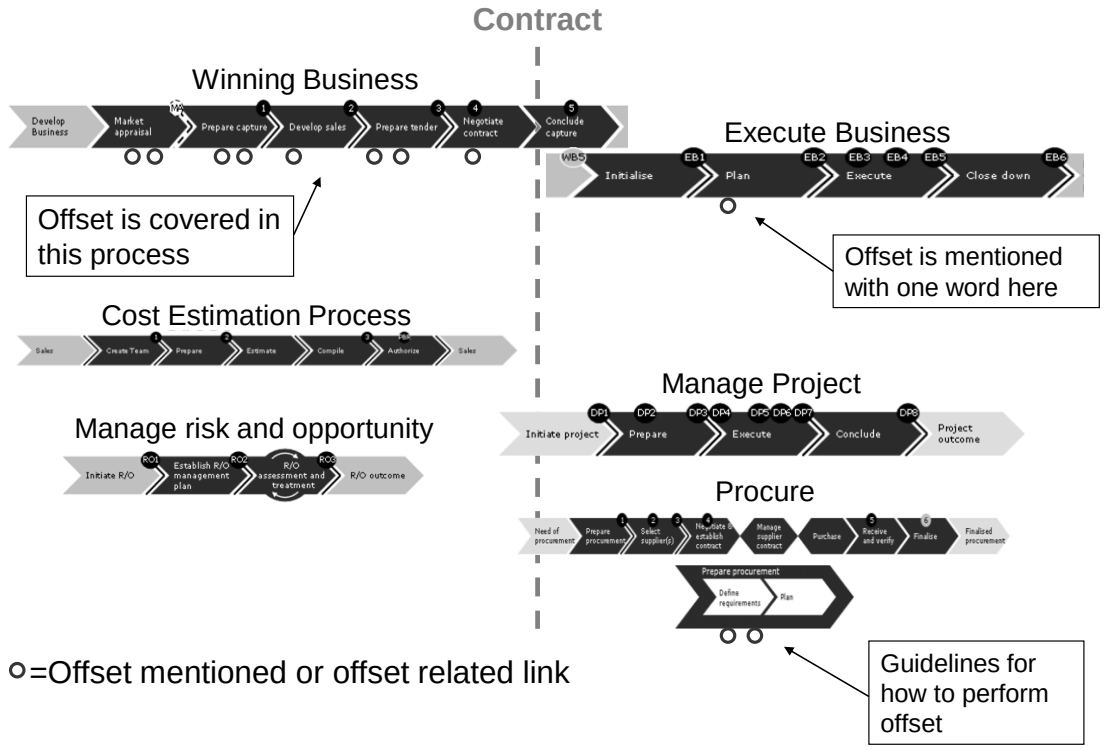

Figure 14 - Official processes during an arms

During the mapping of the offset process, a few areas stand out. At the workshop it was concluded that there are weaknesses connected with the interaction between "daily business" and a sale, especially for the input given to a sale and the handling of learnings from after a sale. It was also concluded that there were deficiencies in the sale process itself.

Ahlström (2000) and Avascent (2012) both stress that offset activities should be started before the signing of a contract. In Saab's processes for an arms trade, the

offset is introduced quite early (see figure 14). However, the offset offer preparations still start in the middle of the process. Interviewees state that this should be done earlier. Therefore it can be concluded that it is imperative for effective offset management to be proactive with offset. Updating the processes with a requirement to make offset preparations earlier would be beneficial for Saab. Most interviewees also agreed with this.

Another critical step in a sale is the handing over from "campaign" to "project" after the signing of a contract (see figure 14). It is evident that Saab repeatedly fails at this, because the responsibility for offset becomes unclear. It was confirmed at the workshop that this was directly connected to offsets poor coverage in the end of the Winning Business process and in the whole Execute Business process, see figure 14 above.

The offset is primarily handled and delivered by the projects related to the arms trade. Especially in EDS, these projects are a part of a matrix organization. This provides the projects with the focus and resources needed. However, offset requires activities that promote the negative sides of matrix organizations. Meredith and Mantel (2012) state that there is a delicate power balance between the projects and the line functions and, if there are doubts about responsibilities, the work can suffer. The deficient coverage of offset in processes and the unclear responsibilities could severely affect this balance. Furthermore, Meredith and Mantel (2012) state that, in theory, the project manager should handle the administrative decisions while the functional managers should handle the technical decisions. Here, good negotiations skills by the project manager are often important. From an offset perspective, the nature of the activities often requires the project to sidestep from traditional project designs and therefore impact on the functional manager's decision space.

A strength identified in Saab's winning business process today is the clear instructions for insuring that the offset offer is in compliance with the customers' needs and legislations. This is important, since the customers has the upper hand in disputes. Saab's internal capacity to generate offset credits within the organization can also be seen as an asset. This is done frequently at Saab today when performing direct offset.

6.1.2 The cost of offset and how it is calculated

It is hard to estimate a total cost for offset since so many actors are involved in the process and also since the process itself can be very lengthy. Some of the costs are also hard to connect to the offset issue and may only be represented in various overhead costs. An example of this is the extra time purchasers must spend to identify which countries to buy from and in getting information and decisions on what to prioritize. This makes it difficult when the contracts are written and the margin for the whole deal is calculated. It also makes it difficult to prioritize actions and tasks that will help in fulfilling the offset requirement. Much work is needed to connect the cost associated with offset and for it to be correctly reflected in the cost calculations for a deal. During the workshop it was concluded that an offset portfolio could be a first step towards both decreasing the overhead cost for direct offset as well as better connecting costs with the offset activities.

In most management strategies there are performance indicators or incentives promoting good efforts. At Saab, a combination of these is utilized. Analyzing this from a value chain (Porter, 1998) perspective, it can be concluded that this is done to promote the value adding activities in the company. However, this does not

necessarily mean that these incentives of performance indicators are aimed at promoting what is good for offset. For instance, Saab enforces a Cost Saving Tracker to lower costs and increase margins, which does not take offset into account. This could probably be solved through knowledge of the cost of offset. A suggestion for procurement is to start with rough estimates of costs connected to offset, in order to connect offset activities to the Cost Saving Tracker.

Overall there are no clear metrics for offset obligations and few tools for measuring the performance of offset at Saab today. This was recognized during the workshop as a problem for improvement. It was concluded that Key Performance Indicators would be a good tool to analyze offset performance.

Ahlström (2000) mentions sub optimization as a potential risk when dealing with offset issues. This was especially noted by procurement at Saab. They are focused on price and performance, and offset is not considered until late in the process. This can create unnecessarily costly solutions. This is also connected to the potential negative effects that can arise from promoting some value adding activities without considering the whole picture. For instance, the Cost-Saving Tracker could counteract its purpose because it does not consider offset.

6.1.3 Communication and system support

The many actors also make communication a problem. There are many functions that need to cooperate. An example is the reporting of offset credits to the buying country. This is done by IC who get their information from the different BA's. As of today there is no system support for this. This is an area where there is a great deal of ongoing improvement instigated by Saab.

An impression from the interviews with IC was that the BA's where not always very concerned with fulfilling the offset requirements and they often saw this as IC's role. On the other hand, people at various levels in the BA's where not always sure of IC's role and its function. This, of course, creates unnecessary tension and confusion. As a conclusion, the structure of the organization and the responsibilities must be better communicated.

6.1.4 Education and definitions

Many people involved in the offset process use different words to mean the same thing. There is also a quite varied knowledge about what offset is and how it should be handled among personal in the different BA's. This obviously complicates communication, since not everybody understands why offset is done in the first place. It also confuses people when different definitions are used for the same thing.

There is a connection between the attitude towards offset and the level of knowledge that the interviewed employee has about it. With increased knowledge, the attitude is generally more positive.

The knowledge about the offset process is mostly tacit among key personnel involved in offset activities. The offset trade was traditionally more seen as an art then a structured and systematic process. This can be risky if a key person resigns or is otherwise separated from the process. This is, however, changing and IC recognizes that as offset becomes more and more common they need to standardize what can be standardized in their ways of working.

Several interviewees argue that offset is something that no one wants to take charge of. They consider that this is partly because offset is not perceived as equal to other deliverables. It is concluded that offset have a clear lack of visualization in the daily business. An easy step to promote offset is therefore to include offset on project KLE boards (KLE stands for: Quality Delivery Economy). Preferably, the offset should be added as separate projects, since they run longer than the projects that they are a part of. This can also be connected to the knowledge about offset in general.

Education should be given to a broad audience on Saab. Offset is an issue that spans over almost all functions at Saab and therefore a general knowledge of offset would be positive. This has not been done as yet but this thesis can act to begin to improve general knowledge of the offset issue. There is much information about offset internally at Saab but it needs to be better communicated to have any effect. For instance, IC has an offset manual which is not communicated. The manual provided this study with great input; hence, it could be beneficial to distribute it internally at Saab.

6.2 Procurement's influence on the offset issue

There is clearly potential to improve the procurement department's offset work. Both in how to work more efficiently and to generate more offset credits.

If the procurement division could be active earlier in the offset process, there would be less stress in the later delivery. The procurements own strategies could also be more aligned with the offset commitments. That would make their strategies more sustainable.

One strategy for generating offset is to outsource some of the offset obligations to their suppliers. This is rarely done today and could potentially generate a substantial part of Saab's offset credits. A supplier has a set of activities available which can generate offset in turn. This could utilize new investments and to put them in countries where Saab has offset commitments.

There is a general lack of knowledge about offset in the EDS procurement department. This hampers efficient offset work. Cost saving was a problem for working with offset but by applying a more holistic view, greater cost savings could be gained by generating more offset credits.

Because there are few formalized procedures for working with offset in the procurement department, unnecessary risk might arise. One such risk is to terminate suppliers without contacting IC. It could be that the supplier is generating offset credits that IC has calculated to continue for years.

The CAM work is only recently starting to integrate offset in their long term sourcing strategies. Many interviewees point to the fact that their functions have also not yet integrated offset into their strategies. This would suggest that offset could be better integrated in all of Saab's BA's and functions.

Long term planning and strategic choices affect the ability to deliver offset. For instance, the CAM stresses that they want to be able to match offset with their long term strategies. But they lack the necessary input for this. During the workshop it was concluded that it is Marketing and Sales, together with IC, that should provide this information. Today, Marketing and Sales has a list of countries on which they focus their market activities. IC also has a list of countries which is based on current and future offset activities. Together these priority lists constitute a vital input to the CAM

work, which in turn affects the handling of offset. During a meeting after the workshop, a method was developed for matching offset activities with long term strategies for the CAM. The method relies on an increased flow of information, such as a priority list as mentioned above. The hypothesis is that, providing the CAM strategists with this information and then matching the CAM strategies in a forum with representation from IC, could increase the offset credit generation from the procurement divisions. This looks promising, but it is only one step in the right direction.

6.3 Learning's from a comparison between Aeronautics and EDS

Area of influence	Nr	Factors	Assumed best	EDS	Aero
General for the offset process	1.	Time from offset tender to contract	Short	Medium	Long
	2.	Production time	Long	Medium	Long
	3.	Number of customers	Few	Medium	Few
	4.	Customer turnover rate	Low	Medium	Low
	5.	Geographical closeness to IC	Close	Far	Close
	6.	Number of active projects at any point in time	Few	Several	Few
	7.	Number of products	Low	medium	Low
Procurements ability to deliver offset credits	8.	Procurements cost of the total cost base	High	Low	High
	9.	Size of the majority of the suppliers	Large	Small	Large

Table 6 - Factors influencing offset management

Table 6 shows the external factors affecting how easily offset can be handled. As can be seen, EDS differs significantly from Aeronautics. It is evident that the factors are in favor of Aeronautics. This could explain why interviewees at Aeronautics viewed offset as a small problem. According to the purchasing director at Aeronautics it was also due to the long history of using offset as a market tool and implementing offset packages. (With market tool, the director refers to offset packages being used to enhance Saabs position in the bidding of a contract).

Some of the factors are hard to counter such as the number of products and the production time. But if procurements role in the organization is deemed to be of great importance for managing offset, this could be remedied by an organizational change. The geographical distance to IC could also be managed by a closer cooperation between the BA's and IC.

The processes and ways of working were not more formally described at Aeronautics than at any other BA, something that was suggested could be done in more detail and could then be exported to the other BA's. To standardize and improve is also in line with Lean philosophy (Lean Enterprise Institute, 2012). Lean is being currently implemented at EDS which means that it could fit with the overall agenda.

6.4 External incentives for fulfilling offset obligations and consequences for failing

The following section aims to describe the external effects on offset at Saab and why offset is important for Saab. The external analysis of the competitive environment for offset is based on Michel Porters' *five forces* framework. It is based on the following sections: *What is offset, Saab, Theoretical framework* and *Empirical findings*.

Porter (2008) states that all five forces; internal rivalry, new entrants, substitutes, suppliers and customers do not have the same magnitude. It is concluded that in this particular setting, in this thesis, the threat of substitutes is negligible. The threat of new entrants is present but still minor compared to the magnitude of the other three forces: internal rivalry, customers and suppliers. In short, the internal rivalry increases the importance of the offset component in biding. The customer's high bargaining power forces the companies into offset agreements. The suppliers are needed for the firms to be attractive from an offset standpoint. That is, it is another source of complexity and cost for the firms. Together these forces show how offset affects Saab and why it is important for future business.

6.4.1 Rivalry among existing competitors

The fact that (the) Sweden (government?) has traditionally funded the R&D for Saab, has for a long time distorted and lessened the effect of international competition for Saab and thus the need for offset. While Sweden still has an interest in keeping the defense providers domestic, current politics is leaning towards internationalization of the procurement policy. According to Porter (2008) this distortion lessens the rivalry, but if the conditions are altered, offset would become even more vital for Saab's survival.

The international competition environment for Saab could become fiercer and the offset component more important in the future, since global defense spending is shifting and actors are become more global. This is particularly interesting if one considers the trend of declining US military spending, together with the main defense firms being American with a majority of them having (as of now) the domestic (US?) market as their primary market. The logical step for these firms would then be to become even more international. What this means for offset is still not certain. On one hand it could lead to the offset component becoming very important as the competition hardens with a concurrent increased bargaining power for buyers with the increased number of actors. On the other hand, the attitude towards offset by the established American actors could have a decreasing effect of the importance of offset. This is due to the fact that offset is not used for indigenous actors. These firms could potentially have enough power to influence the market into a new direction. This could mean increased pressure from the industry to reduce or even eliminate offset. This is, however, unlikely since offset is a relatively easy way to enhance a firm's position from a buyer's perspective, with relative reduction in the price or improvement to technical specifications.

Because Saab is a small actor in the industry, it has little choice but to comply with the offset requirements (Interview: 2 - Saab, 2012; Avascent 2012). Especially since it is now dependent on exports and offset in many cases has been the unique selling point, winning the deal for Saab.

According to Porter (2008) there are several factors that increase the rivalry among incumbent firms, such as slow industry growth, relatively few large companies

dominating the industry, highly specialized assets, high fixed costs and low marginal costs. All of these are true in the A&D market for Saab. Here offset, in the sense of a third component in an arms trade, has the ability to shift focus from the commercial and technical components. Thus, as the rivalry increases, the more important offset becomes.

6.4.2 Threat of new entrants

As mentioned before, Saab's portfolio stretches from low cost-high volume to high cost-low volume products. In the market segments dominated by lower unit price, entry and exit barriers are relatively lower than for the higher unit price sections. For example, developing and selling fighter airplanes requires companies to cover a broader spectrum of technologies and capabilities than for developing and selling camouflage nets.

According to Avascent (2012), a firms potential to fulfill offset obligations is partly linked to the extent of a firms' network of partners and suppliers. This heightens the entry barriers for competing for high value defense contracts (Porter, 2008).

A majority of Saab offset offers include large proportions of transfer of technology and training (Interview: 25, 26 - Saab, 2012). The capabilities of interest are often preceded by large amounts of R&D. This, together with the requirement of commercial strength (i.e. to be able to do investments, start joint-ventures or build up new production plants - Ahlström, 2000) creates large entry barriers for new entrants (Porter, 2008).

These entry barriers are however partly demolished by governments funding domestic defense industries (Deloitte, 2012). Ironically, a way often used to promote the domestic industry is through the use of offset in procurement of defense material (Ahlström, 2000).

In conclusion, being "good" in fulfilling offset protects Saab from the threat of new entrants, by keeping entry barriers high. Offset could also be used to secure a good market position through influencing the customer in wanting offset capabilities that are hard to attain for competitors or new entrants. At the same time, this has to be balanced with the possibility of transferring technology that could jumpstart new competitors. An example of this could be through only transferring old technology, thus keeping a technological advantage while still transferring valuable but outdated knowledge.

6.4.3 Suppliers

The will and ability of suppliers to deliver offset varies. A big international supplier has an easier task of finding offset opportunities than a small firm. A supplier who is familiar with the A&D market and the offset concept knows the importance of offset and understands that it is essential for Saab to win the deal.

In some cases the buying country points to a desired industry or even a specific company who Saab is required to do business with. This can create a monopolistic situation for the supplier.

All in all, offset increases Saab's foreign suppliers' power. It could also be argued that it lowers the bargaining power of domestic, Swedish suppliers if they cannot deliver any offset to Saab.

6.4.4 Customers

Due to the high internal rivalry in the market, customers buying power is high. In addition, because of always having the upper hand in legislative issues and disputes, the market can be classified as a buyer's market. For this reason, countries are able to demand offset from defense companies.

According to Brauer and Dunne (2011) the selling countries own defense policies sometimes strengthen the customers bargaining power, through the raising of exit barriers in the industry.

In smaller sales where Saab's customers are generals or even individual commanders, Saab is in a stronger position. These deals, however, almost never incorporate an offset commitment. To summarize, all deals made that involve an offset commitment are deals made largely on the buyer's terms.

From this framework it can be seen that offset affects the A&D market in mainly two ways. First it gives Saab and other A&D companies an additional tool to market their products, apart from price and performance. Secondly offset creates additional challenges for companies in the A&D market. These are mainly sourcing and strategic decision on which technologies can be transferred to the buying country.

Because Saab is a relatively small company in the industry, offset acts, on the whole, as an advantage. This is because the diverse global offset demands require flexibility, which Saab should be able to meet better than their larger competitors.

The internal rivalry and customer forces show that offset is important and will become even more important in the future.

7 Discussion

This chapter presents the authors recommendations for an improved offset management at Saab. The chapter also covers the authors' own reflections of the implications and feasibility of the recommendations and a section about possible further research.

It is the authors' view that offset is a necessity for Saab and it will become more important in the future, especially direct offset. At the same time, the offset obligations will become even more complex and harder to fulfill. The implication for Saab is that this will increase pressure on the respective BA's to have an efficient and cost effective offset management. The IC's role is essential for the development of a successful offset management today and also into the future. However, the authors believe that IC cannot "pull the whole train" by themselves and that the offset management issue needs to be handled together with the BA's.

Today it is evident that there is no clear strategy or process for offset. The suggestions for improvement found in this study require some sort of framework to enable a structured approach to business development. This also holds true for the critical aspects identified. The authors suggest an update of the current processes connected to an arms trade but perhaps a standalone offset process is required to ensure long term success. This would also have the positive effect of raising offset's status as an activity.

During the study, significant variations in knowledge about offset have been uncovered. The authors conclude that there are various reasons for this. It is partly because not every employee works with offset related issues and therefore it is understandable that some do not have an intimate knowledge of offset. It is also due to the fact that Saab has grown through acquisitions and that the separate companies have previously taken care of their own offset obligations until quite recently. Furthermore, offset has been handled more as an art, by a small set of experts that are now mostly retired. The implication of both this lack of standardization and poor distribution of knowledge is that offset management is inadequate in many places at Saab.

An important result from the interviews and internal documents is that offset and the offset processes per se are not always the problem. This was unexpected since even though offset is complex, it turned out to be more mundane issues that caused problems.

Many problems that occur when implementing the offset requirements can be attributed to ordinary business risk-taking. If the customer is being promised something that is very difficult or even impossible to achieve, problems are bound to arise. An example would be to offer a big direct offset package to a country with a low standard in their industry or even lacking the industry altogether. It is no surprise that the purchasers will have difficulty in finding suppliers from whom to buy the required material. But the problems arising are not more complicated than for example promising a too tight delivery schedule.

Another issue brought up by Avascent (2012) is offset consultants. Saab is not, however, interested in using consultants when working with offset, since there is a

risk of corruption and a lack of transparency. On the other hand they are receptive to cooperating with other companies when delivering offset. This currently occurs at Saab but could be further developed.

7.1 Recommendations for an improved offset management at Saab

It can be concluded that Saab is not doing what the available management literature on offset suggests. This is the basis for the recommendations together with the total experience that was gathered during the thesis work.

This part is divided into two sections based on a timeframe. The first part covers recommended actions that can be taken in a short time perspective (0-6 months). The second part covers actions with a longer timeframe. It is suggested to begin with projects that can be executed quickly and that will have a clear result. Projects like these are sometimes referred to as "low-hanging fruits".

7.1.1 Short term recommendations

The following five actions can all be completed in a relatively short timeframe given that adequate resources are made available.

Establish a structured way of working with business improvement for offset issues. This is believed to be the most important step towards an improved offset process. Business development is a continuous process and there needs to be a structured approach to capture ideas and measure improvement activities. Recommended implementers: IC

Update the processes, namely Winning Business (WB) and Execute Business (EB). These are two main processes that need to better support the offset process. A first step should be to include the offset issue during the concluding meeting in WB before the handover to the project organization. Offset should also be made a mandatory point to be discussed at all the checkpoints in EB. This was decided during the workshop held at EDS.

Procurements processes for handling offset are also in need of an update. Offset needs to be further stressed as a criteria that also needs to be taken into consideration when choosing a new supplier. Further, when it is decided that a supplier should be replaced this must be communicated to IC because they might have an offset setup with that supplier. Recommended implementers: IC and procurement

Create a forum with members of the Category Account Managers (CAM), Industrial Cooperation (IC) and IC's Point of Contacts (PoC) on the five BA's. The purpose is to better coordinate the procurements strategies to what is required by offset obligations. Apart from this it would also strengthen the cross communication of the five different BA's due to the fact that all the PoC will be present. The PoC generally have a good insight in the ongoing projects and upcoming business cases at their BA. This was also an action decided upon at the workshop. Recommended implementers: Procurement

Develop a country priority list from an offset viewpoint. This list should then be distributed to the purchasers so that they would have better information on where to buy their material and systems. Recommended implementers: Procurement and IC.

Visualize the offset projects on the project boards. This would better raise the issue and help project leaders to remember these projects as well. Recommended implementers: Project management.

7.1.2 Long term recommendations

In a longer perspective, actions should be taken to create methods to work more structured with offset. There is also a need to change the mindset and raise the knowledge of offset.

Develop an offset portfolio: a prioritized list of technologies and work packages that can be used for offset. The portfolio should also include a list of technologies that cannot be transferred. There is ongoing work towards this, but it is not coordinated. If a standardized portfolio with coherent requirements was developed there would be less confusion when the different Business Areas discuss future offset set ups. It would also be easier to quickly compile an offset package if a customer requires it. Recommended implementers: Product management and IC.

Map the actual cost of offset. There is a need to better map the costs associated with offset. As of today, these costs are mostly rough estimations. Better knowledge about the costs would make improvements easier to motivate and would also make improvements measurable. Recommended implementers: IC, finance and project management.

Develop key performance indicators (KPI) for offset. When costs and cost drivers are mapped, KPI's can be developed to manage offset in a more systematic way. This is believed to both lower risk and costs. Recommended implementers: IC and project management.

Educate and inform personnel involved in the offset process about the purpose and value that offset creates. A starting point for this could be parts of this thesis and especially the chapter "*Offset – What is it?"*

E-learning can be used for educating all staff about the fundamentals of offset. This is a cost efficient and easy way to raise the general knowledge about what offset is and why Saab is doing it.

We also recommend that Saab introduce another term for offset internally, *semi direct* offset. This term should represent all offset that is defense related but not related to the product sold. With this terminology, Saab would have three terms for classifying offset; *direct*, *semi direct* and *indirect offset*. Recommended implementers: IC

7.2 Implications of the suggestions

As is concluded in the end of the analysis chapter, nine actions are suggested for an improved offset management at Saab. As with all changes there will be reactions and some cannot be predicted. Therefore it is imperative that any improvement work is done in a manner that allows for changes and updates. Consequently the first action is: *Establish a structured way of working with business improvement.*

Since the last action, *Educate*, is closely linked to changing people's mindset about offset, it is believed that this will be time consuming. It could also possibly create conflicts if everybody does not share the same idea about how offset should be handled. This must be effectively managed, preferably by engagement of the senior management. That would create legitimacy for the whole improvement work.

7.3 Suggestions for further research

During the work on this thesis, there have been numerous aspects and projects that we have found interesting but have not fitted within the scope of the thesis. Here we would like to present some of the projects with the greatest potential for further investigation.

- As was noted in the aspect about the offset portfolio there are companies who design their entire production to be offset-friendly. That means that it is easy to outsource the production and that the technologies that can be transferred are already decided upon. It would be interesting to see if this is something that would be feasible at Saab's development department.
- Contract and clauses is a topic that has generated interest from Saab and would possible suit a master thesis project. In some of the business cases that were investigated, it was clear that the clauses concerning offset could have been improved. It is, however, uncertain to what degree this is the case. During work on the thesis, this was presented to a law student who showed interest in the idea.
- The ToT at EDS is today often performed be the function production. They wondered if it would be possible to create special ToT teams that could coordinate ToT efforts between the different BA's. This could create synergy effects.
- What separates offset from other activities is the fact that offset is industrial compensation arrangements. However, it is interesting to compare offset activities and arrangements in other industries, in order to learn more about how offset management is handled. For instance, a Swedish construction company, contracted to build a facility in a foreign country, may use local subcontractors to build the facility. This may be the regular way to conduct business; that is a kind of direct offset. Furthermore, the buyer may want to be able to perform their own maintenance or require the education of domestic contractors to do this. Another example could be licensed production, which could be seen as offset in itself but also the transfer of technology and training required for the producer. There are also cases of international firms investing in the local community. For example, fresh water programs, schools and job opportunities.

8 Conclusions

This chapter presents the conclusions of the thesis along with the recommendations. The overall objective of this thesis is to analyze how offset affects Saab and map the present Offset process. It is also to develop suggestions for an improved Offset process in order to minimize negative effects of Offset on Saab's core business.

RQ1. How does Offset affect Saab?

Offset affects Saab in two ways. First it increases the possibilities to differentiate its offer to the customer. Second, offset limits Saab's freedom to operate.

Through offset, Saab gains an additional dimension to elevate their offer to their potential customers. Since Saab is a relatively small company, especially in comparison with their American competitors, offset is important to compete on the international scene.

Offset presents an additional factor to deliver on, much like price, and technical performance. This implies that Saab must take offset in consideration both when shaping long term strategies and in the daily work.

It is evident from the empirical findings that there are three trends in the offset market.

- More rigorous offset demands
- Stricter control of the implementations
- Higher degree of direct offset

This means that for Saab, the offset issue will become more important in the future, both as an enabler and as a challenge. The last trend is also important for the individual BA's. Since they are responsible for setting up and carrying out the direct offset, they will need to align and incorporate offset in their strategies to a higher degree than before.

The implications for not succeeding with offset projects are dire. The following three results were indicated as most serious.

- Reduced profitability due to high operating cost of the offset activities
- More exposure to risk because of heavy fines for unsuccessful offset projects
- Degradation of Saab's brand and reputation on the international defense market.

It should be noted that offset activities are not a homogeneous set of activities and there are other effects as well of individual projects. The listed effects are however a common denominator for failing with all offset activities.

RQ2. How can the offset process at Saab be described?

There is no clear process for handling offset at Saab, partly because many of the deals are unique. Nevertheless, commonalities exist between offset projects and this should be exploited. Many of the offset activities at Saab are done in an ad-hoc manner. It is believed that this creates unnecessarily risky and costly offset projects.

A reason for the unclear responsibilities and confusion is a lack of communication. Different BA's are unwilling to cooperate and sometimes even discuss offset matters

with each other. This could be explained by Saab's history of differentiated business units. It is only recently (in the last two years) that Saab has begun to integrate the BA's more closely, to create one Saab.

RQ3. What are the most critical aspects of offset at Saab and how can they be managed?

There are several aspects of interest regarding the offset issue. The four most critical were:

- The cost of offset and how it is calculated
- Communication and system support
- Education and definitions
- Organization and responsibilities during the offset process

It is crucial to determine the cost of offset. As of today Saab does not know exactly how much offset costs. To be able to implement efficient business development and to save costs, it is important to determine the costs. This could be achieved by mapping the actual costs and making post-calculations of the offset projects.

Communication and system support were identified as important factors to both plan and execute offset activities. It was also concluded that much time consuming and tedious work with reporting offset credits could be saved by a better integration of the IT-systems.

Many employees have a lack of knowledge about offset. Definitions are also not unified between the different BA's and functions. A consequence of this a wide variety of attitudes towards offset. Some employees did not see the value of offset. This could potentially hinder Saab ability to perform at their best.

The organization needs to better support the offset activities and the responsibilities must be further clarified. This is closely linked to education about offset and how the offset projects are set up.

Finally the report can be summarized in four bullet points.

- Offset is an activity that is needed to perform Saab's core business
- It will become even more central for Saab to perform offset efficiently in the future
- There are many areas where Saab can improve. Those deemed most importantly are:
    - Introduce a more structured way of working with offset
    - Align offset with long term strategies
- The recommendation will give Saab an improved method to work with offset

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10 Abbreviations

ToT – Transfer of Technology

EDA – European Defence Agency

BA – Business Area

IC – Industrial Co-operation, a department at Saab (corporate function)

EDS – Electronic Defence Systems, a stand alone business unit at Saab

Aero – Aeronautics, a stand alone business unit at Saab