Moving average
- Valuation of Inventories

- An empirical study of four manufacturing companies.

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Abstract
The thesis is addressing the inventory valuation method called moving average and how this
inventory method handles exchange rate differences. Intentions of the study is also to
highlight differences and similarities between the two methods standard cost and moving
average. This study fills an existing gap in science regarding pros and cons with the moving
average method which made the topic very interesting. It also has strong practical
contribution regarding possible benefits and problems of relevance to companies that have
intentions of implementing moving average on their inventory.

The relationships between foreign exchange rate risks and inventory leads to the formulated
research question for this thesis: What are the effects of currency movements in the cost of
goods sold from an inventory valued at moving average method?

Based on the technical problem statement was a constructive approach and interpretive
standpoint considered best suited for the study. The gathering of data was conducted by using
a qualitative research strategy. Three different topics are used in the theoretical frame;
inventory valuation, exchange rates and hedging. The theoretical frame describes the
accounting standards behind inventory valuation and exchange rates, as well as the theories
addressed. Third and final topic hedging is about how to manage exchange rate exposures
using different hedging techniques. The in-depth investigation was made for four business
units with inventories valued according to the moving average method. Sampling was divided
into two parts one for the companies and another choosing respondents. Selection of
companies was a convenient sample within the non-probability samples used and the
respondents were selected using a snowball sample. Semi-structured interviews were
conducted with nine respondents.

Both the empirical- and analysis chapter follows the same three topics as the theory structure
and the empirical answers are divided into companies to facilitate the comparison. A short
summary of the analysis is that moving average is most suitable for inventories with; high
inventory turnovers, sales from shelf and stable costs. There is a need to identify input costs to
manage exchange rate differences correctly. The final part about hedging showed that
different exposures need different hedging techniques. Forward contracts were the most
common financial instrument used for hedging transaction exposures. Input risks also
identified as an economic risk is one of the hardest to manage.

This study has showed that effects from exchange rate fluctuations affect the moving average
inventory value different than other inventory models. The input currencies need to be
identified and separated from the sales currencies otherwise there is a potential risk to make
wrong decisions.

Keywords: moving average, standard cost, SAP, hedging, exchange rates.
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1 Introduction

This chapter describes choice of topic and the background to the study based on theories and current articles about inventory valuation, exchange rates and hedging. Further are the contribution of the thesis discussed together with objectives and boundaries for the study.

1.1 Background

“Currencies fluctuate; commodity prices fluctuate. Why should we expect earnings to rise in a straight line upwards.” (Shenkir, Professor at University of Virginia, 2012-05-17) This quote states that there exist currency fluctuations and also commodity price fluctuations and highlights the importance of considering this aspect in the analysis of the income statement.

The topic was introduced as an assignment from BAE Systems that recently has changed their inventory valuation system as a consequence of the implementation of the business system SAP. This change led to difficulties in identifying and valuing the effects of exchange rate fluctuations for sold goods that are bought in different purchasing currencies and later sold in local currencies when goods are picked up by a project. The policy is to compensate this currency transformation that is due to currency fluctuations during the storage period in their internal inventory. If BAE cannot estimate this effect of currency movements during inventory keeping, these effects can be so big that they affect the projects economic margins. These implications and an existing gap in science make this topic both interesting and relevant and gave me the interest to study this in my thesis work. Another important factor is the combination of the theoretical as well as the practical contribution of the thesis.

The thesis is addressing identification and valuation of the effects of currency movements to inventory goods from an inventory valued at moving average. Another important issue is to highlight and investigate possible differences between the standard cost inventory valuation system and moving average. I have also found an existing gap in science around the moving average method as an inventory valuation method which is interesting because it seems like it has increased in popularity the last years. A fact of the increasing popularity is the 2008 approval from the IRS to use the rolling average inventory method in US as a foundation for the income tax declaration (Bloom, 2009, p. 72-73).

1.2 Problem discussion

The globalization process means that boundaries and regulations between countries decrease which open up opportunities for companies to act on an international market. The term is referring to political, economic and cultural factors but is strongly related to the economical aspect of new integrated national economies. Main reasons to the globalization are according to science consequences of improved technological communications, unregulated financial markets and political decision that allow international trades. (Gustafsson, 2012, NE) This integration of national economies has led to a new kind of business environment and also new companies that acts on an international market instead of a national.

An excellent example of an integrated financial market is the European Union that is a close collaboration between 27 states within Europe. The first idea of increasing the collaboration between the European countries was mentioned during the interwar but it did not happen until 1952 when the first treaty was signed. From that moment and
forward has the collaboration between the members in EU increased into the actual relationship that is stated by the Lisbon treaty that was approved in November 2009. (Lindahl, 2012, NE) This new business environment opens up many new opportunities to act as an international company and expand the business into new markets. But the opportunities of new gains also create an exposure to potential risks. International trade is exposed to many different risks such as foreign currencies.

The basis of a manufacturing company is most of the time their inventory that often is a great part of the value of the company. Inventory valuation is according to Charles E. Johnson one of the accountant’s Achilles heel. With this he refers to the problems of valuing the inventories. The value of something is a subjective perception of what that specific asset can bring to a person or company in the future. Looking at the balance sheet some assets are easier to value than others. Cash and receivables are rather easy because the future value is discounted back to a present value using forecast models. One of the biggest challenges is to value the inventories such as; goods, raw materials and semi-finished goods. These are not that easy to value because it is hard to forecast what their discounted future income for the company will be. (Johnson, 1954, p. 15-18)

According to Charles E. Johnson net realizable value is rarely used because of the problems of calculating an appropriate future value for inventories based on their expected future selling price. Most of the time it is easier to use a cost formula to get a good approximation of the inventory value because there are too many uncertainties in establishing a net selling price. (Charles E Johnson, 1954, p. 15-18) This shows the importance of good cost formulas so that the inventory values are stating fair values of the inventory. Only two cost formulas are approved for calculating the cost of similar goods and these are either the FIFO method or weighted average. (IAS/IFRS, p. 201)

The weighted average method that is using a perpetual recalculation for every new purchase is based on the concept of moving averages. BAE Systems business system SAP uses the moving average method which makes this inventory valuation system important for this thesis. Factors that are affecting the value of goods in inventory are mainly variations in prices and quantities for every new purchase made by the company. The weighted average principle means that every new purchase gets the same weight as the other goods in stock and therefore should this method give a fair value of the inventory. (Alfredson et. al, 2005, p. 264)

The definition of an exchange rate is the rate that adjusts one currency’s worth into another country’s currency (Investopedia, 2012). As previously discussed, international companies that both sell and purchases goods in multiple currencies have increased which makes exchange rates an interesting subject. This fact means that these companies have to be aware about the implications that exchange rates can cause to their operations. The definition of exchange rate risk is the risk of exchange rate fluctuations that can either increase or decrease the value of a sale or purchase of goods or transformation to reporting currency (Investopedia, 2012). Theory describes three different exchange rate exposures that a company can face and these are; translation, transaction and operating exposures (Shapiro, 2006, p. 337-341). The exposures have to be identified by the companies and later on also managed. How to manage these can vary depending on corporate policies but one possible way is to hedge these risks by using financial instruments or risk management.

The recent discussions about a possible exit from the Euro for Greece stresses the importance that companies need to be aware of exchange rate exposures and also
manage them. This exit will affect other countries and also the international trades, the question is how much? Both Financial Times and the professor in Economy Paul Krugman are worried for the future if Greece leaves the Euro. Possible consequences are a great capital outflow from other countries with problems like Portugal because of panic. If this scenario arises that also other countries leave the Euro, this can be the end of the European Union according to Krugman. (www.svd.se, 2012-05-20) The Euro will most likely be unstable for the nearest future. This highlights the need to manage exchange rate exposures for companies with foreign operations.

The transaction exposure is often easier to hedge than the economic because the exposure is known in a predetermined contract. One effective way of handling the transaction exposure is by derivative instruments such as forwards, options and swaps. Economic exposure is more problematic to hedge because it is difficult to measure and identify the effects because it is in-direct and on a long term basis. These risks include changes in sales price, sales volumes and costs of inputs for the company and possible effects from their competitors. One way of dealing with economic exposure is according to academics and practitioners geographically positioning. The company should relocate their operation such as; production, sales, sourcing and financing operations to the same place. This option is often very expensive and also difficult to reverse and takes time to implement. (Martin & Mauer, 2003, p. 438-440)

Hilmola states that many of the global manufacturing companies often are using costs as their basis for valuation and pricing of products and not value received by customers. This fact means they are exposed to even more currency risk because both the sales currencies and the input currencies can affect performance. He shows an example that currency differences from sales are small but the differences for the input currencies was high which affects the marginal of sold products and therefore the companies’ performances (Hilmola, 2006, p. 329-330). This example shows the importance of taking both currencies in consideration. I think that many companies do not analyze the input currencies as much as the sale currencies. The linkage between foreign exchange rate risks and inventory leads to the formulated research question for this thesis.

**1.3 Research question**
What are the effects of currency movements in the cost of goods sold from an inventory valued at moving average method.

**1.4 Purpose**
**Main objective**: Identify and evaluate the effects of currency movements in the cost of goods sold from an inventory valued at moving average method.

**Secondary objectives**
1. Investigate how companies can take into account changes in exchange rates arising from the purchase of goods to an inventory that is using moving average as valuation system.

2. How to value cost of goods in a moving average valuation system compared to the standard cost method? Investigate main differences and similarities between these two systems.
1.5 The contribution of this thesis
The contribution of this thesis is both practical and theoretical. Theoretical because of the limited literature available about moving average, it is almost impossible to find regarding this method in inventory valuation. Literature is mainly about how calculations is made and do not show pros and cons with this inventory model or comparisons to others like standard costs. Another interesting factor to study is if the moving average is more appropriate for a typical kind of inventory structure. The literature has shown indications that the inventory valuation model does not fit all inventory structures. This thesis work will fill a knowledge gap regarding a deeper understanding of the valuation system in four different business units.

The practical benefits of the thesis is of course the information that the client BAE gets about how other companies use the moving average method and how they manage the risks involved with exchange rates. My intentions with this thesis are to come up with interesting solutions on how to handle costs from inventories and show how other companies has handled them. It is a cross-disciplinary thesis because of my background with both accounting and finance studies at advanced level and the formulated problem statement. I have brought together knowledge from different people at different positions within the interviewed companies and then summarized the information in the analysis.

1.6 Boundaries
The time frame of this Master’s thesis consists of ten weeks of full-time studies. This time frame requires some boundaries for the study to be successfully implemented and below are the major boundaries.

The first boundary is that the main focus will be on currency fluctuation of goods during the storage period within companies using moving average as valuation method. The final valuation based on sales prices when goods are sold will not be investigated. The geographical limitation is set to only include companies operating in Sweden. I will look at this problem only from the purchasing side and how internal effects of inventory valuation and exchange rate differences are managed. Although similar effects can arise on the sales side of the business, this will not be included in the scope of this thesis.

1.7 Definitions
SAP - Systems, Applications and Products in Data Processing, is the world leader for enterprise application software and third among the world’s software companies (SAP, 2012).

Moving average – is the perpetual method of the weighted average cost formula and recalculates the cost per unit for every new purchase or purchase return (Alfredson et al., 2005, p. 264-265).

Standard Cost - is an expected cost that the company sets for a specific operation and this cost is often on a per unit basis. Standard costs can be used for budgets, control and for evaluating the performance (Blocher et. al., 2010, p. 607).
2 Scientific approach

In this chapter the scientific approaches that I have chosen for my research are stated. The purpose to identify and evaluate the effects of currency movements on the cost of goods sold from an inventory valued at moving average method are motivated by a constructive approach and interpretive standpoint of reality. Finally, research strategy, criticism of sources, selection of theories and ethics are discussed.

2.1 Pre-understanding

All scientists have pre-understandings from previous experiences and a big contribution to mine is the educational experience from five years of economic studies with accounting as major complemented with advanced studies in finance. This background has given me knowledge about inventory valuation, currency movements and hedging opportunities. These pre-understandings can be both positive and negative but I think that it is mostly positive. When analyzing the empirical findings it is important to stay unbiased.

This master thesis is my second thesis. Last year I wrote a 30 hp Degree project for the one year master degree of science. This semester gave me valuable experience regarding thesis writing that will help me construct an even better 2nd master thesis. Last year I studied accounting on an advanced level and this fifth year I have complemented my education with finance on an advanced levels which has given me a good insight in these two topics.

2.2 Ontological approach

Before starting a scientific investigation or thesis work is it important to define what paradigm it is based on. The paradigm is determined by how the scientist is studying the reality and which theories of knowledge he prefers. (Slevitch, 2011, p. 74)

The ontological approach describes how we watch the reality, objective as one scientific truth or many realities that are socially constructed (Patton, 2002, p. 133-135). This definition of ontological approaches is enhanced by Bryman & Bell that describes it as the scientist’s way of watching social entities, as an objective entity or as a socially constructed entity made by social actors. Objectivism indicates the external way of looking at entities and the other is constructionism which states that the reality is socially constructed. (Bryman & Bell, 2007, p. 22) The objective and value free science fits within the positivistic approach and means that all research should be objective, free from values and unbiased. According to literature there is a debate regarding objectivity in research and there are two sides, the positivistic and the non-positivistic. (Kreuger & Neuman, 2006, p. 125-126) This thesis and my considerations regarding ontological standpoint is associated with the non-positivistic side but I think that a truly objective view are impossible. Another consideration to this discussion is that if aspects of organizations, culture and other surrounding aspects are not included the results from the study should most likely be biased.

This thesis should follow the qualitative process and therefore also the constructivism as the ontological approach because of the relationship between entities and researcher. Constructionism implies that the reality is socially constructed which mean that objectivity cannot exist (Bryman & Bell, 2007, p. 22-23). According to Sale et al., (2002, p.45) is this ontological approach constantly changing and this qualitative process needs an interactive linkage between the studied object and the researcher to understand the findings. This statement also implies that objectivity is impossible in
qualitative research and describes the connection between the researcher and object as something that should interact and not be isolated from each other.

2.3 Epistemological approach
A scientist’s epistemological approach decides the way of analyzing an object or phenomena and this also influence the choice of research method. Positivism, realism and interpretivism are the three main epistemological positions in social science. (Bryman & Bell, 2007, p.16-21) The two main approaches are positivism and interpretivism but there is a third position also called realism that has close connections to positivism. Empirical realism is the most common and believes that reality can be understood with the help of good research methods. The critical realism means that the only way of understanding events are by disassembling the causes of the event. (Bryman & Bell, 2007, p. 18) This approach is not a suitable approach for this thesis because of the similarities with positivism and way of looking at reality. I do not believe you can explain the reality without incorporating the people. Positivism is a natural science epistemology and characteristics of this approach are objectivity, hypotheses testing, phenomenalism and it relies more on scientific- than normative statements (Bryman & Bell, 2007, p.16-17). This approach does not feel appropriate for my study because my intention is to use semi-structured interviews with an open standpoint and analyzing approach. This epistemological approach is a precise scientific method that want to quantify their data and most commonly use surveys, experiments and statistics (Kreuger & Neuman, 2006, p.72-73) which is not aligned with my study.

Bryman & Bell (2007, p. 17-19) describes interpretivism as the opposite of the positivistic position and this approach contradicts the belief that objectivity is the best way for a scientist during research. This approach seems more appropriate because I think that it is very difficult to hold an objective standpoint when conducting a qualitative study. This thesis needs an interpretive approach to capture the complexity of the problem and for the analysis of the interviews. Instead of separating objects from the influence of people as the positivists the interpretivism take this in consideration when they are analyzing a social object or phenomena (Bryman & Bell, 2007, p. 17-19). I do not think that it is possible to do a good analysis of semi-structured interviews without an open approach. If you do not include the people I believe you get a misleading picture of the material.

The literature has also discussed the importance of common sense in business research. Positivists argue that science is superior while interpretivism sees common sense as guidance in the daily living of people. (Kreuger & Neuman, 2006, p.80) This standpoint of common sense that guides us in our daily lives and our decisions I think is a healthy way of looking at the reality. Positivistic methods are good for quantitative researcher where you can quantify your research question into smaller measurable parts that can be measured in an objective way, but not for this study when the information enhances the analyzing part.

2.4 Research Strategy
Research strategy is an important question when you as a scientist start gathering of primary data that is central for the thesis. The choice of which research strategy that is appropriate is based on two basic influences; ontological stand of reality and knowledge of that reality called epistemology (Sale et. al, 2002, p. 44). These influences has been
explained more thorough previously and led to the choice of research strategy. The most appropriate method for this thesis should be a qualitative approach because of the complexity that this problem includes. I think that it is difficult to get good and relevant answers for my study with a quantitative approach because the strategy focuses mainly on quantifiable and measurable data. Quantitative research is according to Bryman and Bell an objective view of the reality and has a deductive approach of theory testing as main concern. These attributes are not a fact but the most common distinction for a quantitative research strategy (Bryman & Bell, 2007, p. 28). This research strategy does not suit my type of study because the knowledge I collect from my respondents are restricted to a narrow selection of both people and companies. The quantitative measurement often consists of numbers and separate variables which require great planning ahead because this strategy requires measurable components (Kreuger & Neuman, 2006, p. 170-171). This type of planning is really hard when you have a complex and focused problem that few people are aware of. This is the main reason why I think that the quantitative research design is inappropriate for this study.

The qualitative research strategy has a more open approach to research and their way of looking at reality seems to be the best way of getting access to necessary and vital information for this study. Bryman & Bell describes the most common characteristics of the qualitative research as focused at words rather than scientific models and explains the view of reality as socially constructed and constantly changing. Qualitative studies often have an inductive research approach which means a focus at generating new theories. (Bryman & Bell p. 28-29) This study does not follow this choice. Instead an open deductive approach is used. The deductive approach means that you are testing already existing theories with an empirical study. Deductive approaches in qualitative studies are rare but exist and can be a good way of testing existing theories. (Bryman & Bell p. 28-29) This choice of having an open deductive approach is according to me the best choice because the aim is not to generate new theories, which would be hard to do in my type of study. To be able to generate new theories the researcher should gather accurate and correct information that reproduces the reality (Jacobsen, 2002, p. 35). Because of my approach to only search for in-depth understanding regarding moving average and also the connection to exchange rates and hedging the approach need more structure. Saunders describes that if you use existing theories to approach a qualitative research process a deductive approach should be used (Saunders et. al., 2009, p. 489). This study has a focused research question meaning that existing theories has to be used to gather relevant data. I believe that these arguments show that an open deductive approach is better than an inductive for this thesis.

2.5 Collection of secondary data
The basis of the theoretical framework is scientific articles and e-books that are published on Umeå University’s database called UB. During the search for secondary data a continuous review has been made of the articles so that the theories are reasonable and applicable for this thesis. Some of the used keywords when searching for relevant articles regarding inventory valuation are; Inventory valuation, inventory accounting, inventory risks, accounting standards, FIFO, weighted averages, standard costs, IAS 2, moving average, rolling average. Keywords for exchange rates are; foreign currencies, currency fluctuations, risks, transformation, firm exposure, IAS 21. Finally, hedging keywords are: managing foreign exposure, hedging, risk management.
2.6 Selection of theories
The theoretical framework is built on the foundation of inventory valuation methods such as standard costs and moving average. IAS accounting standards regulates the valuation of goods sold for companies following IFRS and according to these regulations two methods are approved; FIFO and weighted average. Moving average is a version of the weighted average method which explains why I place them under the same section. Exchange rates are the other section of the framework and include currency movements and currency exposure of a firm that is exposed to foreign currencies. This sections purpose is to increase the awareness of how currency movements can influence companies and also show that it is an existing common problem. The third and last part of the theory is about hedging. In this chapter I have stated considerations about hedging and hedging strategies and finally given some examples of hedging the different exposures in a company.

2.7 Assessing the sources
Criticism to sources is based on four principles; observation, origin, interpretation and usability. The observation of sources is mainly the search of relevant sources at databases and other institutions that helps to understand the problem statement. (Holme & Solvang, 1996, p. 130-131) All articles that I have used in the theoretical chapter are scientific articles retrieved from the e-library at Umeå University. These are reviewed and published in accounting papers which also is a quality check of the articles origin. The interpretation of articles is assessing whether the intention of the article are captured and if it is reliable.

To prevent misunderstandings I have tried to use original sources because other scientists might have changed the intention of the original source. The usability is attached to your problem statement and also that the sources are current and not out of date (Holme & Solvang, 1996, p. 130-131). This thesis is built on current sources but for example inventory valuation articles have some articles that are older because of the small changes the last decades.

2.8 Ethics
Social scientists are facing many ethical dilemmas and it is important that you are aware of these and how to act if they occur (Kreuger & Neuman, 2006, p. 98-99). During this thesis I am going to face many different dilemmas and one useful question that you can ask yourself is if you can defend your work for other scientists and have secured the integrity of the people involved in the study. Most ethical dilemmas are based on the pursuit of relevant and interesting data that generates scientific knowledge and forget the respect to the people studied.

Important things to consider are that you cannot write information that damages the respondent’s dignity, self-esteem or democratic freedom. (Kreuger & Neuman, 2006, p. 98-99) To avoid this in my study my intention is to have an open dialog with my respondents and also send them the material that is going to be published. Another important aspect of ethical dilemmas is the fact that writing this thesis on an assignment means another factor to consider and this is made with a close collaboration with the client. The qualitative research strategy requires higher demands and increased awareness of ethical dilemmas according to Kreuger & Neuman (2006, p. 98-99) when conducting social work research. When ethical dilemmas arise a consultation with the supervisor should be made to avoid unethical behavior.
3 Theoretical framework

The chapter follows a structure of the three topics; inventory valuation, exchange rates and hedging. The first part of cost accounting is meant to show the cost flows in a manufacturing company and also how standard costs is calculated. Both inventory valuation and exchange rates have a section about accounting standards that I think is important to show because it shows the regulations behind the theories. After the generalized information gets the theories more specified to the purpose of this study.

3.1 Cost accounting

3.1.1 Cost flow in a manufacturing unit

The cost flow in a manufacturing unit is divided into three different inventory accounting steps which are materials purchased, materials inventory and finally finished goods. In the first step are the materials bought into the materials inventory, for example raw materials for further manufacturing. These materials goes to the second inventory account called work in process inventory (WIP), here are the products manufactured all the costs necessary to complete the product are assigned like labor and overhead costs. Finally after the goods have been manufactured and finished do they end up in finish goods inventory where they are ready to be sold to a client. (Blocher et. al., 2010, p.74)

Cost flow in a manufacturing unit

Step 1

Materials Purchased

Materials inventory

Materials used

Step 2

Labor

Overhead

Work in Process (WIP) inventory

Cost of goods manufactured

Step 3

Finished goods Inventory

Cost of goods sold

Figure 1: Cost flow in a manufacturing process

(Blocher et., al., 2010, p. 75)
You can calculate the beginning and ending balance on these inventory accounts using the formula below:

\[ \text{Beginning inventory} + \text{Cost added} = \text{Cost transferred out} + \text{Ending inventory} \]

The costs added and cost transferred out can mean different things depending on what inventory account you calculate, it is important to follow the steps in the figure. The calculation for costs of goods sold requires two calculations, the first part gives us the cost of goods manufactured and the second part cost of goods sold. (Blocher et. al., 2010, p. 75-76)

Accounting cost information is vital for decision makers so it has to be accurate, therefore do they need a good internal accounting control to detect possible errors and defaults. The internal control helps secure the quality of the information with their policies and guidelines. The Securities and Exchange Commission (SEC) has strengthened the requirements for companies with the Sarbanes-Oxley Act from 2002. Another important factor is the timing of the information so that right decisions can be made at the right time. This information that a management accountant can provide to their managers is a service and creates a value and the preparation of it can be seemed like a cost. This is a decision that the company has to make, are they willing to spend a lot of money to get a more accurate and timely cost accounting information or not. (Blocher et. al., 2010, p. 76)

### 3.1.2 Standard costs

The standard cost is an expected cost that the company sets for a specific operation and this cost is often on a per unit basis. These standard costs can be used for budgets, control and for evaluating the performance. Cost elements that should be incorporated in the standard cost are for example the products or service manufacturing, selling and administrative expenses. The standard costs can either exist in the formal accounting system, and then it is called standard cost system, or outside the system like a control function to the ordinary system. When the company is using standard costs as control function they compare the standard prices with the actual costs. Standard costs can be used for both job costing and process costing but the latest is simpler and in a repetitive nature of operations is this cost system best suited. (Blocher et. al., 2010, p. 607)

To establish a standard cost needs a combination of expertise from management, products design engineers, industrial engineers, management accountants, purchasing department, personnel department and others affected by the standard. The three most important aspects when deciding the standard cost for direct material is quality, quantity and price. It is very important that the quality is specified because this controls choice of material, manufacturing, prices, processing time and the supervision needed to secure the quality. Factors that affect the prices for direct material are quality, quantity and sometimes also timing of purchases. There is a competitive environment where many companies values long-term relationships and good quality from their suppliers and deliveries on time very high. For this type of long term relationships needs only the price to be revised when long term factors changes. (Blocher et. al., 2010, p. 609)

Standard costs for direct labor is dependent on types of work, product complexity, employee skill level, nature of manufacturing process and condition of the machines. The personnel department decides the wages and salaries for different types of work and
skill levels. All benefits like paid vacation, pension plans, health- and life insurances are incorporated in the costs for direct labor. (Blocher et. al., 2010, p. 610)

The standard cost system uses the same accounts that an actual or normal cost system, see figure 1 on page 9. The cost flows in a similar way as in the actual cost models with the only difference that the costs are standard costs instead of actual costs. A difference is that standard cost system has a separate ledger account that track the variances. The positive variances are registered as credit balances and negative variances at the debit balance. (Blocher et. al., 2010, p. 609-610)

In an article by Horngren & Churchill is the standard cost method presented as a better solution than the weighted average or FIFO costing. Standard cost facilitating the cost process a lot compared to actual cost models like weighted average and FIFO in manufacturing companies with a variety of products. He also suggests that the method is more useful for both the product costing part and for control. (Horngren & Churchill, 1967, p. 593)
3.2 Inventory valuation
Inventory valuation is the first section of the theoretical framework and it starts with a brief summary of IAS 2, which regulates how to value the inventory. Then is the approved cost formulas further explained and showed with numerical examples and a brief discussion about pros and cons. Finally is a short description of how the business system SAP handles inventories and how they calculate their value with a moving average.

3.2.1 Accounting standard IAS 2
The International Accounting Standards (IAS) is widely used in the world and gives recommendations on how financial statements are being presented according to the International Financial Reporting Standards (IFRS). The main purpose of IAS is to make sure that the financial accounting follows IFRS and that the information is transparent and able to be implemented without high cost. (IFRS/IAS, 2009, p. 51)

This chapter consists of guidelines on how to report inventories in the financial statement and two of the most important questions are valuation of assets and recognition of expense (IFRS/IAS, 2009, p. 197). The main focus that I have in this paper is to look at the existing cost formulas within IAS and then use this financial information to analyze value of goods.

Definition of an asset in IAS 2 is according to Mirza et al. goods that are; held for sale in core business, in production or material and supply that are going to be used in production of goods (Mirza et al., 2008, p. 27).

The IAS 2 standard states that the appropriate value of the inventory is the lowest of cost and net realizable value. Net realizable value is the expected sales price of the goods after excluding costs for completion and sale. In the cost of goods should every cost according to purchase, manufacturing and other costs be included in the value. Purchase costs and manufacturing costs are mainly the costs that are directly attributable to the goods sold. Other costs include expenses that are crucial for the completion of the goods. (IFRS/IAS, 2009, p. 198-199)

The costs that are included regarding a purchase are all expenditures that are necessary to acquire goods; price, importing expenses and transportation costs. Conversion costs of inventory is all direct, variable and fixed costs that is attributable to the conversion of units of production or raw materials into finished goods. (Mirza et al., 2008, p. 28)

There are two different cost formulas that are allowed according to IAS 2 and they are First-in first-out (FIFO) and the weighted average, regardless of which of the two you choose that model, should be applied for all similar goods in inventory. These two methods are used for all goods except goods that are exchangeable or produced and allocated only for specific projects. (IFRS/IAS, 2009, p. 200)
3.2.2 FIFO cost formula

This cost formula are assuming that all the goods that is acquired first is also the ones that is sold first which means that the goods in inventory are the ones that is most recently acquired or produced (IAS/IFRS, 2009, p. 201). When you calculate the ending value of the inventory you start with the prices of the last bought goods and continue backwards until all goods in inventory are priced (Alfredson, 2005, p. 264).

It is impossible to calculate identical items in an inventory on an individual unit level but it is important to give a good approximation of the cost flows. A method that is widely used and is assumed by many as the best approximation of a company’s cost flows is FIFO. Their ultimate example is regarding the food industry where the groceries that is produced first most logically also is sold first and therefore should give a good approximation of the cost flows. (Wilkinson-Riddle, G., 2008, p. 1694)

Example of the FIFO method:
Company A is an international company and import goods from China and sells in the local market. Listed below are the sales and purchases during one year.

Required:
Calculate the inventory value according to FIFO method at May 31, September 30 and December 31.

<table>
<thead>
<tr>
<th>Purchases</th>
<th>Units</th>
<th>Price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>10000</td>
<td>25</td>
</tr>
<tr>
<td>March</td>
<td>15000</td>
<td>30</td>
</tr>
<tr>
<td>September</td>
<td>20000</td>
<td>35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sales</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>15000</td>
</tr>
<tr>
<td>November</td>
<td>20000</td>
</tr>
</tbody>
</table>

Solution

<table>
<thead>
<tr>
<th>Purchase/Sale</th>
<th>Units</th>
<th>Price ($)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>10000</td>
<td>25</td>
<td>250000</td>
</tr>
<tr>
<td>March</td>
<td>15000</td>
<td>30</td>
<td>450000</td>
</tr>
<tr>
<td>May</td>
<td>-10000</td>
<td>25</td>
<td>-250000</td>
</tr>
<tr>
<td></td>
<td>5000</td>
<td>30</td>
<td>150000</td>
</tr>
</tbody>
</table>

Inv. value FIFO method May 31: **100000**

<table>
<thead>
<tr>
<th>Purchase</th>
<th>Units</th>
<th>Price ($)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>20000</td>
<td>35</td>
<td>700000</td>
</tr>
</tbody>
</table>

Inv. value FIFO method Sep 30: **100000**

Total: **1000000**

<table>
<thead>
<tr>
<th>Purchase/Sale</th>
<th>Units</th>
<th>Price ($)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td>-10000</td>
<td>30</td>
<td>-300000</td>
</tr>
<tr>
<td></td>
<td>10000</td>
<td>35</td>
<td>-350000</td>
</tr>
</tbody>
</table>

Inv. value FIFO method Dec 31: **1000000**

Table 1 FIFO Cost formula

(Mirza et al., 2008, p. 30)
3.2.3 Weighted average cost formula
Weighted averages are based on averages that are weighted on costs of similar goods from the beginning of the time period and the ones acquired during this period (IAS/IFRS, 2009, p. 201). There is two ways of calculating the weighted average cost formula and these are based on either a periodic basis or on every additional shipment received. The periodic based cost formula is calculated as the beginning cost of inventory plus all inventory bought during the period divided with the goods available for sale at the end of period, this method is called weighted average. The other method is called moving average and recalculates the cost per unit for every new purchase or purchase return. (Alfredson et al., 2005, p. 264-265) Weighted average cost formula is quite similar to the FIFO principle when the inflation is low or when the inventory turnover is quick. This type of valuation system can be an indicator that the inventory is computer controlled because of the complexity. (Wilkinson-Riddle, G., 2008, p. 1694)

Example of weighted average method:
Company A uses the latest version of a software package to cost and value their inventory and their software uses weighted average as cost model.

<table>
<thead>
<tr>
<th>Purchases</th>
<th>Units</th>
<th>Price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>100</td>
<td>250</td>
</tr>
<tr>
<td>March</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>September</td>
<td>200</td>
<td>350</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sales</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>150</td>
</tr>
<tr>
<td>December</td>
<td>170</td>
</tr>
</tbody>
</table>

Solution

<table>
<thead>
<tr>
<th>Month</th>
<th>Purchases/sales</th>
<th>Balances</th>
<th>Rate/unit</th>
<th>Amount</th>
<th>W. A cost/unit</th>
<th>Valuation date</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-jan</td>
<td>Purchases</td>
<td>100 units</td>
<td>250</td>
<td>25000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-jan</td>
<td>Balance</td>
<td>100 units</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-mar</td>
<td>Purchases</td>
<td>150 units</td>
<td>300</td>
<td>45000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-mar</td>
<td>Balance</td>
<td>250 units</td>
<td>280</td>
<td>70000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-mar</td>
<td>Sales</td>
<td>(150) units</td>
<td>280</td>
<td>-42000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-mar</td>
<td>Balance</td>
<td>100 units</td>
<td></td>
<td>28000</td>
<td>280</td>
<td>31-mar</td>
</tr>
<tr>
<td>25-sep</td>
<td>Purchases</td>
<td>200 units</td>
<td>350</td>
<td>70000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-sep</td>
<td>Balance</td>
<td>300 units</td>
<td></td>
<td>98000</td>
<td>326,667</td>
<td>30-sep</td>
</tr>
<tr>
<td>15-dec</td>
<td>Sales</td>
<td>(170) units</td>
<td>326,667</td>
<td>-55533</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-dec</td>
<td>Balance</td>
<td>130 units</td>
<td></td>
<td>42467</td>
<td>326,667</td>
<td>31-dec</td>
</tr>
</tbody>
</table>

Table 2 Weighted Average Cost formula

(Mirza et al., 2008, p.30-31)
The method can be used both for sample data and for populations and is called the weighted sample mean. Two factors decide the weighted mean and those are the quantity and price of a product or raw material, this method gives every new purchase equal weights in the calculation. The mathematical formula for weighted mean or average according to statistics is stated below. (Anderson et al., 2007, p. 97-98)

\[
\text{Weighted mean } (\bar{x}) = \frac{\sum w_i x_i}{n}
\]

The reason why you use this type of statistical method is to get a more accurate mean for example raw materials where you buy different quantities to different prices. If purchasing quantities are not considered as weights of data is it only a simple average which makes it misleading. (Anderson et al., 2007, p. 97-98)

3.2.4 Pros and cons with FIFO and weighted average

It is impossible to say that one or the other is the best cost method because this depends a lot on the company’s circumstances and environment that they operate in. This choice is dependent on; information requirement, type of inventory, cost of implementation, inventory turnover and management questions. (Alfredson, 2005, p. 267) Below are pros and cons stated for FIFO principle and moving average that is one way of calculating weighted average.

**Pros**

The weighted average method is best suited for an inventory that consists of homogenous products that are mixed together, for example iron or spring water. (Alfredson, 2005, p. 267) The accuracy of moving average as a forecasting model is according to theory quite good and one reason for this is that it is easy to understanding (Anderson et al., 2007, p. 681-682). Seung Chan Park has confirmed the statement of other scientists that moving averages has significant predictive power of future returns than historical returns. In the article has Park mainly focused at short and long-term moving average ratios, the short-term has predictive forecast power over the long-term that is mostly used as a reference point of the price. The combination of moving averages gives a more accurate prediction of future values because the short term excludes random fluctuations that can be included in the long term ratio. (Park, 2010, p. 415-418) The article highlights the predictive power that moving averages has as a forecasting model in general according to me and is not isolated to the fact that it describes times series of stock returns.

The journal of accountancy has an article about the acceptance of the rolling average method to reflect income for income tax reporting. The inventory valuation method is described as a good and reliable inventory valuation system that already is implemented in companies in different industries and works as a good predictor of cost of goods sold and inventory value. The IRS sees some implications regarding this model when companies are holding their inventory for several years or having unstable costs. (Bloom, 2009, p.72-73) This fact is enhanced by Anderson that describes that moving average method to have lower predictive power in forecasting unstable time series (Anderson, 2007, p. 681-682)

The FIFO principle are better suited to be used in companies with a lower inventory turnover because then do this method reflects the value of the movement in inventory better than the weighted average. There is possible to use both of the models but then
should the company have good reasons and different geographical locations of the inventory are not a legitimate reason. (Alfredson et al., 2005, p. 267) The FIFO principles also outperform the LIFO principle when they are valuing their inventory amounts in the financial statements. Most companies have a higher inventory turnover than 1 and if so does the FIFO model reflect the actual input costs better than LIFO. (Biddle, 1980, p. 246)

**Cons**
The IRS has found some cons and therefore set up two conditions that companies must fulfill for getting the approval of using rolling average as approved for income tax reporting. These conditions has to be fulfilled otherwise do the method not fully reflect the taxable income. The first condition is that the cost formula must be recalculated for every new purchase they made or at a regularly basis at least once a month. The second condition is the fulfillment of one of two tests; no higher cost variations than 1 percent according to identification principles and the second test is an inventory turnover of at least four times. (Bloom, 2009, p.72-73) This article from the IRS discuss both pros and cons with this model but clearly states that the method is not appropriate for every company especially those with low inventory turnovers and large fluctuations in costs. (Bloom, 2009, p.72-73)

**3.2.5 Other cost formulas not recognized by IAS and IFRS**
It has been a lot of discussion about a convergence from the US GAAP accounting standards to start using IFRS standards instead. During 2008 were their discussions about having US companies start using IFRS from 2015 and forward. If a company should converge to IFRS requires SEC that they need to have three years of comparative statements before the switch take place. (Krishnan & Lin, 2012, p. 52) Before a company decides to switch accounting standards is it important that they learn about the differences that there is between US GAAP and IFRS. The differences can be not only in balance sheets but also in cost of goods sold. For example manufacturing units with significant inventories can result in big differences if you switch from the LIFO model, which means Last in First out, which is not accepted by the IFRS. The company Exxon Mobil Corp. reported that their replacement cost for 2009 and 2010 was much higher calculated with FIFO principle, 2009: 17,1 billion USD and 2010: 21,3 billion USD, compared to the LIFO principle. A company like Exxon would face big changes if they converge to the IFRS standards because of the big effects. (Krishnan & Lin, 2012, p. 52)

US GAAP states that similar an interchangeable inventory items cost flows can be assumed using FIFO, average cost or LIFO. Standard costs that are updated so that they reflect the current conditions are also accepted. So the companies that are using the LIFO to value the inventory are the ones that will get the biggest impact if they trade to the IFRS standards because they do not allow this model. (Krishnan & Lin, 2012, p. 52, 58) Plummer and Vigeland have written an article about the life after LIFO where they have stated possible effects of the elimination of the method followed by the convergence to IFRS. The reason why it is not allowed according to IFRS is that the method can be favorable in tax purposes. If prices are increasing and company does not reduce the inventory do this result in a higher cost of goods sold with LIFO compared to FIFO which means lower net income and tax liability. There will also be effects on the balance sheet because the inventory is based on older and lower value than if they had been using FIFO. The lower tax incomes have led to political pressure in USA to withdraw the right to use this method. A repeal after 2012 would increase the tax
income with 52, 9 billion USD on a ten year period until 2021 according to budget. (Plummer & Vigeland, 2011, p. 26, 28)

The criticisms of the model have been about tax purposes, inefficiencies in businesses and may increase possibilities to earnings management. But one interesting thing is that you also need to show your results with either FIFO or average cost so that you can see the differences in the financial statements. Recent proposals of a change for a company have given them an extended time period to recognize cumulative earnings and defer tax liability from 4 up to 8-10 years. But full convergence is not finally decided and voices have been raised in debates that somewhere in between might be the best approach for US companies. (Plummer & Vigeland, 2011, p. 27)
3.3 Practical implementation (SAP)

The worldwide business system called SAP was founded 1972 and stands for Systems, Applications and Products in Data Processing. The company is the world leader for enterprise application software and third among the world’s software companies. Innovativeness and growth are the two main characteristics of the company and their goal is to help businesses of all sizes and are currently active in more than 130 countries and has 183 000 customers. Their business idea consists of local subsidiaries in every major country that have the right to sell SAP products within a specified territory. The right of selling SAP products is regulated and controlled by a license agreement that states a percentage of the revenues that should go to the licensor. (SAP, 2012)

Cost formula for inventories

The system uses two different cost formulas for materials; either you use standard price or moving average price calculations. Moving average price calculations is aligned with the weighted average cost formula, and moving average, which is approved by IAS 2. MAP calculations in the SAP system are varying with every new purchase that the company makes. Factors affecting the value of goods in inventory are variations in price and quantities. The weighted average gives every new purchase the same weight as the other goods in stock so this method gives a fair value of the inventory. The formulas for calculating value, quantity and price in this system are given below. (SAP, 2012)

\[ \text{Quantity}_{\text{new}} = \text{Quantity}_{\text{old}} + \text{Quantity}_{\text{receipt}} \]

The new quantity is calculated by adding the purchased quantity goods to the opening balance in the stock. Important is to check if the quantity between purchase order and goods receipt is consistent otherwise if you have quantity variances they affect the MAP. (SAP, 2012)

\[ \text{Value}_{\text{new}} = \text{Value}_{\text{old}} + \text{Quantity}_{\text{receipt}} \times \frac{\text{Price}_{\text{receipt}}}{\text{Price \ unit}_{\text{receipt}}} \]

New value of total goods in stock is calculated by adding the bought quantity times the best approximation of the price/quantity, usually the purchase order price or if you already have received an invoice you can use that price. When purchase order price are different from the invoice price should the value be adjusted which affect the MAP. If the goods that you received still are in inventory you only adjust the value on stock with the difference between invoice price and purchase order price. When there is not a stock coverage and you already have sold the goods do the revaluations go toward the income statement. (SAP, 2012)

\[ \text{Price}_{\text{new}} = \frac{\text{Value}_{\text{new}}}{\text{Quantity}_{\text{new}}} \times \text{Price \ unit}_{\text{material \ master}} \]

The new MAP is calculated by dividing the new value of the total stock with the new total quantity. The only time the MAP for all goods changes is when the company purchase new goods to their inventory and a difference occur. (SAP, 2012)
3.4 Exchange rates

This section about exchange rates starts by explaining the IAS standards of how to handle exchange rates differences both in balance sheet items as well as income items. Then I discuss more about effects of exchange rate movements and explain more about possible foreign exchange rate exposures in a company.

3.4.1 Accounting standards IAS 21

The principle of IAS 21 is to give directions about foreign currencies, conversion to presentation currency and shows how to account for exchange rate movements in your financial statements. (Mirza et al., 2008, p. 159)

Important definitions in this accounting standard are mainly foreign operation, functional currency, closing and spot rate and finally presentation currency. Foreign operations are a subsidiary, affiliate or a joint venture of a group. The functional currency is the currency within the operations of the entity and the presentation currency is the currency presented in financial statements. Closing rate is the exchange rate on balance sheet date and the spot rate is the rate for immediate delivery. (Mirza et al., 2008, p. 159)

The functional currency should be presented in the currency that the entity usually denominates transactions and the other currencies are treated as foreign currencies (Mirza et al., 2008, p. 159). According to Mirza et al are there five important currency factors that decide the functional currency, these factors are currencies that;

- Influences the prices of goods sold.
- Country’s regulations and competitive forces that influences the pricing structure.
- Influences the costs.
- Funds are generated.
- Goods receipts are stated in.

It is approved that a subsidiary presents their financial statements in any currency but if presentation and functional currencies differs should it be translated into the presentation currency. The translation of foreign operation from a subsidiary that uses another currency in their financial statements should also be translated from their presentation currency when they are incorporated in the group’s financial statement. The recognition of exchange differences in monetary items is recognized as a profit or loss during the same period. One exception to this standard is investments from the entity in a foreign operation which is recognized as a separate part of equity in the group’s financial statements instead. (Mirza et al., 2008, p. 161-163)

Recording foreign currency transactions should be made at the spot rate of exchange at the date of the transaction. It is allowed to use an average rate if the exchange rates are quite stable but if they are fluctuating should the transaction date spot rate be used. At balance sheet dates should foreign currency monetary amounts be reported at the closing rate and non-monetary items carried at fair value should be reported at the date where the fair value was decided. (Mirza et al., 2008, p. 160)

The exchange differences should be reported as a profit or loss in the period, the only exception is exchange differences on monetary items. These differences should be reported in the entity’s financial statements instead. (Mirza et al., 2008, p. 160-161)
3.4.2 Exchange rates and inventory
Global companies all deals with currency exposures in greater or lesser extent. Olli-Pekka Hilmola has written an article about the impact of currency changes as a factor in manufacturing companies' profitability and productivity efficiencies. What he has developed is a method that takes currency changes into consideration and suggests that this effect is one of three main factors in measuring the profitability. The empirical study of this article shows that currency changes has a significant effect on profitability and also indicates that it can be a base for future hedging. (Hilmola, 2006, p. 321-323)

Many of the global companies are exposed to all the currency risk because most often are pricing of industrial products originated from the costs and not from the value received by the customer. The hypothetical example in the article shows an interesting thing that the changes in currencies from sale are quite small but the input currencies have an increase of 40 percent. (Hilmola, 2006, p. 330) This difference shows the importance of taking currency changes in consideration and not only in sales but also in input currencies which this study is about.

There is often an assumption in the real business that global sales and purchases should match up but this is rarely the case because of errors and differences in currencies. Another falsely assumption regarding these errors is according to Hilmola the case that inventories should provide as a short-term hedge for this effect. Companies can therefore take actions of their prices such as, competitive bidding for suppliers and increased prices when it actually is currency changes that are the problem. This type of misunderstandings from management means that they do not handle the real problem which in this case is the currencies. What they should do is look at hedging opportunities to lower these impacts which most often is on a short term basis but can affect the financial performances a lot. (Hilmola, 2006, p. 330-331)

Hilmola suggests hedging with financial derivatives as one way of handling this problem with currency changes but also describes hedging as complex and expensive. The most important thing for financing is to gain a general understanding of both input and output of currency recovery and then in need suggest hedging opportunities. (Hilmola, 2006, p. 331)

3.4.3 Foreign exchange exposure
Multinational companies today that deal with many currencies have to be aware of how they can measure and manage effects from exchange rate movements. Shapiro divides this exchange rate exposure into three risks: transaction, operating and translation. The increased pressure on companies within this field has also led to new sophisticated business systems that can keep track of these effects from exchange rate fluctuations. (Shapiro, 2006, p.337) These facts and the globalization of companies today make this a crucial part for companies that both use different purchasing currencies and those with different local currencies and reporting currencies. The main reason why you measure and manage exchange rate exposure is to be able to create a hedge, an offsetting currency position that offset the gain or loss from possible exchange rate movements (Shapiro, 2006, p. 337).

The transaction exposures and the operating exposure are closely related and together do they and together do they form the economic exposure of a company. (Shapiro, 2006, p. 338, 341) An article from Martin and Mauer states that according to their study of 107 US based multinational companies is their more difficult to hedge an economic

[20]
exposure compared to a transaction exposure. This statement is based on a fact that the economic exposure is more difficult to recognize and therefore also to hedge. (Martin & Mauer, 2003, p. 437-444)

**Translation exposure**
This exposure is the translation loss or gain that you get when translating financial statements from local currencies into reporting or home currencies. This risk or exposure is often called accounting exposure because it is an accounting gain or loss when integrating financial statements from a foreign operation. Investors and the financial community are only interested in home currency values for the group financial statement and not values from local currencies in foreign operations. (Shapiro, 2006, p. 337, 339) Translation exposure is regulated in the accounting standards of IAS 21, recognition of exchange differences in monetary items should be recognized as a profit or loss during the same period (Mirza et al., 2008, p. 161-163). Shapiro describes this effect only of an accounting nature which means that it does not need to be any cash flows involved. Main methods of translating foreign operations into a consolidated financial statement are; the current/non-current method, the monetary/non-monetary method, the temporal method and finally the current rate method. (Shapiro, 2006, p. 339)

Current/noncurrent method means that all current assets and liabilities are translated into the current exchange rate while the noncurrent assets and liabilities are translated at its historical exchange rate. The historical exchange means the prevailing exchange rate at the time that an asset was acquired or a liability incurred. (Shapiro, 2006, p.339-340)

The second method is called monetary/non-monetary method and separates monetary assets and liabilities from non-monetary assets and liabilities. The monetary items are translated at the current rate (cash, accounts payable and receivable and long term debt) while non-monetary are translated at historical rates (inventory, fixed assets and long-term investments). Temporal method is very similar to the monetary/non-monetary method with the only exception that inventory can be valued at current rate instead of historical rate if the inventory are shown in market values in the balance sheet. (Shapiro, 2006, p. 340)

Current rate method means that all balance sheet items and income items should be translated at the current rate which makes this model the easiest. (Shapiro, 2006, p. 340)

**Operating exposure**
All the possible effects that exchange rate movements can have on a company’s future operating cash flow is called operating exposure. This exposure means all effects caused by exchange rate fluctuations that are affecting the company’s revenues and costs. This effect is regardless if there is a domestic company with an operating cash flow denominated strictly in home currency or not. (Shapiro, 2006, p. 339) These effects can as an example arise from increasing or decreasing purchasing currencies which in turn means higher costs for the company.
**Transaction exposure**

Transaction exposures are closely related to the operating exposure and together are they often referred to as the economic exposure of a company. The definition of transaction exposure is changes in value from a contractual binding transaction with an obligated future currency denominated cash inflow or outflow. The difference in exchange rates between the time the transaction was decided and the time until the transaction is settled is the transaction exposure. (Shapiro, 2006, p. 338, 341) This type of transaction exposure is often on a short-term basis and rather easy to hedge because the price of a sale or a purchase is already settled in a contract (Martin & Mauer, 2003, p. 438).

The unsettled transactions regarding accounts receivable and payables that already are listed in the balance sheet are only exposed to an accounting risk and not a transaction risk. While the ones that is not in the balance sheet is exposed to a transaction risk, like a future contract. Inventory and fixed assets are excluded from transaction exposure and contracts for future sales or purchases are excluded from translation exposure. (Shapiro, 2006, p. 338, 341)

One example of a transaction that is exposed to a transaction risk is: a European company with Euro as their home currency buys 100 articles from USA with a price denominated in USD. At the date of purchasing order have the USD a certain value in Euro. Two months after purchasing order delivers the company from USA the articles to the European company and USD has now strengthen compared to the Euro, this means that European company have to pay more than for two month ago. For the European company has they a currency loss in the size of the difference between the purchase order price and the invoice price.
3.5 Hedging
This section is going to describe benefits of hedging, costs attached and how to design a hedging strategy for different types of exchange rate exposures. Finally are considerations regarding whether to hedge or not and a discussion about different hedging techniques.

3.5.1 Hedging strategies
Hedging means that you move the exposure from yourself onto another part and prevent the risk that your exchange rates are fixed and not exposed to fluctuations. The exposure is a two way risk because the opportunities of a benefit are also available which many forgets when they talk about hedging. One thing for sure is that you guarantee a certain amount of cash flow for the company that facilitates investments, reduces risk of financial collapse and follows the risk-averse strategy. (Bligh, 2012, p. 40)

It is very important that the company sets goals for how to manage exchange rate exposure and hedging strategies because different risks can be hedged with different techniques. The risk of putting both risk management and managers in tough decisions between different techniques is big if the instructions are vague. Because of the many hedging techniques available should the instructions be clearer than “hedge all foreign exposure” or “do not speculate”, these vague instructions leads to great confusions. For example if a currency does not allow hedging should the company stop selling to that company and loose big profits? The choice of making profits or hedge the exposure can sometimes be the opposite and this can put managers in tough dilemmas. Another relevant question what are the tradeoffs for transaction risk of hedging for instance a translation exposure. The elements of an effective exposure management contains; identify and monitor the exposure and type, clear corporate objectives, specify responsibilities, limit hedging options, implement a system for evaluation and monitoring of the activities. These factors are some of the important factors that are necessary when building a clear and effective way to handle exchange rate on a company. (Shapiro, 2010, p.343-344)

The first choice the company need to make is if they should hedge currency risks or not and if they decide to do that are they going to hedge the full exposure or only partial. Another decision to make is if the company only should hedge their net exposure to a certain currency. These technique means that you have two offsetting positions in the same currency or a currency that are strongly correlated with that currency. For example if a company have both sales and purchasing materials from USD do this mean that the company only hedges the net transaction flow of this offsetting positions. Centralized or decentralized risk management in the organization is another big question that needs to be discussed. Centralized organizations have both benefits and cons that should be faced against each other when the decision is made. Some of the benefits with centralization are that they have a better overview of the worldwide company and can see effects on the total. As an example can they gather all the exposures from the units and with this information decide if they should hedge all or only the netting position of the organization. This alternative saves a lot of costs both because they can negotiate for better prices worldwide because of the size and also see negative trade off effects that units cannot see. Centralized organization can also be tax beneficial because of the global view that gives them information to hedge right amounts at lowest cost. One of the cons with the model is the opposite that they do not have the local knowledge and opportunity for managers to take advantages of this knowledge. (Shapiro, 2010, p. 350-351)
Hedging techniques
There are a lot of hedging techniques available and some of them is; forwards, futures, money markets, options and currency swaps. All of these models have different costs and benefits and Bligh has in an article discussed key considerations for deciding which of the models to choose. (Bligh, 2012, p. 42-44)

The first choice is if the company should choose to hedge at all, they might consider the currency markets to be stable or moving in a favorable way and ready to take the risk. Maybe do they have the perception that hedging is a waste of time and money or have so many transactions in different currencies so they offset each other. Internal hedging may be possible, for example that they transfer the risk to the other part paying in their own currency or decides to pay earlier if favorable exchange rates. The company might have funds in that currency on a bank account or have an offsetting exposure in the same currencies which is incentives of not hedging this exposure. (Bligh, 2012, p. 42-44)

If the company decides to hedge do they need to choose hedging techniques which are depending on; currency, amount, expertise and costs. The currency is important if the transaction involves a currency that is rarely traded because then is not all hedging techniques available. Futures and options are almost unavailable if there is no actively traded market for that currency. The same applies for the amount of the exposure because this type of instruments as futures and options is only available in big amounts. If the choice is an option are the administrative fixed costs, accounting, monitoring and reporting costs often too high if you only hedge for small amount. These reasons explain why only large companies use futures and options because it takes a lot of skills to use them. (Bligh, 2012, p. 42-44)

The final consideration and maybe the most important are the costs of the hedging techniques that are obvious for some instruments and harder to see for others. The option is the easiest cost to recognize because it is the option premium while the others might be a little bit trickier but one thing is for sure no model are free from costs. Forward contract costs are recognized in the spread on the quoted rate, depending on the standardization is there a possibility that futures can be cheaper than a forward contract. These two instruments are among the cheapest alternatives but it can differ between the conditions and other factors. What we know is that options are the most expensive alternative but they have not fixed the rate either so it can still move in a favorable way. (Bligh, 2012, p. 42-44)
3.5.2 Considerations about hedging strategies
Kawaller has in his article described important things to consider when you decide a hedging strategy for a multinational company with many currencies and explains possible effects that can arise from different hedging strategies. For companies with multiple business units denominated in different functional currencies is risk present both at a unit level as well as the consolidated level. If the business units and the entity are not well coordinated is there almost impossible to commit optimal hedging which leads to income volatility. (Kawaller, 2008, p. 92-98)

You might think that every transaction or balance sheet item in a different currency from the functional currency is exposed to a risk and therefore should be hedged. This is not the case because sometimes does an exposure act as a natural hedge to an opposite exposure in the same currency, for example sales and purchases in the same currency. In this type of case is it wise to hedge only the excess of either the sales or the purchases. The same strategy works for the balance sheet items like payables and receivables, the only thing that you need to hedge is the excess of the two. One important factor when hedging only the excess of sales and purchases is how good your forecasting reports are for your future sales. If you choose to hedge for a certain excess between sales and purchases and your forecasts proves to be miscalculated. The sales might fall short or the expected cost became much higher than expected can the currency exposure risk increase instead of decrease by the hedge. If the companies forecasting have a high degree of uncertainty can options be a good choice if you have a low currency risk. Options have a known cost which is the option premium and the company can decide whether or not to use the option depending on if the risk is realized. (Kawaller, 2008, p. 92-93)

Currency risk can be present even if a company’s transactions are denominated in their own functional currency. If the two counterparties have different functional currencies but one of them agrees to trade in the other company’s functional currency raises the question which of the counterparties bears the currency risk. Most of the time can counterparties agree to trade in another currency but when they do they usually adjust their pricing after the currency risk. This fact means that you are paying for avoiding the currency risk and also facing the risk of making yourself less competitive. The best solution according to Kawaller is instead to trade in another functional currency and hedge the currency risk yourself. Trusting that the counterpart is adjusting their pricing correctly is risky and the hedging solution also makes you a more attractive counterpart. (Kawaller, 2008, p.94)
3.5.3 Managing economic and translation exposure

The transaction exposure is generally easy to hedge because it is on a short term basis and the exposure is known in a predetermined contract. One effective way of handling transaction exposure is using derivative instruments such as forwards, options and swaps, where the company buy the opposite position as the foreign exchange rate exposure. Martin & Mauer gives an example of a selling firm that selling their products in a foreign country and get paid in foreign currencies. That firm can hedge the exposure quite well if they buys a forward contract that expires at the same time as the final payment to the company, this position is not perfect because of a small difference between the forward spot rate and actual spot rate. (Martin & Mauer, 2003, p. 438, 440)

The economic exposure is much more difficult to hedge because it is difficult to measure and identify the effects because it is in-direct and on a long term basis. These risks include changes in sales price, sales volumes and costs of inputs for the company and possible effects from their competitors. Financial hedging for this type of foreign exchange rate exposure is unclear because of the problems of identifying the risk in time and correctly. One way of dealing with economic exposure is according to academics and practitioners geographically positioning. The company should relocate their operation such as; production, sales, sourcing and financing operations to the same place. This option is often very expensive and also difficult to reverse and takes time to implement. (Martin & Mauer, 2003, p. 438-440)

To show the difficulties of managing economic exposure is an example of a US based company with a multiproduct manufacturing operation with input costs in USD and operations in Europe described. If we have a scenario where the USD strengthens is the company affected of this because their input costs are increasing compared to their sales. This scenario set the company into several choices. (Martin & Mauer, 2003, p. 440)

The first option is to continue with the current sales price and not add the increased costs to the customers which lead to lower operating earnings. The second option is to add the increased input cost to the sales price and raise the sales price. Possible effects of this option are loss in sales and market share and with these effects also lower operating earnings. The third and final decision is to change supplier, find someone with the same currency as the one that sales is generated or highly correlated with the currency. This option is time consuming and the possibility of finding a new component supplier in the same country as the sales currency can be very difficult. (Martin & Mauer, 2003, p. 440)

The first option of an increased sales price has effects on a short term basis while the second one has effects on a longer term. The different choices and the long versus short term effects have to be considered as well as other actors; such as competitors, suppliers and new competitors. (Martin & Mauer, 2003, p. 440) This example of the US company clearly shows that economic exposure are much more complex in the decision making process than transaction exposure.
3.6 Summary of theoretical framework

This figure summarizes the theoretical framework and illustrates the relationships of the three topics. Inventory valuation is the central topic with moving average and standard cost valuation system. Connections between exchange rate exposures and inventory valuation is based on the purchasing or sale of inventories. A scientific article shows that currency changes has a significant effect on profitability and also indicates that it can be a base for future hedging (Hilmola, 2006, p. 321-323). This statement means that the information from the exchange rate exposures is the base for hedging decisions which the arrow of hedging activities illustrates.

Hilmola suggests hedging with financial derivatives as one way of handling this problem with currency changes but also describes hedging as complex and expensive. The most important thing for financing is to gain a general understanding of both input and output of currency recovery and then in need suggest hedging opportunities. (Hilmola, 2006, p. 331) This highlights the importance of taking both the input- and the output costs in consideration and not only focuses on hedging the sale exposure which is common.
4 Practical method

This chapter discusses how the study has been conducted; sampling, construction of interview template, use of semi-structured interviews, collection of primary data and finally a critical assessment of the whole practical method. This is according to me the best method to investigate the previously stated problem.

4.1 Population and sampling

The information that a scientist is looking for is entirely decided by the problem statement and the research questions (Holme & Solvang, 1996, p. 181). The sampling is focused on individuals active in inventory valuation and hedging activities. Beside this fact they should also have experience from the moving average inventory valuation model and business system called SAP. The sample companies should also be comparable with BAE Systems in Örnsköldsvik, at least within the same industry and similar structure on inventories. The fact that the problem statement and objectives are so focused means that the sample gets smaller. A scientist should first decide the purpose of the study to be able to generalize the results or not. Samples based on randomness are called probability samples and if the intention is to generalize results is this method preferred. (Holme & Solvang, 1996, p. 183) My intentions of this study are not to generalize the results because of a specific research question and impossibility of making a good randomized sample. There can only be conclusions drawn about the group of companies and individuals included in this study. Therefore I have decided to choose a non-probability sample that is not based on randomness (Holme & Solvang, 1996, p. 183).

There are different types of non-probability samples and Bryman & Bell states three of them; the convenience sample, snowball sample and the quota sample. A convenience sample is a sample that has a high accessibility to the researcher; this sample can be good as a springboard to further research or investigate and link findings to existing areas (Bryman & Bell, 2007, p. 197-198). I have used a mix of both a convenient sample and a snowball sample. I also divided the sampling process into two different parts where I first selected relevant companies and from this population made the sample of the individuals. The first part is a convenient sample in that sense that I gathered information about SAP users through websites, references at BAE and also by conversations with SAP consultants.

It was very difficult to find good information about companies using SAP so this information gathering was time consuming and my time constraint is only 10 weeks. A case study at the client BAE Systems in Örnsköldsvik was out of the question because they implemented this new system in October 2011, because of that reason the client still has very limited knowledge. I therefore decided to reach out to comparable companies that have greater insight in these types of business systems and inventory valuation method. Most of the information about companies using SAP within Sweden came from contacts at BAE. This information gave me 10 possible companies in the same type of industry and similar business models. I started to gather more information about these companies from internet sources as telephone numbers and e-mail addresses to relevant departments and business units. After contacting the companies I sorted out four companies that confirmed the choice of using moving average as inventory method and also SAP as business system. Bryman & Bell (2007, p. 182) states that the sampling frame consists of all units that the selection is made from. My sampling frame was these four companies and they all agreed to be interviewed. I understand it is not a scientific
sampling method and it reduces my chances of generalization but this is not the intention of this thesis work either.

Jacobsen describes choosing respondents as closely related to the information that you want. Sample criteria can be based on; randomization, breadth and variation, information, extremes or snowball. Subjective choices of respondents can be as important for getting right information in qualitative as quantitative research strategies. (Jacobsen, 2002, p. 198-200) In the first contact with the companies I talked with a representative by phone and also e-mailed them the interview template. The possibility to get in contact with right people right away seemed higher if they knew the questions. The informant suggested which people to talk to and these respondents were later contacted. Because the study consists of two main topics, inventory valuation and hedging are the expertise for the respondents often focused at one of these. The sample criteria used are information which means that you choose people with a certain knowledge and expertise within certain subjects (Jacobsen, 2002, p. 198-200). This part of sample is a snowball selection because I did not decide the respondents and have instead been referred to the right people for the questions. The snowball sampling is quite similar as convenient sampling but uses an initial contact to establish contacts to others. (Bryman & Bell, 2007, p. 200) This method is according to me the best way of finding respondents with both the right knowledge and time to make an interview.

Qualitative research has not the same focus on large samples that can be generalized and instead the importance lays on finding appropriate respondents and useful information (Holme & Solvang, 1996, p. 101) Number of respondents required depends on the time constraint of 10 weeks and specific type of information that is intended to reveal during the interviews. When the information does not add something new to the study is the right amount achieved according to Holme & Solvang (1996, p. 100). For the case of Outokumpu I needed to involve three respondents instead of two because the first two did not have the ability to give sufficient answers. I interviewed in total 9 people from four different companies, they provided me with enough information and more people would not add the study new things. This is the main reason to why I believe to be close to the right amount of respondents.

4.2 Semi-structured interview
Qualitative research has two major types of collecting primary data and these interviews are called unstructured- or semi structured interviews. Main differences between the two are the use of a template with questions about specific subjects that structures and guides the interview. (Bryman & Bell, 2007, p. 474) A form of semi-structured interview with this guidance would be best suited to answer the research question of this thesis. These interviews are good because the interview template gives a clear direction but also offers the possibility of follow-up questions that can enhance the quality of the information.

The reasons why I think that the unstructured interview is inappropriate for this thesis are the focused research question. If this method is chosen there is a great risk that the information cannot be comparable between the studied companies. There is also a great risk that you will get wrong type of respondents and irrelevant information. However during the interview it is important to be flexible as researcher, the order of the manual do not need to be followed as long as you cover right subjects (Holme & Solvang, 1996, p. 100-101).
4.3 Interview template
To get an overview of potential problems at BAE Systems in Örnsköldsvik was short open interviews done within the company. I interviewed people from the inventory management about the new inventory valuation model called moving average. From finance were two persons interviewed regarding their considerations concerning accounting and hedging. The information from the interviews gave me useful information of knowledge gaps and question marks with the new system. This information combined with the stated research question and theoretical framework provided a good base for the interview guide.

Main subjects are aligned with the theoretical chapter; inventory valuation, exchange rates and hedging. Patton states that an interview guide should provide topics for the interview which help keeping the same basic lines for all respondents. Predetermined topics make the interview more systematic and the researcher is more time efficient (Patton, 2002, p. 343-344). The comparability of these companies is especially important for this thesis. But also the time aspect is important according to me because you facilitate the decision for them to participate if you have a time frame.

Kvale state that it is important to have a wide variation of questions in the guide and a successful interviewer should be active and listen to the respondent. The stated categories are; initial-, follow up-, probing-, precise-, direct-, in-direct-, structured-, silence and interpretive questions. (Bryman & Bell, 2005, p. 371-372) The instructions about varied questions were in mind when constructing the interview template. It consists of three phases starting with initial questions, a main phase consisting of the three topics and finally some ending questions. The main phase and the three topics should always be finished with a question that collects thoughts and comments that have not been mentioned (Bryman & Bell, 2005, p. 372). The ending questions for all three subjects are: “In general are you satisfied with…” which collects the information and is a good and clear end. (See appendix for interview template)

4.4 Collection of primary data
The primary data is collected using a qualitative research strategy and semi-structured interviews. After identifying the companies and individuals in the study, a decision was made about using telephone interviews instead of a face-to-face situation. The biggest reason is the geographical limitation which is one of the highest costs of the face-to-face interview (Jacobsen, 2000, p. 161-162). Two of the companies are located here in Örnsköldsvik but the other two at Västerås and Linköping and finally have Outokumpu their hedging department in Finland. The companies in Örnsköldsvik should be easier to conduct face-to-face, but all interviews should have the same conditions and therefore was telephone the best choice. Telephone interviews miss the opportunity of reading body language but also have the advantage of decreasing possible effects that I can have during the interview.

The time and date for the interviews has been set by the respondents and I have tried to be flexible but still within the time frame. I think that flexibility is very important because most of the people I interviewed have been busy with completing financial statements. Another important aspect is to have a fixed time frame and this was set to 60-90 min for the interview which aligns with theory. Jacobsen (2000, p. 167) said in his book that a recommendation of the length of the interview is between one to one and a half hour. The interviews have also been conducted under the same conditions which decrease the risk of bias.
An important factor regarding interviews is where it takes place, are the surroundings familiar or artificial (Jacobsen, 2000, p. 164-165). The environment for my interviews is for the respondent a familiar place at their work, in a conference room or at the office. My environment has for all interviews been calm and without interferences located in a group room in Umeå University in Örnsköldsvik. During the interviews I have used a speaker phone and recorded the whole interview after getting the respondents approval. The recording was done by borrowing a dictaphone from the university, this facilitated the ability to actively listen and ask follow-up questions. Being a good interviewer is much about listening to the respondent and adapt to situations that arise.

Another important thing about recording the interview is the possibility to transcribe whenever it is possible (Bryman & Bell, 2007, p. 489-490). This is vital because I have written the thesis on my own. The interviews were later on transcribed word by word with the recording as help and this method is according to me the best because you can rewind if you do not understand. The transfer from transcribe to the empirical chapter is object for a bias in language because the interviews has been conducted in Swedish. At the end of every interview has the respondent been asked if they or the company would like to be anonymous in the study or not. One of the respondents wanted this and therefore is all respondents anonymous in the study. The respondents were also asked if they wanted to approve the material before it was included in the thesis. But they declined this opportunity and instead asked if they could get the link to the published material.

**4.5 Critical assessment**

The method chapter has clearly described how to perform a good sampling, interview method, how the interview template is constructed and finally how the primary data was collected. The criteria for how to collect relevant information using a qualitative method is shown throughout. I believe that the data gathering follows the stated criteria and that the right environment has been set. The clear and structured interview template and knowledgeable respondents has also given relevant and interesting information.

One of the risks with the data is the language bias when the interviews are conducted in Swedish. This can lead to a small bias in language but I believe that my English skills are sufficient to handle this translation into the empirical chapter. The reason why I chose this alternative is because of the pro of better understanding and follow up questions in the main language. This pro exceeds the possible cons that can arise during translation. To fulfill the variations of the nine categories of questions that Kvale stated I think Swedish is necessary both for mine and the respondents’ sake (Bryman & Bell, 2005, p. 371-372). Homogeneity problems are not a big risk in the thesis because almost all the respondents have a controller position at inventory or hedging. The respondents have answered the questions according to their best knowledge but slightly deeper within their area of expertise. But the homogeneity should always be something to keep in mind when analyzing the empirical results.
5 Empirical findings

In this chapter the primary data are presented and to ease the comparison between the four studied companies the findings are separated in different sections. The same structure as the theory with three topics is used presenting the results from the interviews.

5.1 Cargotec Örnsköldsvik
Cargotec Örnsköldsvik is a business unit for Cargotec Sweden in the marine division that manufactures cargo equipment. Their customer orders are driven from the project module in SAP which is the operating system. The product is both standardized but also modularized; it is a combination of purchased articles and components as well as articles from the open stock. It is a project driven business so the sales orders only serves as a base for the bill and not a need for material because that is connected to the project module in SAP. The company follows the accounting standards of IAS and IFRS. The company does not have any own production. Instead they supply components to their production partners, mainly located in China, Korea and Europe, who are doing the final assembling.

5.1.1 Respondent A
The respondent’s age is 48 years and he has worked with the business system SAP at Cargotec since 2004 when they implemented the system. Prior to this employment he has experiences from work at ABB with SAP so he knows the system well. The current position is called application and function manager, with the orientation of business systems. The experience from inventory valuation comes from his current position at Cargotec and also from a previous employment as manager over the supplies at the company Macgregor, where he was manager of production planning.

5.1.2 Respondent B
The respondent’s age is 62 years and her position is business controller on the operating unit of Cargotec Örnsköldsvik. She has about 15-20 years of experience of working with finance which has given her good insights. Her current position as business controller has given her experience of exchange rates and hedging. She has worked for the same company during all these years.

Inventory valuation
Total inventory consists of 70-80 percent articles in open stock and the remaining 20-30 percent is bought for specific projects. But the value of these two are the opposite because the items that are project specific and bought separately are often very big and expensive compared to the ones in open stock. This means that the total value of the open stock is not that high compared to the work in progress for the projects, respondent A explains. Both respondents said that the aim is to have high inventory turnover and short time in storage for the articles and think that they have succeeded with their work.

The complexity of separate products in inventory is quite low. But there are a large number of articles to keep track of so in that sense the complexity can increase.

The accounting standards that Cargotec is using for their inventory is the moving average calculation which is aligned with the perpetual weighted average method. This method updates the inventory value for every purchase that the company do. The reason why they choose this inventory valuation method is because the Cargotec group decided
that the whole group should implement the business system SAP and use the moving average calculation, respondent A describes.

At our company we only have an effect of moving average on articles that are stored in the open stock, respondent A tells. He continues to describe that the products that are bought for a specific project are directly recognized as a cost in the project, which means that there is no effect of moving average calculations on these components.

He has not been given any explanation why this method should be the best for their group or why they changed to moving average calculations. The benefits that he has perceived with this calculation is that at every moment in time you get a more accurate and precise value of your stock. But this benefit also leads to a disadvantage which is the problem of making good and reliable forecasts. If the value of stock is constantly changing it is more difficult to make good forecasts and calculations. Respondent A perceives that "if you use standard cost that we did before is it easier to make good calculations and forecasts because they are often the same". To make calculations based on standard cost for an article two month in advance and knowing that the standard cost price does not change during the time makes it very easy to calculate the price because it is the same. Using moving average, the price is never the same after two months so the calculations get more difficult.

Cargotec in Örnsköldsvik does not have different accounting principles for manufactured and purchased articles because they do not manufacture any articles. Their inventory values are based on the cost and not the net realizable value. As respondent A described their prices are based on a cost based pricelist. This pricelist is based on the costs of the components, manufacturing cost from production and finally any additional costs before the price is set.

The articles or components are recognized as a cost on different points in the work breakdown structure of a project depending on if it is an article from open stock or a project specific article. Respondent A explains that project specific components with high values and often quite large components are recognized as a cost directly when the invoice is received by the project. These components do not get valued in inventory. Cargotec has cut the intermediary and deliver the component to the production partner directly. When a project takes an article out from the open stock into a project that article is valued at moving average, respondent A continues. The costs are recognized in the project when the article is taken out from the inventory. The inventory value of the open stock first estimate an expected value aligned with the purchase order price and finally when the invoice arrives they set the final value of the goods receipt. This means that the inventory is revalued if the estimated price differs from the invoice price. As an example, respondent A tells that in the transaction history of an article in the open stock you sometimes can see that the moving average price have changed regardless of any purchase during a period. This means that the invoice has arrived later, maybe a month after the goods receipt and that the invoice and purchase order had a difference that led to a revaluation of the article in inventory. These differences tend to be quite small but it can be good to understand what the changes depend on. Quantity differences are according to the respondent not a problem. The only thing to do is to correct the system and let it know how many of the quantity that arrives.

Another problem that can arise in the moving average inventory valuation is when the purchaser buys an article for the first time and does not know the price. If the purchaser does not investigate and ask the supplier for the price and instead just guess what the
price will be it causes a big problem. One control function for this type of problem is when the supplier issues the acknowledgement of the order. Respondent A gives following example to illustrate the potential problem; if a purchaser believes that the price of an article is 1 000 SEK and orders 10, the inventory value will be 10 000 SEK at goods receipt. Before the invoice arrives, seven of these products are picked out from inventory at the price of 1 000 SEK. The invoice later on shows that the price was 150 SEK instead of the expected 1 000 SEK. This causes a problem in the system because the system wants to decrease the value with -8500 SEK but there is only 3000 SEK in inventory so you get a negative value which is impossible. Then you create a lot of problem to fix this problem because you need to reverse everything back to purchase order, goods receipt and invoice, otherwise this price difference cannot be handled, according to respondent A. It is important that the purchaser have good and reliable information so that these mistakes do not occur. It happens, not so often, but a few times per year. Overall respondent A is satisfied with how the system performs. He believes that there are many informative reports to get and has not run into any problems that he considers need to be improved. The only thing that he misses is support for how to handle impairments for financial statements and help for articles that moves slowly in the inventory.

**Exchange rates**

Cargotec Örnsköldsvik uses different currencies when they purchase articles for their inventory, respondent B explains. The main currency is Euro but they also use SEK, USD and RMB when they buy inventories and sales are mainly in USD. Reporting currency for the whole group is Euro but the operating unit in Örnsköldsvik uses SEK as local currency.

Respondent B describes “differences in exchange rates because of a price difference do not get controlled by the system but it affects the inventory valuation and moving average price”. If the SEK value is higher or lower depending on exchange rate differences at purchase order date compared to invoice date, a revaluation is necessary. It is important to get the invoice in time because the exchange rates can be volatile and this affects all similar articles in inventory, she says. The accounts payable and accounts receivable that are left at the end of the month are valued in the balance sheet at the spot rate of the last day every month.

The existing exchange rates are updated on a daily basis and this input is done centralized at a higher level in the group and not at every business line or unit. Respondent A says that the exchange rates follow the spot rate that banks are using and do not think that they are calculated at the company. These daily update of exchange rates does not affect the value of articles that are stored in the open stock, she says. The only effect in inventory is when purchase order and invoice is translated into local currency.

In general is respondent B satisfied of how the system handles exchange rates and she perceives the system to be well thought.
Hedging

Respondent B explains that the decision of having SEK as local currency is not theirs but directives from upper management. She considers it to be good because it is a familiar currency for them which facilitates. She is also under the assumption that other business lines within the group use local currencies. This led to the conclusion that upper management does not mind a difference in reporting and local currencies.

The transaction flow of their business line is mainly in foreign exchange rates both in sales and purchases. The purchasing currencies are mainly Euro but a small part is USD and SEK while they sell almost everything in USD, according to respondent B. The main exchange rate is the USD because of the big sale exposure and the fact that they also have manufacturing costs in USD. Respondent B describes “foreign exchange rate transaction flow is vital for our business”. On the question if they try to have both purchase and sales in the same currency she says that it would be optimal but that easy to achieve. Mainly because main components are in Europe and they manufacture and sell the products in China, which uses RMB or USD. They have searched for suppliers in China but have not found any appropriate yet. Respondent B also said that the security of having opposite positions in the same currency is not the only reason because it is also a cost aspect of buying from China. The supplier are an important factor when deciding who to buy from because especially in their business is the suppliers few. Cargotec in Örnsköldsvik only trade with reliable and stable currencies, but respondent B explains that most important is reliable suppliers that deliver in time.

Theory describes three exchange rate exposures and these are transaction, translation and operating exposure and the respondent said that their unit is exposed to all of the three risks. Cargotec manage the transaction risk and the operating risk through full hedging, respondent B tells. They make an internal hedge to the treasury department on the total flow, both for costs and sales. After this uses the treasury department this information from the internal hedges for all business lines and operating units to create bigger and more favorable hedges for the whole Cargotec, she explains. The treasury department is quite new and before they did hedge their own flow in Örnsköldsvik. The translation risk is not something that they think about, respondent B says that these effects should be taking care of at the treasury department.

The policy at their unit is to hedge every project and not at a company basis. Hedge accounting is the reason why they want information regarding the hedges and these effects are later on reported to the group. Respondent B explained that “Before only the net flows of the companies were hedged but now we hedge the whole contract, costs of major components, manufacturing costs and finally sale in every project”. The reason they changed from using net hedging is because they buy and sell in different currencies now and the increased demand from the hedge accounting to the group, she explained. They have not considered any alternative hedging because that kind of decisions is at the treasury department, meaning that they are not authorized to make these decisions.

The advantages that the respondent B sees of full hedging at every project are the detailed information they get for every project. The information can be used both for reporting and gives an overview of the exchange rate changes in every project, she tells. The answer to the question how to manage a change in exchange rate risk if you hedge at a company level was that it should be very hard to do.

The final question was if the respondent was generally satisfied with how the company hedges and respondent B said that it was working fine. The only disadvantage that she
noted is how to know the moving average price on articles from open stock when they are included into a project.

5.2 ABB Machines
ABB has a head office in Zurich and the corporation is located in over 100 countries with around 100,000 employees. The Swedish organization has around 10,000 employees and is located mainly in Ludvika and Västerås. The organization is divided into five divisions and ABB Machines belongs to discrete automation and motion. The unit develops, manufactures and sells synchronous and asynchronous AC machines for motor drives and generator applications. Another product that they develop, manufacture and sells is traction motors. ABB have two main specializations and these are projects and products, the unit that I interviewed belongs to the product side. The projects are often very expensive and can last many years while the product side is in general smaller and more into selling a product than a service. ABB machines were one of the first to implement the business system SAP in 1997 so they have a long experience of the system. ABB Machines belongs to the product specialization and manufactures mainly big electric motors. When they get a new order starts the engineering process which involves both development and manufacturing.

5.2.1 Respondent C
Works as a business controller, is 31 years old and have seven years of experience from the employment at ABB Machines. Four of these years were within logistics and three of them at his current position as business controller. His experience from inventory is good because except his controller position he has been a process manager at the inventory for the last six years. During the employment at ABB Machines have he used the business system SAP on a daily basis and been participating in numerous development projects, this mean a good insight in the system.

5.2.2 Respondent D
Respondent D is 51 years old and a project controller at ABB Machines since three years ago and works at the hedging department where he deals with different projects. The previous employment was at the centralized financial department at ABB involving currencies, hedging and financial statements. His work at ABB means that he has many years of experiences regarding the business system SAP.

Inventory valuation
Inventory is divided into two parts, one is for work in progress and the other one is for spare parts, respondent C explains. Inventory turnover is around 2-3 for the WIP and a little bit lower for the spare parts, around 1, 5. Total worth of inventories is around 300 million SEK and is divided into 250 million in WIP and 50 million in stock, he says. “We are project-driven but do not apply project accounting instead we use project-specific components to keep track of the big costs in our projects”. The project specific components are only in the WIP stock and not in the inventory and this is why the worth is so much higher in the WIP compared to regular inventory.

The accounting principles that ABB follows are mainly US GAAP and Swedish GAAP but respondent C states that the company have ambitions of implementing IFRS from year 2015 and forward. Why they follow GAAP is because they are noted on the New York stock exchange. ABB Machines follows the recommendations of the business system SAP and uses moving average as inventory valuation method. This means that inventory is updated for every new purchase and not on fixed dates, respondent C
describes. On semi- and manufactured articles they use standard prices that are updated every year but this is a very small part of the total inventory, around one percent of the 50 million. Inventory value is based on the lowest of net realizable and cost. He explains that they continuously look at latest purchasing price in relationship to the average price in inventory and deposits the difference in a reserve. Respondent C continues by describing that these differences rarely arise because most articles are part of a project and not sold as finished goods. The manufacturing process is driven by an order so they do not have this problem of valuing finished goods. Instead standard prices are based on contract price and purchasing price and they are used as complement to the moving average inventory valuation, respondent C tells. These standard prices are updated on an annual basis and are also used when they are making calculations for example for spare part orders. Why the standard prices are updated annually is because they are operating in a mature business with few technological advances, he explains.

ABB Machines choose to implement SAP 1997 and with that also moving average. Why they choose this model was because it is recommended in SAP. During the employment at ABB Machines respondent C have always used moving average calculation. During this time there has not been any comparisons made with other cost models. He explains that moving average calculation always treats a purchase the same. First they have a purchase order which works as the preliminary price of the goods until the invoice arrives. When the company gets the goods it is valued according to the purchase order price. Finally when the invoice arrives the value of the goods is updated if price differences arise between PO price and invoice. This is the general procedure in the moving average calculation.

Pros and cons with moving average compared to standard cost depend on how the system is used. One general pro that respondent C perceives is that it gives a fair value of the price because it is updated for every new purchase. He said “If you look at it from a statistical view it is more accurate than if you use standard cost”. Another pro that he perceives with moving average is that the system automatically adjusts and keeps track of the value, meaning less work with revaluations and also smaller risk for errors. “Standard costing is more slow-moving because a change in an articles purchasing price do not change the value immediately so the risk of valuing that article a little bit higher or lower is greater”. This can lead to that you might assign a larger cost than you should for that article, respondent C says. He continues by mentioning that a pro for standard cost is better projections for future prices.

The project-specific articles does not have valued goods issues and the costs are realized when the invoice arrives meaning that moving averages are not affected. ABB Machines has discussed ways of starting with valued goods issues but do not think that the increased costs justifies the benefits of implementing it, but maybe in the future respondent C explains. The problem they have is that this type of articles have never been bought before, sometimes not even the supplier know the costs of the article until it is manufactured. Uncertainties regarding purchasing price can according to respondent C cause big price differences between expected and actual prices which in turn leads to more administration of handling these price differences. The only way to offset this problem is to administrate the purchasing process more and increase the knowledge about the cost before buying an article, respondent C describes. The only question is if the extra cost of administration with valued goods receipt is justified or not? Their answer has been no but in agreement with their accountants have they
decided to introduce valued goods receipt in a near future. Otherwise they have goods in the WIP that is unvalued until the invoice has arrived. This bothers both the accounts and respondent C.

Price differences are handled at the unit by a control function that sets in if the purchase order price and the invoice price not match, the system only allows a small price difference. The control function means that they cannot pay the invoice until informing the people from the purchasing process. Quantity differences is handled quarterly where respondent C gets a list of differences that he analyses and talks about with those involved in the purchase. Most of times the invoice match the purchase price, especially when they sell on a contract. Respondent C explains that there are bigger chances of price difference if you do not have a contract and instead need to assess previous prices from pricelists because of possible changes. He says “in general is there not a big problem at ABB Machines, the biggest problem is when price differences arise for the project specific articles and these are not valued with moving averages”. The reason why they do not use moving averages for these articles is not based on the big price differences. They are so unique that they only buy them once and then consume them meaning that a moving average is useless. These machines and components are often very expensive and large.

In general is he satisfied with the system and how the inventory method works, they rarely have differences in the master record or in the accounting. Evaluation methods are mostly internal methods at ABB and not so much in SAP because they use self-developed transactions as well and these cannot be evaluated effectively in the business system.

**Exchange rates**

ABB machines have many purchasing currencies but the foreign currencies are mainly USD and Euro. The transaction flow of foreign exchange rates are for sales around 50 percent and the purchase is a little bit lower because of more purchases in local currency, tell respondent D. ABB has a policy to look for suppliers all over the world. The exchange rates are updated on a daily basis and the transactions are recorded in the system at daily spot rates and the inventory is valued in SEK so all foreign transactions are recalculated into the local currency.

Respondent D says that daily updated spot rates are required when you are using US GAAP and their spot rates comes from their headquarter which gets inputs from the internal bank at ABB. He explains that every purchase has three values; first you get one value for the goods receipt, then you get a value when the invoice arrives and finally is the third value when you pay the invoice. These exchange rate differences affect the result on the unit and the effects can be quite big but still they do not have a method to prevent them. Respondent D is unsure if this affects moving averages but believes that the value registered at goods receipt is the one they use. He continues by saying that accounts receivable and accounts payable left at the end of the month is valued at closing rate for every month.

ABB machines do not have different handling for invoices in foreign currency compared to local currencies. They have a centralized department for ABB Sweden that handles all invoices for the Swedish business units. Respondent D describes that all units translates the invoices into SEK before they send them to approval and payment. This means that the handling process at the centralized department do not differ for
foreign invoices. In general is he satisfied with how they handle the exchange rates and they have not experienced any big problems.

Hedging
The Swedish unit uses SEK as local currency but report to the group in USD. The foreign currency transaction flow is a big part of their total flow, around 50 percent which indicates that it is very important both for sales and purchase, respondent D explains. As an example does he mention other units within ABB that have up to 97 percent in foreign operations which means that this is a crucial part for the whole company. “A reason why we have lower transaction flow in foreign currencies is that we have one big Swedish client and also a foreign client that pays in SEK”.

Theory states three different foreign exchange exposures and these are translation-, transaction- and operating exposure. On the question if the unit is exposed to one or more of these exposures respondent D said all of them. Their unit is exposed to all three but only handles the transaction risk that is hedged with financial instruments. The operating exposure is obviously there but they do not pay this exposure any attention, respondent D explains. One type of risk management for exchange rates is for example that one big foreign client pays the unit in their local currency. ABB has a policy to continuously look for new suppliers but this approach is mainly focused on a cost and quality perspective and not the exchange rate risk. Respondent D explains that low cost countries for example China and India is places where they are looking for suppliers, but it takes time and it is important to build long term relationships. The translation risk is nothing that they consider because all units in Sweden use SEK and it is only an accounting effect at the group. The transaction risk meaning predetermined contracts with exchange rate exposures is something that always is hedged, respondent D describes.

According to respondent D the hedging policy for ABB is very strict and decided from the HQ in Zurich, then for every country and finally regulated locally for every unit. It is also a difference between ABB main specializations which are focused on projects or products. If you look at the project specialization every in- and out-flow is hedged in the projects while the product specialization only hedges the continuous flow for the unit. ABB machines always hedges the net transaction flow because they have a bigger exposure on their sale side than on purchases. Financial derivatives used are according to respondent D forward contracts, but they are managed in Zurich which gathers all the contracts from the units. This means that they can trade much bigger volumes and also get better conditions than the units can get if they hedge themselves, respondent D tells.

ABB machines do not think that the currency is the most important factor when deciding supplier. This is instead quality and cost. Because of global sales they trade with many countries and also small currencies but they need to be convertible otherwise do they use some of the big currencies like USD or Euro instead. According to respondent D there is no problem using USD or Euro for the suppliers. This is a reason why respondent D does not consider the currency as a big problem. The transaction risk for their unit is hedged with forward contracts, the only effects from exchange rate differences are differences between purchase orders an invoice. Regulations are not a problem that they have encountered because of the fact that you can do the transactions in other currencies, respondent D tells.

How their unit handles different exchange rate risks in a project when they only hedges on a company level is through continuously updates of their forward contracts.
Respondent D said “Once a month or at least quarterly do they look at the order stock, how much goes out from the unit and how much goes in and in which currency and also what the projections for the future are”. This is gathered in a forward contract and these contracts are later on updated for every new order, or when orders are done and you have not got payed yet. The big contracts are according to respondent D updated continuously when something new comes in or anything goes out. ABB machines has quite many projects going on at the same time but also a stable cash flow because they have produced near maximum the last years. The respondent feels that it is not important to track single projects because the updates capture the risk anyway. One problem that can arise is when the orders and projects get delayed, because they have hedge for a certain flow for one period but it does not occur until later. It is really important to track possible delays of orders and really adjust the hedge but like the respondent said this can be much more difficult than handling new orders. ABB machines order stock is around one year so it is quite long compared to other units and the policy is to hedge for the entire order stock.

Respondent D says that they do not evaluate the efficiency or profitability of the hedges and instead have a defensive approach. ABB Worldwide has a policy of hedging foreign exchange rate exposures, so that they can predict inflows and outflows, the reason is not at speculation or making profits. He also explains that they do not have a connection between the outcomes of hedges and inventory valuation, instead all currency effects are kept separated and also accounted separately.

In general respondent D is satisfied with their hedging but a lot of the hedging activities are controlled from headquarter in Zurich. He explains that the control is because they need to have clear directives so that all units act in a similar way and also correctly.

5.3 Saab Aero
Saab Aero is divided into four businesses and two of them are located in Linköping. The most famous military airplane that they manufacture is Gripen which is within the military side of SAAB. The commercial part involves the aftermarket and manufacturing for commercial purposes. The two respondents that I have interviewed are from the commercial side and not the military side of SAAB. These two units do not use the business system SAP anymore, before was the system used but recently did they switch to a system called IFS, which is a similar system. Both units follow the accounting standards IFRS and IAS.

Respondent E is employed at SAAB Support and Services which is in the civil specialization and not the military. The unit ended the manufacturing of airplanes around 2000 and is now managing the aftermarket. They are also involved in special missions like modifications of civil airplanes into airplanes with radar carriers. Support and services and Aero Structure is two separate business units.

The other unit SAAB Aero Structures that respondent F has the financial responsibility for, is a manufacturing unit of Airbus and Boeing. Both units are into commercial manufacturing and not military. Aero Structure uses standard costs for their inventory valuation and therefore is their part in the inventory valuation limited because of the focus of moving average. The hedging part is the main focus at this unit and the hedging policies for SAAB are according to respondent F similar meaning that it can be applied for Support and Services.
5.3.1 Respondent E
Works as a controller at SAAB Aero at the unit called Support and Services and are 61 years old. The experience from inventory valuation comprises his total work experience. He has always dealt with different inventory questions and says that it is hard to switch because he likes it so much.

5.3.2 Respondent F
Is a business controller but at SAAB Aero. The respondent has total financial responsibility for this unit. She has worked as an accountant for 20 years before the employment at SAAB Aero. The accountant experience gives her a slightly different approach to inventory valuation but the main expertise is within hedging.

Inventory Valuation
SAAB Aero Structure has an inventory structure with one part raw materials and the other part manufactured, they have chosen to have standard costs on both. Respondent F says that moving average is not recommended for manufactured materials. Big projects start the manufacturing process and they work with long time perspectives and different programs, the current programs are to year 2020-25. Respondent F says that they do not have a choice because moving average on only generated cost is almost impossible. Raw materials can be valued with moving averages but she says that they want to see material- and currency differences and therefore consider the standard cost model best suited.

SAAB Support and Services inventory structured are explained by Respondent E, their purchase consists of either articles or components bought against a project or a distribution inventory. The articles bought for a specific project can be used when they modify an airplane. Articles bought for an anonymous distribution inventory can be spare parts, motors or other components. The values of these inventories are in a wide range, from screws to very expensive airplane motors, describes respondent E. The unit uses the moving average model with perpetual updates as inventory valuation method which is within the weighted average cost formula. This means that they update their inventory for every new purchase. The articles assigned for projects get labeled with a project number and when they are incorporated into the project they are realized as a moving average cost, he describes. For the service part and exchange articles a standard cost is used but this is not considered as a real inventory and instead more a fixed asset because they do not sell to customers.

Moving average is calculated like this; first you have an expected value of the order, when the goods get received they are booked to the expected value and first when they receive the invoice the final value is decided. A pro with moving averages compared to standard cost is that you need less administration because the updates of prices are automatic. If you use standard cost and have manually updates of the prices this should lead to more administration. Respondent E explains these manual updates as time consuming. If you want accurate values, you need to look at previous prices and find new reasonable levels for the new standard prices. “Another pro that he perceives with moving averages is that the inventory adapts the value of the inventory faster if foreign currencies are changing. If the dollar is high, then you sell for high prices but you also buy for a high price depending on the turnover”. This automatic update and the simplicity is a big pro for the moving average model according to him. Cons perceived with the moving average is for example if you have a lot of movement between different inventories within the same company, then different values can appear for the
same article but in different inventories. This problem respondent E has experienced at SAAB because they have inventories located around the world, for example in Basel for European customers and USA for American customers. These effects can be harmonized and handled so it does not affect the total income but demands administration, he says. On the question if it is a con to have moving averages when you calculate projections for the future the respondent said that they are mainly focused on replacement costs and not inventory values.

According to respondent E moving average cost formula is best suited for distribution inventories with high turnovers or inventories with high turnover that buys articles to the shelf and then sells straight to a customer. Support and services articles bought to inventory are; fuel pumps, aggregates and other things that they can sell to an end customer. I asked him if he thought that moving average was a good cost formula to handle big and expensive projects for 2-3 years. He said that for that kind of projects the articles are given a project number that shows their belonging to the project and from that time the articles are free from moving average effects. He continues to explain that the costs for these articles are realized for the project when they are mounted into the airplane. This project connection is quite new for the unit and before could they encounter problems when a component or article part of a project already was taken when needed. According to respondent E this lead to increased costs and problems to keep track of and assign them to that specific project which is much trickier than using a project connection directly. Their previous attempt to prevent the problem was to use separate sites but still they were able to move articles between the different sites.

Both units inventory value are based on the lowest of net realizable value or costs according to the IFRS. In general respondent E is satisfied with the inventory valuation and moving average but he has also encountered some problems. As an example he explains that they recently bought an inventory from Lufthansa and should incorporate this in their inventory. When they incorporated these articles in their inventory to a standard price the value of the articles became 0 and resulted in a huge price difference instead. This problem can occur if you have a new article that is not in the system before and you do not have a purchase order value. He says “it is a lot of how you handle the system and that you need to know things like this so it is done correctly from the beginning”. Many people are involved with the inventory such as purchasers, inventorying and people who values the inventory so it is important to correct small errors in the system as soon as possible. It is hard to say if you are totally satisfied says the respondent but the moving average is rather simple to value and handle, standard costs can mean more administration.

Exchange rates
Aero Structure has almost all their sales in USD and therefore they try to have suppliers from USA as well to lower the currency risk, explains respondent F. Any differences in price or currencies are assigned to the article in inventory and if the goods are sold they affect the income statement. Quantity differences are handled by simply removing the false purchase order and then register a new one. The unit has a control function that stops the match of the purchase order and invoice if the price difference is bigger than 0-1 percent, described respondent F.

The exchange rate that decides the value on invoices and sales is updated on a monthly basis and this rate is the closing rate for that month. The monthly rate is according to her decided because they want to keep track of the effects that foreign currencies have
on the liquidity and income statement. Their unit also have an annual budget exchange rate or standard rate as she call it which is used when they receives the goods. Later when they get the invoice of the goods they take the difference between standard rate and spot rate for that month and assign this exchange rate difference to the material that affects the income statement directly. The translation of the goods from foreign currencies to local currency is made when the goods are received and updated when the invoice has arrived according to respondent F.

**Hedging**
The local currency for the units is SEK and the reporting currency is the same for the consolidated financial statement. Respondent F explains that the foreign transaction flow in Aero Structure is very important because almost all of their sales are in USD and also the largest part suppliers. Some of the European suppliers are still remaining but she says that they try to decrease the use of them and buy everything from USA instead. The European suppliers have offered them to sell the goods in USD but Aero Structure did not accept it because they wanted too much in compensation. Because of this big exposure hedging is something that they have worked a lot with and believes to have good knowledge about. They have SAAB’s biggest exchange rate exposure with 350 million USD in forward contracts. Theory describes three different exchange rate risks and these are; transaction-, translation- and finally operating risks. On the question if they are exposed to one or more of these risks respondent F said that the main risk they handles is the transaction risk. Because they have contracts without any currency clause the unit bears all of the currency risk in the contract. This risk is the most important one according to her and also the one they hedges with forward contracts or options. Operating risk is not something that they have thought so much about, she feels that the transaction risk hedge covers this also. The translation risk is not a problem for them because they deal with the currencies on every unit and the consolidated financial statements is reported in SEK. To eliminate currency risks they try to choose suppliers with the same currency as the unit sells the products in which can be seen as a way of risk management.

Aero structure hedges the net transaction flow of their order stock, because they do not have fixed contracts and only deal with a framework so it gets tricky. Respondent E explains that these orders are not fixed regarding when they should deliver and how much so it includes a lot of uncertainty. Not until a client sells a plane externally they hedge the net flow for that specific order which means that they cannot be ahead in the planning process, she described. The hedge contract that they use is mainly forward contracts and sometimes also options. She is under the perception that if they should use some kind of averages or average rates in their inventory then they lose track of the liquidity. The accounting standard that they follow is IAS 39. SAAB Aero has a general policy to hedge all flows at the units, but because of Aero structure big exposure have them been granted to use net transaction hedges instead. If they should hedge all their flows it should be so many contracts and a big workload for them at the unit. Respondent F said that it is really difficult when you do not have fixed contracts so they have special rules for their unit regarding hedging. The financial instruments that they should choose is mainly forward contracts but sometimes also options. On the question if they do not think that options are an expensive alternative the answer was “even I have problems to see benefits with the option model sometimes...” But one reason to why they use it she said is to hedge both upside and downside risk with a cap and a floor. This is aligned with their policy that it is forbidden
to speculate. Respondent F generally thinks that the demands of following IAS 39 are tough because of the time pockets that they are exposed to. IAS 39 says that you need to hedge the opposite side of a flow if the time is changed and they have a big uncertainty if and when their flows occur. So the accounting standard in IAS 39 and tough demands leads to a lot of hedging for our unit.

5.4 Outokumpu
Outokumpu is a Finnish company and one of six top producers of stainless steel, the group’s head office is located in Espoo Finland and the group has around 8,000 people employed in over 30 countries. Outokumpu has plants located in Finland, Sweden, UK and the US and has been listed on the NASDAQ OMX Helsinki since 1988. Outokumpu produce a wide range of stainless steel products including hot and cold rolled, precision strip, tubular and long products together with a comprehensive range of fittings, flanges and welding consumables. All stainless products are available in various grades, dimensions and surface finishes. (Outokumpu.com, 2012-05-13)

The unit in Örnsköldsvik makes stainless steel fittings in different materials, both standard material and duplex materials to oil platforms. They also manufacture t-tubes and cones at the unit. During one year they produce 3000 ton material and has a turnover around 400 million SEK. Last year there was a big downsize of the business. 20-25 employees had to leave and they also downsized the WIP, manufacturing and inventory. The unit sells both standard articles and manufacture for different projects. This varies depending on what the market wants but now there are a lot of projects.

5.4.1 Respondent G
Is a supervisor at the inventory for Outokumpu’s business unit in Örnsköldsvik and has worked with mainly control in 42 years. His experience from SAP is from the implementation for 1, 5 years ago at the unit.

5.4.2 Respondent H
Is 45 years old and she works as a controller on the business unit in Örnsköldsvik and have good insight in the inventory and the business system SAP. Except the 1, 5 year experience from SAP at Outokumpu has she also worked with the system at Avesta from 2003. The employment at Avesta was at financial services and more into inventories and fixed assets.

5.4.3 Respondent I
Work as a credit controller at Outokumpu Stainless Tubular Products, which is located in Jakobstad in Finland and is 55 years old. This central department handles all hedging activities for Outokumpu Sweden. She has worked in this department for 37 years and has been handling hedging activities for the last 20 years.

Inventory valuation
The inventory values for Outokumpu Örnsköldsvik are quite high, around 60-70 million per month but this number is downsized after last year said respondent H. After the downsizing the demands have been raised, the standard material should be in inventory only for around two weeks for example. The inventory turnover is therefore high, around 4, 7, explains respondent G; the products are categorized into A-, B- and C-articles. A-articles have a turnover at 100 times a year and C-articles 10-50 times a year. These ABC articles are 90-95 percent of all products that they have at the unit according to him. The accounting standard that they follow is IAS and IFRS but they also follow
OP (Outokumpu principles) but they are aligned with the same framework. Most of the articles are in their own inventory and only a small part is purchased from Finland and delivered straight to clients, says respondent H.

The unit in Örnsköldsvik follows the weighted average principle and they update the value for every purchase according to the moving average model. This method is used for all articles, the same calculations for both raw materials and finished goods. Why they have chosen this cost formula is according to respondent H both from the accounting standards and pressure from central departments at Outokumpu. The current situation for the unit is that they have two systems, SAP for finished goods and Movex for raw materials, describes respondent H. The function of moving average calculation is not activated in SAP so they calculate the moving average with the help of Movex instead of using the function in SAP. This is a problem according to her because it means a lot of administrations instead of letting SAP update the system automatically.

A pro that she perceives with the moving average model is that it is stable: “if the market is volatile this model helps to smooth out the effects on the results”. A possible con is if you renegotiate the prices and uses standard costs instead you get a good effect instantly where it takes longer time if you use moving averages. On the question if respondent H considered it to be easier to make forecasts and projections with standard prices she answered yes because of fixed prices. They are instructed to use the moving average model after a decision from the accountants and upper management so they have no choice. Comparisons with other cost models at their unit have not been made either.

Evaluations for the inventory and inventory model are mostly focused on delivery security against the clients, respondent G explains. He continues that on a weekly basis they have a follow-up where they measure how fast they can get the products out to their client compared to the order. This week he said that they had a delivery security at 90.5 percent and they also have a bonus system that they are using. Inventory values are based on the lowest of net realizable value or costs according to the IFRS principles. The biggest part is valued according to costs says he and referring to the replacement cost of the inventories.

Moving average records an expected value of the order at goods receipt based on purchase order price. Later when the invoice arrives the value is updated if there arise any price differences. Price differences are very rare at the unit according to the respondent because they have pricelists that are updated every month for the raw materials that they buy. For raw materials they use Movex and not SAP so they do not have a specific control function for this type of price differences. What they always do is that they match the purchase order against the invoice so that is their control function.

Routines and administrations of invoices is that the invoices goes to the accounting unit in Avesta that scans and register in SAP. Outokumpu Örnsköldsvik get this with the mail and handle it and make a check in SAP and then wait for the approval from the manager before Avesta gets it and makes the final payment. The unit does not evaluate the hedges according to respondent H and they do not have a connection to the inventory.
In general the respondent is not completely satisfied because she wants to have all articles in SAP and not the raw material in Movex. In Movex are also the calculations and projections for the unit so she is not satisfied with that part of integration. A point from respondent H is that it takes much longer time in administration with SAP compared to the old system which is a con.

Exchange rates

The purchasing currencies for Outokumpu Örnsköldsvik are SEK when they buy from Avesta and Euro when they buy from Torneå. For standard products they sell quite a lot to Germany, France and Holland meaning that Euro as their main currency in sales.

The spot rates for foreign exchange rates are updated on a daily basis so all transactions is recorded at the daily spot rate, respondent H tells. Outokumpu has a link to the banks and through this the system get inputs of current spot rates. Respondent I describes that when you issue an invoice for a sale you get an accounts receivable with that days spot rate and later on when you get the payment you get an exchange rate loss or gain. These differences are handled at the end of every month and become an unrealized currency gain or loss. Next month the gain or loss is reversed and at the end of next month you do the same calculation.

The translation from foreign currencies to local currencies is according to her when the goods are received and this value of the goods is later updated when the invoice arrives and any differences arise. The inventory is not affected by the updates of the currencies in the system and the only time the inventories are affected is at a new purchase.

Currency fluctuations are handled in Avesta and not at the unit in Örnsköldsvik. The respondents do not think that there are any differences in handling a foreign invoice compared to a local. The only thing is that you change the currency

Hedging

The local currency for the unit is SEK and the reporting currency for the group is Euro. The foreign transaction flow of the company is around 10 percent of the total transaction flow for the unit in Örnsköldsvik according to respondent G.

Outokumpu Sweden has an exposure against Euro, GBP and USD and these are the currencies that they hedge. At the end of every month respondent I make an exchange report consisting of accounts payables and accounts receivables, loans and the account balances and then she summarize their net position. Usually this net position is a claim for Euro but if you have lots of loan it can be the opposite she says. If they have a claim for 10 million Euro in net position then they hedge this currency exposure against the central department for the entire Outokumpu. “All contracts are gathered and hedge centrally so she does not hedge against an external bank”. Outokumpu Sweden sells the 10 million to the central department at a fix rate and after one month the contracts are realized and if they still have the need for the 10 million they sell them again, explains respondent I. Every month the contract is realized and Outokumpu Sweden makes a new exchange rate report and sells their exposure again to a new fix rate. These forward contracts should be for a minimum of 400 000 euro otherwise they do not need to hedge their exposure. This hedging policy is according to her for all Outokumpu and the only difference with the core businesses is that they can make forward contracts for six
months. The only financial instruments that they use at Outokumpu Sweden are forward contracts.

Most of the time it is the net position from the order stock that Outokumpu Sweden hedges but sometimes for big projects can they hedge a specific project, these should be around 10 million USD according to her. This is very rare she said and the main difference for these contracts is that the timeframe is a little bit longer.

Theory describes three different types of exchange rate risks; transaction-, translation- and operating exposure. On this question if Outokumpu Sweden was exposed to one or more of these risks she said that they only handle the fair value exposure. By this she means what you really have sold and what you actually have bought and excludes the projections of sales and purchases. Earlier they included projections for a year ahead but not anymore. Now they only hedge what actually has occurred and the order stock.

Respondent I said that they do not select suppliers as part of risk management but she had an example of their unit. “We have a purchasing exposure in SEK and previous we also had a sale exposure to SEK but when we stopped the sales we asked the supplier if it was ok to pay in Euro instead”. This means that they do not need to hedge their exposure in SEK because they can pay in Euro. The supplier agreed to this so they are now paying the supplier in Euro instead and according to her this alternative is cheaper than hedging the exposure themselves. They have a policy that they prefer to trade with Euro before USD and within Sweden SEK is the preferred currency.

On the question how you can handle changed currency risks in a project with net hedges on a company level respondent I said that they can hedge specific projects as well. She also said that the monthly updates should capture these changed conditions and that the project hedging should not be necessary.

In general she is satisfied with how the hedging is handled, it is both simple to handle and easy to understand. Outokumpu group is also a good partner according to her that is easy to discuss with and get advices from.
6 Analysis

In this chapter are the empirical results from the studied companies analyzed with the theoretical frame as the basis. The chapter follows the same structure of the three topics to facilitate the reading and understanding. After the generalized analysis with the interview template as basis a self-constructed figure is presented as a summary of the analysis.

6.1 Inventory valuation

The literature about how moving average is calculated is presented in the theoretical chapter. After studying the empirical results I conclude that the type of weighted average method that all of them use is the perpetual one called moving average. The accounting principles that three of the companies uses are IFRS and ABB Machines use US and Swedish GAAP. The handling of new purchases was the same for the four companies. First they have an expected value of the order, called purchase order price, and this value is used for the goods receipt. When the invoice arrives the final value is determined for the goods in inventory. This is how the purchases are valued and as the method states the inventory value is updated for every new purchase (Alfredson et. al, 2005, p. 264-265). One of the four companies uses a business system called IFS instead of SAP but calculates the moving average in the same way. This is an indicator that it is a general approach to calculate.

Moving average valuation systems can be an indicator that the inventory is computer controlled (Wilkinson-Riddle, 2008, p. 1694). Three out of four uses the business system SAP with automatically adjusted moving average calculations and one of them a similar system called IFS. Outokumpu have not started using the function in SAP yet and instead uses the system called Movex when they calculate the moving average. But as respondent H says this is a problem that they should fix. They plan to integrate the systems and use the available function in SAP to avoid the extra administration they have now. One of the biggest pros with the moving average calculations is the benefit of automatically updated inventory values.

Price- and quantity differences are important to keep track of because of the automatically updated inventory valuation systems. The empirical results showed that a quantity difference is not a big problem for the companies because it is quite easy to back the order and register a new one with the right amount. Price differences could be a little bit trickier because of a control function that SAP has which means that it is not possible to register the invoice if there is a bigger price difference than 1 percent. Three of the four companies mentioned that it is important to have good and reliable purchase order prices because it prevents the risks of price differences when the invoice comes. Both Respondent A and C highlight the importance of investigating the price with the supplier closely to avoid big price differences. This can according to the respondents arise for example when the purchaser buys an article for the first time or uses old pricelists when the expected price is set.

An example to illustrate a potential problem described by respondent A; If a purchaser believes that the price of an article is 1 000 SEK and orders 10, the inventory value will be 10 000 SEK at goods receipt. Before the invoice arrives, seven of these products are picked out from inventory at the price of 1 000 SEK. The invoice later on shows that the price was 150 SEK instead of the expected 1 000 SEK. This causes a problem in the system because the system wants to decrease the value with -8500 SEK but there is only 3000 SEK in inventory so you get a negative value which is impossible. Another
example was when SAAB Aero support and services bought an inventory of Lufthansa and should incorporate it to their inventory. But because they did not have a purchase order price the whole value was assigned as a price difference. These two examples led to a lot of problem and work since it was necessary to reverse everything back to purchase order, goods receipt and invoice.

All the companies value their inventory to the lowest of net realizable value or cost. The general perception of the respondents is that it is the costs that are most common when valuing the inventory. This empirical result strengthens the statement of Hilmola that most of the pricing of industrial products originates from costs and not value received by the customer (Hilmola, 2006, p. 330). This further enhances the importance of getting more accurate and reliable cost formulas. Respondent A also describes that their prices are based on all the costs that is attached to manufacturing, components and the costs of selling the goods.

The inventory structure for the four interviewed companies is quite similar and all of them use the moving average valuation method. ABB Machines is the only company that use standard costs on their semi- and manufactured articles, but as respondent C described this was only for one percent of total inventory. One of the two units at SAAB called Aero Structure used only standard costs for both raw materials and manufactured goods. Outokumpu has a slightly different structure of smaller projects and as I perceives it also more sales from the shelf. An interesting thing was that all companies except Outokumpu had different ways of separating the moving average effects for project-specific articles and other big components that is bought for a certain project. Why Outokumpu do not separate the moving average effects I think is connected with their high inventory turnover, structure and lack of big projects.

Cargotec and ABB Machines use project-specific components that never is affected by moving averages and instead realized as a cost for the project instantly. Respondent C explains why: “we are project-driven but do not apply project accounting instead we use project-specific components to keep track of the big costs in our projects”. SAAB Aero support and services also separates project articles from moving average effects by assigning every article with a project number that shows their belonging to the project. The value is constant from that time it is mounted into an airplane and this is the cost that is realized for the project.

Moving average cost formulas are according to respondent E best suited for distribution inventories with high inventory turnovers that buys articles to the shelf and then sell it to a customer. Bloom states in a scientific article for the IRS that the moving average method is not appropriate for inventories with low inventory turnovers and fluctuating costs (Bloom, 2009, p. 72-73). The article verifies respondent A and his experience of appropriate structures for the method. Previously stated methods of preventing effects from moving average for project articles also give me incentives that the method may not be optimal for inventories with that type of structure. Out of the four companies that I interviewed Outokumpu seems to be best suited for this type of method. Based on their structure of high inventory turnovers, with a lot of sales from the shelf and also not exposed to projects with a long time frame. Theory describes homogenous products that are mixed together best suited for moving averages like for example iron products (Alfredson, 2005, p. 267).

Standard costs are preferred on manufactured articles in the business system SAP. Respondent F agrees with this and says that moving averages is not recommended for
manufactured articles. Moving averages on only generated costs is almost impossible to use according to her. Standard cost method can be a better solution than weighted averages and other actual cost methods when you have a manufacturing company with a variety of products (Horngren & Churchill, 1967, p. 593). Even ABB Machines have chosen to have standard costs that are updated every year on their semi- and manufactured articles.

The increased administration of deciding these standard costs is the biggest con with the standard cost model according to all respondents. To establish a standard cost needs a combination of expertise from management, products, design engineers, industrial engineers, management accountants and purchasing departments. It is a big administrative cost to set and update standard costs, three of the important factors are quality, quantity and prices. (Blocher et. al., 2010, p. 609) The manual updates of the standard costs prices can demand a lot of work because you need to look at previous prices and find new reasonable levels, respondent E explains. ABB Machines update their standard costs one time every year which is quite rare but it is only a very small part of the inventory that have standard cost.

Their unit also uses standard costs as a control function of the articles that is valued with moving averages. Standard costs can be used as a control function outside the system and is later on compared with the actual costs, which is moving average costs in this case (Blocher et. al., 2010, p. 607). Outokumpu also have the possibility of comparing moving average costs with standard prices. Because of the potential problems that can arise with moving averages this control function is a good way of discovering problems in time.

A benefit with the moving average model is automatically updated values and also according to the respondents more accurate values. Respondent C says “if you look at it from a statistical view is it more accurate than standard costs”. Anderson et. al. explains that if you use the weighted average statistical method you get a more accurate mean because you consider purchase of different quantities to different prices. The method gives every new purchase equal weights and this should mean that you get the most accurate values. (Anderson et. al., 2007, p. 97-98) Every respondent agree that correctly assigned this method is more accurate than for instance the standard cost method. As an example respondent H says that if the market is volatile this model helps to smooth out the effects on the results. Respondent E agrees and explains that a big pro with moving averages is that the articles adapts the value of the inventory faster if foreign currencies are changing. If the dollar is high, then you sell for high prices but you also buy for a high price depending on how fast the inventory turnover is, he tells. The simplicity of the moving average model with automatically updates and accuracy are the main pros according to most respondents and I agree with their opinion.

I understand from the empirical findings that the increased information requirement is a con with the moving average model and a risk to potentially increased costs. ABB Machines do not have valued goods for their project specific articles and these should have caused big price differences. Because when you use moving averages and do not have a purchase order price do this means that the whole value is treated like a price difference in a moving average system. Information requirement of better purchase order prices means more administration and increased costs for the purchasers. Theory suggest that a management accountant provides information to their manager that helps them make right decisions, this service can be viewed as a cost. The company needs to
decide whether the company is willing to spend a lot of money to get accurate and timely accounting information or not. (Blocher et. al., 2010, p. 76) This dilemma does respondent C have with the valued goods for project-specific articles or not which is according to the previous discussion above mandatory in moving averages. He says that after discussing with the accountants should they start with valued goods in the future because otherwise will goods have no value in inventory until the invoice arrives. This is an example of increased information requirement and I believe it is a con with the moving average model. At present their project specific article is outside the moving average effects but this might be a reason why.

Moving average compared to standard costs

<table>
<thead>
<tr>
<th>Company</th>
<th>Moving average Pros</th>
<th>Cons</th>
<th>Standard cost Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargotec</td>
<td>Accuracy &amp; simplicity</td>
<td>Projections &amp; first time purchases</td>
<td>Reliable projections because of stable prices</td>
<td>Less accurate than M.A</td>
</tr>
<tr>
<td>ABB Machines</td>
<td>Quick adaption to changes, simplicity &amp; accuracy</td>
<td>Movements between inventories</td>
<td>Easier to identify material &amp; price differences</td>
<td>Manual updates &amp; more administration</td>
</tr>
<tr>
<td>SAAB Aero</td>
<td>Accuracy &amp; automatic updates</td>
<td>Information requirement for purchase orders</td>
<td>Reliable projections &amp; control function of M.A</td>
<td>More administration for updates &amp; slow moving</td>
</tr>
<tr>
<td>Outokumpu</td>
<td>Smoothing effects for income statement</td>
<td>Also smooth short term positive effects</td>
<td>Reliable projections with fixed prices</td>
<td>Slow moving</td>
</tr>
</tbody>
</table>

Table 3 Moving average compared to standard costs, self-constructed table from the empirical findings.

Expressed pros and cons for the two methods are stated in the table. The main factor that determines best suitable method is the structure of the inventory. Theory states that it is impossible to say which model performs better because it depends on; information requirement, type of inventory, cost of implementation, inventory turnover and management decisions (Alfredson, 2005, p. 267). I cannot from my study find arguments for saying that moving average method is a generally better method than standard costs. What I can do is to show pros and cons. The decision is up to management to decide which of the methods that is best suited for their specific inventory and policies.

6.2 Exchange rates
As I mentioned in the previous chapter about inventory valuation the importance is to consider not only the sales exposure but also the input currencies. Hilmola states that it is important to identify both exposures because sometimes might management act on the assumption that sales and purchases match and therefore change the sales price when in fact it is the input costs that should be changed. (Hilmola, 2006, p.330-331) This fact shows the importance of connecting the inventory valuation with this chapter of exchange rates. My intention with this analysis is to connect the inventory valuation and hedging part.
All of the interviewed companies have both input costs and sales in foreign currencies which mean that they are all exposed to an exchange rate exposure. Currencies other than the functional currency that a company usually denominates transactions in is called foreign currencies. The functional currency of the four units is SEK and according to theory this currency is decided by factors like; geographical location, influences on costs, funds are generated in this currency and all the goods receipts are stated in this currency. (Mirza et. al., 2008, p. 159) Because all global companies have units and subsidiaries located in different countries today and also high demands of cost minimizing it is impossible to use only one currency. Outokumpu has recently done a big downsizing on both staff and costs. One possible and also common way of cutting costs can be to look for new suppliers for example in low cost countries. ABB Machines look for low cost and quality when they are searching suppliers and do not think of the exchange rate risk so much. The understanding that I have after this thesis is that cost minimizing is much higher on the company priority list than thinking about potential effects and risks from exchange rates. The exchange rates involved in a purchase in foreign currencies are handled on a similar way as a regular purchase with moving average. Respondent D explains that every purchase has three values; one at the goods receipt, another one when the invoice arrives and finally a third when the invoice is paid. These values should be valued with either daily updated spot rates or if stable exchange rates an average rate according to IFRS accounting standards (Mirza et. al., 2008 p.160). The update in the system does not affect the inventory values, according to respondent H does only new purchases affect inventory values.

The empirical results show that the most common solution is to use daily updated spot rates and this is supported by three of four companies. ABB machines that use US GAAP have also daily updates and this was according to the respondent required by their standard. The daily updated spot rates get the input from either one of the bigger banks or as for example ABB that have an internal bank. According to two of the respondents, these exchange rate effects can be quite big and they highlight the importance of getting the invoice in time. Despite the fact that all respondents are aware of the risks involved with the exchange rates have none of them yet found ways of preventing them. The accounts receivables and account payables are valued in the financial statements to the closing rate for all companies.

Respondent B highlighted an interesting aspect: “differences in exchange rates because of a price difference do not get controlled by the system but it affects the inventory valuation and moving average price”. By this statement she referred to the fact that in the business SAP they have a control function when there is a difference between the purchase order price and invoice price that is very low. But exchange rate differences are not controlled in the system in a similar way which, according to their connection to inventory value in moving average calculation, can seem strange. This is an effect that the standard cost do not get because they only assign the actual exchange rate difference straight to that article and if it is sold it does affect the income statement, explains respondent F. The main difference is that it does not affect all the other similar goods in inventory. Not all respondents had thought about this aspect that the inventory value is affected by the exchange rate differences. Personally I believe that this shows a perception among many that exchange rate differences are just something that exists when doing business on the international market. How to actually manage the exchange rate exposure seem to be of less concern. The translation from foreign to local currency is decided at the goods receipt for every purchase and later on updated when the final value of invoice is translated into local currency. Another reason that supports my
perception on maybe too little attention on managing exchange rate differences is that a foreign invoice are handled exactly the same as an invoice in local currencies. Respondent H describe that the only difference in the handling process between them is that you change the value into local currency.

The main reason to identify and measure exchange rate differences is to create good and reliable information that is the base for the upcoming hedge, (Shapiro, 2006, p. 337) In this chapter identification and handling of exchange rates has been discussed and possible ways of handling these differences are by using hedging (Hilmola, 2006, p. 331). Different exchange rate exposures are identified in the next section together with an analysis of hedging considerations and techniques.

6.3 Hedging

The transaction flows in foreign exchange rates are vital to the different business units, meaning that all have thought about it and manage them. Outokumpu has the lowest foreign transaction around 10 percent and the highest foreign exchange exposure has SAAB Aero structure. Respondent F explains that all of SAAB Aero structure’s sales are in USD and most of their purchases too, except a small part in Euro. Almost all of the exposures are against the big exchange rates like USD, Euro and GBP. The reason to this I believe depends a lot on the desire to use more stable currencies which these in general are. Respondent D explains that it is possible to use one of the big exchange rates dealing with smaller countries using non-convertible currencies as well because they have to adapt if they want to sell. Theory describes that for globalized companies using different purchasing currencies and different local- and reporting currencies are the management of exchange rates a crucial part (Shapiro, 2006, p. 337). The only unit that has the same local currency and reporting currency for the group is SAAB Aero which uses SEK. The other three uses SEK as local currencies but when their results and financial statements are incorporated into the consolidated financial statement in the group they are translated to their reporting currency.

Theory divides possible exchange rate exposures for a company into three risks; transaction, operating and translation. Operating and transaction risks are the two cash flow risks which together are the economic risks that can change a company value from changes in exchange rates (Shapiro, 2006, p. 337). The empirical results strengthen a study for US based multinational companies that showed that economic exposures is more difficult to hedge than the transaction exposure. As respondent D said “our unit is exposed to all three of these exposures but we only handle and hedge the transaction risk with financial instruments”. The other companies agree in this statement and gave similar answers and the conclusion is that all of them focus on the transaction risk. The translation risk is not something that they think about on the units because it is taken care of at the centralized treasury department, Respondent B explains. I believe that it is good to let these effects be taken care of at a centralized level where you get a better overview of the whole group. The empirical result supports this statement because none of the companies use hedging for the translation risk.

None of the companies use financial derivatives hedging the operating risk either, but other types of risk management are used. Respondent F said that they try to find suppliers that use the same currency as their main sales currency and this is a form of risk management. This is further enhanced in theories that sometimes can one exposure act as a hedge for another exposure and this is called a natural hedge (Kawaller, 2008, p. 92-93). I believe that this is one the most common types of risk management and this
are also supported by the empirical findings. All respondents agreed that it was a good way but as respondent B said: “it would be optimal but not so easy to achieve”. She continued to explain that their suppliers are in Europe but they manufacture and sell the products in China. For the future they hope to find suppliers in China.

Respondent I said that they do not choose suppliers as a form of risk management but gave an example where they got one supplier to accept payment in their local currency. Respondent D also said that they have one big client that pays them in SEK. Transferring the risk to the other part, for example pay in your own currency is called internal hedging (Bligh, 2012, p. 42-44). This is a good way of preventing an exchange exposure but this method of risk transfer from you to the other part can also have cons. Kawaller describes that when the counterpart agrees to trade in the other company’s currency they usually adjust the exchange rates or prices so that they get payed for the currency risk (Kawaller, 2008, p. 94). This means that you are paying the other part for bearing the currency risk, so before a company chooses this alternative they should consider the costs. Respondent I have considered this extra cost with higher exchange rates but accept them as fair and that it would be even more expensive to make a hedge.

The hedging policy and the information on how to manage exchange rate exposures needs to be clear because different risks can be hedged with different techniques. If the instructions are vague, the risk management and managers must make tough decisions between different techniques. (Shapiro, 2010, p. 343-344) All the interviewed companies have hedging policies that are pretty clear and easy to understand. This seems to facilitate their decisions a lot. During all of the interviews with the different respondents, the central topic in the discussion was always the company policy which indicates that it is a security for the employees to have clear directives. According to respondent D is the hedging policy for ABB very strict. It is decided first by the HQ in Zurich, then for every country and finally also local regulations for every unit. If you have a large company with businesses in many countries like ABB is it very important to have strict policies and rules so that you do everything in a similar way and also correctly, he describes. The policies for the units are; Outokumpu hedges the fair value exposure, both SAAB Aero structure and ABB hedges net transactions on a company level and Cargotec hedges both in- and outflow.

When the decision is taken to hedge the company must decide which strategy to use and one decision is if they should use a centralized organization or hedge at every unit. The empirical results show that three out of four units uses centralized organizations for their hedging. A general pro that the respondents see with a centralized hedging department is bigger volumes and more favorable conditions than if they would hedge themselves. Pros with centralized organizations are according to Shapiro a better overview of the company, ability to negotiate better prices and also see negative trade off effects that units cannot see. (Shapiro, 2010, p. 42-44) One thing that I find interesting is if the foreign units in a group should hedge their exposure against the local currency or against the group reporting currency. None of the interviewed companies said anything about this aspect, yet I think that it should be considered because of the risk for negative trade-off effects. The reason for decreased costs with centralized hedging is the opportunity to gather all hedges from the units and just hedge the net position of the whole organization. (Shapiro, 2010, p. 350-351) Respondent B said that they recently switched from hedging their own exposure to a centralized department and now they have also started with full hedging compared to net hedging before. Why they started with full hedging is according to her an increased demand for hedge accounting.
and they are very interested in the effects from the hedge. I believe that this switch from net- to full hedging might be a consequence of the centralized hedging because the centralized department should be interested in more information now. The biggest con with the centralized decision is that you do not have local knowledge and the opportunity of taking advantages of that in centralized hedging (Shapiro, 2010, p. 350-351). If you lose the local knowledge from hedging at the unit, the need for information increases and more efforts are required by thorough analysis and reports to the centralized department as base for good decisions.

Another decision is if the company should hedge a full, partial or just the net exposure in a certain currency (Shapiro, 2010, p. 350-351). SAAB Aero structure is a good example here, their policy is to hedge all the flows at the units but because of their big exposure has they been granted to only hedge the net transactions in a certain currency. Respondent F said “if we should hedge all our flows should it be so many contracts and too big workload for them at the unit”. This shows that full hedging might be preferred but the workloads increases and in turn the costs. For units like Aero structure that has SAAB’s biggest exchange rate exposure of 350 million USD is full hedging not applicable because of the work, but I think that the cost aspect also is a big factor. The two units that uses full hedging are ABB and Cargotec and these two do not buy any contracts themselves. This means that their costs should not be as high as Aero structure that buys the contracts and hedges the exposure at the unit. It is scientifically investigated that centralized hedging with a global view can hedge right amounts at the lowest costs (Shapiro, 2010, p. 350-351). I believe that the question of full hedging or net hedging is dependent on centralized or decentralized hedging and also how big the exposure is, for small exposures it might be easier to use full hedging.

Respondent I describe their way of handling net positions slightly different to the other. Every month he makes an exchange report consisting of accounts payables, accounts receivables, loans and account balances and then summarizes the net position. The difference that I noticed for Outokumpu compared to other units is that they include loans and account balances in this hedge, they are not only looking at the transaction flows. Bligh (2012, p. 42-44) describes an incentive of not hedging an exposure if you have funds in the same currency in a bank account. This strategy I think is good because this way saves money on hedges. A hedge seems unnecessary if you already have an offsetting exposure. Why the other units have not mentioned so much about this I believe depends on the quite small sizes of the units. They handle all their loans and account balances in their local currency which means that it cannot act as an offsetting exposure.

Many companies choose to use project hedging to keep track of all exchange rate fluctuations that should be addressed for that specific project. Two of the interviewed companies use project hedging but one of them said that it is very rare that they actually use the project hedge. Respondent B said that the advantages that she sees with the project hedge is that you get a very detailed information for reporting and that it gives a good overview of the project. ABB Machines that also have a lot of projects believes that they capture the risks by their continuously updates that is done at least quarterly and also when something new enters or leaves from big projects. He also explains that they have quite stable cash flows because they have produced near maximum for a few years. This decision of using project hedging I believe is much about costs compared to benefit. All of the hedging decisions seem to be based on these cost-benefit analyses and this is also strengthened in the empirical results. For example ABB Machines that
has big projects and maybe should use project hedging have decided that the costs outweigh the benefits with project hedging. Their continuous updates of their hedges are sufficient because of their stable cash flows in the projects. The only problem that respondent D sees with not using project hedging is the importance to closely monitor and track delays in the company that can affect the net flow hedges.

The main focus in risk management of exchange rate exposures are on the transaction risk for the interviewed units. The choice of hedging instrument is dependent on; currency, amount, expertise and costs (Bligh, 2012, p. 42-44). Empirical results strongly show that the most popular financial instrument is the forward contracts. One of the biggest reasons for that might be that forwards is together with futures the cheapest alternatives (Bligh, 2012, p. 42-44). Forward contracts are also one of the easiest to use and understand which is connected to the expertise level. The interviewed units are quite small which could be main reason for why they choose simple instruments. Respondent I, B and D all said that they always use forward contracts when they hedge their exchange rate exposure. The only one of the units that has looked at other alternatives is Aero Structure. They have decided to try options. The amount is one thing that affects the choice of hedging instrument and they have the biggest exchange rate exposures of them all. This might explain their considerations about looking at other instruments, but respondent I seem to prefer forward contracts anyway. Bligh (2012, p. 42-44) states that what we know about the costs for hedging techniques is that the option is the most expensive. The advantage of the option is that you do not get a fix rate as the forward contract and then do you have the possibility of a bigger profit. But all of the units are not into this for making money, the only thing that they want is to secure their cash flows and prevent exchange rate changes. Respondent D said “ABB Worldwide has a policy of hedging foreign exchange rate exposures so that we can predict inflows and outflows and not speculation or making profits”. This quote enhances the perception of not hedging for profits, instead they just want to secure what they receive and pay.

How the companies evaluated their hedges was rather unclear and I perceived that the importance was to secure the cash flow and not evaluation. Respondent D explained that they do not evaluate the efficiency or profitability of the hedges and instead have a defensive approach. He continued to describe that they do not have a connection between the outcomes of hedges and inventory valuation either, instead is all currency effects kept separated and accounted separated. The other units did not mention anything about a connection between their inventory valuation and hedging activities either. This might be a consequence of the difficulties of identifying and managing these risks. Theory states that the hardest exposure to measure and identify is the economic risk which is in-direct and on a long-term basis. These risks include changes in sales prices, sales volumes, effects from competitors and costs of inputs for the company. (Martin & Mauer, 2003, p. 438-440) The empirical results have showed that the exchange rate differences affect the moving average valuation which affects the input costs. In my opinion this proves that a connection exists. But I also understand that the units are quite small and that they might not have enough expertise or money to handle these economic risks that are really hard to identify and also hedge. The best way of dealing with the economic risk is by geographically positioning the operation (Martin & Mauer, 2003, p. 438-440). This alternative is both time consuming and really expensive but the best alternative to prevent this type of risk. I believe this is something to consider at a group level and not at a unit level, but the units should be aware of the effects.
6.4 Summary of analysis

The overlapping circles illustrate the relationship and connection between the three different topics. Exchange rates are closely connected to the hedging part because it is the information of exchange rate exposures that is the foundation for the hedging decisions. These two topics are also connected to the inventory valuation because these exchange rate movements have shown to have significant impacts on the inventory value.

**Inventory valuation:** the inventories best suited for moving average calculation are according to both theory and empirical results inventories with; high inventory turnovers, sales from shelf and quite stable costs. The calculation is less suitable for project specific articles due to higher costs and more efforts needed to establish a reliable purchase order price.

**Hedging:** states how to handle different exchange rate exposures with different techniques. Forward contracts are the preferred instrument because of simplicity and low costs. Project hedging is a suitable alternative to keep track of exchange rate effects on the project level, although the empirical results indicate that this can be too costly for smaller units. The input costs are identified as an economic risk that is one of the hardest to measure and hedge with financial instruments. Geographical positioning is recommended to be the best way of handling economic risks and that type of effects.

**Exchange rates:** is the part that connects the inventory part with the hedging part as exchange rate differences affect the inventory values. The analysis shows a need to identify the input costs to manage exchange rate differences correctly. This part is also the information basis for the hedging decision that involves both hedging techniques and which instrument you use.

Figure 3 Summarizing model of analysis
7 Conclusion

In this chapter are the general conclusions drawn from the research question and purpose of the study, by this reason they are also stated in the beginning. Then the practical and theoretical contribution follows as well as the suggestions to further research.

7.1 General conclusions

Objectives: Identify and evaluate the effects of currency movements in the cost of goods sold from an inventory valued at moving average method?

- How to value cost of goods in a moving average valuation system compared to a standard costing system? Investigate main differences and similarities between the two systems.

- Investigate how companies can take into account changes in exchange rates arising from the purchase of goods to an inventory that is valued at the moving average system.

The moving average valuation system means that it is computer controlled and has automatically updates of the inventory value. This is a big pro with the valuation system because it means less administration compared to the standard cost system that have manual updates which can be time consuming. A downside with the moving average valuation system is the extra information that is required at purchase orders. The accurate prices that are updated for every purchase means that it quickly adapts to changes and that it is simple to use and understand. This means a smoothing effect compared to the standard costs that have fixed prices with manual updates a few times a year, which make the model slow in responding to changes and less accurate.

The standard cost valuation system is preferred when the companies are making projections because the prices are manually updated which avoids unpredicted fluctuations. Another potential problem with moving averages is movements between inventories within a company, meaning that you can get different values in different inventories even if the goods are not leaving the company. The empirical findings and theory support that inventories best suited for moving average calculation is inventories with; high inventory turnovers, sales from shelf and quite stable costs. The calculation is less suitable for project specific articles due to fluctuating costs and more efforts needed to establish a reliable purchase order price.

This study has highlighted the importance of considering the exchange rate differences that can arise when purchasing goods to an inventory. Both empirical results and theory shows that these exchange rate differences significantly affect the moving average valuation and therefore also the input costs of the company. It is important to identify the changes in the input costs so that risk management can find good ways of preventing negative effects and give them information to take proper decisions. If the information is not correct a potential problem is that effects on profitability from input costs can be misinterpreted as effects from sales prices. These accounting issues in inventory might lead to wrong decision of increased sales prices of products which makes the company less competitive on the market with lower sales. Despite negative trade-off effects the real problems are not addressed. For the standard cost method is it easier to identify the effect of exchange rate differences, because the effects are assigned directly to the
articles that is purchased and do not affect all similar goods in inventory. This makes it easier to keep track of exchange rates differences because they are only affected of these effects one time. The moving average method updates the entire inventory value for similar goods which makes it harder to identify and manage the currency effect.

Among cash flow risks are the economic risks hardest for companies both to identify and manage. All of the units in this study focus on the transaction risk which is the easiest to hedge because the exposure is stated in a predetermined contract. The economic risk with input costs is much harder to measure and evaluate because it is on a long term and the effects can be either direct or in-direct. Financial instruments are best suited for hedging the transaction risk, but the economic risk demands other types of risk management. Theory describes geographical positioning as the best idea, meaning a localization of the entire operation to the country of business. A geographical positioning is both expensive and time consuming and not a decision that can or should be taken at a unit level.

**Research question:** What are the effects of currency movements in the cost of goods sold from an inventory valued at moving average method?

The effects of currency movements using the moving average method may result in a change in inventory value for every new purchase that the company makes. Currency movements in moving average valuation systems affects all similar goods in inventory, which means that the exchange rate differences are equally distributed. Because of this fact the currency movements are harder to identify and measure in a moving average valuation system than for instance a standard cost method. The effects are hard to manage by ordinary hedging, using financial instruments. Instead geographical positioning is proposed as a way of preventing economic risks. What I believe is the most important thing to identify the currency movements in all specific cases so that risk management can consider them when they decide possible actions. Because of the problems of managing economic risks the focus for the companies should be on separating these effects from the sales currency effects on sales price. This information should facilitate the decision-making a lot at the risk management department. Mistakes, like changing the sales price when the effects come from input costs can be avoided. The decisions of geographical positioning usually taken are on a central level in a group but the units should consider separating these effects to enhance their awareness of currency effects.

The conclusions from this study cannot be generalized to all companies and units using the moving average valuation method. The intentions of this thesis have been to conduct an in-depth investigation for the four companies included in the study. The empirical findings and the similarities with stated theories that has been shown in the analysis indicates that this thesis work can be used as a help mitigating potential problems and describes benefits with this inventory valuation system in general.

[59]
7.2 Practical contribution

The practical benefits of the thesis are big because companies that are thinking about implementing this inventory valuation model gets a god insight of possible benefits and also problems that can arise. Exchange rates are also an important thing for companies to consider and how they are handled in a moving average system is shown in this thesis. The handling is rather different in this system compared to for example standard costs. It is harder to identify and measure them because of the automatically updates for every new purchase that the system uses. This information about exchange rates can enhance the reports to risk management if done properly. With the empirical results have I been able to state possible pros and cons with moving averages and standard costs that facilitate a selection between the two cost methods for companies.

The biggest contribution to the client BAE Systems is the stated pros and cons of moving average compared to standard costs, and also the optimal inventory structure for this type of valuation method. How the companies have handled project-specific articles with high values and variation in costs is also of great importance for the client. Mainly because of their inventory structure that might not be optimal for moving average calculation because of the big projects. This means that they should consider ways of preventing moving average effects for project articles with high values and variations in costs. The insight of the four studied companies can help them to find good ways of handling these project articles.

7.3 Theoretical contribution

The theoretical contribution is how moving average are calculated and possible effects that can arise in the different values in a purchase. The empirical findings have given me enough information to state pros and cons for both moving average system and standard cost system. I found small notes in articles about the best inventory structure for moving average in different accounting journals but the information were not sufficient to be confirmed. The empirical results has strengthen many of these theories regarding moving average calculation as not being optimal for all inventories and instead best suited for a certain kind of inventory structure. This fact that not all inventory structures are suitable for this valuation system is very important both in practice and theory.

The connection has also been made between the three topics; inventory valuation, exchange rates and hedging. This study has started to investigate the possible connections between how the exchange rate differences affected the moving average inventory value and how to best manage this with hedging or risk management. This connection is something that needs to be analyzed and investigated more in further research but hopefully has this thesis highlighted a need for it. The only article that has connected the currency movements to input costs before is Hilmola, the result of this thesis shows that this is a topic that needs further research. Moving average calculations are clearly affected by currency movements which change the inventory value and this is something that need more research.

Because of the lower degree of generalization that this thesis has can the theoretical contribution not be confirmed as theories. But I believe that the information is very relevant and that many of the questions that have been raised need further research.
7.4 Suggestions for further research

A suggestion for further research is to conduct a deeper investigation of identifying and managing the economic risks. The only theories regarding risk management of this type of exposure is geographical positioning which is expensive and takes time. There should be other forms of risk management that can prevent negative effects from economic risks. Research should be made about different hedging techniques and their effects on economic risks.

A further study of the connections between inventory valuation, exchange rates and hedging should be very interesting after realizing that it do exists a connection from this thesis empirical findings. The focus for this research can be on either one of these three topics because all of them are interesting and also to see the relationships between them. The effects of exchange rates in inventory and input costs do I think is really interesting, a deeper investigation of the highlighted topic this thesis has addressed would be a good research question.

The final suggestion is to study how companies evaluate their hedges and from this perspective see the connection and relationship with the inventory valuation. This is especially important for an inventory that is valued at moving average. It would be really interesting to see how much the input costs really affects and a possible way of investigating this can be by evaluating the hedges outcomes.
8 Truth criteria

In this chapter is the truth criteria explained which facilitates the critical assessment of the results from a qualitative research strategy. The three criteria’s that I have used is reliability, validity and finally the objectivity.

The reliability and validity concept have not been adapted in the qualitative research as much as the quantitative but Lecompte and Goetz have written about it. This type of measuring issues is far more developed in quantitative research compared to qualitative but is also used for this research strategy. (Bryman & Bell, 2007, p. 410) These measurements are according to me the best way of measuring some qualitative studies if the criteria validity and reliability is adapted to qualitative research. The argument why I chose these criteria is because of the deductive approach and more structured qualitative study. After considering the different criteria available I thought that these concepts were most informative and best according to this study but a discussion regarding the qualitative criterions is also shown. The most important thing is that the criterions are understood such as validity, reliability and finally the objectivity so it can be applied to a qualitative approach.

8.1 Reliability

External reliability

External reliability means to the degree that a study can be replicated which is seen as a difficult thing in qualitative research (Bryman & Bell, 2007, p. 410). I believe that a replication of a qualitative study is next to impossible because of the role that a researcher has and also the importance that the respondents have. Besides this fact have I tried to describe how my study has been performed in the methodical chapter and also stated my scientific approach. According to the theoretical approach should a replicating researcher adapt a similar social role as the original researcher to get comparable results (Bryman & Bell, 2007, p. 410). This is hard to achieve because then should you be able to describe your feelings as a researcher and set up identical environment and also think in a similar way which is very hard. With these facts can I conclude that the chance of replicating this study is small but I have tried to describe all critical factors that need to be considered if another researcher should try to replicate. Guba & Lincoln calls this criterion for dependability and says that you should adopt a critical approach and secure that you have explained all phases in the research properly (Bryman & Bell, 2005, p. 307). I believe that the different phases have been described throughout the thesis which means that this criterion is fulfilled but the chance of replicating is small because of the research strategy.

Internal reliability

The internal reliability is explained as differences between researchers when there is more than one researcher in the study (Bryman & Bell, 2007, p. 410). This is not a problem for me because I am the only researcher so there is no risk for differences regarding how the findings are being analyzed. This might be seen as a con to some that I write the thesis on my own but I do not believe that this affects the quality. Because during the whole study have I got advices and opportunity to brainstorm with my two supervisors. Catherine Lions from Uméå School of Business and also Maria Ekman the supervisor from the client BAE Systems. These have not been involved in any writing but have as critical readers elevated the quality on the thesis. A conclusion from the stated facts is that the thesis has a high internal reliability.
8.2 Validity

**Internal validity**

Internal validity is the criteria that evaluate if the study really has measured the thing that it was intended to (Jacobsen, 2002, p. 425-426). The internal validity is good according to me because I put a lot of work into the semi-structured interview template which made it very relevant to my thesis. The questions in the template have a good structure that has helped me a lot in the interviews and helped me get information aligned with the problem statement and objective for the thesis. The respondent has also been really knowledgeable within their fields, they all has long experience of the topics and has given me relevant and good answers. I think that the choice of letting the companies find suitable respondents to interview was good because they have more insight in their employee’s expertise knowledge and abilities than I have.

Another way of measuring the internal validity of a study is to compare the results with other studies or theoretical ideas and if they are consistent do you have a good internal validity (Jacobsen, 2002, p. 425-426). This is something that I noticed rather fast that much of the empirical results are aligned with the theories. A factor at the inventory valuation part is that moving average is not written so much about but support for these calculations was found in the practical implementation of the business system SAP. The overall internal validity is very good considering the conditions of a focused problem statement and cross-disciplinary study between accounting and hedging. Guba & Lincoln explains their corresponding criteria to internal reliability as credibility, which is to secure that the primary data is trustworthy. One way of secure this criterion is to use respondent validity which means that the respondents will approve the material before publishing it. (Bryman & Bell, 2005, p. 307) I asked all the respondents if wanted to examine the empirical findings before they were used in this thesis but they declined and wanted a link to the finished thesis instead.

**External Validity**

External Validity is according to qualitative research the ability to generalize your findings and results. Lecompte and Goetz have discussed the possibilities of generalization as difficult because of the often small samples and case studies that qualitative research often have (Bryman & Bell, 2007, p. 410). My focus of this thesis has never been at generalizing the results which justifies my smaller sample. The intentions has more been into in-depth investigation of the four interviewed units and investigate how they uses the moving average model and also find support for how their hedging has been performed and evaluated. Guba & Lincoln criteria transferability, say that qualitative studies are more into creating depth than width and therefore focus at the uniqueness and a specific socially constructed reality (Bryman & Bell, 2005, p. 307). This is more my intention, I will like to give an in-depth information regarding moving average valuation system and how you can handle the currency movement in the system.

The degree of generalization is as discussed quite low but the intention was instead in-depth investigations of a small number of units and this intention is fulfilled. I believe that the information that I have received is sufficient to fulfill the objectives of the thesis which is considered more important than the degree to generalize. The criteria transferability is more informative in this case and shows the importance of getting relevant in-depth data instead of representative and generalizable data.
8.3 Objectivity
Objectivity is often assessed as the researcher ability to confirm and strength the results and also if the researcher have influenced the study or have been objective (Bryman and Bell, 2005, p. 307-308). In qualitative research it is difficult to be totally objective but this enhances the importance of describing both pre understandings and the approach you have as a researcher. My position has not been objective in this thesis but I have done everything to keep an open mind meaning no prejudice or letting the theoretical frame control the results. It is an important aspect that the researcher has secured that the researcher has no hidden agenda or letting the preconceptions affect the study, if the ability to confirm and strength should be fulfilled (Bryman & Bell, 2005, p. 307).

The potential threats against the ability to confirm and strength has been explained and this means that I as a researcher have been aware of these factors during the investigation. The results can also be strengthened both through other studies and the way that this study has been conducted. These are the reasons to why I think that the results of this thesis have a high ability to both confirmation and strength.
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10 Appendix

10.1 Swedish interview template

Tidsram: 60-90 min

Inledning

- Namn
- Ålder
- Position
- Erfarenhet av lagervärdering?
- Erfarenhet av SAP?
- Organisation
  - Verksamhetstyp, affärssystem?
  - Redovisningsstandarder?
  - Komplexiteten i lager?
  - Lageromsättningshastighet?
  - Höga/låga lagervärden, projekt- eller anonymt lager?

Huvudfas

Lagervärdering

- Använder ni er av FIFO och eller Weighted Average?
  - Om båda för vilka typer av artiklar?
- Weighted Average är uppdelaad i antingen Perpetual/Periodic? (uppdateras priset för varje inköp eller endast på fasta datum)
  - Varför har ni valt denna modell?
  - Fördelar/nackdelar i er verksamhet med denna lagervärdering?
- Olika redovisningsprinciper för tillverkade artiklar och inköpta?
  - Verkliga värden eller förväntade värden?
  - Anonyma lager eller mer kund unika?
- Använder ni er av Moving Average som lagervärderingsmodell eller Standardkostnader?
  - Fördelar/nackdelar med vald metod?
- Hur valde ni lagervärderingsmodellen?
  - Har ni gjort en jämförelse med andra metoder?
  - Annat?
- Hur utvärderar ni er lagervärderingsmodell och hur kan ni i framtiden upptäcka ett eventuellt behov av att byta modell?

- Vad baserar ni erat lagervärde på?
  - Nettoförsäljningsvärdet
  - Kostnader

- Beskriv hur ni arbetar med lagerhantering?

- När fastställs lagervärdet?
  - Beställning
  - Godsmottag
  - Faktura

- Hur hanterar ni pris- och kvantitetsdifferenser i systemet?

- Rutiner och reskontrahantering av leverantörsfakturor?

- Generellt sett är du nöjd med erat lagervärderingssystem?

**Valutakurser**

- Gör ni inköp i olika valutor?

- Hur hanteras valutakursdifferenser?
  - Godsmottagning/faktura?
  - Annat?

- När sker omräkningen från utländsk valuta till lokal valuta?
  - Hur ofta och hur görs detta?

- Har ni en kontrollpolicy kring valutadifferenser för leverantörsfakturor?

- När och hur ofta uppdateras valutakurserna i era affärssystem?
  - Hur beräknas dessa?

- Påverkas artiklarnas värde av valutakurssuppdateringar i systemet under lagerhållning?

- Eventuella skillnader i rutiner och reskontrahantering av leverantörsfakturor i utländsk valuta?

- Generellt sett är du nöjd med hur valutakurser behandlas i erat system?
Hedging

- Vilken är er rapporteringsvaluta (koncernens valuta) och lokala valuta?
  - Varför har ni valt dessa?
- Hur ser transaktionsflödet ut i utländsk valuta i er organisation?
  - Inköp
  - Försäljning
- Hur betydelsefullt är detta transaktionsflöde för det totala flödet?
- Teorin beskriver tre olika typer av valutakursrisker; transaktions-, omräknings- och kassaflödesrisk. Är ni utsatta för någon eller några av dessa?
  - På vilket sätt?
  - Hur hanterar ni dessa risker?
- Använder ni valutasäkringar?
- Hur sköter ni hanteringen av möjliga effekter av valutakursdifferenser?
  - Finns det någon policy kring detta?
  - Använder ni några speciella instrument?
- Vilken betydelse har dessa faktorer vid val av valutakurser:
  - Leverantör
  - Område
  - Regleringar
- Valutasäkrar ni hela företaget eller endast projekt?
  - Nettokassaflödet eller inköp kontra försäljning?
  - Snittflöden
  - Projektflöden
- Hur hanteras förändrade valutakursrisker under ett projekt vid valutasäkringar på företags- istället för projektnivå?
- Generellt sett är du nöjd med hur eran valutasäkring ser ut?
10.2 English interview template

Timeframe: 60-90 minutes

Introduction

- Name
- Age
- Position
- Experience of inventory valuation?
- Experience of SAP?
- Organization
  - Business type, business systems?
  - Complexity of stock?
  - Accounting standards?
  - Inventory turnover?
  - High/low stock values, project- or anonymous inventory?

Main phase

Inventory valuation

- Are you using FIFO and or Weighted Average?
  - If both for what type of goods?
- Weighted Average is either calculated on a Perpetual or a Periodic basis? (depending on the prices are defined for every purchase or at fixed dates)
  - Why did you choose the method you use?
  - Pros and cons in your business with this inventory cost formula?
- Different valuation methods for purchased and manufactured articles?
  - Real values or expected values?
  - Anonymous or client specific?
- Which method are you using, Moving Average or Standard Costs?
  - Pros and cons with the method you use?
- How did you choose?
  - By a comparison between the methods?
  - Other?
- How do you asses your method and how will you know in the future if you should change method?
- What is the basis for the calculation of inventory value?
  - Net realizable value
  - Costs
- Describe how you are working with your inventory?
- What sets the final value of goods in inventory?
  - Purchase order
  - Goods receipt
  - Invoice receipt
- How are the systems handling price- and quantity differences?
- Routines and administration of invoices?
- Are you generally satisfied with your inventory valuation?

**Exchange rates**
- Do you make purchases in different currencies?
- How is currency fluctuations handled in the system?
  - Goods receipt/invoice receipt?
  - Other?
- When does the system translate foreign currencies into local currency?
  - How, and how often?
- Do you have a control policy regarding exchange rate differences for invoices?
- When and how often are the exchange rates updated in your business system?
  - How are the updates calculated?
- Are the articles value affected by the exchange rates updates during storage?
- Any differences in routines and administration of supplier invoices in foreign currencies?
- Are you generally satisfied with how exchange rates are handled in the system?
Hedging

- What is your functional and local currency?
  - Why have you chosen these?
- How does your organizations transaction flow of foreign currencies look?
  - Purchase
  - Sales
- How important is this transaction flow compared to the company’s total flow?
- Theory describes three different types of exchange rate risks; transaction-, translation- and operating exposure. Are you exposed to one or more of these?
  - In which way?
  - How do you handle them?
- Do you apply hedging?
- How are you dealing with possible exchange rate differences?
  - Do you have some kind of policy?
  - Are you using one specific financial instrument or many?
- How important are these factors in choice of exchange rates:
  - Supplier
  - Area
  - Regulations
- Are you hedging the company as a whole or every individual project?
  - Net cash flow or purchases/sales?
  - Average flows
  - Project flows
- How can a change in exchange rate risk exposure be implemented to an ongoing project if you are hedging on a company basis?
- Are you generally satisfied with your hedging?