

# CASH MANAGEMENT

## FROM A PURCHASING PERSPECTIVE

- A study of the possibilities for Siemens PGI4 to utilize  
Cash Management in purchasing -

Louise Nilsson & Jacob Persson



**Linköping University**  
**INSTITUTE OF TECHNOLOGY**

Master Thesis LIU-IEI-TEK-A--07/0034 – SE

Linköping University  
Department of Management and Engineering  
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Tutors:

Linköping University: Björn Oskarsson

Siemens Industrial Turbomachinery: Kristofer Forsmar

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## PREFACE

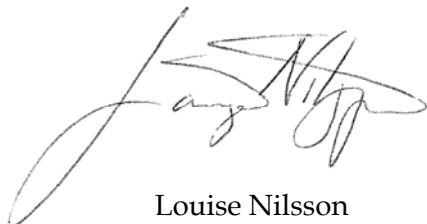
We are grateful that we have had the opportunity to write our master thesis at SIT in Finspong, and at same time been given the privilege to experience a large multi national company from within. All the help and support we have been given during the time of work have contributed to the result of this thesis. Therefore we would like to take this opportunity to send our gratitude to the people who have helped us.

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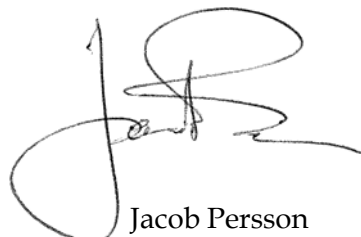
A special thank directed to our tutor at Linköping University, Björn Oskarsson, who have been a great help during the whole time of work. Also we would like to thank our opponents for their inputs and times of discussion.

Last but not least we would like to express our gratitude to the three companies participated in the field study. Thank you for your helpfulness and polite reception. Thank you also Karin Sancho at Ernest & Young for your valuable inputs.

Finspong 15 January



Louise Nilsson



Jacob Persson



## SAMMANFATTNING

Detta arbete är skrivet för inköpsavdelningen på enheten PGI4, representerat på Siemens Industrial Turbomachinery i Finspång (SIT), med målet att reducera kostnader genom ett förbättrat arbete med Cash Management. Då inköpt material utgör en så pass stor del av värdet på slutprodukten, nära 60 procent, inses genast vilket stort inflytande inköpsfunktionen har på företagets totala kostnader. Även om Cash Management ägnas störst fokus hos företag med likviditetsproblem, finns det mycket att vinna genom att arbeta aktivt med konceptet också i goda tider.

Därmed är syftet med arbetet att; *"analysera möjligheterna för inköpsavdelningen på Siemens PGI4 att utnyttja Cash Management för att reducera de totala kostnaderna"*.

Längs arbetets gång har en totalkostnadsmodell tagits fram för att tydliggöra kostnaderna relaterade till inköp, och därefter har områden specifikt intressanta ur ett Cash Management-perspektiv identifierats. Utgående från dessa områden har undersökts hur dagens verksamhet ser ut på SIT samt hur andra företag hanterar liknande aktiviteter. På så vis har lösningarna tagits fram angående vad inköp på SIT bör arbeta annorlunda med, samt hur de kan nå förbättringar. De rekommendationer som arbetet resulterat i presenteras nedan:

Inköpsvillkor	Förbättra och förenkla standardkontrakt
	Öka avtalstäckningen mot leverantörer
	Utnyttja kassarabatt
	Tydliggör värdet av kredittid
Prognostisering	Reducera risker kopplade till prognostisering
	Förbättra informationen angående VSA
Transport	Tydliggör användandet av Incoterms
	Använd de Incoterms som är mest lönsamma
Orderprocess, leveransbevakning och fakturering	Definiera och använd konceptet "komplett leverans"
	Betala aldrig för tidigt
	Eliminera räntefakturor
Lagerstyrning	Använd lagerränta för att beräkna de riktiga kostnaderna
	Involvera inköp mer i lagerstyrningen

Genom tydligare riktlinjer för standardkontrakt, ekonomistyrning och villkor för transporter och prognostisering kan arbetssätt inom inköp förbättras. Ett utnyttjande av kassarabatter kan ge kostnadsbesparingar motsvarande 1% av köpesumman. Rekommendationer kopplade till orderprocessen och fakturering syftar till att undvika de årliga kostnaderna på 2,4 miljoner SEK och 300 000 SEK för tidiga leveranser respektive räntefakturor. Ett utnyttjande av inköparnas kompetens inom lagerstyrning, kan resultera i sänkningar av lagernivåer genom att styra lager per leverantör.





## ABSTRACT

This thesis is written at the purchasing department at the subdivision PGI4, a part of Siemens Industrial Turbomachinery in Finspong (SIT), with the objective to reduce costs through an improved Cash Management. Since purchased material constitute a great part of the final product value, around 60 percent, one can easily understand the purchasing departments' possibilities to influence the firms' Total Cost. Even though Cash Management is given the greatest focus within companies with liquidity problems, there is a lot to gain even in times of prosperity.

In those means the purpose of the thesis is to; *“analyse the possibilities for purchasing at Siemens PGI4 to utilize Cash Management to reduce the Total Cost”*.

To clarify the costs related to Purchasing a Model of Total Cost is compiled. Specific areas, important from a Cash Management point of view, are identified and furthermore mapped at SIT. Moreover it is also examined how other companies manage these areas in practice. From this approach solutions are developed to suggest how Purchasing at PGI4 could utilize Cash Management, and also how improvements can be met. The recommendations that the thesis resulted in are presented below:

Terms of Purchasing	Improve and simplify frame agreements
	Increase agreement coverage
	Utilize Cash discounts
	Clarify the worth of credit time
Forecasting	Reduce the risk associated to future cash flow
	Improve information regarding VSA
Transportation	Clarify the use of Incoterms
	Practice the most profitable Incoterm
Order processing, Expediting and Invoicing	Define and practice the concept of complete delivery
	Never pay too early
	Eliminate interest-invoices
Inventory Management	Use the inventory cost rate to calculate real costs
	Increase purchasing involvement in inventory management

Through clear guidelines for frame agreements and controlling as well as comprehensible conditions for transports and forecasting, the work within Purchasing can be improved. Cost reductions corresponding to 1% of the purchased amount can be achieved by utilizing Cash Discounts. Recommendations regarding order processing and invoicing aims to avoid the annual costs of 2,4 million SEK and 300 000 SEK caused by early payments respectively interest invoices. By making use of the purchasers' competence within inventory management, inventory levels can be reduced through managing the inventory per supplier.



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### Appendix 3: Questionnaire – Field study

### Appendix 4: Interview sources

# 1 INTRODUCTION

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*This chapter introduces the reader to the background and presents the purpose of the thesis. Further the purpose is discussed and broken down into two main questions.*

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## 1.1 Background

Purchasing is a very important link in the supply chain as a whole, directly or indirectly controlling the inflow of goods and the outflow of cash to and from the company. According to Christopher (2005) Supply Chain Management is the management of relationships with objective to deliver superior customer value at less cost to the supply chain as a whole. The supply base is, as stated by Monczka et al (2005), a very important part of the supply chain as approximately 60 percent of the value for goods sold is comprised from external obtained material. Consequently purchasing, by specifying purchased goods and selecting suitable suppliers, has a major impact on the quality of the final product and also on the firms Total Cost.

Over the last couple of years, purchasing at Siemens subdivision PGI4 in Finspong, a part of Siemens Industrial Turbomachinery (SIT), has experienced an increased volume of sales. This has resulted in augmented material- and cash-flows as well as steady growing inventories, causing greater workload for SIT and likewise for their suppliers. While focusing on keeping up with the higher pace, the Cash Management has been given a low priority at PGI4. However, since the increasing sales and purchase volume is causing augmented cash flows, the significance of Cash Management is even greater. Therefore PGI4 wishes to elucidate how Cash Management can be involved in the purchasing activities, particularly strategic purchasing, and also make the influences on Total Costs clear. Striving to attain competitive advantage, management at PGI4 wants to achieve a greater value and reduce Total Costs by a more efficient purchasing.

## 1.2 Purpose

The purpose of the thesis is to analyse the possibilities for Purchasing at Siemens PGI4 to utilize Cash Management to reduce the Total Cost.

### *1.3 Directive*

- The study focuses on core engine strategic purchasing, FPT, at PGI4 in Finspong. Therefore, when nothing else is mentioned, Purchasing department refers to FPT, and PGI4 refers to PGI4 in Finspong.

### *1.4 Delimitations*

- This thesis is written at the purchasing department and therefore only Cash Management concerning the outflow of funds are taken under consideration.
- Even though the concept of Total Costs is used, this thesis focuses on the costs that can be influenced by Cash Management.

### *1.5 Decomposition of the purpose*

Costs related to and affected by purchasing are to be considered in this thesis. Therefore it needs to be clarified how the purchasing activities influence Total Cost. Costs related to purchasing are identified and presented in an adapted Model of Total Cost. Subsequently it should be illuminated how Cash Management can be utilized to reduce the identified costs.

Following main questions are to be answered in order to fulfil the purpose:

- *How is Total Cost affected by Cash Management from a Purchasing perspective?*
- *How can Purchasing at PGI4 utilize Cash Management?*

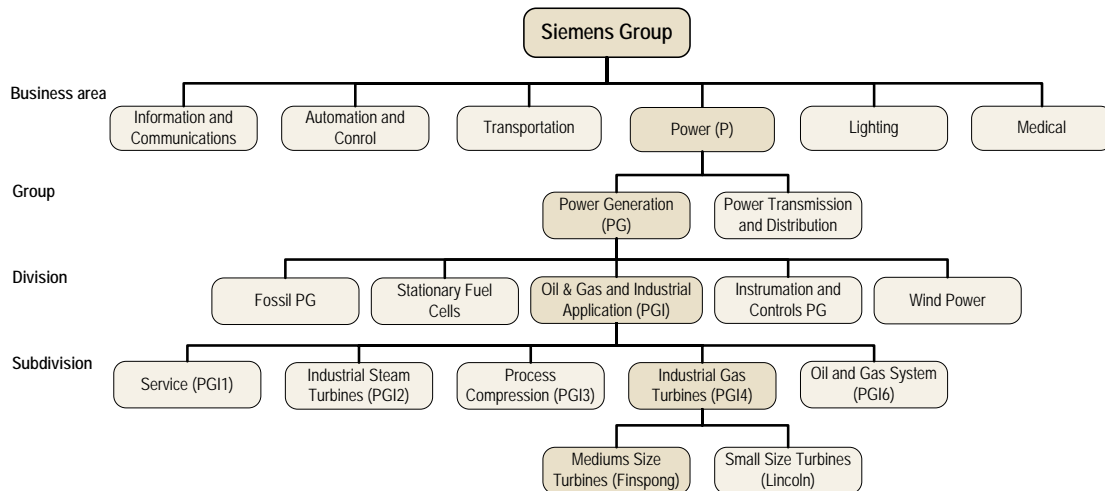
## 2 PRESENT SITUATION

*This chapter introduces the reader to the Siemens Group. Due to the subject of this thesis the subdivision PGI4 will be in focus and in particular one of its local purchasing departments, FPT, in Finspong.*

### 2.1 Siemens Group

The company Siemens was founded in Berlin in 1847 and is today one of the world's largest companies in electrical engineering and electronics. In fiscal year 2005 Siemens sales from continuing operations reached €75,4 billion and the net income landed at €2,248 billion. Around the world, in 190 countries, Siemens employs over 460 000 people working with everything from development to manufacturing as well as installing and service of complex system, tailored to fit the customers demand.

Siemens acts in six different business areas: Information and Communication, Automation and Control, Transportation, Power, Lighting and Medical.



**Figure 2-1: Siemens Group - Organisation**

### 2.2 PGI4

The business area Power (P) is broken down into groups, where one of them is Power Generation (PG). PG is one of the worlds leading specialist in wind power and in the oil and gas sector. They develop and produce turbines, compressors, complete solutions for industrial plants as well as service. PG is divided into different divisions where this thesis concerns Power Generation – Oil & Gas and Industrial application (PGI). Furthermore PGI is divided into five subdivisions where PGI4 is one of them. PGI4 is mainly represented in Lincoln and Finspong but also have units in St. Petersburg and Houston. This study will focus on PGI4 in Finspong, where

medium Gas Turbines in the range of 17 to 47 MW are being produced. PGI4's relation to the Siemens Group is more easily comprehensible as shown in Figure 2-1.

### 2.2.1 PGI4 in Finspong

The Finspong site, most commonly known as Siemens Industrial Turbomachinery (SIT), has been a part of PGI since its acquisition in 2003. Apart from PGI4, subdivisions PGI1, PGI2 and PGI6 are represented at SIT. However, PGI4 has the major part of the employees in Finspong.

#### *Products*

In the product portfolio of PGI4 in Finspong there are four different Gas Turbines; SGT-500, SGT- 600, SGT-700 and SGT-800. The turbines are for example used in power plants to produce electric power and heat or as mechanical force, driving a compressor or pump in the gas and oil industry. SGT-500 which is the smallest gas turbine (17MW) was developed in Finspong in 1954 and has been produced at SIT ever since.

As mentioned in chapter 1.1, SIT has experienced increased volumes of sales. Production capacity is forecasted to increase from 42 turbines in fiscal year 2004/2005 to 83 turbines in fiscal year 2007/2008.

#### *The Market*

The gas turbine market is characterised by recurrent fluctuations. These are affected by various factors, for example the world markets oil-price and the political situation/instability in some countries. The customers are spread all over the world, but during the last five years significant volumes has been sold to Iran for use within the oil industry.

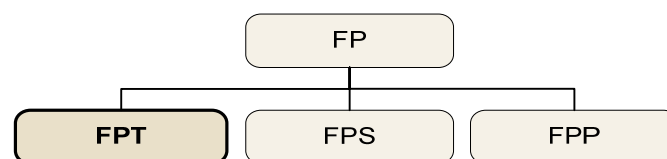


Figure 2-2: PGI4 Purchasing in Finspong

#### *Purchasing*

PGI4 Purchasing has recently undergone a reorganisation, which has left the function with a new structure. Figure 2-2 illustrates the strategic purchasing organisation. It is divided into Core engine (FPT), Packaging (FPP) and Supplier Base Development (FPS). FPT is responsible for purchasing material to the core product and FPP focuses on buying peripheral equipment. FPS is a recently formed group that aims to



develop and improve the supplier base. This thesis is written on behalf of FPT and the directive is given that this department is to be in focus. Although the objective is that the result of this thesis can be utilized at all purchasing departments within PGI4.

### ***2.3 The studied system – FPT***

According to Bruzelius & Skärvad (2000) a description of the studied system is needed. In that way it is easier to comprehend which parameters that have an impact on the system. In this thesis the first main question to be answered is; how the Total Cost is affected by Cash Management from a Purchasing perspective. Therefore this chapter only gives a general description without making any further exclusions or delimitations. As the first main question is answered later in this thesis, the studied system is narrowed. A general description of FPT and its environment follows.

#### **2.3.1 System Tasks and Objectives**

FPT's tasks are to acquire, maintain and develop a supplier base, enabling a competitive core-engine production. The objectives of FPT are to achieve so called World Class purchasing. The main task is to compose and sign supply agreements with suitable suppliers, to secure that the production's demand is met. A selection of other tasks is here mentioned:

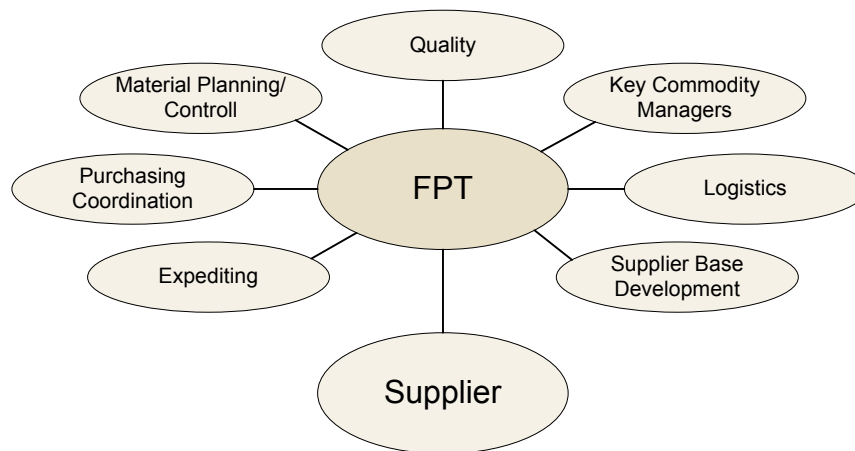
- Forming supplier strategies
- Creating commodity strategy and implementation
- Sourcing
- Evaluating suppliers
- Reducing costs
- Reducing supplier base

#### **2.3.2 The System Environment**

The system's environment consists of the functions surrounding it. The system can not directly influence the environment, but they both have an impact on each other.

FPT purchases from a big variety of suppliers partly from global sources and partly from local sources. Hence the variety of goods is even greater, stretching from standardised low-value to customer tailored high-value products. The lead times for some products stretch up to a year. FPT's role on the different markets can also vary, from being one of the biggest actors to having a marginal influence.

Figure 2-3 describes the different functions constituting FPT's environment. In FPT's work to coordinate the interface to their suppliers, they form cross-functional teams.



**Figure 2-3: Environment of FPT**

To sum up, the work performed by FPT is often far from standardised and the handling of every supplier needs its own measures. According to a study performed by Boston Consulting Group (BCG), goods for 1,7 billion SEK purchased by FPT on a yearly basis, and together with FPP it is almost three billion SEK. For the whole site in Finspong, SIT, the purchased value represents approximately 60 percent of the yearly turnover.

### 3 METHODOLOGY

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*This chapter aims to specify the approach and the method of the thesis. The questions of the thesis are clarified and also it is described how these are to be answered.*

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#### **3.1 Approach to the problem**

As mentioned in chapter 1, the purpose of this thesis is “...to analyse the possibilities for purchasing at Siemens PGI4 to utilize Cash Management to reduce the Total Cost”. To clarify the aim with the study, the purpose is divided into two main questions. Here these main questions are broken down into sub questions.

The first main question of this thesis is:

- *How is Total Cost affected by Cash Management from a Purchasing perspective?*

In literature, purchasing is often neglected when Cash Management is discussed, or at most only briefly mentioned. Therefore there is not enough information to make a credible connection between these two subjects directly. As this thesis aims to give a holistic view, it is first clarified how purchasing can be explained in terms of Total Cost. With that as a starting point, purchasing parameters affected by Cash Management are pointed out. As a last step to answer the first main question, the results of the sub questions are adjusted to Purchasing at PGI4. To sum up this leads to following sub questions:

- *According to literature, which parameters of Total Cost are related to purchasing?*
- *Which purchasing parameters of Total Cost are affected by Cash Management?*
- *Which of the identified parameters are relevant to Purchasing at PGI4?*

The second main question of this thesis is:

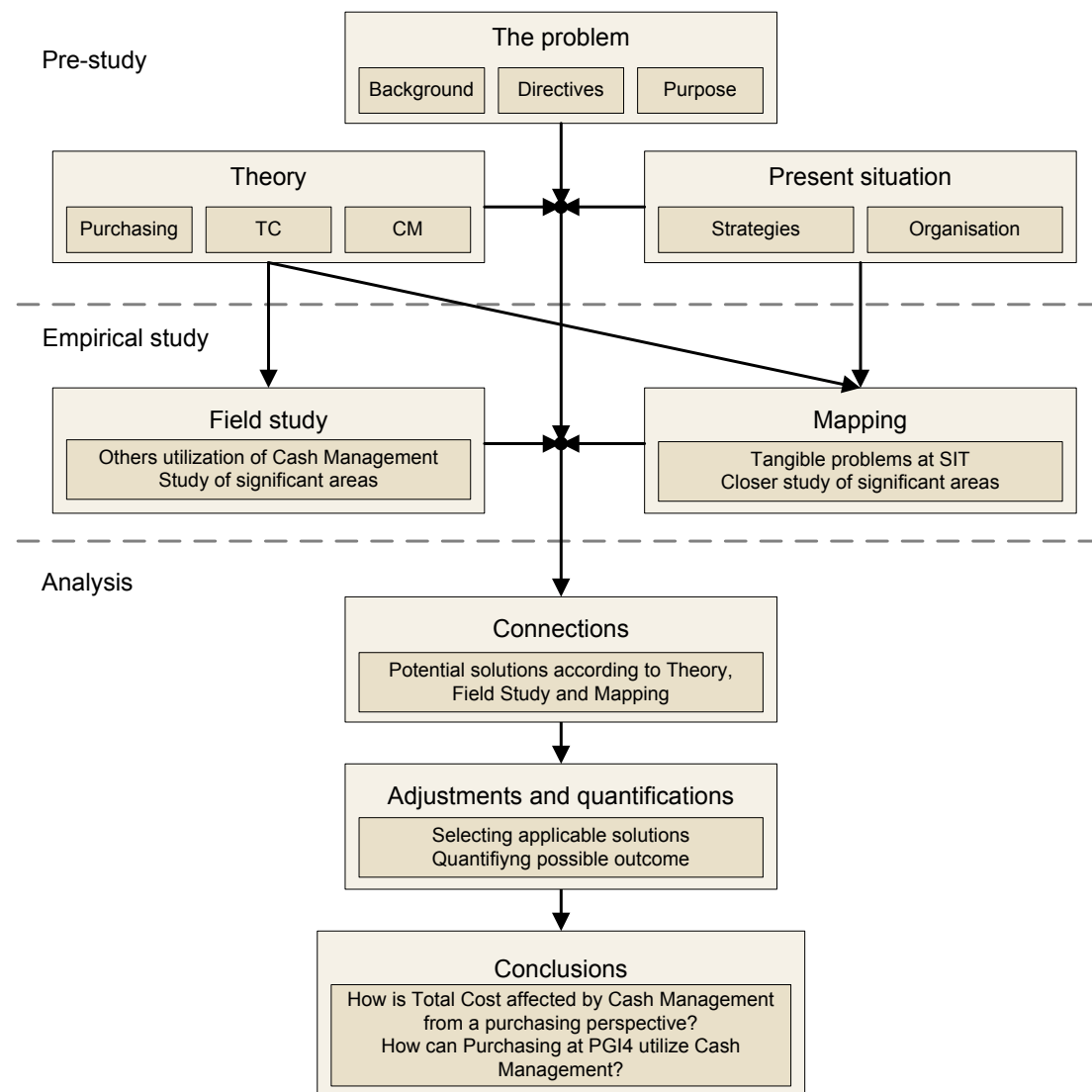
- *How can Purchasing at PGI4 utilize Cash Management?*

To answer the second main question, information is gathered from literature and from internal and external sources. With compiled information about identified parameters, it is analysed how Purchasing at PGI4 can utilize this information to improve their performance. To sum up this leads to the following sub questions:

- *How is Purchasing at PGI4 managing the parameters identified as the connections between purchasing and Cash Management?*
- *How are other companies managing these parameters?*
- *How can Purchasing at PGI4 meet improvements by utilizing Cash Management?*

### 3.2 Line of action

Here the method of the research is outlined. Figure 3-1 visualises the way of working to reach the goal. As indicated in the figure, the thesis is divided into three phases. Further descriptions of what are included in each phase follows in this chapter.



**Figure 3-1: Line of action**

### 3.2.1 Pre-study

The first stage of the study involves getting a picture of the problem and the present situation. It also includes setting up the purpose for this thesis and how to gather relevant literature. Both primary and secondary information is needed to fully understand the problem. Presentations, performed by the initiator to this thesis, to introduce the background to the work as well as interviews are primary information collected to understand the situation. Secondary information in form of internal presentation material and documents are used in the same purpose. As a conclusion of the Pre-study, relevant areas of further studies are pointed out. These further studies are then undertaken in the Empirical study.

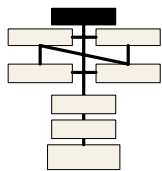
The Pre-study aims to answer the following sub questions of the thesis:

**How is Total Cost affected by Cash Management from a purchasing perspective?**

- ▶ - According to literature, which parameters of Total Cost are related to purchasing?
- ▶ - Which purchasing parameters of Total Cost are affected by Cash Management?
- ▶ - Which of the identified parameters are relevant to Purchasing at PGI4?

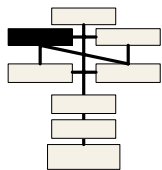
**How can Purchasing at PGI4 utilize Cash Management?**

- How is Purchasing at PGI4 managing the parameters identified as the connections between purchasing and Cash Management?
- How are other companies managing these parameters?
- How can Purchasing at PGI4 meet improvements by utilizing Cash Management?



#### *The problem*

In order to explain the background of the thesis it is at first important to have a fully understandable picture of the problem. This thesis is stated by Purchasing at PGI4, so in order to set the purpose of the work the supervisors of the project are consulted. Therefore interviews with the purchasing manager, who also is the initiator to this thesis, as well as with other parties concerned, are undertaken. These interviews form the directive and also assure that the purpose of the thesis is proper and reachable.



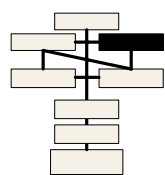
#### *Theory*

Since this thesis is written at a purchasing department, it is necessary to have fundamental theory concerning Purchasing and Supply. Theories regarding Total Cost and the basics of Cash Management also need to be included. Even though this work only focuses costs affected by Purchasing and Cash Management related to outflow of funds, it is necessary to keep a holistic view in mind.

The sub questions belonging to the first main question of the thesis are answered through developing an adjusted Model of Total Cost. This adjusted Model declares the areas of Total Cost affected by purchasing and also elucidates the interface between Cash Management, purchasing and Total Cost. The adapted Model, presented in chapter 5, is developed in following steps according to the theories of Aronsson et al (2004):

- **Step 1:** Based on theories regarding Total Cost and Total Cost of Ownership, it is clarified which costs that are created and affected by Purchasing.
- **Step 2:** Creating an initial Model of Total Cost that includes all possible costs affected by purchasing.
- **Step 3:** Classifying costs in order to find the most significant ones. The focus is to investigate how Cash Management can affect Purchasing, and according to the delimitations of the thesis, the revised model involves only those costs that are possible to influence with Cash Management.
- **Step 4:** Finally the remaining parameters relevant to strategic purchasing are illuminated. Because this thesis is written at the strategic purchasing department at PGI4, a model adjusted to their work is required.

The theories are gathered from previously acquired knowledge and prescribed books from courses, relevant to the study, at Linköping University. Furthermore data is collected from the library at Linköping University and from Economic Databases. In Appendix 1 the search of literature used in the thesis is summarised.



### *Present situation*

The present situation is described to create an understanding for the problem and the following steps of the thesis. With support from company presentations, internal documents, interviews with the staff and observations, it is possible to get an adequate picture of the routines, the organisational structure and the work performed by purchasers at PGI4. With this information the adapted Model of Total Cost is further evaluated when identifying parameters relevant to Purchasing at PGI4. The studied system, its elements and the influence of its surroundings are described in chapter 1.

### 3.2.2 Empirical study

The objective in this phase is to collect empirical data, which together with the literature studies form the basis of the analysis. During the field study as well as the mapping of Purchasing at PGI4 the information is mainly gathered from semi-structured interviews. This type of interviews imply, according to Björklund & Paulsson (2003), that only the subject fields are determined beforehand. Thereafter the questions can be asked in a convenient order depending on how the discussion develops. The advantage of this type of interview is that the questions can be suited to the situation. Furthermore it is possible to formulate the questions according to how the respondent reacts or answers to previous questions. The use of semi-structured interviews is motivated by the fact that there is no general recognised connection between Cash Management and Purchasing. Hence structured interviews might overlook different angles and perspectives on this issue, but still some structure is needed to keep the interviews on track.

Respondent errors can, according to Lekvall & Wahlbin (2001), occur due to that the respondent is not able to answer the question or due to that the person simply does not want to. Moreover Lekvall & Wahlbin (2001) define an instrumental error source. This is created from shortcoming questions. In this thesis instrumental errors are avoided by preparing the interviews well and by informing the respondents of the objective with the interview.

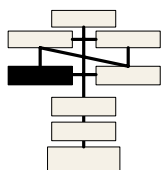
The following sub questions are answered in this phase:

**How is Total Cost affected by Cash Management from a purchasing perspective?**

- According to literature, which parameters of Total Cost are related to purchasing?
- Which purchasing parameters of Total Cost are affected by Cash Management?
- Which of the identified parameters are relevant to Purchasing at PGI4?

**How can Purchasing at PGI4 utilize Cash Management?**

- ▶ - How is Purchasing at PGI4 managing the parameters identified as the connections between purchasing and Cash Management?
- ▶ - How are other companies managing these parameters?
- How can Purchasing at PGI4 meet improvements by utilizing Cash Management?



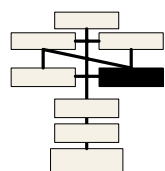
#### *Field study*

The field study is based on information gathered from selected companies. The judgement is made that at least two companies are needed to create a sufficient picture to compare with the actual practice at SIT. To make reasonable conclusions it would be preferable to study several


different companies, but the number of studied companies is due to lack of time limited.

When selecting suitable companies for comparison, Bailey et al (1998) mention following procedures to find best practice; ask supplier whom they regard as a good trading partner, find companies regarded as successful by measures of market share and profitability and also ask professionals within the subject for leads. For this study, companies are chosen both according to the sponsors request and by searching for other suitable companies. With suitable is meant that the company should be an established actor on the market that is being a part of an international logistic network. Due to the proposed respondents lack of time and perhaps a limited interest as well, the selection of companies are depending on their willingness to participate.

The selection of persons that are interviewed and what questions they are asked are based on the areas that are relevant to this study according to the adapted Model of Total Cost. Essentially it is of interest to interview persons that are responsible for or have an extended knowledge about the company's purchasing department. Consequently, mainly purchasing managers are interviewed. As a result of this, the information gathered in the field study might represent the goals and objectives of the studied companies, rather than the actual situation. But since this error is not in SIT's favour, it will most probably only help to elucidate their weaknesses.



### Mapping

 This part aims to result in a more detailed mapping of the relevant areas at SIT. In similarity with the field study, the mapping is performed based on the areas found to be relevant according to the adapted Model of Total Cost. Due to more time-resources and the fact that Purchasing at PGI4 is the main object for this study, the mapping at SIT implies a more thorough study of these areas.

Mainly the information is gathered through interviews with personnel concerned. These persons are contacted and interviewed according to their connection to the different areas that are being mapped. Moreover internal documents and data collected from Siemens ERP-system, SAP R/3 is used.



### 3.2.3 Analysis

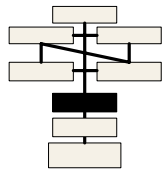
Information gathered in the pre-study and the empirical study is in this section interconnected. Thereafter it is in this phase possible to analyse the information and suggest solutions as well as recommendations suitable for Purchasing at PGI4.

In the analysis complementary data are collected from the SAP R/3 system at SIT. This is done with the objective to perform different calculations in order to come up with different examples to illustrate factual problems at SIT. In that way it is in several cases possible to esteem the outcome of different recommendations. As performing a data collection like this one must be aware of different sources of error that may occur. One aspect is the technique of measurement used, in this case collection from data in SAP R/3. It is assumed that the information in the system is correct and therefore the causes of error are limited to the analyses and the interpretation of data. To avoid these types of error sources employees at SIT have been asked for assistance as soon as any doubts have occurred.

Due to limited time resources, it is sometime necessary to generalise results from measurements taken under a shorter period. To be able to draw conclusions from this kind of measurements one must assure that the period of investigation is representative. In this thesis the data is mainly used to exemplify and point out possible cost savings, therefore it is assumed that one month can give a representative picture for the whole year. Moreover, a continuous dialog with involved personnel at SIT is undertaken to assure that the right data is examined.

The objective is to come up with recommendations as the following questions of the thesis are answered:

- |   |
|---|
| ▶ <b>How is Total Cost affected by Cash Management from a purchasing perspective?</b>                                     |
| - According to literature, which parameters of Total Cost are related to purchasing?                                      |
| - Which purchasing parameters of Total Cost are affected by Cash Management?  |
| - Which of the identified parameters are relevant to Purchasing at PGI4?  |
| ▶ <b>How can Purchasing at PGI4 utilize Cash Management?</b>  |
| - How is Purchasing at PGI4 managing the parameters identified as the connections between purchasing and Cash Management? |
| - How are other companies managing these parameters?  |
| ▶ <b>- How can Purchasing at PGI4 meet improvements by utilizing Cash Management?</b>                                     |

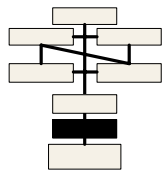


### *Connections*

It is now stated what the theory says about how to work with Cash Management and Total Cost at the Purchasing department.

Furthermore it is described how Purchasing at PGI4 as well as other companies do this in practice. By compiling these inputs possible solutions of how to utilize Cash Management to positively influence purchasing, are developed. It is sorted out in which areas Purchasing at PGI4 are successful, in comparison to theory and others practice. Moreover it is investigated in which areas they can reach advantage through improvements.

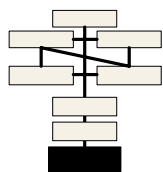
Appropriate suggestions and recommendations are constructed based on the adapted Model of Total Cost



### *Adjustments and quantifications*

An adjustment of the possible solutions is made to guarantee that the suggestions really can be implemented at PGI4. The recommendations must be applicable at the purchasing department, regarding their routines, strategies and organisation. Otherwise a further explanation is needed to state which changes that are necessary.

Furthermore it is preferable to esteem the expected outcomes of different recommendations. In those cases the recommendations are possible to quantify this is approximated through a calculation of cost savings.



### *Conclusions*

In this part the selected recommendations, suited for Purchasing at PGI4, are presented. Moreover it is described how Cash Management can be utilized at PGI4. The objectives of different recommendations are explained and furthermore the effects that they may bring to Purchasing at PGI4 are made clear. Finally the purpose of the thesis is fulfilled by answering the questions:

- *How is Total Cost affected by Cash Management from a Purchasing perspective?*
- *How can Purchasing at PGI4 utilize Cash Management?*

### 3.2.4 Validity, Reliability and Objectivity

Three significant measures in a critical examination of the study are validity, reliability and objectivity. This is relevant to make sure that the results from the study are credible.

- **Validity** should illuminate if the chosen method really measures what should be measured. By looking at the problem from different perspectives, in this case from PGI4's point of view, according to other companies and according to literature, the validity is increased. During the empirical phase high validity is achieved by interviewing personnel at different positions. In compliance with Lekwall & Wahlbin (2001), subjective questions are avoided.
- **Reliability** measures the capability of chosen method to achieve the same result from several measurements, Björklund & Paulsson (2003). To attain high reliability in the gathering of information complementary questions are asked during the interviews in order to avoid misunderstandings. Furthermore the information is checked with different sources.
- **Objectivity** is in accordance with Björklund & Paulsson (2003) increased by clarifying assumptions and motivating choices through out the study.



## 4 THEORETICAL FRAME OF REFERENCES

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*The theoretical framework, that forms the basis of this thesis, is gathered in this chapter. It aims to elucidate the concepts of Purchasing, Total Cost, Cash Management and to support analyses and conclusions throughout the thesis.*

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### 4.1 Relevant theories

The objective of this thesis is to investigate how Purchasing can utilize Cash Management to attain cost reductions. Therefore it is described in which way Purchasing can affect Total Cost and also to what extension this positively can be influenced by efficient Cash Management.

Since the purchased goods often compose a major part of the final product value, the supply base has a large impact on the firms Total Cost, according to van Weele (2005). Hence purchasing is a very important function, responsible for the supply of goods, managing supplier relationships and also striving to achieve competitive advantage for the firm by seeking cost reductions. Björnland et al (2003) mention the mapping of the “actual price” as a main responsibility for the Purchasing function. With the “actual price” it is meant that the price of a product differs from its costs. The authors suggest that all costs related to a product must be taken under consideration, such as transport, lead time and inventory. It is therefore, in this context, highly motivated to discuss concepts of Total Cost.

As the first main question of this thesis aims to elucidate the connections between purchasing and Cash Management, it is evident that also a description of the later is needed. According to Hedman (1991) purchasing is often given an insignificant role in Cash Management. Therefore the Cash Management connection to purchasing needs to be elucidated in order to fulfil the objective of this thesis.

### 4.2 Purchasing

The role of purchasing is, in compliance with Baily et al (1998), to secure the supply of material and services in a way that can contribute to the efficiency of the organisation. Among other activities purchasing include buying and managing inventory, maintaining supplier relationships and developing good routines and procedures.

According to Van Weele (2005), the definition of purchasing is, *“the management of the company’s external resources in such a way that the supply of all goods, services, capabilities and knowledge, which are necessary for running, maintaining and managing the company’s primary and support activities, is secured at the most favourable conditions.”*

#### 4.2.1 Development

Globalisation of trade, the development of informational technology and the ever changing customer demands are according to van Weele (2005) some of the causes to the increasing impact of supply chain management and effective purchasing. Today the business faces a constant changing world where the competitive rules vary extremely fast. Therefore the role of purchasing has nowadays developed from an independent function to an integrated and strategically very important activity in successful companies.

During the last decade the question of core and non-core competence has been given increasing focus in many companies. To meet the requirements from their customers and to improve their competitiveness, companies need to concentrate on the things they do best. Non-core activities are outsourced to specialist suppliers and therefore along with the growing importance of supply chain management the significance of purchasing increases. (van Weele, 2005)

#### 4.2.2 The impact on overall business

An analysis of the cost structure shows according to van Weele (2005) that the largest part of the cost of goods sold is composed by purchased materials and services. The value of the purchased goods corresponds to approximately 50 percent of the cost of goods sold. Other authors, Killen & Kamauff (1995), esteem that the average manufacturing firm spends corresponding 60 percent of its sales, for purchasing material and equipment.

#### *Shareholder Value and Economic Value Added*

The Shareholder Value tells how much the company is worth to its owners, and that is, according to Christopher (2005), one of the most important measures of business performance. When defining Shareholder Value it is often referred to as the net present value of future cash flows.

Another concept that is closely linked to creating shareholder value is Economic Value Added (EVA). As described by Christopher (2005) EVA is calculated as the difference between profit after tax and the true cost of capital employed. Improvements in EVA lead to improvements of Shareholder Value, and likewise a

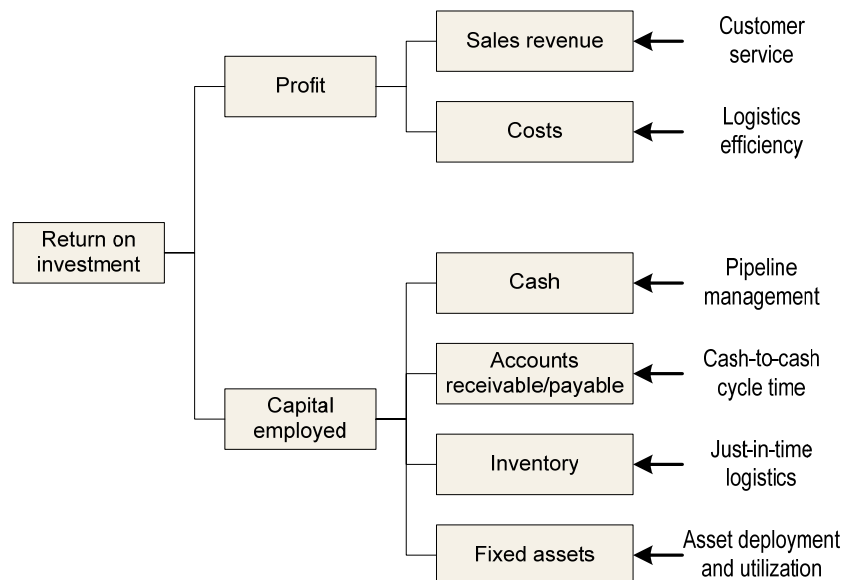
negative impact in EVA have a negative impact of the Shareholder Value. Many companies of today have realised how the logistic activities affect the EVA and hence the Shareholder Value. Efficient logistic performance can influence the EVA positively, by finding ways to shorten pipelines and reducing the working capital.

### *Return on Investment*

An investor's main interest is usually to get the best possible return on invested capital. Therefore it is a general goal for companies to improve the productivity of capital. Christopher (2005) continues to describe that a measure for this is the concept Return on Investment (ROI). It is the ratio between the net profit and the capital employed to produce that profit. There are two ways to improve ROI:

- Increase Margin
- Increase Capital Turnover

It can often be more effective to use the leverage of improved capital turnover, according to Christopher (2005), though the focus typically lies on improving the margins. For example, a high capital turnover can make a low-margin-company very profitable. Figure 4-1 describes how different elements of logistics are connected to ROI.



**Figure 4-1: Logistics impact on ROI (Christopher, 2005)**

### *Return on net worth*

Van Weele (2005) describes how savings in purchased materials leads to improvements on the company's return on net assets. The return on net assets is according to the author contributed in the same ways as the ROI:

- Reduction of the material costs which will result in a higher sales margin.
- Reduction of the net capital employed which will improve the capital turnover ratio.

The first of those points can be achieved through cooperating with new suppliers, using substitute materials or competitive tendering. Examples of what might affect the second are longer payment turns and reduction of inventories, either through supplier quality improvements or better supplier agreements to shorten the pipeline. (van Weele, 2005)

Stock & Lambert (2001) explain how purchasing influences the return on net worth. Higher sales might be achieved as a result from better quality which motivates an increased price or through improved order fill rates which leads to an increased volume. Another way to positively affect the net profit is to reduce the costs of goods sold as well as other expenses. By reducing fixed and current assets purchasing excellence also leads to an increase in asset turnover. Linked together increased asset turnover and greater net profit margin results in an upward pressure on return on assets. Combined with a possible debt repayment and reduction of financial leverage, this leads to a higher return on net worth.

#### 4.2.3 The purchasing process

Van Weele (2005) describes the main activities within purchasing through a model of the purchasing process. This model divides the purchasing function into following activities, as seen in Figure 4-2:

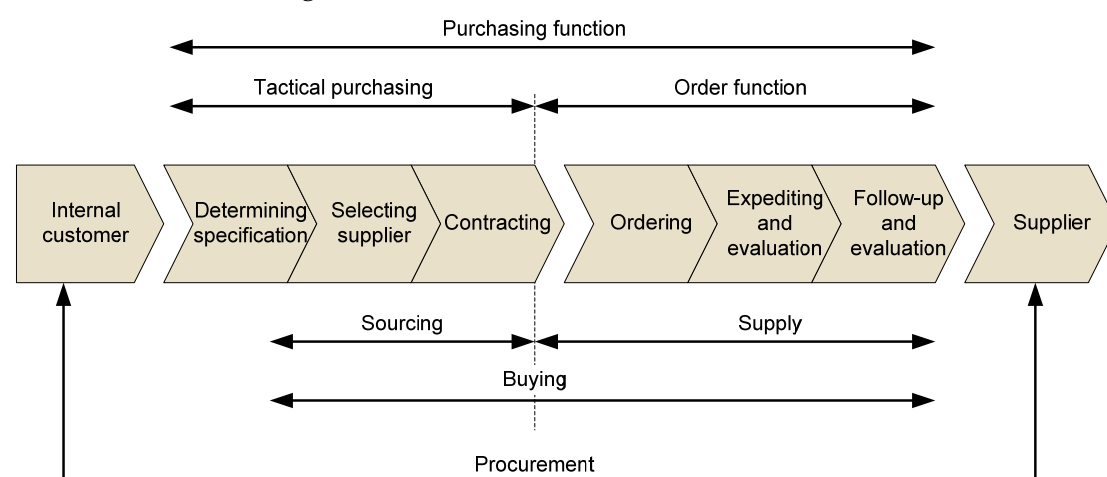


Figure 4-2: The purchasing process (van Weele, 2005)



- **Determining the specification.** A basic decision in the initial stage of the purchasing process concerns the make-or-buy question. The company has to determine which products and activities to be outsourced and which to be produced by the own company. Making this decision it is necessary to specify the items being purchased. Depending on the situation the specification could be either functional or detailed technical and is ought to contain technical specifications, logistics specifications, maintenance specification, legal and environmental requirements and a target budget.
- **Selecting supplier.** When the specifications have been clarified it is possible for the purchaser to explore the supplier market. This step will have a great influence on the final purchase and is therefore one of the most important steps in the process. At first the purchaser has to determine the way of subcontracting. Different contract alternatives are for example fixed-costs, cost-reimbursable or unit rate. A possible procedure to select the most suitable supplier starts with assembling a “bidders list”, which gathers the qualified suppliers. Next, an evaluation of these suppliers’ capabilities is accomplished to come up with the supplier short list. After that, the requests for quotation are sent and the suppliers are invited to submit their bids. To be able to select the most suitable supplier good procedures and routines are required.
- **Contracting.** This activity starts with preparing the negotiations, continues with carrying them through and ends with signing the contract. When drawing up a contract, several terms and conditions must be considered and therefore it is not always possible to use standardised contracts. Important aspects of the purchasing agreement are prices and terms of delivery, terms of payment, penalty clauses and other arrangements such as third-party-contracting, insurance and safety regulations.
- **Ordering.** The ordering itself can preferably be arranged by an efficient handling system. In that way a lot of work in the ordering process can be reduced. Normally a purchase order is initiated from a requisition generated from the materials requirement planning system or direct from the purchasing contract. Integrated material planning software enables the transfer of the requisition to order electronically. In these cases it is extra important that the supplier sends a confirmation for each order received.

- **Expediting.** To secure the supply it is important to monitor and control the order. This activity is demanding and therefore it is often conducted from an overdue list. The expediting can be performed at different levels where the most simple undertakes action first when material shortages are a fact. For critical items it is suggested to use a more advanced expediting method where it is possible to inspect and follow the critical paths of the production plan.
- **Follow up and evaluation.** The role of the purchaser is important even after the goods have been delivered. To avoid things going wrong after the product is set into production it is important to clarify warranty claims and penalty clauses. It is recommended to follow up and document the performance of the supplier, for example in terms of fulfilment of the specifications. This data can be very useful in future vendor rating.

### 4.3 Total Cost

The goal with the concept of Total Cost is to make the total effect of different actions clear and to avoid focusing on single activities isolated. By bearing the Total Cost in mind it is possible to keep away from sub optimising separate areas. The concept Total Cost of Ownership (TCO) is suitable from a purchasing perspective. Since information regarding this concept in literature is quite general, this is supplemented with different logistic models of Total Cost. In the next chapter these are adjusted to an adapted Model of Total Cost, to fit the requirements of Purchasing at PGI4.

#### 4.3.1 Total Cost of Ownership

The price is, according to Baily et al (1998), traditionally the most common factor that a purchaser focuses on. Even though price constitutes a significant part, the Total Costs are compiled by all the things you actually pay for when buying goods and services. Important costs to be included are for example tooling, duty, inventory carrying, inspection, remedy or rectification. Baily et al (1998), uses a price/cost iceberg to make hidden costs

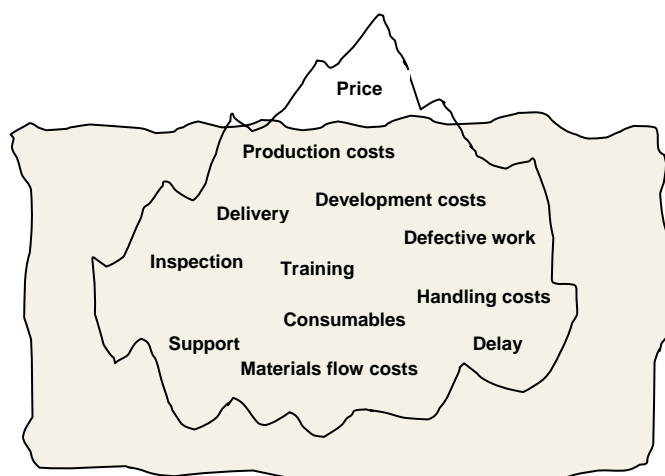


Figure 4-3: The Price Iceberg

visible. According to the authors purchasing has an important role to improve business by reducing the total acquisition costs.

Also Gadde & Håkansson (1993) use a price iceberg to state the costs affected by purchasing. Price and discounts are direct costs and in general visible costs. Other indirect costs are often less tangible but still they represent a big part of the Total Costs. The authors claim that different purchasing methods have great influence on the indirect costs and also point at the significance of a close relationship with suppliers. Figure 4-3 illustrates a price iceberg, which combines the relevant parameters according to previously mentioned authors.

Baily et al (1998) state that once goods have been acquired it may attract further costs while in use. When goods are to be retained for some time, the Total Cost is often referred to as the Total Cost of Ownership. Monczka et al (2005) define the Total Cost of Ownership as the present value of all costs related with a product, a service or capital equipment that are incurred over its expected lifetime. The same authors break down the included elements into four categories:

- **Purchase price** – The amount paid to the supplier for the actual goods or services purchased.
- **Acquisition costs** – All costs related to bringing the goods from the supplier to the customer. That includes sourcing, taxes, administration, and freight.
- **Usage costs** – The entire costs caused by converting the purchased material into finished products. In the case of purchasing services, this means all costs for performing the service that is not included in the price. Example of usages costs are inventory, scrap, warranty, installation, conversion, down time and training.
- **End-of-Life costs** – Costs that are created when the goods or service no longer is useful. As examples those are costs for obsolescence, disposal, clean-up and project termination.

Stock & Lambert (2001) write that in order to add more value to the company purchasing is nowadays redefined as a key process in strategic sourcing. To unlock savings and growth opportunities companies must avoid paying attention to the price alone and instead have a Total Cost perspective. The same authors also state that savings in Total Cost of ownership can be achieved in four strategic ways, buy for less, buy better, consume better and sell better. The first three all represents incremental ways to achieve cost savings by improving purchasing.

### 4.3.2 Different models of Total Cost

Stock & Lambert (2001) describe a Model of Total Costs that includes six major cost categories; customer service, transportation, warehousing, order processing and information, lot quantity and inventory carrying. This model, shown in Figure 4-4, is developed to manage the logistic function and aims to reduce the Total Cost of logistic activities.

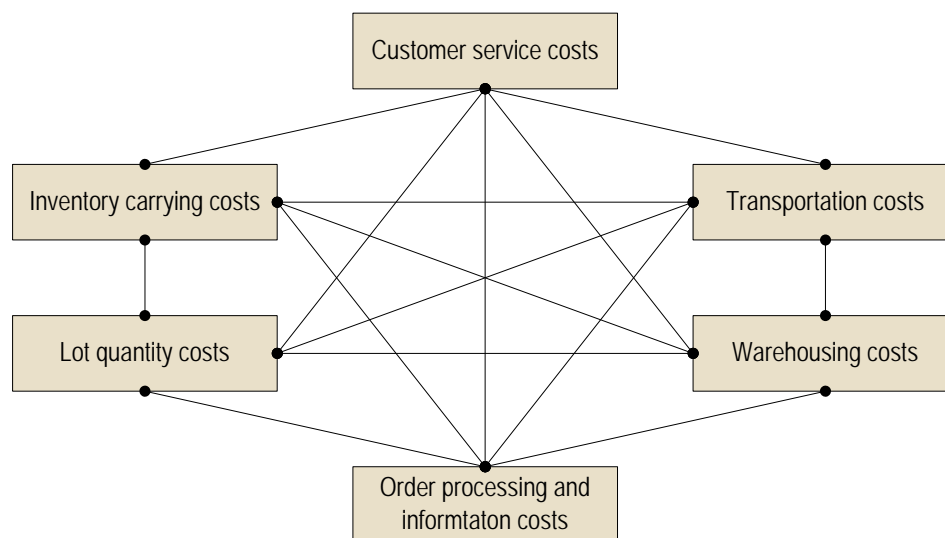


Figure 4-4: Model of Total Cost (Stock & Lambert, 2001)

- **Customer service costs** - The authors describe this cost as the trade-off related to cost of lost sales. Included in customer service are order fulfilment costs, costs for parts and cost for service support.
- **Transportation costs** - These costs heavily depend on the volume and weight of shipment, the distance, points of origin and destination, and also with the chosen transport mode. When categorising these costs it can be done in many different ways, for example by customer or by type of product.
- **Warehousing costs** - Depending on how many warehouses there are and where these are located these costs differ. Included are costs caused by warehousing and storing activities.
- **Order processing and information costs** - These costs are created from processing customer orders, distribution and forecasting. Costs of order transmittal, order entry, order verification, order handling, as well as internal and external costs created from notifying shipping information and product availability are all comprised within order processing.
- **Lot quantity costs** - Lot quantity costs are influenced by lot size and order quantity, by those means this category is closely connected to production as well as purchasing.

- **Inventory carrying costs** – Elements in this category are often hard to identify, among others it can be costs for inventory control, salvage and scrap disposal, and risk costs related to packaging and obsolescence. In these costs are also capital costs, storage space costs, insurance and taxes for the inventory included.

The objective of logistics management is according to Aronsson et al (2004) to receive a high customer service combined with low Total Costs. Hence the authors connect the logistic costs to service elements as shown in Figure 4-5. In reality it is common that the level of service is defined and based on that, the company is ought to reduce their costs. One alternative is according to the authors to define the service elements as a cost for loss of sales.

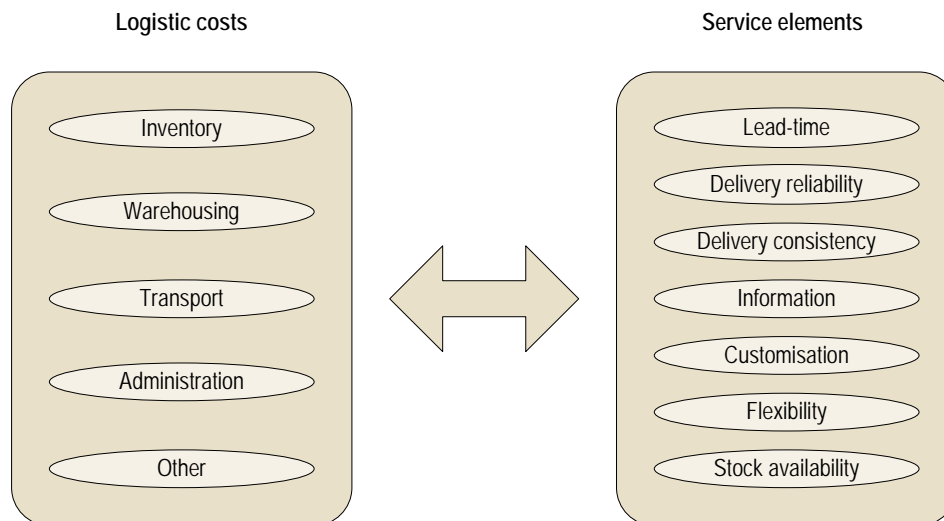


Figure 4-5: Logistic costs versus Service elements (Aronsson et al, 2004)

### *Logistic costs*

- **Inventory costs** – The goods stored create costs of fixed capital. Also storage of goods brings risks, in form of obsolescence, insurance and waste.
- **Warehousing costs** – Are by the authors explained as the costs of storage. Costs for in-house transport are also included.
- **Transport costs** – Includes all external transports as well as transports between the different buildings within the company.
- **Administration costs** – Involves costs for receiving order, invoicing, payment of wages and controlling. To make clear which costs that are directly related to a certain order these costs are, according to the authors, preferable calculated for separate orders.

- **Other costs** – Costs for information system, needed to support the material flow, costs for packing and other costs related to logistics are to be included in this category.

#### *Service elements*

- **Lead-time** – Entail the time from customer order to final delivery. A shorter lead-time can be achieved by reducing the non-value adding time in the supply chain.
- **Delivery reliability** – Implies how reliable the lead-time is. When reducing inventory along the supply chain this type of service gets a growing importance.
- **Delivery consistency** – Means that the order shall arrive in correct quantity and have the agreed quality.
- **Information** – This service post has a great influence on the cooperation between suppliers and customers. Regarding supply it is desirable for the supplier to attain predicted demand as soon as possible, which makes it possible to plan the business.
- **Customisation** – To attain satisfied customers the company sometimes must offer adjusted products or solutions.
- **Flexibility** – Flexible logistics is needed to cope with unexpected incidents, such as changing market patterns, unpredictable inquiries and fluctuations in demand.
- **Stock availability** – Refers to the number of orders in stock, available for delivery to customer.

### ***4.4 Cash Management***

Cash Management has, according to Dolfe & Koritz (1999), a direct impact on the company's shareholder value. Regardless if the company is managing their cash or not, it will have an impact on the profitability. The difference is that an active and effective Cash Management affects the shareholder value positively whereas neglected Cash Management has a negative impact.

Purchasing is often given an insignificant role in Cash Management. According to Hedman (1991) this is due to a misconception that no capital is tied up, and the belief that the potential profit is less than the actual. However purchasing has a great impact as they are responsible for a major part of the flow of money through the company. Hence, the purchasing function should reasonably have an opportunity to influence the outcome of Cash Management.

#### 4.4.1 Definition

Cash Management can be defined in many different ways. One common definition, according to Karlsson (1996), is “making money on money” which also can be expanded to include “making money on efficient procedures and support systems”.

Another description from Hedman (1991) divides Cash Management into three main parts:

- **Outflow of funds** - postpone the disbursement as long as possible.
- **Liquidity Management** - administer the money efficiently in between.
- **Inflow of funds** - retrieving payments as soon as possible.

Since this thesis concerns purchasing, delimitations are made to only focus on the outflow of funds. For that reason a further explanation of this part follows.

#### 4.4.2 The outflow of funds from the corporation

The most important Cash Management rule concerning disbursement is that payment should be made at the right time, not earlier and not later. The arrow in Figure 4-6 describes the different steps in the disbursement process. Follows does an explanation of suggested Cash Management in each step. (Dolfe & Koritz, 1999)

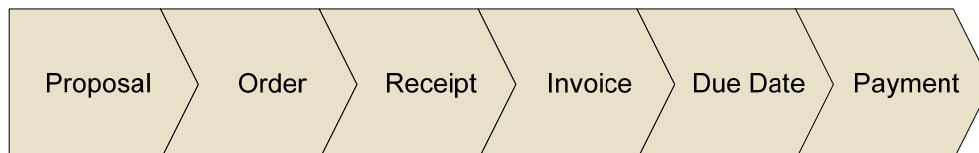


Figure 4-6: The disbursement process (Dolfe & Koritz, 1999)

##### *Proposal*

In this stage the conditions for payment are made, and therefore this is an important part of the process. Anything neglected in this stage may lead to unwanted consequences later in the disbursement process.

- **Credit and payment terms.** It is important that everyone involved in the purchasing process are well informed about policies and guidelines concerning credit and payment terms. As long as other conditions remain unaffected the longest possible credit term should be sought after.
- **Cash discounts.** Cash discounts are often very valuable for purchasers. Most suppliers are aware of the disadvantage, but cash discounts are still common in several countries. The Cash-discount-key from Dolfe & Koritz (1999)

illustrates the possible profit in annualised interest rate for the purchasing company. The table in Figure 4-7 shows the equivalent annualised interest rate for given cash discount when making payment X days earlier.

Cash discount	Days				
	10	15	20	30	45
0,5%	18	12	9	6	4
1%	36	24	18	12	8
1,5%	54	36	27	18	12
2%	72	48	36	24	16
2,5%	90	60	45	30	20

Figure 4-7: The impact of Cash discounts  
(Dolfe & Koritz 1999)

- **Payment method.** The method of payment must satisfy both parties. If the requested payment method is not preferable to the buying company an alternative method should be agreed upon.
- **Invoicing fees.** For the supplier to be allowed to charge administration and invoicing fees these subjects must be negotiated and agreed upon in the proposal. In order to avoid this type of costs, the purchaser should insist that these fees are removed from the proposal.
- **Penalty interest.** Control if any penalty interest rate is defined in the proposal. If this rate is higher than the rate stated by law it should be negotiated.

### Order

After having accepted the proposal, an **order confirmation** is to be done. For this procedure it is important to have good routines to control that only agreed changes have been made. A vital part in this stage is to inform the supplier of the correct **invoicing address**. This is especially important if the shipping address and the invoicing address differ. Mistakes may not only cause administrative problems but also delayed payments which in turn lead to penalty interests. Another very important issue in this stage is the **internal information**. Every section concerned, among others production, purchasing and goods reception, must have access to information about the order.

### Receipt

First when the purchasing department has access to the goods the delivery can be considered completed.

- **Reception control** - To make sure that the delivery is on time, complete and consistent, the company must have well-organised routines for controlling. If there is any discrepancy, some sort of compensation should be requested.
- **Control of the receipt date** - When receiving the invoice the receipt date should be compared with the delivery date. Pre-dating of invoices is not



acceptable. In that case the credit term should be prolonged. Also when invoice arrives prior to delivery, extended credit times are motivated.

- **Internal information** - Finally efficient procedures should simplify the information, to all departments concerned, that goods have been received.

### *Invoice*

Inefficient procedures cause time lags which may bring unnecessary costs to the company, for example in form of penalty interests. Investigating how to prevent those costs one must start with identifying the time lags that can be avoided. Regarding penalty fees it can be examined how much the company paid last year and what the underlying causes were. In that way the weaknesses can be pointed out and taken care of. When receiving the invoice it should be compared with the conditions stated in the previous documentation. Any extra fees found should not be accepted for payment.

### *Due Date*

As mentioned before invoices should always be paid exactly on the due date. Hence it is very important to be absolutely sure about how to calculate the due date. The most common way is to calculate the due day based on the invoice date. An alternative is to calculate the due date based on the receipt date. In other words the credit time corresponds to the actual time for handling the invoice. Another advantage of this practice is avoidance of paying for incorrectly pre-dated invoices.

### *Payment*

The most appropriate payment method, which enables keeping the funds on an interest bearing account for as long as possible, is to be chosen. Different fees and administration costs for respective payment method should also be considered.

## 4.4.3 Weighted Average Cost of Capital

Stock kept items imply tied up capital. Instead this capital could, if used in another way, result in revenues, for example earnings from investments or increased sales volume due to a marketing investment. Hence tied up goods are equally costs to the company. The size of this cost depends on the possible return on investment for liberated capital. (Aronsson et al, 2004) This cost is sometimes called the interest calculated for costing purposes, but at SIT it is named the weighted average cost of capital (WACC). Therefore, from now on in this thesis this cost is defined as WACC.

In the context of Cash Management WACC is used to calculate how the in- and outflow of funds, as well as investments influence the profitability of the firm. (Blomstrand & Källström, 1991). The authors describe WACC as the price for money per unit time. Commonly WACC is divided into three components; real rate of interest without risk, risk premium and compensation for inflation.

When working with Cash Management it is, according to Hedman (1991), important to use a relevant WACC. It should correspond to the alternative interest that the company, according to a certain action, should receive or pay. Many of the improvement suggestions related to Cash Management results in setting capital free. The chosen WACC is therefore of great significance when estimating different measures.

#### *Inventory cost rate*

Beyond the WACC, storing of items also bring different kind of risks. For example risk of a burglary, a fire and other damages. Furthermore items may decrease a lot in value or become "out of date". Hence when calculating inventory costs both WACC and risk costs are to be included. Commonly the inventory cost rate is used to calculate these costs. This interest is, as the WACC, depending on the stock value. In cases of a calculated WACC the inventory cost rate is, according to Aronsson et al (2004), described with following formula;

$$\text{Inventory cost rate} = \text{WACC} + \left( \frac{\text{annual cost of risk}}{\text{average value of stock}} \right) * 100$$

#### 4.4.4 Budgets and Cash Concepts

Killen & Kamauff (1995) explain that a budget is a formal written statement, that expresses planned future operations in financial or numeric terms. The authors specify five major types of budgets:

- **Sales or revenue budget** - The first step in the overall budget processing.
- **Materials and supply budget** - Project the amount and cost of materials. What, how much, and when will material and goods be needed? Identifies how much money that should be spent on purchases.
- **Capital budget** - Includes the money to be spent on plant and equipment.
- **Expense budget** - Based on operating and administrative workload. Salaries, telephone, space costs, heat etcetera. It also includes Maintenance, Repair and Operating Supplies, (MRO).

- **Cash budgets** - This budget shows the amount of income and expenditures. How much cash will be needed and when? Large corporations can earn \$3 million per month by investing their unused capital for periods of 30 to 90 days. The terms and conditions developed by purchasing can have a significant effect on the cash flow statement.

#### 4.4.5 Cost savings

Cost savings can be sought after in many different ways, for example by individuals or by different areas. The authors Killen & Kamauff (1995) are suggesting five methods to cut costs.

- **Adopt an open minded attitude.** When starting a cost saving program it is important to have the right mental attitude. Cost reductions are in peoples mind often related to downsizing of personnel, therefore the term cost savings is sometimes better to use. The goal should be a focus on cost savings, which maintains a realistic and continuous objective to save money.
- **Choose a cost to be reduced.** The more money being spent the greater is the potential to make cost savings.
- **Identify target areas.** Distinguish two or three specific cost items as targets and scrutinize them closely.
- **Motivate the staff and get their ideas.** One of the most efficient ways to carry through cost savings is to motivate the staff to fully participate. By making contact to each person, everyone become cost conscious in their work and also you get the opportunity to hear their personal opinion.
- **Question every element of the cost.** Every area suggested for cost reduction should be analysed in detail. For every specific object the following questions can be asked:
  - o Why - Could it be eliminated?
  - o What - Can it be accomplished in another way?
  - o Who - Is the right person responsible for the area?
  - o When - Can cost be reduced by changing the time when it is done?
  - o Where - Does location affect cost or efficiency in any way?
  - o How - What methods could reduce costs?

#### 4.4.6 Creating Shareholder Value through Cash Flow Management

One of the key measures in business performance is Shareholder Value, which also can be described as the net present value of future cash flows. As mentioned previously management is driven to enhance the Shareholder Value because that is what determines how much the company is worth to its owners. In the article by

Srivastava et al (1998) the four drivers for increasing Shareholder Value are identified as:

- **Accelerate cash flows.** Early cash flows are preferable because risks as well as time reduce the value of later cash flows. Through loyalty and long term relationships between customer and supplier, investments are more likely to be fastened up and optimised purchases are stimulated. This accelerates cash flows and thus shareholder value.
- **Increase the level of cash flows.** This could come from higher revenues, reduced costs, reduced working capital and lowered fixed investments. A closer relationship enables both parties to achieve efficiencies by linking their supply chains.
- **Reduce the risks associated with cash flows.** A reduction of volatility and vulnerability of future cash flows imply lower risks which results in a lower cost of capital. Partner relationships enable the coordination of activities through out the supply chain, which makes it easier to attain stable cash flows.
- **Enhance residual value of the business.** A long term value is created through a large customer base, where the quality as well as the loyalty is high.

As shown in Figure 4-8 the strategies can either accelerate or enhance the cash flow. The sooner the cash flow is received and the greater the amount is, the greater net present value will it result in. (Christopher, 2005).

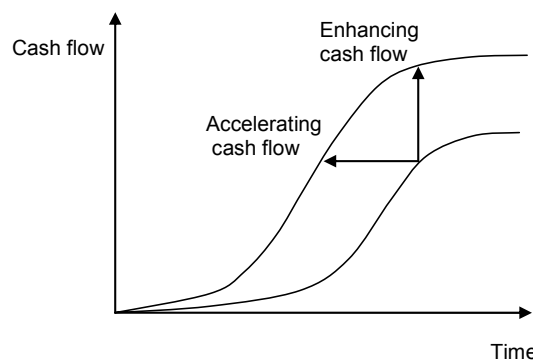


Figure 4-8: Improving Cash Flow Management  
(Christopher, 2005)

## 5 ADAPTED MODEL OF TOTAL COST

*An adjusted Model of Total Cost, to fit the requirements of Purchasing at PGI4, is developed in this chapter. Hence connections between identified costs, affected by Purchasing, and Cash Management are looked into.*

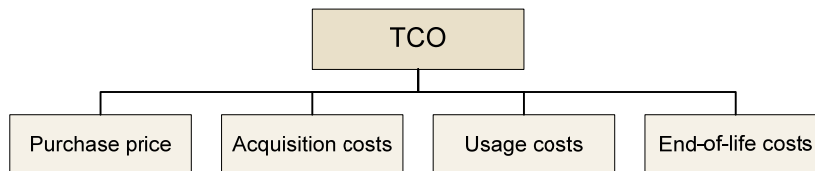
### 5.1 Creating an adapted Model of Total Cost

Aronsson et al (2004) describe an appropriate method for adjusting a Model of Total Cost. At first it needs to be clarified how different decisions have impact on the Total Costs. Then an initial Model, that includes all costs concerned, can be developed. Thereafter a classification must be performed where the most important costs are sorted out. To limit the work effort needed, the adapted Model is suited to the specific case. Costs with little impact are to be excluded.

According to Aronsson et al (2004) it is important to include all relevant costs in the model, however it is less significant in which category the different costs are classified. The authors admit that it might not be possible to capture all costs, but clearly state that it is of highest relevance to always bear a Model of Total Cost in mind.

### 5.2 Total Cost of Ownership

In section 4.3 various concepts of the Total Cost are described. Though, when the Total Cost of Ownership (TCO) is mentioned, the majority of the studied authors describe it as a very convenient concept from a purchasing perspective. Therefore the decomposition of TCO by Monczka et al (2005), as seen in Figure 5-1, is used to describe how purchasing affects the Total Cost in the Supply Chain.



**Figure 5-1: Total Cost of Ownership**

The concept of TCO aims to consider all possible costs connected to a purchase. In the following sections, a discussion is undertaken concerning the parameters that are relevant to a specific topic. As previously mentioned it is important to include all relevant costs. This is done through a combining of theories regarding Total Cost, gathered from different authors. As these authors use different angles of defining

costs, there are some mismatches when combining them. Under each and every of the following four sections, costs and activities are listed. In order to keep a grasp of them, they are arranged in groups.

### 5.2.1 Purchase price

As mentioned in section 4.3.1, Monczka et al (2005) refers to the purchase price as the amount paid for the actual goods bought. Mainly the price is set by the market. Moreover the market price reflects the accessibility on the market and the quality desired.

As described in section 4.4.2 by Dolfe & Koritz (1999) the proposal is the stage where the conditions for the payment are set. Among these are the terms of purchasing, which in this thesis represent the conditions of payment. These are invoice date, delivery date, credit time, cash discounts and how delays are managed. These terms of purchasing are usually clearly stated in the supply agreement between purchaser and vendor.

Included in this part is also the lot-quantity cost, described by Stock & Lambert (2001) in section 4.3.2. The quantity purchased influences the price, as an example it is possible to attain better price when using large-scale production. In turn this might though lead to increased usage costs.

Costs related to purchase price is summed up into following parameters:

<b>Market price</b>	<b>Terms of purchasing</b>	<b>Lot-quantity</b>
- Quality	- Invoice date	
- Accessibility	- Delivery date	
	- Credit time	
	- Cash discounts	
	- Delay	

### 5.2.2 Acquisition costs

As previously mentioned, Monczka et al (2005) describe this category as the costs related to bringing the goods from the supplier to the customer. That includes sourcing and transportation, where sourcing defines the process of selecting a suitable supplier and handling the relation. Under the topic of Transportation the delivery conditions, defined as Incoterms, are discussed.

Dolfe & Koritz (1999) define order confirmation, sharing invoicing information and internal information as order processing. According to Stock & Lambert (2001) this

also includes forecasting, but since forecasting alone can have an impact on lead-times and inventory levels, it is here discussed as a separate parameter.

Expediting is the process of monitoring the acquisition of goods. In this thesis this will be connected to reception control, which affects the receipt date, and how this information is spread to parties concerned. Parallel to the flow of goods the invoice is sent to the purchaser. The process of invoicing is managing the payments according to due date. Controlling is a support for financial decision making and at the same time it has responsibility for monitoring the accuracy of financial reporting.

Costs related to the acquisition of goods are summed up into following parameters:

<b>Sourcing</b>	<b>Forecasting</b>	<b>Order processing</b>	<b>Expediting</b>
- Supplier evaluation		- Invoicing information	- Delivery monitoring
- Supplier handling		- Order confirmation	- Receipt control
		- Internal information	- Internal information
<b>Transportation</b>	<b>Controlling</b>	<b>Invoicing</b>	
- Incoterms		- Due date	
		- Payment	
		- Internal information	

### 5.2.3 Usage costs

Management of Inventory has an important role of assuring that the right type of goods in the right quantity is held in stock. In this category costs for inventory and warehousing represent the major part. That include costs for tied up capital and risk related costs such as obsolescence and waste.

Gadde & Håkansson (1993) mention costs related to production, such as processing and handling of goods. Baily et al (1998) also add cost of defective work, which in this thesis will be placed under production. Training of personnel is, by Baily et al (1998), added to the usage costs.

Costs related to the usage are summed up into following parameters:

<b>Inventory management</b>	<b>Production</b>	<b>Training</b>
- Inventory	- Processing	
- Obsolescence	- Defective work	
- Waste	- Goods handling	
- Warehousing		

### 5.2.4 End-of-life costs

Typically these costs arise first when the product no longer is useful. Costs for recycling, disposal and final termination belongs to the end-of-life costs. This category is enlarged to involve the trade-off cost related to loss of sales, referring to the costs for customer service defined by Stock & Lambert (2001).

Costs related to end-of-life are summed up into following parameters:

#### Recycling

- Termination
- Disposal

#### Lost of Sales

## 5.3 Model of Total Cost adjusted to Purchasing at PGI4

The adapted Model of Total Cost aims to clarify the connections between Purchasing and Cash Management. As previously mentioned, this is done gradually and the first step is to create an initial Model connecting Purchasing and Total Cost through TCO.

### 5.3.1 Initial Model

In Figure 5-2 the different parameters of TCO are summarised, constituting the initial Model of Total Cost. The model describes the parameters that should be taken under consideration when conducting a purchase. It aims to answer the question:

- According to literature, which parameters of Total Cost are related to purchasing?

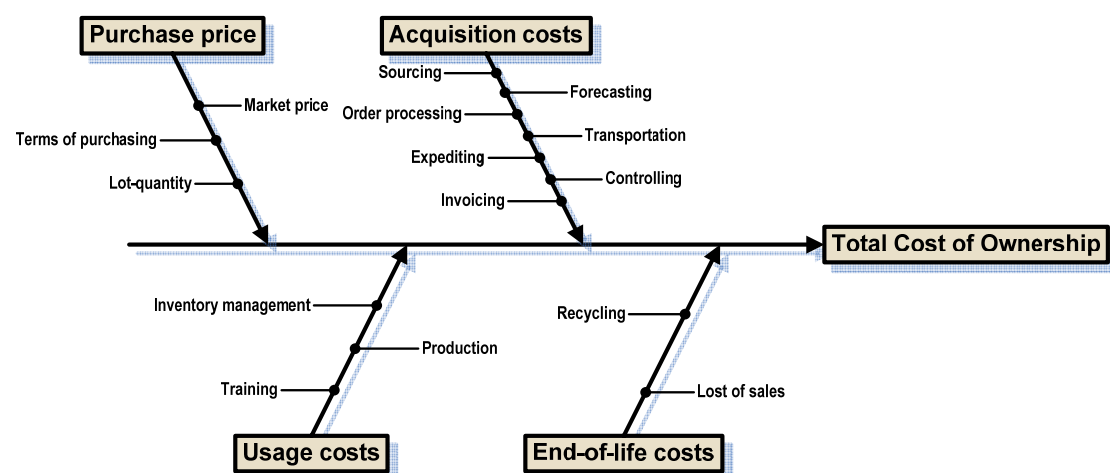


Figure 5-2: Initial Model of Total Cost

### 5.3.2 Redefined Model

The next step is to identify the parameters that Cash Management can have an impact on. Based on Cash Management theory and the delimitations of the thesis the



initial Model of Total Cost is revised and irrelevant parameters are neglected. This results in the redefined Model, seen in Figure 5-3. It aims to answer the question:

- Which purchasing parameters of Total Cost are affected by Cash Management?

### *Neglected parameters*

Purchasing aims to supply **Production** with goods in the right amount and at the right time. It is very interesting from a Cash Management perspective since the lead-times within the production has a great impact on the total amount of capital employed. But this thesis is limited to study the outflow of funds and the parts that Purchasing has an influence on. Therefore this parameter is neglected.

**Recycling**, termination and disposal are all parameters connected to the end-of-life costs. Although these parameters should be carefully considered when purchasing, Cash Management do not have an impact on them. Hence these parameters are neglected.

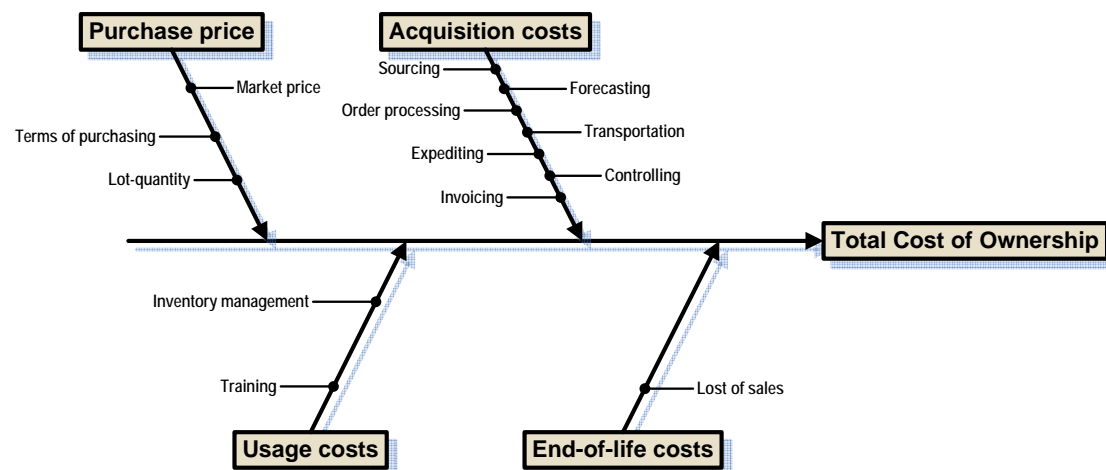


Figure 5-3: Redefined Model of Total Cost

### 5.3.3 Final Model

Finally the adapted Model of Total Cost is revised in order to focus on the parts relevant to Purchasing at PGI4. This is done to answer the last sub question of the first main question:

- Which of the identified parameters are relevant to Purchasing at PGI4?

Thus the adapted Model of Total Cost focuses on the parameters that are directly relevant to Purchasing at PGI4. With relevant is meant either primary tasks for the Purchasing department, or indirectly connected to the work performed by the same.

In section 2.3.1 it is stated that the main task of Purchasing at PGI4 is to compose and sign supply agreements with suppliers. Other parameters are still taken under consideration but they are given less significance.

### *Parameters directly relevant to strategic Purchasing*

**Terms of purchasing**, such as credit times and cash discounts, should to the largest extent be negotiated and settled with consideration to Cash Management. It is important that the strategic purchaser is aware of the possibilities and exactly what different terms imply.

Increased **Lot quantity** normally results in lower price per unit, but at the same time capital is tied up. Cash Management does not affect the quantities directly, but it is affected by the levels of inventory. When setting agreements the strategic purchaser has an important part for determine the best lot quantity. At SIT, the setting of lot quantities are closely connected to Inventory Management, hence these parameters are discussed together in this thesis.

**Forecasting** is a basic condition for optimising the buying point. From the Cash Management point of view, it is desirable to make disbursement as late as possible. Satisfying forecasting makes it easier both for the supplier and the purchaser to have better timing. Nowadays more and more sophisticated tools are being used to provide forecasts, though it is not always clearly stated how these are affecting the management of cash.

The **Transportation** mode chosen will have an effect on the means of payment and also the cost of the actual transport. Another vital question, regarding who is responsible for the goods during the transportation, affects when payments should be made.

**Order processing** and **Expediting** are both important to fulfil Cash Management measures. If it is not possible to trust all suppliers completely there must exist ways to control their performance. Are goods delivered on time and in the right quantity according to the contract? If not, it is important to have efficient routines for demanding penalties etcetera. **Invoicing** is the documentation issued by the seller to the buyer, indicating the sold product, quantities and the agreed price. Normally this is performed by the operative department of purchasing. The invoice plays an important role in the terms of payment, which is set by the strategic purchaser.

Inventory ties up a lot of capital and therefore slows down the flow of capital. Hence, the **Management of Inventory** has an important role to assure that the right type of goods in the right quantity is held in stock. Warehousing includes the storage facilities and personnel working there. Furthermore Obsolescence and Waste are connected to the inventory activities performed. These mentioned parameters are not directly affected by Cash Management, but since they all have a relation to the levels of inventory, they should in this context be taken under consideration.

### *Parameters indirectly controlled by strategic Purchasing*

Cash Management might have an impact on quality, as quality shortages can lead to delayed sales and unnecessary capital being employed. Though in this case it is assumed that goods are bought with quality according to specification, and therefore quality is not a cost driven by Cash Management. It is assumed that the lowest possible **Market price** available is used, provided that specifications are granted. Even though accessibility affects the purchasing price, it is controlled by the market and therefore purchasing's impact could be considered as negligible. In the end it is all about how different terms and settlements, between the purchaser and the supplier, affect the price.

The method of **Sourcing** and the suppliers selected have an indirect effect on several other components. Geographical aspects affect parameters as lead-time and transportation.

**Controlling** is a support for financial decision making and at the same time it has responsibility for monitoring the accuracy of financial reporting. The function has a big importance in supporting and evaluating Cash Management, but is not direct connected to the strategic purchasing.

**Lost of sales** might be connected to the quality and correctness of a purchase, these however can not directly be connected to Cash Management. Although in a bigger perspective, when decisions are made without considering the consequences, it might result in a negative impact such as lost of sales. Therefore this parameter is important to take in consideration.

One significant part of active Cash Management is to involve all parts concerned. Through **Training** a good Cash Management awareness can be built up, making improvements possible.

Finally the adapted Model of Total Cost is illustrated in Figure 5-4.

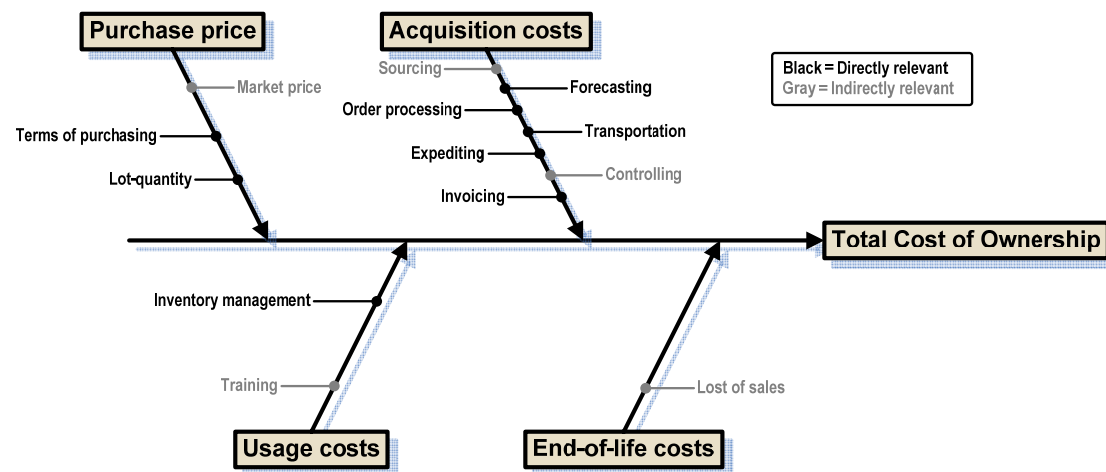


Figure 5-4: Adapted Model of Total Cost

## 5.4 Areas of further studies

As a conclusion to the compilation of an adapted Model of Total Cost, the areas relevant of further studies are pointed out. This is made to create a more comprehensible picture of what is mapped in chapter 6.

As previously mentioned, according to directive and delimitations, areas connecting Cash Management and strategic purchasing performed at PGI4 are studied in this thesis. Hence the further studies are made based on the identified parameters, with highest significance, in the adapted Model of Total Cost. Remaining parameters, toned in the adapted Model, are though still discussed under the holistic view of Cash Management.

### 5.4.1 Scrutinized areas

In the contracting process, where the supply agreement and the terms of purchasing are set, the conditions of the remaining disbursement process are created. Thus the strategic purchaser can significantly influence the cash flow.

The areas which are to be studied closer are:

- Terms of Purchasing
- Forecasting
- Transportation
- Order Processing, Expediting and Invoicing
- Inventory Management and Lot Quantity

### 5.4.2 A holistic view of Cash Management

Even though this thesis concentrates on the strategic purchasing it is important to have a comprehensive picture in mind. In this context the influence on Cash Management of chosen sourcing method are taken under consideration. Also the impact of controlling and their eventual cooperation with the purchasers are discussed. Furthermore it is discussed which consequences an increasing awareness of Cash Management might have on training and lost of sales. The parameters that are to be considered to create a holistic view are:

- Market price
- Sourcing
- Controlling
- Training
- Lost of Sales



## 6 MAPPING

*Based on the adapted Model of Total Cost, a detailed study of the areas identified as significant in order to fulfil the purpose is made. In this chapter the reader is introduced to the findings from these studies at SIT in Finspong.*

### 6.1 Scrutinized areas at SIT

As mentioned in section 2.3, the studied system is narrowed when the first main question of the thesis is answered. Figure 6-1 describes the system studied in this mapping, based on the different flows and functions connected to the areas of further studies. Other departments playing major roles in this context are sub departments of materials planning (GTM) and the department responsible for payables and receivables (FFL). In order to get the required information, a vast variety of people at SIT are interviewed. The interviewees are listed in Appendix 4.

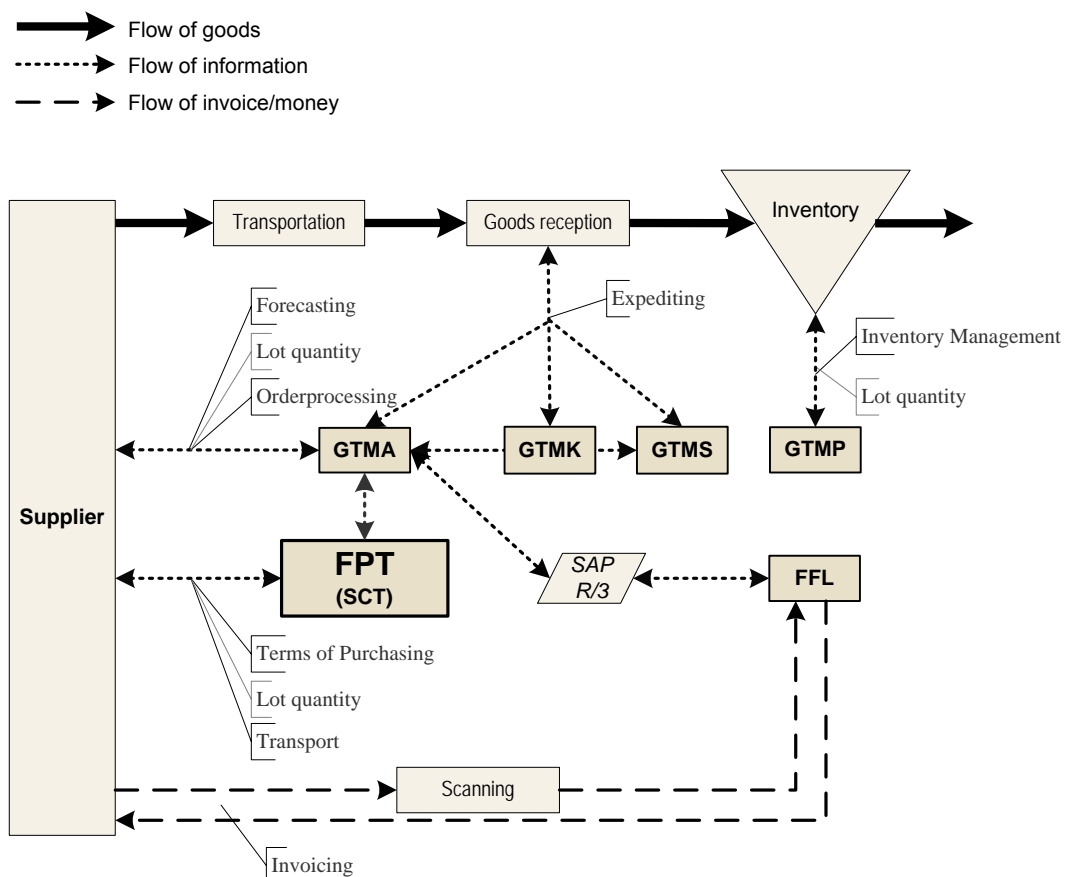


Figure 6-1: Flows and functions connected to the areas of further studies

Through a mapping of the flows and functions previously mentioned, following sub question is answered:

- *How is Purchasing at PGI4 managing the parameters identified as the connections between purchasing and Cash Management?*

### 6.1.1 Terms of Purchasing

As mentioned in section 2.3.1, one of the purchaser's main tasks at SIT is to compose and sign supply agreements with suppliers. Even though the terms differ between different purchasing areas and products, the topics included in the agreement are usually the same. Development of a contract should be originated in a frame agreement constructed by Siemens AG, the Siemens Umbrella Agreement. This agreement, 23 pages excluding appendix, establishes the legal basis of the business relations between Siemens and their suppliers with regard to both production and supply.

Among the strategic purchasers the use of the umbrella agreement is limited. Some of the purchasers use parts of the frame agreement, but as they are developing new contracts most of them start out from a "home made" version. Even though some directives and guidelines, given by the management of strategic purchasing, are in accordance with the Umbrella Agreement it is rarely used. One explanation given is that the Umbrella Agreement in some cases is too general and too much "pro-Siemens". At FPT the goal is to cover 80 percent of the volume bought with agreements.

In this section the terms of purchasing affecting Cash Management is mapped. When creating a supply agreement nothing is definitive, that means that almost every parameter is negotiable.

#### *Invoice date*

The definition of Invoice date in supply agreements at PGI4 in Finspong differs from the measures taken by the financial department.

Generally the invoice date is defined as follows:

*"Payment shall be made \*\* days after the latest to happen of following events, namely completion of the delivery and the Purchaser's receipt of a correct invoice..."*

Or as worded in Siemens frame agreement:



*“The period allowed for payment shall commence subsequent to completion of the supply or service in conformance with the Purchase Order (including the complete documentation) and receipt of a proper invoice by SIT.”*

A complete delivery is defined according to Incoterms, further described in section 6.1.3 Transportation. Since 2006 though, the reality at SIT is that the financial department defines the invoice date to be equivalent to the scanning date, neither considering Incoterms nor completion of delivery.

### *Delivery date*

The precise dates on which deliveries are due, are specified in the Purchase Order. This brings uncertainty because the date defined in the Purchase Order refers to the date when SIT needs the product to be available in Finspong. When other Incoterms than DDU/DDP are agreed upon, SIT faces problems because the supplier's lead-time sometimes are not adjusted to meet with the date given by SAP R/3.

### *Credit time*

At SIT the goal is to have a standardised credit time of 60 days. Although towards some suppliers SIT only have 30 or 45 days credit time. Also the credit time can be extended up to 90 days in a number of relationships, which also is the target given by Siemens in the Umbrella Agreement. According to current measurements at SIT the average credit time is 45 days, though there are clear directives given by the management to prolong this to 60 days.

### *Cash discounts*

The following terms of payment shall according to Siemens Umbrella agreement apply:

- *within 14 days of the invoice date with a deduction of 3.0 percent prompt payment discount, or*
- *within 30 days of the invoice date with a deduction of 2.0 percent prompt payment discount, or*
- *net within 90 days of the invoice date with no deduction*

Among the strategic purchasers cash discounts is not a frequent occurrence and when it is discussed, this is often done in close connection to both price and credit time. According to the finance manager at SIT there is most to gain for the purchaser if the cash discount is separated from the other two conditions. He states that commonly the best result is reached by first setting other conditions and afterwards discussing a cash discount. Further he explains that this actually can lead to win-win

situations, where both companies can benefit from cash discounts. Both parties could gain profit by letting the company with lowest WACC act as a bank. If SIT has a lower cost for their expenses they should agree on paying their suppliers earlier. In exchange the suppliers should be able to give SIT a discount, to reduce their own costs of capital.

When utilizing cash discounts further one must be aware of the risk for an internal controlling conflict. Even though the total result for the company is improved the results for the own division might change to the worse.

### *Delay*

According to the Umbrella Agreement, Siemens are entitled to collect penalties if the supplier will not carry out its commitments. Should the supplier fail to meet any or all of the Times for Completion identified in the agreement, including the obligation to surrender documentation and technical documents, Siemens are entitled to demand a contractual penalty of maximum 0,3 percent of the total value of the Purchase Order. For each working day which exceeds the completion date an additional penalty also can be withdrawn. The penalties for delay should not exceed ten percent of the total value of the Purchase Order. Even though it recently have been used in a few cases, the use of penalty clauses at SIT is very rare. The overall opinion is that these are to be used very carefully, not risking the supplier relationship. Instead it is in some cases used as a commercial tool in negotiations.

### 6.1.2 Forecasting

A sufficient tool for forecasting is necessary for supply planning. Forecasting makes it easier for the supplier to arrange their production and is also a requirement for optimising the buying point. Also the financial department is in need of forecasting. As stated by the financial manager at SIT, the work at the financial department would be facilitated if they were given cash forecasts. An unsure approximation of how much money that is to be paid, and also when, is much better than a totally unexpected payment.

SIT is currently implementing a forecasting tool, developed by Siemens, called Vendor Scheduling Agreement (VSA). It is a forecasting tool which should ensure a constant and safe flow of material by enabling a better planning horizon, internally as well as to the suppliers. A further objective of VSA is to divide the risk-taking between the supplier and SIT. At SIT the forecasts on a material level are derived from the production planning system SAP R/3 and distributed to the supplier via

the e-procurement tool e-Net "I". With VSA the planning horizon is divided into three zones, which are seen in Figure 6-2.

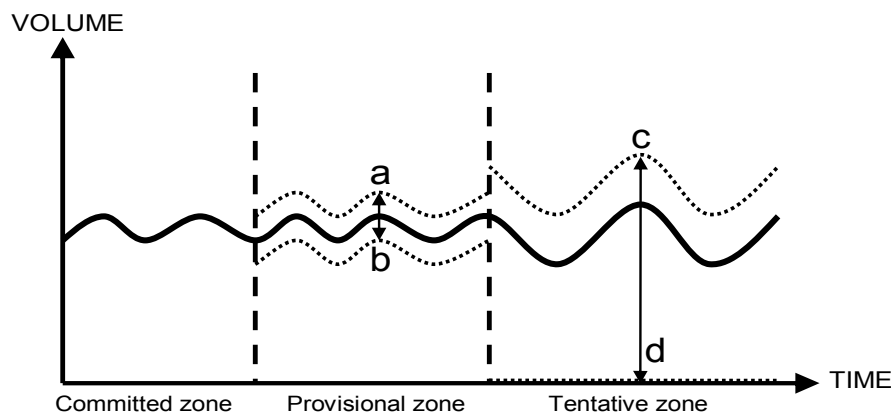


Figure 6-2: Visualising the different zones of VSA

- **Tentative zone** - The first zone, which is most distant in time, starts by the planning horizon and aims to give the supplier input to the long-term planning. In the tentative zone Siemens has no commitments neither in volume nor delivery date. The supplier should manage a volume increase of 20 percent at previous given lead time.
- **Provisional zone** - This zone starts as it is time for the supplier to procure Siemens specific material, therefore Siemens is committed to buy the scheduled quantity. If there are any cancellations Siemens is responsible for the material costs of the scheduled quantity. Although, in the provisional zone Siemens is allowed to postpone the delivery date. The supplier should manage a volume increase of ten percent at previous given lead time.
- **Committed zone** - The committed zone corresponds to the supplier's Siemens-specific production lead time. In this zone Siemens is committed to buy the finished product at the date specified in the delivery schedule. In occurrence of any cancellation Siemens will bear both the material cost and the costs of production. The supplier is committed to deliver the right quantity on time.

The project VSA was initiated in 2004 and the aim was to implement the system in 2005. Implementation has though been delayed and currently there are six suppliers connected via VSA, of those only three uses e-Net "I". In total there are 12 suppliers that use e-Net "I" and the initial goal were to, by the spring of 2007 having connected as much as 50 suppliers to the system. The ones responsible for involving suppliers at SIT are not as positive as the management though, they esteem that the number could reach 30 suppliers.

The implementation problems can be assigned to:

- Connection cost of e-Net "I" which is 3 000 Euro
- Lack of IT-support
- The fact that the goods in SAP R/3 must be defined as goods kept in stock.
- Current decrease of volume which has resulted in several planning corrections.

### 6.1.3 Transportation

At SIT there are different kinds of transport modes used and the responsibility of transporting differs between SIT and suppliers. Normally the International Commerce Terms (Incoterms) are practiced to state the valid conditions. In the agreement it must then be clearly explained how different conditions should be interpreted.

#### *International Commerce Terms*

The Incoterms consider standard conditions regarding delivery and transportation of goods, and also the risk connected. The objective with Incoterms is to prevent misunderstandings between supplier and buyer. Hence, to preclude misunderstandings and interpretation problems, the standard conditions are carefully defined. The newest version of Incoterms, from year 2000, includes 13 different standard conditions, which is seen in Figure 6-3. In the figure the Incoterms are organised in accordance with the type of transportation and the type of contract. (Van Weele, 2005)

Transportation method	Type of contract			
	Departure	Main Carriage Unpaid	Main Carriage Paid	Arrival
Sea Carriage	<b>EXW</b> - Ex Works	<b>FCA</b> - Free Carrier <b>FAS</b> - Free Alongside Ship	<b>CPT</b> - Carriage Paid To <b>CIP</b> - Carriage and Insurance Paid To	<b>DES</b> - Delivered Ex Ship <b>DEQ</b> - Delivered Ex Quay
Other Transportation	<b>EXW</b> - Ex Works	<b>FOB</b> - Free On Board	<b>CFR</b> - Cost and Freight <b>CIF</b> - Cost, Insurance and Freight	<b>DAF</b> - Delivered at Frontier <b>DDU</b> - Delivered Duty Unpaid <b>DDP</b> - Delivered Duty Paid

**Figure 6-3: The Incoterms from year 2000 (van Weele, 2005)**

If the contract is of the type Departure the standard conditions are always EXW. This means that the buyer is responsible for everything, included picking up the goods at the supplier's factory as well as arranging the transportation.

In the second group, Main Carriage Unpaid, the responsibility mainly lies by the buyer. The supplier has fulfilled the commitments when the goods have been delivered for transport at a settled location. Are the conditions FCA used the supplier

carries the costs and responsibility until the goods have been delivered to the transportation firm.

The Incoterms DDU and DDP are included in the fourth group. These are the opposite of EXW, and here the supplier is responsible for delivering the goods to the buyer's front door. The only difference with DDU is that the buyer pays the import duties.

At SIT the Incoterms EXW and DDU/DDP are mainly used. During year 2006 the management expressed a strategy which means passing on to DDU/DDP-agreement to greatest possible extent. The objective is that the supplier should take the risk and responsibility during the transportation. According to them it is also easier to define when goods are delivered when practicing DDU/DDP. A result of changing from any other Incoterm to DDU/DDP is increased purchase price. It is however not stated by management which increases of price that is acceptable in making this transformation possible.

#### 6.1.4 Order Processing, Expediting and Invoicing

The order process including the connections between goods flow, invoice and cash flow is illustrated in Figure 6-4 and further described in the following section.

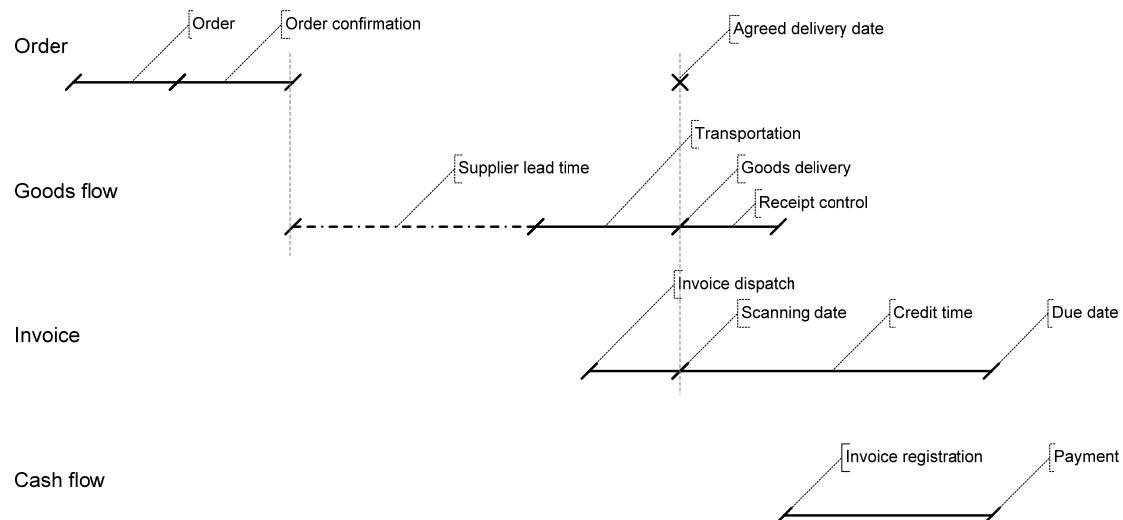


Figure 6-4: Description of the procurement process according to SIT

#### *Invoice information*

At first, when sourcing from a new supplier, the basic information such as the supplier address, bank account number and credit terms must be entered in SAP R/3. Responsible for this task is FPT together with FFL. When making agreements

the strategic purchasers receive the information and then it is their task to forward it to FFL, whom in turn enters the information in SAP R/3.

### *Order confirmation*

An order requirement is created in three different ways, from a delivery project where the machine is broken down into constituent parts, from a project team who needs a specific item, or through material planning when for example the level of inventory is too low.

Responsible for placing the order is GTMA. Regarding the suppliers which are connected via VSA they should receive orders automatically. For suppliers connected via the web-based system e-Net-“I”, an order is placed through the system. Otherwise orders are placed using fax. When the supplier have received and confirmed the order they are supposed to send an order confirmation. This is made in the same way as the order was sent, via e-net-“I” or by Fax. All conditions agreed in the contract should be included in the order. When the supplier has confirmed the order, it is preceded to the accounts payable. If the supplier would not confirm the order, the strategic purchaser must be involved and the previous settled conditions negotiated once again.

### *Delivery monitoring*

As the order and order confirmation are completed, the delivery of the goods depends on which lead time the specific supplier has for the required material. When the goods are ready, the transportation is performed according to the standard conditions agreed in the contract. At SIT there is, as previously mentioned, an ongoing project which means a switch from the standard conditions EXW to DDU. In that way it should, according to the management at SIT, be easier to determine when the goods have been delivered.

Normally the suppliers send the invoice to the invoicing address at the same time as they dispatch the goods. The day the invoice arrives at SIT, it is scanned and given a scanning date, which then is equal to the invoice date. After the invoices have been scanned the original papers are put into a cue and handled in order of priority. As the invoices are taken care of, they are registered in SAP R/3 with a credit time that starts ticking at scanning date.

### *Receipt control*

The order is considered as delivered when invoice, goods and belonging order documentation have arrived at SIT. When the goods arrive at SIT, Siemens assert that

a receipt control is made within five days. Previously there have though been complications with the receipt control, sometimes it could take weeks before the receipt control had been made. In addition, due to insufficient reception it is common that material planners at SIT spend hours every week, "hunting down" incoming goods.

Until now there have not existed any registration of arriving goods and therefore a match with the belonging invoice has not been possible. Due to insufficient methods to measure and register goods received, SIT has problems with early delivered items. Goods and belonging invoice may sometimes be sent to SIT weeks before appointed date and long before it is required. This results in payments being made too early as well as unnecessary stock keeping.

Concerning reception of order documentation this is made at the same time as the reception of goods. A check is made that demanded documentation with correct order number has arrived, although there is no sufficient control of what the document actually contains.

### *Due date and Payment*

If the goods and the documentations have arrived during the credit time, the invoice is paid according to the scanning date and the additional credit time. Should problems occur, for example a not completely delivered order before the credit time has elapsed, the invoice is not paid. The order is then blocked and removed to a certain list and the responsibility is handed over to GTMA. Mainly there are three reasons why an invoice is blocked:

- Missing documentation
- Wrong quantity
- Incorrect price

In case of late delivery of goods, but still within given credit time, no measures are taken. From a Cash Management point of view late delivery should lead to postponed payment. That is not the case at SIT today.

Penalties against suppliers are rarely used, mainly due to the fear of damaging the supplier relationships. The other way around, penalties from suppliers are generated as SIT is paying too late. These payments are commonly known as interest invoices and mainly used by Swedish suppliers.

### *Internal information*

The communication and cooperation between strategic and operational purchaser is individual. When the agreement has been settled the information should be passed on to the operative purchaser as well as to the financial department.

There is lack of understanding and knowledge between Purchasing and the work performed by the financial department, as well between strategic and operative purchasing. This is often explained to be an effect of undergoing work with defining roles and responsibilities between and within different departments.

For instance an approximate worth is much better than none, in case of exact worth missing. When the purchasers are not sure about the price they sometime register an order with the sum of 0 SEK. This practice creates unwanted and unnecessary large variations in the planning of payments at the financial departments.

### **6.1.5 Inventory Management and Lot Quantity**

Gas turbines, which are the main products at SIT, are capital intensive and have long lead times. Hence, the inventory management is very important to avoid huge costs in tied up capital. By interviewing employees at the material planning division information is gathered in purpose to map the present inventory situation at SIT.

### *Inventory*

At SIT in Finspong the inventories are managed by the department of GTMP. Their task is to monitor the inventories related to production of the core engine and to set the parameters of replenishment. Previous this work was based on ad hoc procedures, but today the goal at Siemens is to classify suppliers by their performance, such as delivery precision and amount of defective goods etcetera. The better performance, the less safety stock is needed.

The goods stored at SIT ties up capital equal to approximately 460 million SEK. Out of this the safety stock constitutes 70 to 80 million SEK. In total it is roughly 13 000 items. Of those approximately 6 000 are active items, and around 4 000 are steel items which mainly are used as tools in the production.

### *Obsolescence and waste*

At least two times every year, obsolete goods are identified in order to reduce the storage of unnecessary items. The procedure starts with compiling a list from SAP



R/3. This list is then filtered according to three conditions, stated below, and redundant material is cleaned out.

- Any consumption during the last two years.
- Current reservations, equal to existing requirements
- Included in MAS, the market adjusted standard

The foremost problem is inaccurate customer reservations which remains in the system and therefore can not be removed from the inventory. This leads to storage of the wrong articles.

### *Warehousing*

The high levels of inventories results in high warehousing costs. According to numbers given by a controller at SIT, the Total Cost of warehousing is calculated to approximately 50 million SEK a year. This includes costs of personnel as well as obsolescence and waste.

Five years ago an inventory cost rate was calculated in order to be used within inventory management at former Alstom. This resulted in an inventory cost rate at 17 percent including costs of warehousing. This rate is still being used today when setting lot quantities at GTMP. Though, except for at GTMP the knowledge of the inventory cost rate is scarce.

### *Lot quantity*

There are three different aspects of the Lot quantity decision-making. During the negotiation with the supplier, for which FPT is responsible, different terms related to lot quantities might be set. These are influenced by for example minimum production-batch-requirements set by the supplier, or simply a quantity discount. If one or another of these options is the case, the information is to be mounted as parameters into SAP R/3.

The next step is for GTMP to decide what lot quantity to be set for each and every article kept in stock. When deciding the quantity of each item held in stock, a combination of the Wilson formula and the rate of inventory turn over are used. The goods are classified into three different groups according to the accumulated worth per article. The aim is that A-items should have an inventory rate of turnover larger or equal twelve, B-items represents a turnover rate of eight and C-items turnover rate of six. Proper lot quantity is determined by the system as the least amount given by either Wilson formula or rate of inventory turnover. Notable is that the

determination of safety stock and lot quantities are separated when managing inventories at SIT.

As GTMA places the orders, which should be issued based on lot quantities set by GTMP, they are supposed to check the plausibility. In a perfect world this would not be necessary.

## *6.2 A holistic view of Cash Management*

Areas defined as indirect influenced by Cash Management are in following section discussed to create an overall picture.

### 6.2.1 Market price

As previously mentioned in section 5.3.3, the work performed by a purchasing department usually comes down to the purchase price. Even though it might not be possible to affect the Market price directly through Cash Management, an active Cash Management may imply improvements as well as cost savings that leads to a reduction of the market price.

### 6.2.2 Sourcing

SIT strives to increase global sourcing in purpose of reducing costs. Furthermore they would like to renew their supplier base in order to, when applicable, find better alternatives. The goal is to increase sourcing in so called Low Cost Countries (LCC) from today's eight percent to 30 percent in 2008. Examples of LCC in focus are Eastern Europe, Asia and South America.

At the same time there is a focus on reducing the total supplier base. All together this results in an increased pressure on both strategic buyers as well as on the current suppliers.

### 6.2.3 Controlling

According to the financial department the purchasers should have enough knowledge to make financial decisions by themselves. However, there is no existing support for purchasers at Siemens concerning financial decision-making. The strategic buyer is supposed to use tools as the WACC when deciding the most profitable alternative, concerning for example quantity discounts and inventory costs. According to strategic purchasers, there is no common way or any distinct guidelines of how to take these decisions at SIT. Hence, the decisions are made based on personal knowledge and experience.

#### 6.2.4 Training

The target for competence development at the purchasing department is ten days of training a year to the KPI's of Purchasing. According to current measurement they are having troubles of fulfilling this. For example there were during the autumn of 2006, three days of training dedicated to strategies in Purchasing. Furthermore one day was assigned to an economical education, which was arranged by the financial department.

#### 6.2.5 Lost of Sales

Circumstances that are not elucidated in the contract may lead to misunderstandings and complications. By settling distinct terms and being plain in the contracts many interpretation problems can be avoided. Suppliers insufficient of managing their commitments may result in delays in the own production at SIT and in a worst case scenario also late deliveries to the customers. This can lead to lost of sales as well as a bad reputation among the customers. Thus it is very important that SIT is able to rely on their suppliers and also to have adequate systems for controlling their performance. Otherwise it will not be possible for SIT to guarantee their customers a secure delivery.



## 7 FIELD STUDY

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*In this chapter it is presented how companies in the field study handle areas identified as the most significant ones according to the adapted Model of Total Cost. These findings together with the SIT mapping outcome constitutes the basis for developing solutions.*

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### *7.1 Scrutinized areas in the field study*

Five different companies are chosen according to the specifications described in section 3.2.2. Out of these, three accept to be a part of this study. As anonymity has been requested, none of them will be mentioned by name. All three of them represent big Swedish international companies and even though they act in other businesses than SIT, they all can contribute with relevant and applicable information regarding their Cash Management activities. Furthermore a consultant whose expertise lies within Cash Management is asked in purpose of advice.

Through the field study, following sub question is answered:

- *How are other companies managing these parameters?*

In the following sections the outcome of the field study is presented. Mainly the focus lies on interesting findings in some manner relevant to SIT. This can be things that studied companies manage very well, which SIT could learn from. Otherwise the results can be used as a confirmation of SIT doing things right.

As an overall opinion about working with Cash Management, Karin Sancho at Ernst & Young states the importance of having uniform processes and clear policies. Due to very low rates of interest, the focus on Cash Management has been set aside. However, over the last couples of years she has seen that financial departments at bigger companies are making efforts to reach out to their organisations, regarding how to better manage the cash flows.

#### 7.1.1 Terms of purchasing

Both company 1 and 2 have standardised agreements that they use to a wide extent. The standard contracts are short, less than ten pages, and all the details are cleared in belonging appendix. Also company 3 uses different standard agreements, which they

have adjusted to the things being purchased. The extent of these agreements differs but they are around 15 pages plus appendix.

Regarding the number of suppliers covered by valid agreements, company 1 and company 2 estimate an 80 respectively 95 percent coverage. Company 3 on the other hand does not measure agreement coverage and can not approximate it. Due to lack of time agreements are missing in some relationships, but along with the purchase order it always follows a standard document concerning their practiced conditions.

In contrary to SIT, company 1 defines the invoice date as the date printed at the invoice. At company 2 the invoice date is equal the date as goods are received and registered. Company 3 defines the invoice date to be the date when goods have been received, according to valid Incoterm, and also controlled.

Company 2 has a standard credit time of 60 days, but in some collaboration it only reaches 45 days. At company 1 a credit time of 30 days is standard. They like to avoid smaller suppliers to act as a bank and therefore this credit time is sometimes shorter. Although they are not using this fact to utilize cash discounts.

Cash Discounts are not common among the studied companies. In general this is not a condition in standard contracts but cash discounts could though be practiced at supplier's request. As an example one supplier in the US offered a cash discount with the objective to shape up their financial results.

As a result of the fast growing supplier markets in Asia, Sancho (2006) explains that larger banks have started to offer a service of being the middle-man when using cash discounts. The smaller Asian supplier is generally in urgent need of cash, to keep its business going, and at the same time the big customer wants to prolong credit times. For example, when the customer requires 30 days of credit time, the bank pays the supplier after 15 days and charges the customer first after 30 days. This given that the bank gets a discount when paying the supplier. In that way the bank meets both needs, by utilizing a cash discount.

### 7.1.2 Forecasting

The strategy to attain supplier flexibility at PGI4 is, as previously mentioned, the forecasting tool VSA. Instead of using "committed zones" in their forecasting, company 1 is buying capacity from their suppliers.

For products of strategic importance Company 2 shares delivery plans with their suppliers. This means that the suppliers are planning their activities according to forecasted delivery and in return Company 2 is committed to buy certain items. By defining clauses of flexibility in the supply contract it is possible to modify the agreement concerning both volume and time.

Due to a vast variety of the goods being bought, the use of forecasting to a great extent is depending on which group of products one is talking about at company 3. For example the use of forecasting for products with characteristics similar to products bought at PGI<sup>4</sup> is scarce.

### 7.1.3 Transportation

At all companies in the field study, the Incoterm FCA is used. All of them only accept delivery at the agreed day. Compared to the case with DDU, it is in this way impossible for the suppliers to blame the transportation firm for a late delivery. Regarding the time of transport the companies handle it in different ways. Company 1 specifies the day when they need the goods. To ensure exact delivery at their firm they see to that the suppliers add the transport time to the lead time. Instead company 2 gives the exact date to the supplier, as they are ought to put the goods on the carrier. Company 3 gives the supplier the date, when the transport firm is coming to pick up the goods.

### 7.1.4 Order Processing, Expediting and Invoicing

All invoices addressed to company 1 are, as previously mentioned, sent to an external division where they are scanned into the system. The invoice is paid according to the printed date. However the invoice is only paid if the goods have arrived within the credit time. There is no direct match between the invoice date and date of goods reception. Hence the date of payment is never postponed as a consequence of late delivered goods. As goods arrive it is registered in the ERP-system, afterwards a notation is made when a receipt control have been performed and the goods put into stock. Approximately they calculate one day for internal handling of goods.

At company 2 the items which represent 90 percent of the total value of goods bought must be marked individually and possible to track. At the goods reception items identification numbers are registered in the business administration program. Likewise, when belonging invoice arrives it is registered at the identification number. By this procedure the invoice electronically can be matched to correct goods. In similarity with company 1, company 3 defines a full order as goods are received. At

company 2 an order is seen as complete when goods are on the carrier and a correct invoice has arrived. Notable is that the invoice date is defined as the date of goods reception, even though the Incoterm FCA is being used. This makes them the only company of the field study where the reception of goods has an impact on the invoice date.

Concerning the outflow of money, company 1 pays their invoices two times a week. This leads to some early as well as some late payments. In the agreements this is not explained to the suppliers and consequently delayed payments result in unnecessary penalties. At company 2 penalties from suppliers are rare. Even though late payments sometimes occur, it seldom results in any penalties. Quite the reverse seems to be the reality at company 3. Regularly they are paying interest invoices which the suppliers are entitled to according to the contract.

Recently company 1 has started to dispatch penalties to suppliers who do not fulfill their commitments. This procedure has resulted in evident improvements from several suppliers, for instance a much better delivery precision. Company 2 is usually not making use of penalty fees towards their suppliers. Standardised contracts handle this, as a precaution for liquidated damages, but normally interest invoices are not dispatched. At company 3 this is used to a wider extent. If the supplier causes any damage or stops the production through a late delivery, they will receive a penalty fee.

#### 7.1.5 Inventory Management and Lot Quantity

One of the companies, Company 1, handles spare parts and naturally their inventory management differs a bit from what is suitable at SIT. Noticeable is though how they are working with their logistic structure. They are focusing on postponing the decision point in order to transport parts as late as possible. By stock-keeping low valued goods and postponing the value adding activities, the tied up capital is kept low. Company 1 has a separate inventory planning system, Synchron, which is a software system that continuously analyses different inventory parameters and also communicates with the other business administration systems.

At Company 2 the operative purchasers are also those responsible for material planning. Consequently they are setting the lot quantities and have a significant role in inventory management. The material planners are responsible for managing the inventory at company 3, and to do so they cooperate with the purchasers. Requirements from the supplier, as product batches and fixed lot quantities, are to greatest possible extent handled in the agreements.



## 7.2 Compilation of the Field Study

Figure 7-1 presents a compilation of how the different companies handle the studied areas. Based on this, a comparison with factual practice at SIT can be made.

	Company 1	Company 2	Company 3	PG14 Siemens
<b>Active Cash Management</b>	Not at the purchasing department	Focused to the treasury department	Yes. Project to improve CCC - Cash to grow	Not at the purchasing department. Increased focus from management
<b>Standardized agreements</b>	Yes, 9 pages excluding Appendix	Yes, 7 pages excluding Appendix	Yes, different standard agreements for different products	Not commonly used
<b>Valid agreements</b>	80%	Long-term contracts. Approximately a 95% coverage	No measurement of agreement coverage	Striving to reach coverage corresponding 80% of the volume
<b>Cash discount</b>	Not used	Not specified in contracts. Occasionally used at suppliers request.	Have been used. Nothing they strive for, not included in the standard agreement	Not used
<b>Credit time</b>	30 days	60 days. Sometimes 45 days.	Free delivery plus 90 days	60 days. Occasionally 30 or 45 days, sometimes up to 90 days
<b>Goods reception</b>	1 day	1 day	From 1 hour to 1 day (JIT - delivery)	Approximately 5 days (2-14 days)
<b>Order fulfillment</b>	Goods on carrier and invoice at the invoice address	Registration of goods and correct invoice.	According to Incoterm	Goods delivery, incoming invoice and documentation
<b>Invoice date</b>	Date printed at the invoice	Registration of goods received.	Goods received and controlled	Scanning date
<b>Inventory management</b>	Separate inventory administration system, Synchron	Operative purchasing are responsible for material planning and inventory	Increasing focus on TCO	Wilson formula and inventory turnover rate
<b>Incoterms</b>	FCA	FCA	Mainly FCA	DDU, EXW and sometimes FCA
<b>Forecasting</b>	Buying capacity	A-items: Committed delivery plans. B&C-items: MRP information	Direct material - accurate planning. Indirect material - Insufficient forecasting	Forecasting tool VSA
<b>Delivery control</b>	Control of late deliveries. Early deliveries is seen as a bonus	Control of both late and early delivered goods.	Strict control. Early deliveries are avoided, by self picking up the goods.	Control of late deliveries. No follow-up of early deliveries
<b>Penalty fees sent to suppliers</b>	Yes. Introduction of penalties resulted in much better delivery precision	Contracts include liquidated damages, but penalty interest are not used.	Yes, are practiced according to the agreement.	Not common, have recently been used in a few cases.
<b>Penalty fees paid</b>	Not common	Does not exist.	Penalty fees are common. Are practiced according to agreements.	313 000 SEK in fiscal year 2005/2006

Figure 7-1: Compilation of the Field Study



## 8 ANALYSIS

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*This chapter aims to come up with possible solutions, suitable for Purchasing at PGI4. To do so the material gathered in the frame of reference, mapping and field study are interconnected and analysed. This procedure is described and the findings are presented.*

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### 8.1 Development of solutions

Based on the information gathered at SIT and in the field study, the aim is to point out connections with support from theory. By doing so, the last sub question of the thesis is answered:

- *How can Purchasing at PGI4 meet improvements by utilizing Cash Management?*

In the same way as in previous chapters connections and possible solutions are sought according to respective areas identified in the adapted Model of Total Cost.

#### 8.1.1 Terms of Purchasing

##### *Improve and simplify frame agreements*

As described by Dolfe & Kortitz (1999), it is important that everyone involved in the purchasing process are well informed about policy and guidelines concerning credit and payment terms, and these are to be clearly stated in the supply agreement. The field study has revealed a frequent use of standard agreements, developed for the situation at the specific company. Even though there are intentions at PGI4 to make use of the Umbrella Agreement, it is far too extensive and generally very hard to apply in real case situations.

To start with, Purchasing at PGI4 needs to simplify their standard agreement so that it easily can be used. It may not be possible in every relation, as stated by van Weele (2005); *“when drawing up a contract, several terms and conditions must be considered and therefore it is not always possible to use standardised contracts”*, but still it can be used in a wider extent than at SIT today. One alternative is to, like companies in the field study, have a few different standard contracts, adjusted to different purchase situations. In that way one lighter version can be used when purchasing non strategic items and in situations with lack of time. Moreover, a more comprehensive standard agreement can be developed to fit important purchases and strategic components.

All contracts should include the special requirements from SIT, for example; definition of invoice date, description of a complete order and the payment procedure at SIT. Furthermore the contracts are ought to have the same layout, and also terms and conditions that always are the same should be stated. Other special conditions and more detailed information can be handled in belonging appendix.

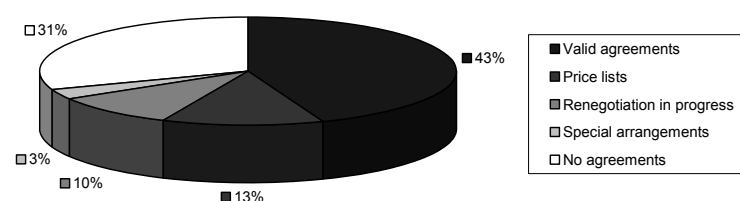
By utilizing standard agreements, with a uniform layout, it is easier to find specific information and in that way the work, both for the operative as well as for the strategic purchasers, will be facilitated.

### *Increase agreement coverage*

Without a starting point it is hard to define what and how to improve. In the case of purchasing, the supply agreement is a good starting point. This, of course, requires an existing supply agreement. Based on these assumptions, some companies have chosen to use “agreement coverage” as a KPI. What you do not measure, does not exist.

At FPT the goal is to cover 80 percent of the purchased volume with contracts. The manager also clearly states that some type of contract is preferable even in those cases where the collaboration previous have been sufficient. However, agreement coverage is not measured at SIT today and therefore it is hard to tell to which extent the goal of 80 percent is achieved.

All together eight of the strategic purchasers at FPT are doing business with 138 suppliers. Out of those only 59 have valid agreements. Some purchases, around 13 percent, are done according to a pricelist. Commonly this procedure concerns few articles and small volumes. About ten percent of the agreements are under renegotiation and also a few other special cases do exist. Finally there are in total 31 percent of the suppliers, which are not covered by any agreement. The motives for not having any agreement are many, often reasonable but not in all cases. The most common reasons for missing contracts at FPT are small volumes, lack of time or that the cooperation has worked out well so far. In Figure 8-1 the agreement coverage at FPT is visualised.



**Figure 8-1: The agreement coverage at FPT**

With a few different standard agreements it should be easier to introduce an agreement, at least the lighter version, to any supplier. In that way several uncertainties are avoided. Also everyone involved are aware of that the valid conditions are printed in the contract. Utilization of standardised agreements is a requirement that will make it a lot easier to increase the agreement coverage.

### *Utilize Cash discounts*

According to Dolfe & Koritz (1999), cash discounts are often very valuable for the purchaser. At the same time cash discounts are sometimes of disadvantage to the supplier, but still it is very common in several countries. But there are though, as confirmed by both Sancho (2006) and the financial manager at SIT, win-win situations where the supplier as well as the buying firm can benefit from a cash discount. Seen from the perspective of SIT, situations like these concern foremost suppliers with a high cost of capital, for instance suppliers in low cost countries. Especially in those cases cash discounts should be utilized.

All companies in the field study rarely make use of cash discounts, mainly based on an unawareness of its potentials. When interviewing the finance manager at SIT, who has worked with Cash Management for a long time, he states that purchasers often can benefit from using cash discounts. He also suggests that an eventual cash discount should be discussed first after having set the price and the credit time. In that way the cash discount is separated and it will then be easier for the purchaser to gain advantage from it.

An example from Asia makes it clear that it is possible to benefit from cash discounts. As stated by Sancho (2006) it is getting common that larger banks offer a service of being the middle man when using cash discounts. In that way the smaller Asian suppliers, whom are in need of cash to keep their business going, can collect the money earlier. Namely by the bank, which in turn demands a cash discount. The customer, whom sought for longer credit time is satisfied and pays the money directly to the bank. The bank would not offer this kind of service if they could not benefit from it. Hence, for a cash rich company there is no meaning in using such a bank, they can offer this service themselves and keep the profit.

The Cash-discount-key from Dolfe & Koritz (1999), presented in section 4.4.2, is a tool for calculating the corresponding annualised interest rate for different cash discounts. In Figure 8-2 the Cash-discount-key is extended to include the days of discount that should be applied according to Siemens Umbrella agreement. For a Weighted Average Cost of Capital (WACC) of eight percent, all alternatives marked

in the figure imply that it could be profitable to utilize cash discounts. The possible benefit is the difference between the given annualised interest rate and the WACC at Siemens. It should though be considered what kind of costs this might cause due to a possible increase of administrative handling.

Cash discount	Days							
	10	15	20	30	45	60	76	90
0,5%	18	12	9	6	4	3	2,4	2
1%	36	24	18	12	8	6	4,7	4
1,5%	54	36	27	18	12	9	7,1	6
2%	72	48	36	24	16	12	9,5	8
2,5%	90	60	45	30	20	15	11,8	10
3%	108	72	54	36	24	18	14,2	12

Figure 8-2: Extended Cash-discount-key

The following terms of payment should according to the Umbrella agreement be applied at SIT:

- *within 14 days of the invoice date with a deduction of 3.0 percent prompt payment discount, or*
- *within 30 days of the invoice date with a deduction of 2.0 percent prompt payment discount, or*
- *net within 90 days of the invoice date with no deduction*

The first formulation, 14 days -3% or 90 days net, is the same as taking a loan for 76 days to a cost of 3%. The annualised interest rate is then, as seen in Figure 8-2,  $360/76 * 3\% = 14,2\%$ . The second formulation, 30 days -2% or 90 days net, represents taking a loan for 60 days to a cost of 2%. The annualised interest rate is then equal to  $360/60 * 2\% = 12\%$ , also seen in Figure 8-2.

In the case of SIT using the second formulation when purchasing to an amount of one million SEK, they would receive a deduction of 20 000 SEK. At the same time the cost of capital for these 60 days can, with a WACC of eight percent, be calculated to  $1\,000\,000 * 8\% / (360/60) = 13\,333$  SEK. Hence, it would be profitable for SIT to take a bank loan to be able to utilize this cash discount. The actual saving in this case is equal to almost one percent of the buying amount.

### *Clarify the worth of Credit time*

The trend at PGI4 is to prolong the credit time as long as possible, preferably 90 days, all this in accordance with many authors. Even though there is a very big reluctance against this from suppliers, an increase is usually possible. The question is to what cost.

To exemplify how much a prolonged credit time is worth to a company with large cash flows the equal savings for one extra days credit time is calculated. In fiscal year 2004/2005 SIT purchased material for about four billion SEK and had a WACC of seven percent. Assuming that SIT would have paid every single invoice one day later this would generate savings of 800 000 SEK.

However, if improvements somewhere within the supply chain would result in not only saving one day of payment but also one day of inventory, the savings are even bigger. With four billions SEK of purchased material and an inventory cost rate of 17 percent, one day would instead generate savings of 1,9 million SEK.

Seen from a bigger perspective, Siemens AG CEO Klaus Kleinfeld recently wrote, that; *“if each of our Siemens businesses were to process and collect their customer bills just one day faster, it would mean about EUR 280 million in additional cash for the company.”* Many define Siemens as being “cash-rich”, causing several doubts in why the focus should be on Cash Management. However, Sancho (2006) explains that as the industry puts a lot of effort and recourses in improving production processes (TPS, Lean etcetera) they should also focus on having an effective Cash Management. A chain is never stronger than its weakest link.

As said by Sancho (2006), it is of greatest significance to have distinct guidelines and policies regarding how to use and value credit times. Everyone must be aware of the actual WACC and inventory cost rate and also how to use them in calculations. Only then it is possible to use the two rates as a controlling instrument. For instance is an increased cash flow stimulated by raising the WACC. A basic requirement is that everyone are aware of this information, and also that they use it.

### *Summary – Terms of Purchasing*

- Improve and simplify frame agreements
- Increase agreement coverage
- Utilize Cash discounts
- Clarify the worth of Credit time

## 8.1.2 Forecasting

### *Reduce the risk associated to future cash flows*

Forecasting future cash flows should, according to the financial department at SIT, be a part of the strategic purchasers’ tasks. By approximating payments in time and also to amount, they will facilitate the work at the financial department.

As mentioned in section 4.4.6 *“a reduction of volatility and vulnerability of future cash flows imply lower risks which results in a lower cost of capital”*.

To be able to handle and manage the company's cash flows in best possible way, the financial department depends on forecasts. Through these risks are avoided and also great cash flow fluctuations can be detected and the consequences lowered. It is very important that correct information is available in the system and therefore it needs to be made clear who to hold responsible for this task.

Shortage of policy and guidelines for deliveries between processes entail a risk for information loss. By going over the settled conditions together the strategic purchasers significantly could facilitate the operational work. A shorter run-through of the most relevant parts in the contract would reduce the risk for misinterpretations and moreover upcoming questions could be clarified immediately.

By communicating relevant and reliable information, the purchasers have a very important role in making the work at the financial department easier. One part is to see to that information entered in SAP R/3 is trustworthy. Most important though is to esteem the day of payment and to approximate the sum.

### *Improve the information regarding VSA*

Due to various reasons, there are several problems at PGI4 related to the implementation of the forecasting tool VSA. The companies in the field study are using other, not so complicated, tools in order to fulfill the main purpose of VSA, which is to increase supplier flexibility. Until now, the new forecasting tool at PGI4 has only caused unnecessary procurements due to commitments. This in turn leads to unnecessary capital being employed.

As in the field study, company 2 only makes commitments according to their delivery plans towards suppliers with products of strategic importance. Towards other suppliers the MRP-planning is shared. In that way less important suppliers can take part of the forecasting without that company 2 has to make any commitments.

Seen from a Cash Management perspective VSA is a great tool, as long as it works as it ought to. In that case it should be possible to optimise the buying point and never to pay for items before they are required in the production. But, as the current situation at SIT implies, the forecasting tool VSA suffers from different teething problems and therefore it rather have negative influences on Cash Management. SIT is committed to buy things that are not demanded and this in turn leads to increased



inventory costs and risk for obsolescence. Furthermore, when supply schedules are changed it is not certain that the suppliers conceive this corrected information which might be the cause of many early deliveries. However, at this point of time it is not measurable since the VSA deliveries are not included in the system.

To start with SIT must ensure that VSA performs the functions of the demanded forecasting tool. Put resources in fixing VSA, otherwise it will lead to increased costs combined with a greater workload. An improvement concerning the information regarding VSA is needed and also SIT must clearly state the reasons for using the tool. To create a belief in the forecasting tool, awareness of VSA's advantages must be spread among the employees. Further an explanation of how to market VSA towards different suppliers is wanted. There is an existing description of how to implement VSA but its usage needs to be encouraged.

#### *Summary – Forecasting*

- Reduce the risk associated to future cash flow
- Improve the information regarding VSA

### 8.1.3 Transportation

#### *Clarify the use of Incoterms*

The choice of Incoterm affects the flow of goods and therefore the flow of cash, mainly in terms of when suppliers are to be paid. At PGI4 there are clear doubts about the directive of only using DDU/DDP, this because no one is sure about the motive. Companies of the field study do not prefer these Incoterms as they result in increased transportation costs.

According to an example at one of the studied companies, it is not necessary to let the choice of Incoterm affect the date when payments are due. Company 2 pays the suppliers first when goods have been received, even though the Incoterm FCA is used. All the companies in the field study use FCA and they all have different ways to define the invoice date and how to handle payments.

As stated in section 4.4.2 *“It is important that everyone involved in the purchasing process are well informed about policy and guidelines concerning credit and payment terms”*. Of highest significance are to clarify what different Incoterms imply and also how the belonging conditions are to be interpreted. By not defining what is right and what is wrong and who to hold responsible, a conflict may arise. For example the suppliers want their payments as they have fulfilled their commitments. In the case of EXW

this is when they have put the goods at their front step waiting for SIT to pick it up. Because SIT sees this delivery as completed first when goods and invoice arrives in Finspong this might lead to unnecessary cost, in form of interest invoices, or even worse bad-will and an impaired relation to the supplier. To avoid similar problems, the use of Incoterms needs to be defined and clarified. Preferably this is discussed when setting up agreements and at that time made clear in the contracts.

### *Practice the most profitable Incoterm*

At SIT the directives are to use DDU or DDP as far as possible. There are several cases though where this is not profitable, neither for SIT nor for their suppliers. Often SIT has better transport agreements, which can not be utilized with this strategy. Consequently the supplier adds the increasing transportation costs to the price. Before switching from, for example, EXW to DDU the actual cost increase must be clarified. To start with, the motive of only using DDU must be made clear to all employees concerned. Furthermore there might be other alternatives for reaching the goal sought after. This can though only be achieved by explaining the goal to the ones striving to attain them.

The field study shows that involved companies mainly practice the Incoterm FCA, and that they all have different ways to handle the time of transport and definition of delivery. For example one company tells their suppliers when they need the goods and the suppliers are then responsible for adding the time of transportation to the lead time. Mostly the motive for using FCA is better control. By letting the supplier know the exact date for picking up the goods the delivery precision can be improved. Also it is made clear when the supplier have fulfilled its commitments.

Of greatest importance is to explain the requirements to the suppliers, thereafter the terms and conditions belonging to a certain Incoterm can be adjusted to suit the relation between SIT and the specific supplier. This is seen at the companies in the field study, which all uses FCA but practice it in different ways. The advantage of practicing both FCA and DDU is that the transport can be arranged from the company with the most profitable agreements.

### *Summary – Transportation*

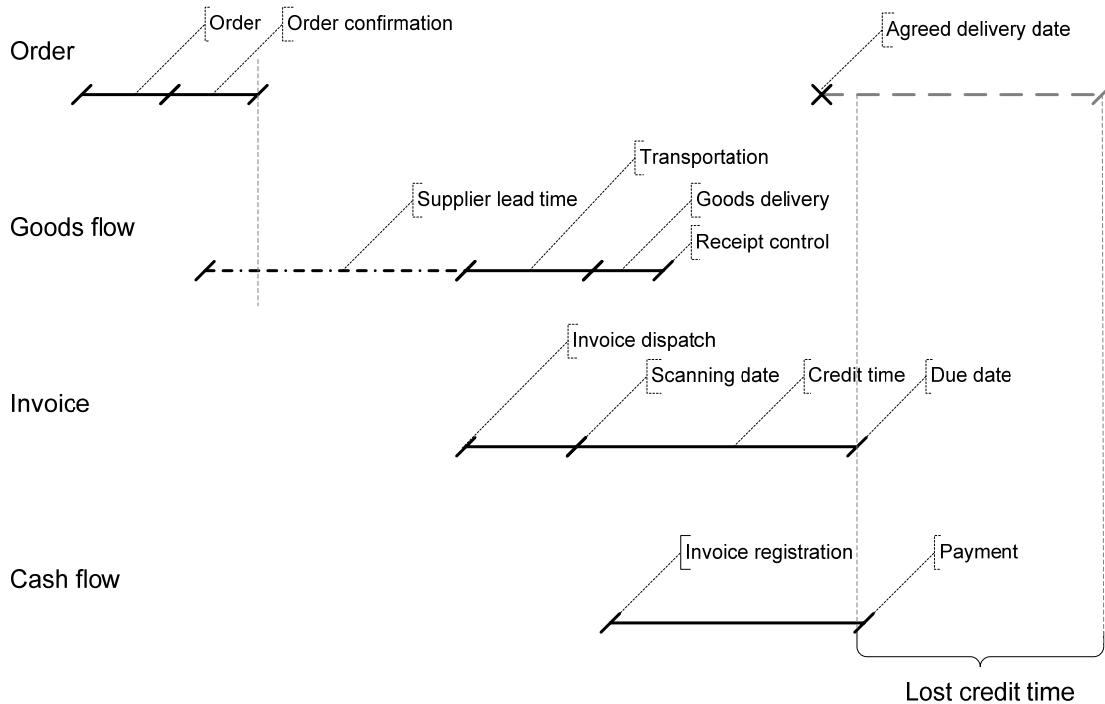
- Clarify the use of Incoterms
- Practice the most profitable Incoterm

### 8.1.4 Order processing, Expediting and Invoicing

#### *Define and practice the concept of complete delivery*

As a result of the field study, one can tell that at many companies it is not completely clear to their purchasers exactly when invoices are paid. SIT in Finspong is no exception. This unawareness causes early payments, as well as late ones, and they are both almost impossible to follow up due to insufficient internal processes.

In comparison with Figure 6-4, Figure 8-3 illustrates how credit time sometimes is lost due to the current definition of a complete delivery. As goods and invoice are received, the payment is released based on the scanning date. Hence, as described in the next section, many deliveries are paid too early.



**Figure 8-3: Illustration of Lost credit time due to current definition of complete delivery**

As an invoice arrives at SIT it is scanned into the system and then paid according to the agreed credit time. Any corrections of the day of payment do not currently exist at SIT. Although goods or documentations are delivered late, no measures are taken as long as the delivery occurs within the credit time. From a Cash Management point of view this is not preferable, as the actual credit time should start counting first when the complete order has arrived. Dolfe & Koritz (1999) clearly state this; *“when receiving the invoice the receipt date should be compared with the delivery date. Predating of invoices is not acceptable. In that case the credit term should be prolonged”*.

A registration of arriving goods as well as arriving documentation in SAP R/3 would make a match between items and belonging invoice possible. Similar to company 2 in the Field study, the receipt control can be made afterwards and marked with a special notation in the system.

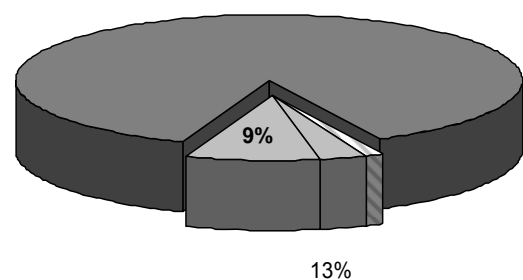
### *Never pay too early*

Never to pay too early is desirable in any business. As Dolfe & Koritz (1999) point out in 4.4.2; *“The most important Cash Management rule concerning disbursement is that payment should be made at the right time, not earlier and not later”*. Even though it sounds simple, in reality it is not that easy. For example a system to control early deliveries is missing at SIT. When the order and belonging invoice are delivered the payment is made, even though the items are not demanded at that time. This kind of too early negative cash flows indicate poor Cash Management. At the same time the inventory level increases and capital is tied up.

As stated in section 4.4.2 *“invoices should always be paid exactly on the due date. Hence it is very important to be absolutely sure about how to calculate the due date”*.

SIT needs to define what the actual due date is, both within the company and towards suppliers. Invoices are never to be paid too early and therefore better processes for matching the invoice to requirements and received items are crucial.

During one month, 2006-07-25 until 2006-08-25, SIT received 2245 deliveries whereas 285 (13%) of these were delivered early. Early is defined as at least five days prior to the agreed delivery date. The matter is that 196 of these early deliveries, in other words nine percent, also were proven to be paid in advance. This is illustrated in Figure 8-4.



**Figure 8-4: Nine percent of deliveries are proven to be paid too early**

These nine percent of early deliveries represent goods worth more than 11,2 million SEK, and on average these are paid 48 days ahead of the agreed date. For the same payments the median is 21 days. Hence the dispersion of early payments is large. Another noticeable fact is that the same payments have an average credit time of 48 days. Accordingly one could say that all these invoices were paid cash.

This is not only indicating bad Cash Management, also the early delivered goods tie up capital in inventory costs. For this month the cost is approximately 200 000 SEK.

Based on the assumption that this month is representative, the annual cost will be 2,4 million SEK.

By avoiding too early payments the incentive for suppliers to deliver before the given date is lowered. Likely the suppliers will not deliver early when they are not getting paid for the goods. If that is the case, never pay too early will also be a motive for keeping the stock levels down.

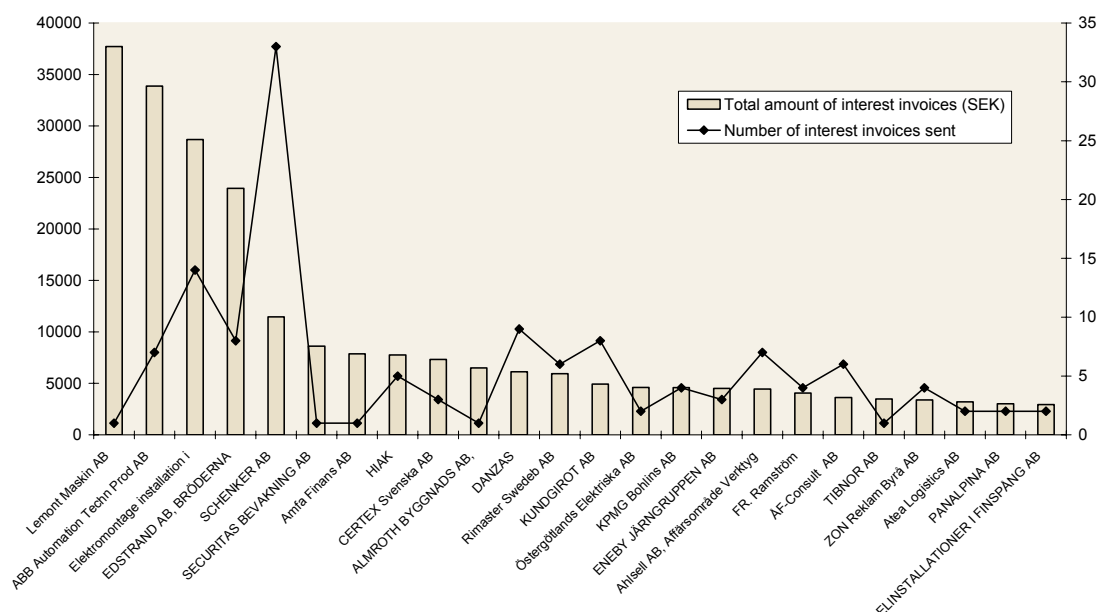
### *Eliminate interest-invoices*

Due to vague definition of invoice date and uncertainties in the internal processes, several invoices at SIT are paid too late. This results in unnecessary costs, which could have been avoided by an improved communication and more distinct guidelines.

Even though the use of penalty fees, in this case interest invoices, usually is limited to Swedish suppliers, late payments may cause bad relations and create a strained position when negotiating. Hence interest invoices are to be avoided to the greatest possible extent.

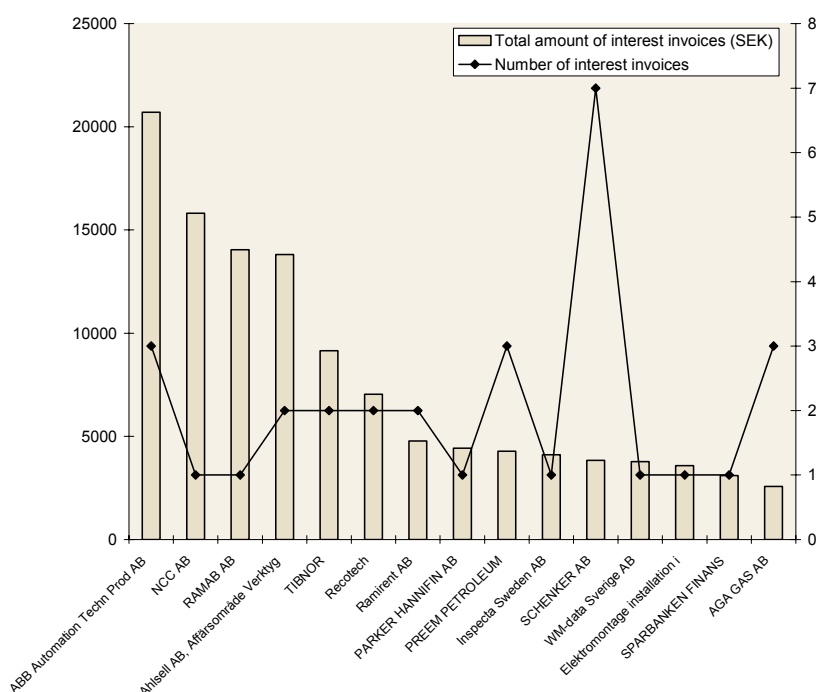
As stated in the frame of reference, section 4.4.2, *“For the supplier to be allowed to charge invoicing fees these must be negotiated and agreed in the proposal. In order to avoid this type of costs, the purchaser should insist that these fees are removed from the proposal”*. Hence the purchaser can already when settling agreements try to avoid this type of fee. If it is not possible, then the task is to make clear to the supplier how the invoices are paid at SIT (two times a week according to the scanning date). Furthermore the purchaser should communicate what has been agreed upon in the settlement to the parties concerned at SIT.

During the previous fiscal year SIT received 307 interest invoices from in together 137 companies. The total amount reached 313 300 SEK and from this 75 percent of the interest invoices, in other words 234 000 SEK, came from 20 percent of the companies, more precisely from 24 of those companies which had sent invoice fees during the year. In Figure 8-5 the interest invoices which represent 75 percent of the total amount, received during fiscal year 2005/2006 are illustrated. Some of the mentioned companies have, as seen in the figure, only sent one large interest invoice while others have sent several, to the amount smaller.



**Figure 8-5: Suppliers with the largest amount of interest invoices, fiscal year 2005/2006**

Concerning the current fiscal year, SIT has between 2006-10-01 and 2006-12-14 received 114 interest invoices which in total reached 167 700 SEK. When performing the same calculations as above, 20 percent of the suppliers (in this case 15 suppliers) represent almost 70 percent of the total amount paid. The dispersion of these interest invoices according to amount and number are illustrated in Figure 8-6.



**Figure 8-6: Suppliers with the largest amount of interest invoices, 2006-10-01 - 2006-12-14**

An increased focus should especially be given to suppliers that are sending SIT interest invoices on a regular basis. As an example SIT should investigate their

handling towards Schenker AB, whom on an average sends three interest invoices per month. Other frequent penalty users are ABB Automation Technologies, Bröderna Edstrand and Danzas. At first SIT should examine the reasons why several companies send recurrent interest invoices. Moreover SIT must look into their internal processes with the objective to prevent these unnecessary costs.

*Summary – Order processing, Expediting and Invoicing*

- Define and practice the concept of complete delivery
- Never pay too early
- Eliminate interest-invoices

### 8.1.5 Inventory Management and Lot Quantity

*Use the inventory cost rate to calculate real costs*

At SIT the WACC, set to eight percent in year 2007, is used to calculate the inventory costs for tied up capital. No inventory cost rate is used when managing inventories, instead fixed markups are used to estimate the costs of stock keeping items. These markups are independent of how long the item is kept in stock and therefore the costs are deceptive. A better alternative would be to use an inventory cost rate. Among the strategic purchasers very few are aware of which inventory cost rate to use at SIT, and others do not even know that one exist. For instance the WACC was raised from seven to eight percent in the beginning of fiscal year 2006/2007. In December 2006 none of the strategic purchasers asked knew anything about it.

Obviously there is a need for information and guidelines at SIT. It needs to be clarified how to use the WACC and the inventory cost rate in calculations. First when this is done it is possible to use the both rates actively, as a tool of management. When the WACC and the inventory cost rate are used regularly it will be easier to mediate different objectives. As an example an increased cash focus can be created by raising the WACC.

*Increase purchasing involvement in inventory management*

Company 1 in the field study postpones the value adding activities and can by those means put low valued goods in stock. Hence the tied up capital are kept proportionally low. In simpler words, they are striving to keep the inventories as early as possible within the supply chain.

Whereas both company 1 and 2 are involving their purchasing departments in the management of inventories, the high levels of inventory at SIT are today solely

managed by the materials planning department GTMP. With the lack of interaction between these two functions, information from strategic purchasers that would be valuable to GTMP can not be utilized. For example, information regarding inventories kept by the supplier never reaches GTMP. The other way around, information about which suppliers and what materials that are building up the major part of inventories, never reach the purchasers.

At company 2 in the field study the material planning role is integrated with operative purchasing. In that way they avoid these kinds of communication problems. Perhaps this integration is not necessary at SIT, but an improved integration of inventory management, into both operative and strategic purchasing, would give opportunities to reduce inventories. A first step for strategic purchasing is to create an ownership for the inventories created by each and every of their suppliers.

The inventories that today are managed by GTMP, constitutes a value of approximately 300 million SEK. In Figure 8-7 the ten suppliers with highest value of inventory are presented, as well as the amount of articles. These ten suppliers represent 40 percent of the 300 million SEK. If a reduction of inventory for these ten suppliers with an average of five percent would be accomplished, six millions SEK would be set free, representing an annual inventory cost of one million SEK. Even though a reduction of five percent may not be feasible against all suppliers, an involvement of strategic purchasing in inventory management will lead to improvement to the supply chain as a whole. This based on the fact, among others, that as it has been settled for suppliers to keep inventories on behalf of PGI4, the levels of inventories have not been altered.

Notable is that out of these 300 million SEK of inventory, 30 million could not be connected to any specific supplier due to lack of information in SAP R/3.



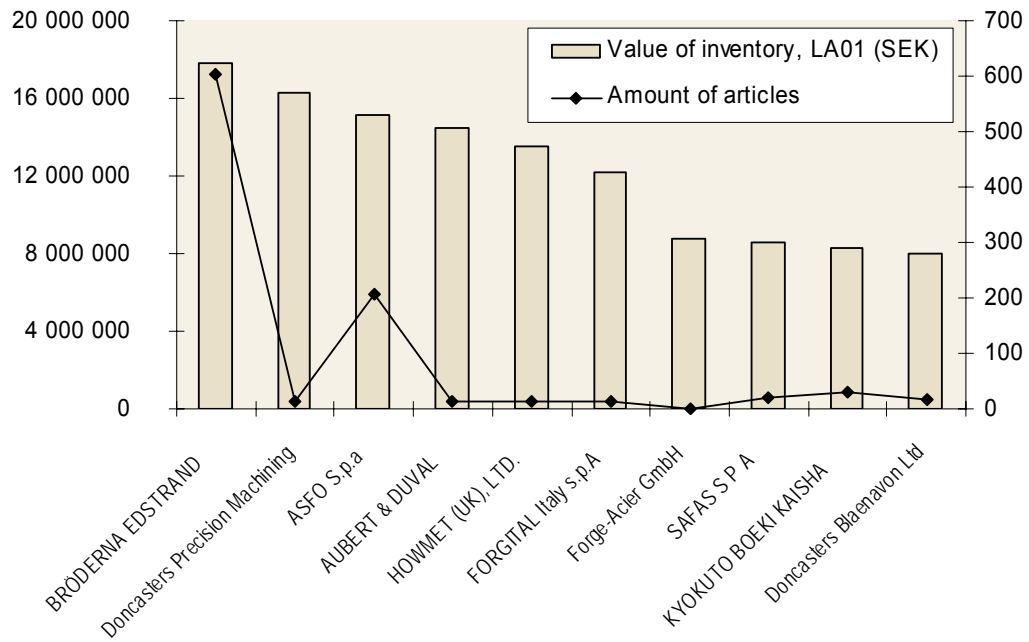


Figure 8-7: Top ten inventory suppliers, December 2006

*Summary – Inventory Management and Lot Quantity*

- Use the inventory cost rate to calculate real costs
- Increase purchasing involvement in inventory management



## 9 CONCLUSIONS

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*Finally the recommendations are presented to the reader. Here the two main questions of the thesis are answered in order to fulfil the purpose.*

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### *9.1 Cash Management's connection to purchasing*

Purchasing, with main responsibility for the supply base, have a large impact on the company's Total Cost. As referred to in 4.1 this is a natural consequence since the purchased goods constitutes such a large part of the final product value. In this context it is significant to discuss the concept of Total Cost. This thesis however, focuses on Total Cost with objective to create an overall picture rather than to calculate actual costs. To summarise the outcome of the pre-study the first main question is answered.

- *How is Total Cost affected by Cash Management from a Purchasing perspective?*

In fiscal year 2005/2006 purchasing at SIT bought material for approximately four billion SEK, which corresponds to around 60 percent of the company's turnover in the same year. SIT is selling and also purchasing cash intensive products which imply large cash flows. Hence an appropriate way of managing the flow of funds is required. Although SIT is currently classed as a cash rich company, they can obtain several advantages by working active with Cash Management.

#### 9.1.1 An adapted model of Total Cost

By using the concept Total Cost of Ownership, combined with different models of Total Cost a model adjusted to Purchasing at PGI4 is developed in chapter 1. This Model of Total Cost, seen in Figure 9-1, is suited to concern the areas relevant to purchasing, directly or indirectly affected by Cash Management.

As Cash Management generally has been an issue of financial departments, this figure aims to give a comprehensive view of which areas where Purchasing can contribute and affect.

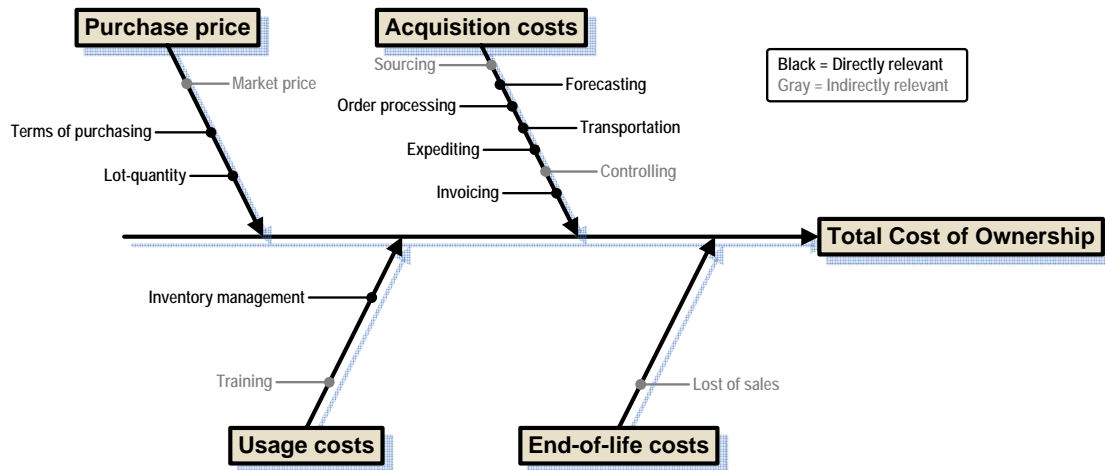


Figure 9-1: Adapted Model of Total Cost

### 9.1.2 A holistic view of Cash Management

As an adapted Model of Total Cost is discussed in chapter 1, some areas are given a less focus and referred to as “a holistic view of Cash Management”. Seen retrospectively it is discussed how these delimitations are interrelated with the findings of this thesis.

In order to achieve a better Management at SIT, the areas of controlling and training play an important roll as through these the employees can be given the knowledge and tools to make this possible. Therefore these two areas will have a significant role if SIT is willing to carry out the recommendations of this thesis.

During the time of work the subject of sourcing has been an issue within purchasing. At the same time as an overall goal is to reduce the supplier base, a lot of effort is put into an increase of so called Low Cost Country (LCC) sourcing. For instance a connection between this and Cash Management has arisen as cash discounts have been discussed. In the case of different demands of cash a cash discount can bring satisfaction to both parties. But further effects of this, such as prolonged lead-times, the transaction of knowledge and what effect this might have on lost of sales has not been discussed.

As previously mentioned, it finally all comes down to the price. The market price was delimited based on Cash Management’s lack of effect on it. Though hopefully, this thesis might have given an additional perspective on the actual price, in terms of TCO.

## 9.2 Utilizing Cash Management at PGI4

Based on the adapted Model of Total Cost this thesis emphasises five different areas which are mapped at SIT and also studied at other companies. In chapter 8.1 connections between practice at SIT and companies of the field study are made. Moreover these findings are, in chapter 8, together with theories analysed in order to come up with solutions relevant for Purchasing at PGI4. Hereby the second main question of the thesis is answered.

- *How can Purchasing at PGI4 utilize Cash Management?*

Altogether the analysis resulted in 13 recommendations. Some of these recommendations will directly influence the cash and open up possibilities for cost savings. Other suggested solutions have softer characteristics and imply improvements to the way of working. In the following sections the recommendations are summarised. The action that SIT are ought to take are briefly described and moreover the expected effect is revealed.

### 9.2.1 Terms of purchasing

As mentioned in 5.3.3 the terms of purchasing are to be negotiated and settled with consideration to Cash Management. Based on the mapping at SIT the analysis of this area resulted in four recommendations, presented below.

Recommendations	Action	Effect
<b>Improve and simplify frame agreements</b>	Suit frame agreements to SIT. Develop different types of standardized agreements to fit different groups of suppliers.	A prerequisite both for standardized ways of working and to increase the agreement coverage. Facilitated work through more comprehensible contracts.
<b>Increase agreement coverage</b>	Measure agreement coverage. Utilize adapted frame agreements.	As suppliers are covered with valid agreements misunderstandings can be avoided. Agreements clarifies the way of working at SIT and also clearly states the conditions sought after.
<b>Utilize Cash discounts</b>	Investigate suppliers suitable for using cash discounts, most likely to be found in low cost countries. Use cash discounts when it is profitable.	A purchase of one million SEK, paid 60 days earlier with a cash discount of 2% corresponds to a 1% saving of the total amount. Possible win-win situation for SIT and suppliers.
<b>Clarify the worth of credit time</b>	Create uniform ways of how to calculate the inventory cost rate and how to use it. Focus on better internal processes to utilize the entitled credit time.	Possibility to better manage the cash flow. One days extra credit time for all purchases made in fiscal year 2005/2006 would result in 800 000 SEK.

### 9.2.2 Forecasting

Forecasting is a significant tool in order to manage the flow of cash out from the company. From a Cash Management point of view it is therefore important to have sufficient tools for forecasting future demands and payments. The study of this area has resulted in two recommendations.

Recommendations	Action	Effect
<b>Reduce the risk associated to future cash flow</b>	Prognosticate future purchases to amount as well as in time.	Facilitated work at the financial department. Better possibilities to steer the cash flow at the company.
<b>Improve the information regarding VSA</b>	Put resources in VSA and see to that it works. Motivate the benefits and clarify how VSA should be implemented.	A good and well functioning forecasting tool which makes it possible to plan cash flows.

### 9.2.3 Transportation

The effect of transportation to payments and Cash Management has in this thesis been limited to concern the use of Incoterms. In the analysis it is stated that SIT should concentrate on the two following recommendations.

Recommendations	Action	Effect
<b>Clarify the use of Incoterms</b>	State the content of Incoterms, to the employees, to the suppliers and in the contracts. Clarify the underlying objectives at SIT.	Misunderstandings and false interpretations are avoided. Facilitated work of implementing Incoterm directives.
<b>Practice the most profitable Incoterm</b>	Clarify the motive to use a certain Incoterm. Provide alternative solutions to attain the goals set up.	Chance to use the most profitable transport agreement. The cost savings depend on the purchase situation.

### 9.2.4 Order processing, Expediting and Invoicing

Concerning this area, well functioning internal processes are of highest importance. For SIT to make cost savings possible they need to focus on three different recommendations.

Recommendations	Action	Effect
<b>Define and practice the concept of complete delivery</b>	Control delivery completion. Compare the invoice to the delivery of goods and the delivery date agreed upon in the order.	Enables a better control of payments. A necessary condition to never pay too early.
<b>Never pay too early</b>	Keep the money within the company as long as possible. Do not pay for goods until it is required.	The average cost for early payments are 200 000 SEK on a monthly basis. Less early deliveries results in decreased inventory levels.
<b>Eliminate interest-invoices</b>	Follow up interest invoices regularly. Prevent unnecessary costs by specifying the actual praxis in agreements. Focus on companies with recurrent interest invoices.	During fiscal year 2005/2006 the amount of interest invoices reached 313 300 SEK.

### 9.2.5 Inventory Management

The inventory at SIT ties up a lot of capital and, as mentioned in 5.3.3, this slows down the flow of capital. Therefore the management of inventory has an important role of only stock keeping necessary material. Furthermore SIT would meet advantages by including the purchasers in this work. Regarding this area two recommendations are stated.

Recommendations	Action	Effect
Use the inventory cost rate to calculate real costs	Communicate how to use the WACC and the inventory cost rate when calculating costs. Utilize both rates for managing the cash.	Better possibilities to manage the company's cash. WACC can be used as a tool to either increase or decrease the cash focus within the company.
Increase purchasing involvement in inventory management	Create ownership of inventory. Active communication between purchasing and GTMP.	Decreased inventory levels through utilizing purchasing knowledge.

## 9.3 Concluding discussion

The purpose of this thesis is *“to analyse the possibilities for purchasing at Siemens PGI4 to utilize Cash Management to reduce the Total Cost”*.

Analysing the possibilities for the purchasing department to involve Cash Management in their work resulted in a number of recommendations, all suited to PGI4 at SIT. Moreover the conclusions are in this chapter discussed as the two main questions of the thesis are answered. By those means the purpose of this thesis is considered to be fulfilled.

### 9.3.1 The recommendations impact on ROI

The recommendations are compiled based on the areas that affect the Total Cost of purchasing. In return, the result of these will have an impact on the company's return on investment. As stated in 4.2.2 the return on investment can be increased in two different ways, either by increasing the margins or by raising the capital turnover. Figure 9-2, an adjusted version of Christopher (2005), shows in what way the suggested solutions will impact the company's ROI.

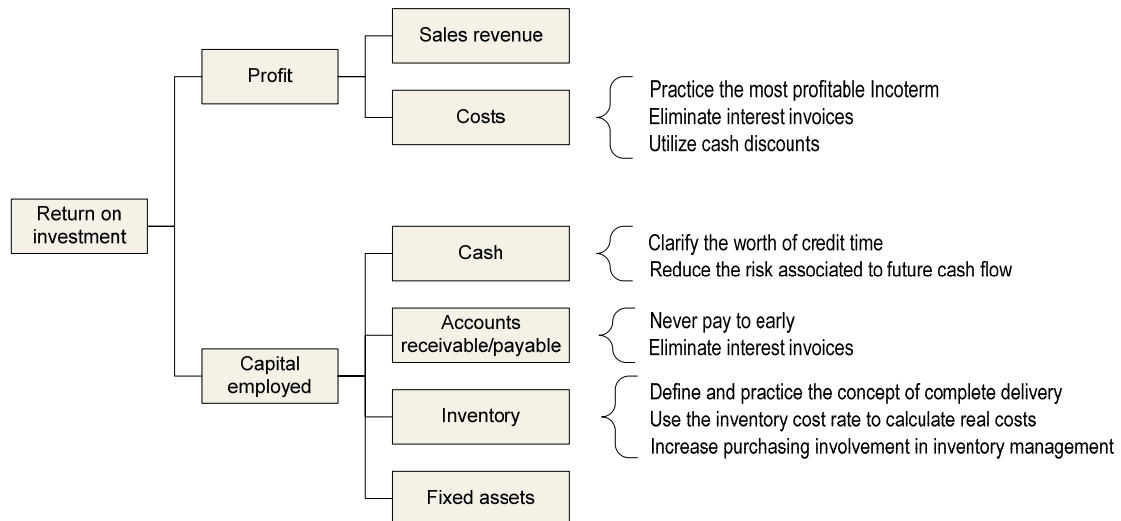


Figure 9-2: Cash Management impact on ROI at SIT

Even though the remaining recommendations can not be directly related to the return on investment, they will play an important roll in facilitating purchasing work to improve Cash Management. Developing suitable frame agreements and improved directives regarding both Incoterms and VSA, will in many ways be crucial steps for PGI4 to meet improvements as well as cost reductions.

### 9.3.2 Further studies

As performing a detailed study at one department it is easy to come across information that is not concerning the actual investigation, or to notice things that have to be delimited due to lack of time. The unwillingness to leave interesting areas that might bring further improvements to SIT has led to this discussion. This section presents issues that can be beneficial for SIT to look into in future studies.

- The goods reception - More than once it has been evident that the goods reception is in need of improvements. For example material planners are wasting hours per week chasing lost goods. Furthermore deliveries waiting for days before they are available to the production, as other companies manage this in one day. Solving these problems would help out in many ways, and erase many uncertainties at SIT. Why should you bother asking your suppliers for a few more days of extra credit, when five, ten sometimes 15 days are wasted in the goods reception?
- Inventory - It would be interesting to further investigate the levels of inventory and also to determine how much tied up capital different suppliers are responsible for. This thesis has come into contact with the inventory



LA01, managed by GTMP. Moreover it would be relevant to investigate also the stockpile and the goods tied up in the production.

- LCC sourcing – As the strategy communicated from top management is to increase the LCC sourcing it would be interesting to elucidate how this directive influences the cash flow. Prolonged lead times, due to larger geographic distance and new suppliers, brings a risk for slowing down the cash flow.



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Karlsson A (1996), *Att tjäna pengar på pengar – Cash Management*, Stockholm: Ernest & Young Skriftserie nr 31, ISBN 91-87178-58-3

Killen K H & Kamauff J W (1995), *Managing Purchasing – Making the supply team work*, Tempe: Irwin Professional Publishing, ISBN 0-7863-0127-9

Lekvall P & Wahlbin C (2001), *Information för marknadsföringsbeslut*, Göteborg: IHM Förlag. ISBN 9-1864-6063-3

Monczka R, Trent R & Handfield R (2005), *Purchasing and Supply Chain Management*, Mason: Thomson South-Western, ISBN 0-324-20254-7

Sancho, Karin (2006-12-12), Ernst & Young

Srivastava R K, Shervani T A & Fahey L (1998), *Market-Based Assets and Shareholder Value: A Framework for Analysis*, Journal of Marketing Vol. 62 (January 1998)

Stock J R & Lambert D M (2001), *Strategic Logistics Management*, New York: McGraw-Hill, ISBN 0-256-13687

Van Weele A (2005), *Purchasing and Supply Chain Management – Analysis, Strategy, Planning and Practice*, London: Thomson Learning, ISBN 1-84480-024-5

## APPENDIX 1 : SEARCH OF LITERATURE

### **Source:** Literature known from previous studies

Aronsson H, Ekdahl B & Oskarsson B (2004), *Modern logistik – för ökad lönsamhet*  
Björklund M & Paulsson U (2003), *Seminarieboken*  
Björnland D, Persson G & Virum H (2003), *Logistik för konkurrenskraft: ett ledaransvar*  
Bruzeliuss L H & Skärvad P-H (2000), *Integrerad Organisationslära*  
Christopher M (2005), *Logistics and Supply Chain Management*  
Lekvall P & Wahlbin C (2001), *Information för marknadsföringsbeslut*  
Stock J R & Lambert D (2001), *Strategic Logistics Management*  
Van Weele A (2005), *Purchasing and Supply Chain Management*  
→ Srivastava R K, Shervani T A & Fahey L (1998), *Market-Based Assets...*

### **Source:** University of Linköping, Library Catalogue

#### **Search:**

Keyword: "*Cash Management*"

Hits: 34

Used: 4

Blomstrand R & Källström A (1991), *Att tjäna pengar på pengar...*  
Dolfe M & Koritz A (1999), *European Cash Management – A guide to best practice*  
Hedman P (1991), *Cash Management – Hur ett förbättrat kassaflöde...*  
Karlsson A (1996), *Att tjäna pengar på pengar – Cash Management*

#### **Search:**

Keyword: "*Purchasing*" + "*Supply*"

Hits: 33

Used: 2

Baily P, Farmer D, Jessop D, Jones D (1998), *Purchasing, Principles & Management*  
Monczka R, Trent R & Handfield R (2005), *Purchasing and Supply Chain Management*

#### **Search:**

Keyword: "*Purchasing*" + "*Management*"

Hits: 68

Used: 4

Baily P, Farmer D, Jessop D, Jones D (1998), *Purchasing, Principles & Management*  
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## APPENDIX 2: QUESTIONNAIRE – MAPPING

### Scrutinized parameters:

#### *Terms of Purchasing*

Invoice date

Delivery date

Credit terms – policy and guidelines

Cash discounts – Cash discount key

Delay

#### *Forecasting*

How does Purchasing utilize forecasting?

VSA

#### *Transportation*

Different modes

Incoterms – DDU, EXW etc

Connections between payment and transportation

#### *Order processing*

Invoicing information

Order confirmation

Internal information

#### *Expediting*

Reception control

Receipt date

Internal information

#### *Invoicing*

Due date

Payment

Internal information

#### *Inventory Management*

Warehousing

Inventory

Obsolescence

Waste

What is kept in stock and why? Lead time influence

In what way is Purchasing communication with inventory managers?

Parameters of inventory

Classification

Fixed capital

### *Lot quantity*

Discount – Inventory

Economies of scale versus tied up capital

Affecting payments?

Part-payments – Different invoicing and order handling?

## **A holistic view of Cash Management:**

### *Sourcing*

Supplier evaluation

Supplier handling

### *Controlling*

Support for the Purchasing department

### *Training*

Cash Management awareness

Involvement

### *Lost of Sales*

Affected by Cash Management?

Outcome from false/bad decisions



## APPENDIX 3: QUESTIONNAIRE – FIELD STUDY

### *Cash Management*

- Does an active Cash Management exist at the purchasing department at your company?
- If not, is any other department at the company paying attention to the subject?
- Is there an awareness concerning the effects which can be reached by managing cash flows?

### *Agreements*

One of the most important tasks for the strategic purchasers at SIT is to develop and settle agreements with suppliers. Among others the agreement includes conditions regarding the outflow of funds from the company, and hence it is a significant part of Cash Management.

- Are the purchasers work based on any model or standard agreement?
- Is there any statistics kept over the supplier agreement coverage? (To what extent do purchases occur according to a valid agreement?)
- Are there any suppliers, which you would not like to sign an agreement with?
- Are Cash Discounts used?

### *Connections between the flow of goods and the flow of cash*

In a producing company there is often a great focus at the own manufacturing. In this relation the purchasers' role are to see that required material are available on time. As long as the delivery not are late no one complains, and items which arrive too early are often seen as a "bonus". The flow of goods is though close connected to the flow of cash and therefore it is of great interest for this thesis.

- How long is the time for goods reception? (The time from goods arrive at the company until it is available?)
- How is a complete order defined? (Goods, invoice, documentation etcetera)
- How is the invoice date defined? (When does the credit time start counting?)
- Is there any expressed goal for the length of credit time towards suppliers?
- Is there a focus on prolonging credit times?
- Are there any guidelines for which Incoterms that should be practiced?

- Which role does strategic purchasing has in the managing of inventory? (Are they in some way involved in this work?)
- Are any forecasting tools integrated in the supply agreements, in order to improve and make the acquisition easier?

### *When problems occur*

Usually company concentrates on taking care of suppliers with late deliveries, but the same focus to those with early deliveries is often missing. We would like to know how incorrectness and problem situations are handled as they occur.

- Do you control early deliveries from suppliers?
- Are penalty fees regularly used towards suppliers that do not fulfill their commitments?

If the own company has not paid on time, the suppliers have possibilities to send an interest invoice.

- Are interest invoices followed up actively? (For example to control why the supplier has reason to use it)

## APPENDIX 4: INTERVIEW SOURCES

### **Siemens Industrial Turbomachinery in Finspong**

*(Name – Department – Title)*

Anders Alriksson – GTM – Director of materials planning

Åsa Holmer – GTMA – Manager of procurement, core engine

Gunilla Rydell – GTMA – Buyer, cold blading

Hans Bergsten – GTMP – Manager of Inventory Management

Robert Verhey – GTMS

Marin Bucic – GTMS

Fredrik Kornebäck – FPC

Emma Priem Abellsson – FPC

Thomas Wahlström – FPT – Manager of Strategic Purchasing, core engine

Kristofer Forsmar – FPT – Lead/Senior buyer

Maria Lingner – FPT – Senior buyer

Ola Ericsson – FPT – Senior buyer

Marc Samuelsson – FPT – Senior buyer

Göran Carlsson – FPT – Senior buyer

Björn Teryd – FPT – Lead/Senior buyer

Curt Siikonen – FPT – Senior buyer

Stefan Nygren – FPP – Manager of Strategic Purchasing, packaging

Ulrika Freij – FPS – VSA

Thomas Danielsson – GTU – R/3-expert

Mikael Jönsson – FF – Finance Manager

Lennart Larsson – FGP – Controller

Lena Forsberg – FFP – Manager Payables & Receivables

Henrik Lingborg – FD – Controller

Christoffer Dahlén FFP

Cecilia Jacobsen – SLL

