



UNIVERSITY OF GOTHENBURG  
SCHOOL OF BUSINESS, ECONOMICS AND LAW

**Foreign Currency Denominated Debt as a Hedging Instrument**  
-a case study on AstraZeneca, Nestlé and SKF

Andreas Karlsson and Per Palm

**Graduate School**  
Master of Science in Finance  
Master Degree Project No. 2012:98  
Supervisor: Stefan Sjögren

# Acknowledgement

First and foremost, we would like to acknowledge our thesis supervisor Stefan Sjögren for providing us with important insights along the writing process. Further, we would like to express our gratitude towards individuals at AstraZeneca Treasury that gave up some of their precious time in order to help us through initial topic discussions.

May 16<sup>th</sup> 2012, Gothenburg

---

Andreas Karlsson

---

Per Palm

## **Abstract**

In the current global economic environment post-crisis, the area of managing foreign exchange rate exposure becomes increasingly eminent. The recent turmoil has shown that there is a wide variety of ways trying to mitigate risk exposure. One aspect that caught the authors' attention is the choice of currency composition of global companies' liability portfolios.

This thesis is written in order to examine how corporations use strategic hedging and especially foreign debt to hedge economic exposures. The process of this case study includes providing an estimation of the current situation based solely on public information for three corporations within three different industries in terms of currency debt structure, revenue breakdown by currency and net exposure by currency. What will be shown is that due to different factors, the extent of foreign debt usage will vary between the corporations. With support of economic and financial theory together with our empirical overview, we evaluate the current disposition of the corporations' liability portfolios and if possible argue for adjustments.

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Background . . . . .	1
1.2	Problem Discussion . . . . .	1
1.3	Purpose . . . . .	3
1.3.1	Question Formulation . . . . .	3
1.4	Limitations . . . . .	4
1.5	Methodology . . . . .	4
<b>2</b>	<b>Theory</b>	<b>8</b>
2.1	Enterprise Risk Management . . . . .	9
2.2	Why Hedging Matters? . . . . .	9
2.2.1	Types of Exposure . . . . .	10
2.3	Strategic Hedging . . . . .	12
2.3.1	Financial Hedges as Derivative Hedges . . . . .	12
2.3.2	Operational Hedges as Natural Hedges . . . . .	13
2.3.3	Financial Hedges as Natural Hedges . . . . .	13
2.4	Achieving Preferable Liability Portfolio . . . . .	14
2.4.1	Foreign Currency Denominated Debt . . . . .	14
2.4.2	Currency Swaps . . . . .	15
2.5	Balance Sheet Considerations and Net Investment Hedges . . . . .	16
2.6	Corporate Governance and Financial Risks . . . . .	17
2.7	Motives for Determinants . . . . .	18
<b>3</b>	<b>Case Study</b>	<b>20</b>
3.1	Company Descriptions . . . . .	21
3.1.1	AstraZeneca . . . . .	21
3.1.2	Nestlé . . . . .	22
3.1.3	SKF . . . . .	22
3.2	Industry Description . . . . .	24
3.2.1	Pharmaceutical Industry . . . . .	24
3.2.2	Food Processing Industry . . . . .	25

3.2.3	Industrial Engineering Industry . . . . .	25
3.3	Company Results . . . . .	27
3.3.1	Liability Portfolio Composition . . . . .	27
3.3.2	Non-Current Assets . . . . .	29
3.3.3	Revenue Compositions . . . . .	31
3.3.4	Cost Breakdown . . . . .	33
<b>4</b>	<b>Analysis</b>	<b>34</b>
<b>5</b>	<b>Conclusion</b>	<b>44</b>

# 1 Introduction

## 1.1 Background

In times of financial turmoil the role of *risk management* becomes eminently more important since it provides a foundation on which the corporations can and handle risk. Following the financial crisis of 2008, volatility has increased in all financial markets, not the least currency markets. With that in mind, the increased volatility of currency fluctuations and the emergence of Eurozone debt crisis, it will be of utmost importance to have optimized your *strategic hedging* policy, which we define as a complete long-term setting including both financial and natural/operational hedging, that is minimizing the pure foreign exchange risk that is monitored and handled through continuous Treasury operations. The liquidity risk in the derivatives markets has after the crisis become more substantial as a result of heavier regulations and a decrease in propriety trading. The effects of this includes that prices might not be available at all times, spreads increase and bigger trading blocks are more difficult to trade. In order to handle these arisen market conditions one has to counteract in an efficient manner. In a dynamic market and ever changing risk structure it becomes more important to account for these facts and strategic hedging is an efficient way of doing so, that is, manages the major currencies in which one produce and sell.(Lind, 2011)

## 1.2 Problem Discussion

Since the turn of the century there has been increased focus on alternative hedging methods. In the academic literature ways of managing FX risk other than using standard forward exchange contracts has been introduced, where issuance of *foreign currency denominated debt*, hereafter referred to as *foreign debt*, is one example.

Hagelin and Pramborg (2004) published an article regarding hedging practices and exposures of Swedish firms and reached the conclusion that a mixture of financial derivatives and foreign debt issues effectively reduce risk exposure. Carter et al. (2003) coherently stated that both financial and operational hedges effectively reduce foreign-currency exposure and introduced the view that operational hedges can be seen as a real option for the firm. Three years later, de Jong et al. (2006) issued their journal article where they analyzed foreign exchange exposures of Dutch firms and found that exposures were reduced through on-balance sheet hedging such as foreign loans. A similar result, that foreign debt is an important alternative to the use of financial derivatives, was reached in an article by Aabo (2006) in the same year based on a sample of Danish firms. Finally, Gonzalez et al. (2010) expanded the analysis of foreign debt use to incorporate not only optimal hedging theory but also capital structure theory in their study of Spanish non-financial corporations.

Further, previous research has also shed light on what specific determinants that are significant when issuing foreign debt; factors which we throughout the thesis will analyze more closely. Both Gonzalez et al. (2010) and Kedia and Mozumdar (2003) showed that *foreign currency exposure*, *size* and *information asymmetries* are significant, whereas

Kedia and Mozumdar (2003) also showed on *foreign operations* and Gonzalez et al. (2010) on *economic sector* as important determinant for issuing foreign debt. The importance of looking at these determinants lies in the suitability of actually issuing foreign debt. If a corporation is not suitable for issuing foreign debt it can have catastrophic consequences, since one goes into a long term commitment which at some future date must be repaid. Also, if one hedge with foreign debt in order to reduce the FX exposure towards a certain currency and later current positions in that currency abruptly changes, such as revenue sources, the company would still have the long term obligations which is brought with issuing foreign debt. Hereof it becomes eminent to decide on the determinants and evaluate the position in each currency by these.

However, using foreign debt can potentially have certain drawbacks or at least important *ex ante* considerations. A productive trading agreement includes continuous assessments of the adequacy of individual parts, e.g. such as in present times taking on debt in weak Euro denominated Greek bonds. When considering strategic risk, and evaluating a range of possibly suitable currency portfolios, one has to account for several factors with one of them being individual countries, or even clusters of countries, sovereign default risk. Companies should always aim to hold stable currencies in the portfolio in order to keep financing flows as secure as possible.

Even though the reasons for the emergence of the financial crisis are many and the relative significance of each are still debated, one factor remains coherent among financial experts; inappropriate usage of financial instruments worsened financial stability. Even though the reasons for the emergence of the financial crisis are many and the significance of each are still debated, one factor remains coherent among economic experts; inappropriate usage of financial instruments (French et al., 2010). McGrath (2011), senior foreign-exchange trader at Western Union Co.'s Western Union Business Solutions in Victoria, British Columbia says:

*"Companies that hedge their currency exposure by buying forward contracts and options through Western Union Business Solutions are generally trying to protect against exchange-rate fluctuations of about 8% over the life of a contract. But since the crisis of 2008-09, exchange rates can now change in double-digit increments over those periods, making hedging more difficult and costly."*

Based on the quote above one could argue that in times of high volatility on the FX markets the importance of long term hedging activities increases. Introducing financial natural hedges such as foreign debt might offset currency fluctuations in longer term, and thus possibly reduce costs of hedging and mitigating FX exposure. In relation to the sovereign default risks under the financial crisis, foreign debt denominated in "safe haven"-currencies such as the US Dollar and the Japanese Yen was considered suitable candidates for undertaking debt.

The different kinds of exposure that arise by being globally active can be classified into three groups; translation, transaction and operating exposure where the latter of the two constitutes economic exposure. During the thesis we will put main emphasis on economic exposure; that is a more general and long term exposure that arise by unanticipated changes in the exchanges rates. Thus, when considering economic exposure,

we are adopting an initial view that one has to efficiently involve both short and long term perspectives and not limit hedging practices to manage short term exposures using forwards. Therefore, as we will come back to later, perhaps the hedging activities should consist of a mixture of *financial and operational hedging (natural hedges)*.

Apart from the pure financial hedging alternatives available, corporations should continuously evaluate operational practices and on a dynamic basis consider renegotiating payment terms with suppliers and customers in order to calculate for ever changing dynamics in the markets. This aforementioned payment terms and pricing negotiation process is widely discussed in academic literature as an example of operational hedging and is as such extremely important. However, for the purpose of this thesis it is a factor that we acknowledge but leave behind for corporations to handle internally with all information at hand.

### 1.3 Purpose

Logic tells us that alignment of debt, assets and revenues by currency should be something that corporations strive for. The argument is that a currency mismatch between current assets and liabilities poses a foreign exchange rate risk. Further, a mismatch between *assets and liabilities* on one hand and *revenue streams by currency* on the other; is a setting that in the longer term might create or worsen already present imbalances and increase risk from future transaction currency exposures.

The purpose of our thesis is to analyze three corporations in different industries; look at their respective disposition of liabilities and assets, revenue streams, estimate current exposures by currency and draw conclusions on how they could effectively reduce exchange rate risk in a long term setting. We will be focusing on to what extent they use strategic hedging and especially foreign debt, both natural and synthetic, to manage exposures and hedge balance sheet items. The fact that we have chosen companies from three different countries in widely different industries provides us with the aim to gain insights and draw conclusions on what factors that determines in which currencies to take on debt, and the extent on debt as a hedging tool.

To conclude this section, later in the thesis we will analyze different factors, or determinants, that need to be considered in relation to issuing debt in specific currencies for risk reduction purposes. These factors are chosen mainly on the basis of previous findings such as Kedia and Mozumdar (2003) and Gonzalez et al. (2010). The determinants that we analyze are *Size, Economic Sector, Foreign currency exposure, Foreign Operations and Information Asymmetries* and *Market Stability*.

#### 1.3.1 Question Formulation

This has led us to the following research questions:

1. Given the analysis of the determinants from previous literature, are the three corporations suitable for using foreign debt in order to reduce FX risk exposure?



2. Based solely on public information and with the starting point of the companies' liability distributions by currency, what adjustment could potentially be done in order to reduce FX risk with regards to the determinants analyzed and using the firms' geographical dispersion of their revenues, non-current assets and net flows?

## 1.4 Limitations

Although a lot of effort has been exerted on this thesis, it is inevitable to avoid shortcomings. This thesis is based solely on public information gathered mainly from the corporations' Annual Reports and Thomson Reuters<sup>TM</sup>. Therefore, we have encountered the issue of lacking information and have had to adjust purpose and question formulations accordingly. Unfortunately, topics regarding corporations' risk management practices are often difficult due to strict confidentiality. If we would have had access to inside information regarding the firms, we would have wanted to write a more extensive thesis that then could make more bold statements regarding company-specific optimal liability portfolios based on a more quantitative approach.

Further, it could be seen as a limitation that the case study only included three corporations due to the time limitations which implies that the results are very specific for these cases. Therefore, the results suffer from loss of generality and transferability onto other global companies.

One of the main objectives of this thesis was to analyze foreign currency exchange risk in a long term perspective. Therefore we have neglected the short term practices of hedging exposures using forward contracts, not because they are not important, nor has it been forgotten since our long term reasoning should be seen as a complement to firms' already existing shorter term derivative management.

These limitations result in that the conclusions that we draw are limited in the sense that they are solely based on a foreign exchange risk reduction long term point of view. Naturally, there are other factors for the responsible funding manager to account for other than the foreign exchange rate risk effect but we felt that we had to have a narrow objective in order to obtain sensible results.

## 1.5 Methodology

In the beginning of the thesis project we were obliged to examine theories and previous studies in order to obtain a broader knowledge base regarding hedging with foreign currency denominated debt. While researching literature a pattern started to form in terms of determinants of issuing foreign debt. Furthermore, relevant literature regarding foreign debt usage in order to reduce exposure was examined and it provided significant empirical evidence in favor of that foreign debt can reduce exposure. Based on previous literature we accepted the premise of foreign debt issuance reducing exposure and corresponding determinants, such as net exposure, size, foreign operations, foreign sales to name a few. In order to evaluate the determinants we had to decide on what measurements that is useful since it would not be sufficient to analyze all factor based

on reasoning and thus quantifying some determinants would provide more information. Thereof, with the purpose of evaluating *foreign currency exposure*, we looked at *net currency flows* which indicate the net exposure positions in each currency. The *size* parameter was quantified by looking at a combination of *total assets* and *non-current assets* and the *foreign operations* factor through evaluating the non-current assets position by currency and also taking factories by location in account. Regarding *foreign sales* we simply extracted the disposition of *revenues* associated with different currencies. Supplementary determinants mentioned in previous literature, such as *economic sector* & *information asymmetries*, were also discussed, yet not quantified, instead a corresponding reasoning was applied when analyzing issuance of foreign debt.

As we wanted to examine and evaluate these factors in terms of real life practice, the case study approach was implemented. With the purpose of evaluating the implications of these determinants in real corporations we decided to scrutinize three different companies using the available public information. The decision of what corporations to study landed on AstraZeneca, Nestlé and SKF, where the decision was initially based on the firms being interesting, well-known and successful in each industry, yet also biased towards availability of information.

Moreover, as the process was based solely on public information we started to dissect the corporations' Annual Report from 2011 together with the financial information provider Thomson Reuters<sup>TM</sup>. At this point the process came down to gathering as much data as possible in order to provide a foundation for reasonably reliable breakdowns and analysis. Given the collected data we could obtain a disposition of each corporations liability portfolio depicted by individual currencies. The current state of the liability portfolios was deduced by adopting the face values of debt each corporation on 2012-03-20, together with exchange rate figures from 2011-12-30. The reason for the prior date was to obtain the most recent liability distribution as possible and evaluating at the exchange rates on the 2011-12-30 was due to all figures in the Annual Reports were accounted at the same date, thus make the study increasingly coherent.

As stated above, in order to quantify the net exposure determinant we estimated firms' respective net currency flows; a measurement that was obtained by taking revenues by currency less costs by currency. The process of gathering the revenues by currency was relatively straightforward, using the companies *Segment Information* in their Annual Reports in which they disclosed the revenues on a continental level, but also for specific large countries. In order to complement for missing information regarding individual countries, we used the companies' country specific home pages where revenue figures for that country most often could be found. When fully accomplished we summarized the information in 3 separate pie charts in order for the reader to obtain a visualization of the distribution.

When it comes to the costs by currency, the estimation process became increasingly difficult. The initial starting point was solely the total costs for each corporation, extracted from the Annual Reports for 2011. Hereof, the cost distribution by currency became subject to our estimations of where the corporations were bearing their highest costs. This, together with the fact of information discrepancies between Annual Reports, made the arbitrary dispersion somewhat inconsequent between corporations. However, as authors, we aimed for the most reliable estimations as possible which due to information

asymmetries resulted in to some extent different approaches. In the case of AstraZeneca, information regarding locations of the company's R&D sites, countries with manufacturing and dispersion of total plants/factories was the foundation of the cost designation. From the company website we could easily get the information needed in order to split the R&D costs based on list of the 14 R&D sites in 9 countries. The *Cost of Sales* amount was divided based on the list of *Principal Subsidiaries* found in AstraZeneca (2011) where one can see in what countries that manufacturing was a principal activity. Further, the negatively signed net financial items were distributed based on the debt structure with relative cost weights based on this structure. The remaining amount was split on the basis of number of employees in each country and in the cases where this specific information was not available, which fortunately enough was only in relatively small and negligible countries for our purpose, the remaining employment figure from the given continental employee distribution, was equally split.

With Nestlé, the approach was adjusted towards a more totalistic dispersion. From the Nestlé (2011), we find a *Total Costs* figure by taking revenues less *Profit before taxes and associates*. This amount consists of *Costs of Goods Sold, Distribution Expenses, R&D (-Marketing and Administration Expenses), Other* and *Net Financial Income/(Expense)*. These costs are then distributed among countries with operations, and in term currencies to the best of our knowledge given the information available. The net financial items are straightforwardly distributed on the basis of the company debt structure since one can easily argue that this would give provide the fairest depiction of in which currencies the financial income and expenses lay. Further, a gathered list of the geographical dispersion of the company's factories will be used as a proxy for the distribution of the remaining costs. In Nestlé (2011), the company claims to has 461 factories located in 83 countries and the total number of employees was 328 000. We assigned employees per country to be the same percentage as the number of factories in the specific country compared to the total. The most simple approach would then be to divide the cost figure by total employees, and thus then allocate the costs to each country based on this cost per employee figure. However, we felt that by applying this approach to all countries would result in underallocating costs to the countries with most operations, i.e. countries with a relatively high number of factories, and vice versa, overallocating costs to countries with relatively few factories. One reason for this over and underallocation stems from the fact that this approach assumes equal sizes of the factories, for example that a single factory in the US or France would bear the same cost as a factory in Panama or Jordan. To adjust for this, we decided on a certain threshold which in the Nestlé case was 10 factories, and the associated cost per country with more than 10 factories based on equal cost per employee was excluded from the total cost figure. The remaining cost amount was then split by the total number of employees and assigned to all countries by the relative amount of estimated employees. As a final adjustment, the excluded associated costs for countries with more than 10 factories was then added back to the countries in question which results in them getting proportionately higher costs. In other words, these countries are assigned higher costs than they would have got if one were to split equally based on the factory percentages.

When evaluating the cost distribution by currency of SKF we approached the issue through thoroughly assessing in which countries SKF has offices, number of employees by different countries and regions, and from this, arbitrarily disperse costs in different

currencies. Important to note is that when separating the cost by currency, one might do it in a number of ways. Our approach, given SKF's total operating costs, is based on given numbers regarding employees by regions; *North America, Latin America, Western Europe, Eastern Europe, Middle East and Africa* and *Asia*. Furthermore, we examined how many facilities they have in each region and country together with explicit employee numbers for Sweden, Canada, France, Italy and Germany. Bearing this in mind, we could assign employees to each country within different regions. Having done this, we first broke down the *Total Costs* proportionally against employees, i.e. costs divided by total number of employees. However, there will most likely be a mismatch by adopting this simplistic approach because manufacturing countries will get too little and non-manufacturing countries will get too much costs assigned, as in the Nestlé case described above. Therefore, in SKF, we extracted the ones with 2% or more of total employees, which corresponded to approximately 1bn SEK in associated cost, and summarized to a total for *High-Cost Countries*. Furthermore, we subtracted the *High-Cost Countries* from the *Total Costs* and divided the residual with total employees, and thus obtained a *Cost per Employee* on the residual. Consequently we could compute the *Total Associated Costs* for all the countries using *Cost per Employee* multiplied by number of employees in a given country, however we also added back the previously deduced costs to the *High-Cost Countries*, thus hopefully more accurately display the differences in costs among countries. (SKF, 2011)

Furthermore, when we evaluated the *size* and *foreign operations*, we could simply extract the information regarding the proxies *non-current assets* by currency or region from the Annual Reports from 2011. The same extraction could be made for *total assets*, which, as stated before, was used as a measurement for the *size* parameter.

When all the distributions and measurements were complete, we approached the analysis by setting up a cross-sectional analysis, in which we for each determinant evaluated each corporation individually given results, referring to previous research, and also where it makes sense the firms were analyzed against each other and put into context. In the end of the analysis, based on the separate cross-sectional analysis, we recapitulated the story for each corporation with the purpose of providing a complete perspective of each company, and to isolate the most significant factors for the corporations' decision regarding taking on foreign debt or not.

## 2 Theory

Part II of the thesis aim to provide a foundation for the reader regarding the reasons for reducing risk using the liability portfolio. With the purpose of managing and reducing risk exposure using the liability portfolio, one has to consider several aspects, which will be defined and described here.

Initially, the section will give an overall perspective of Enterprise Risk Management and based on this, which types of approaches one can take regarding managing risks. Furthermore, we want to provide an understanding of why hedging in general is preferable, and the consequences brought about in terms of exposure.

Moreover, we will provide the definition and depict strategic hedging as a policy approach and the corresponding features. There will be a brief representation of the main fragments, yet quickly shifting over to the long term feature of foreign debt as a hedging instrument. The emphasis and further considerations will be focused towards managing the allocation of the liability portfolio by different currencies. Consequently, we will portray previous academic literature concerning determinants of issuing foreign debt in order to provide a base for the reader which we will continuously refer to throughout the thesis.

Key Words: Enterprise Risk Management, Strategic Hedging, Foreign Debt

## 2.1 Enterprise Risk Management

Corporations all over the globe have for many years, in various ways, practiced what we today call Enterprise Risk Management (ERM, henceforth). First off, ERM is according to the US Committee of Sponsoring Organizations of Treadway Commission (COSO) defined as;

*”a process, effected by an entity’s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.”*

During the evolution of ERM, the practice has changed and shifted more responsibility towards senior management. Even though all changes have been the same throughout all corporations and industries, they can be characterized by a few key driving forces such as more complicated risks, increased external pressure from regulators and several developments in the field of financial theory (e.g. Modern Portfolio Theory). A reasonable assumption would be that as risks in the markets becomes more complex; the risk management practices must follow and in turn become more sophisticated. (Miccolis et al., 2003)

Furthermore, one could say that corporations have three ways of implementing risk management goals; through modifying *operational* actions, changes in *capital structure*, and usage of *financial instruments* (derivatives). In current risk management, the chosen technique is most often a mix of all these, in order to manage the aggregated level of risks that the firm is exposed to. This path of risk management emerged as a real possibility when the practical tools became available, such as improvements in information and communication technology as well as financial systems. Managing risk with this aggregated risks approach can be seen as more of *strategic* nature than of *tactical*. In tactical risk management one considers a more narrow focus that involves hedging of contracts or other future commitments made, e.g. exchange rate exposure on future import payments. Throughout this thesis, we will shift focus towards a strategic (natural) approach of reducing exposures in the sense of capital structure, asset-liability management, currency holding mismatch and so forth. (Meulbroek, 2002)

## 2.2 Why Hedging Matters?

While academic finance theory has produced a framework based on the assumption of perfect markets, implying that hedging is not necessary, that dates back to the well reputed duo Modigliani & Miller; any complete version explaining risk management in imperfect markets do not exist. Based on this argument it becomes relatively clear that one of the most important objectives for senior management is the field of risk management. Several academics such as Brown (2000), Smith and Stulz (1985) have produced papers on the main motives for hedging.

First off, the relevance of hedging depends on which industry environment one is active within and on certain characteristics, such as financial vs. non-financial firms. For

financial firms risk management in general, and specifically foreign exchange risk management, has a central role and is of utmost importance. In contrast, for non-financial firms risk management has historically been of lesser importance, however it is an area that has greatly developed in recent times. Brown and Toft (2002) establish that costs of financial distress (also sometimes referred to as bankruptcy costs), agency costs and tax reasons are all examples used to explain why corporations should hedge risk exposure. Furthermore, in a Working paper from Ammon (1998) for Centre of European Economic Research, the author observes and states empirical evidence of hedging motives:

*"In general, one can observe that (i) hedging taxable income is of minor importance, (ii) firms with a high probability of financial distress hedge more, (iii) companies with greater growth opportunities hedge more, (iv) managers with common stockholdings hedge more than managers with option holdings and (v) high ability managers hedge more than low ability managers."*

As mentioned, hedging strategies differ depending on the managements objectives. As the policy is focused towards a certain exposure one also has to decide whether to minimize volatility or solely evade large losses. This decision is of utter importance and should be decided upon ex ante. The consequences of a hedging strategy decision made today will be echoed in the future (Ammon, 1998). For example, taking on debt in foreign currency is a long term strategy action which may reduce economic exposure; however it can reflect poorly in the short term P&L due to the constant book revaluations that has to be made. Regarding exchange rate risk hedging, this decision relates to a trade-off of the corporations between preferable risk exposures.

### 2.2.1 Types of Exposure

When discussing the terms of a FX risk management program, there are a few eminent exposures that need to be considered. In traditional risk management the main focus lies towards the three previously mentioned categories; *translation*, *transaction* and *operating exposure*. Furthermore, we will provide our definition of *economic exposure*.

**Translation Exposure.** Translation exposure arises from the process of converting results of foreign operations, foreign subsidiaries, to the reference currency, thus being of an accounting nature. Therefore, the impact of changes in exchange rates will affect the balance sheet assets and liabilities and also already existing income statement items.

Translation exposure remains a non-cash item in the balance sheet exposure until it is sold, in the case of an asset and until maturity in the case of a liability, and hereof has no effect on profit and loss accounts until this point. The importance of hedging this exposure has empirically been debated. Dodds (2008) states that the dilemma of hedging translation exposure becomes more important for corporations with high leverage and thus need to protect banking covenants. Thus it becomes very important to quantify the exposure, through VaR, and understand the consequences of not hedging the translation exposure. One relatively popular and efficient manner to hedge this type of exposure is to take on foreign debt so that assets and liabilities match in the foreign subsidiary. However, it might come with some drawbacks in terms of issuing guarantees for the subsidiaries since they might have limited net equity and also, unless you are a

global institution it might result in additional costs by taking on debt outside ones home country. (Dodds, 2008)

**Transaction Exposure.** Transaction (or contractual) exposure refers to gains and losses incurred when monetary transactions are settled in current and future foreign currency denominated cash flows. That is, as exchange rates might change between the contractual agreement and settling dates, the corresponding value of the associated foreign currency cash flows will also change.

The typical type of transaction exposure is the account receivable associated with a sale in denominated in foreign currency. As discussed, one might consider the possibility of taking on debt in foreign currency in order to offset uncertainties stemming from currency fluctuations in relation to cash flows. Such strategy program would increase the transaction exposure since the debt needs to be repaid in the future and thus in itself would be exposed to currency fluctuations, thus the decision regarding hedging strategies will always have to be re-considered and re-evaluated in terms of trade-offs between different exposures. (Azarmi, 2009)

**Operating Exposure.** With the *transaction exposure* definition above in mind, it can be extended in order to define *operating exposure*. Whereas transactional exposure is mainly short term in nature, operating exposure can be defined as changes of firm value due to currency fluctuations stemming from future cash flows in operations, i.e. revenues and costs. It can further include price alterations and relative market position compared to competitors. Hence, it is a long term exposure of overall operations in foreign markets.

**Economic Exposure.** Economic exposure is here seen as the combined exposure of transaction and operating and can be defined as the exposure that is affected by random fluctuations in exchange rate which affects current and future earnings, cash flows and investments.

However, these unanticipated fluctuations arise, not from one certain factor, but from an overall economic environment. That is, reasons for this exposure could be changes in foreign market conditions where sovereign bankruptcy risk of a nation can be seen as an extreme, however currently topical, example. For instance, corporations currently holding Greek government bonds are facing increased economic exposure due to Greeces current financial situation and likelihood of default. This could in fact be observed during the financial crisis when many economies were under pressure thus explaining why the demand for Japanese Yen and American dollar increased since they were considered to be safe havens.

The currency mismatches a corporation could be faced with through economic exposure can be mitigated though different hedging methods, operational or financial hedging. Further, the problem will be approached through assessing the exposure for the three different companies. For example, unanticipated events, like sovereign default, are why corporations should be very selective in their choice of taking on foreign denominated debt.



STRATEGIC HEDGING		
FINANCIAL HEDGES		OPERATIONAL HEDGES
DERIVATIVES HEDGES (Short Term)	NATURAL HEDGES (Long Term)	
forward, futures and swaps	foreign currency debt	diversifications across currency zones, operational matching of revenues and expenditures

Figure 1: Illustration of Strategic Hedging Framework

## 2.3 Strategic Hedging

As aforementioned the main focus will be towards the usage of foreign debt as hedging instrument, in the sense of allocating ones liability portfolio. However, it is important to provide the complete setting of strategic hedging, which is the overall perspective where foreign debt is a long term approach in reducing risk exposure.

The structure below is for the most part taken from "*Hedging and invoicing strategies to reduce exchange rate exposure: a euro-area perspective*" by Döhring (2008) at the European Commission. With this view, one can think of *strategic hedging* to be an overview-approach of risk management within a corporation; as aforementioned it is a mixture between short and long term hedging. The concept of strategic hedging might further be broken down into *operational* and *financial* hedging, which in can be classified as either *derivative* or *natural* hedges. As can be observed in Figure 1 natural hedges are generally of a more long term nature, and can consist of both financial and operational hedges, as in taking on foreign currency debt and diversification across currency zones, respectively.

An important remark in relation to Figure 1 is the time horizon of each hedging alternative; that *natural hedges* are long term actions, which is something that we will focus on throughout the paper. Thus, strategic hedging aims to hedge through both on and off balance-sheet strategies.

### 2.3.1 Financial Hedges as Derivative Hedges

A *Derivative Hedge* is a pure financial hedge in order for a corporation to fix values of future commitments. In general, reducing risks by usage of financial hedges, such as; forwards futures and swaps are considered to be less costly than manipulating real assets and liabilities. However, as previously stated by McGrath (2011) it depends on the volatility in the markets; if volatility is too high then financial hedging becomes more costly. With regard to the foreign exchange rate risk, financial hedging definitely serves a purpose in securing future cash flow commitments such as import payments in the foreign denominated currency, i.e. usage of a forward to lock the exchange rate for a predetermined date corresponding to the date of the actual cash flow transaction. According to Figure 1, one can consider financial hedging being of short-term nature, where corporations typically use a hedging horizon of up to 12 months. The chosen

derivative hedging horizon of course depends on for example cash flow patterns and in turn which industry one is active within. Logic dictates that in a more stable, i.e. less volatile, market one can employ longer hedging horizons due to the higher degree of certainty. However in highly dynamic markets such as high-tech markets or more specifically consumer technology goods: one might not with adequate certainty know what lies ahead for the upcoming six months, therefore cannot take accurate hedging decisions and thus forced to a shorter hedging horizon setting.

### **2.3.2 Operational Hedges as Natural Hedges**

In *Operational Hedging: A Review with Discussion*, Boyatali and Toktay (2004) recites the definition of operational hedging from Huchzermeier (1991), who defines it as follows;

*"Operational hedging strategies [...] can be viewed as real (compound) options that are exercised in response to demand, price and exchange rate contingencies faced by firms in a global supply chain context".*

This definition addresses the supply chain network and how the global diversification takes place in terms of production, sourcing and/or sales. Boyatali and Toktay (2004) discuss the fact of operational hedging in terms of a contingent decision making process, i.e. operational hedges can be performed through decisions regarding logistics, capacity, production/outsourcing et cetera. According to Boyatali and Toktay (2004);

*"These real options, used as operational hedges, are argued to mitigate the risk exposure in the long run by reducing the downside risk".*

That being said, operational hedges can take form through numerous ways, however, facility diversification might be the most clear representative illustration.

### **2.3.3 Financial Hedges as Natural Hedges**

In order to achieve the objective of reaching an overall agenda in managing corporations foreign exchange rate risks and exposures, one has to consider the balance sheet aspect which includes the choice of capital structure. It is easily argued that the choice of capital structure relating to risk management influences well-known, large multinational corporations. By thoroughly analyzing the companys revenue streams, the operational costs and the assets in place and by a break-down currency wise; companies might be able to reduce their foreign exchange exposure by issuing debt denominated in a foreign currency. Such currency matching procedures then act as natural financial hedges towards future exchange rate fluctuations of company cash flows.

In previous literature such as Hagelin and Pramborg (2004), they concluded that usage of financial derivatives and foreign currency denominated debt coincidentally reduces firms exchange rate risk exposure. The authors argue that the reason for the reduced exposure through the use of foreign debt is that it reduces the firms long-term economic exposure. Similar results and arguments can be found in other studies as well, for example Carter et al. (2003) published results from a study on US multinationals and also Cowan et al. (2005), that published a study on Chilean firms. Despite this, the picture

is not completely straightforward since de Jong et al. (2006) published contradictory results based on a survey of Dutch firms, that operational hedging can reduce exposures whilst financial hedging cannot.

The argument that the use of foreign debt as a hedging instrument can decrease foreign exchange exposure is interesting since it potentially opens up for analyzing firms liability side of the balance sheet in relation to its risk management operations and the possibility of finding preferred liability portfolios in different currencies in relation to its currency composition of assets, revenues and costs.

One of the most popular, although far from exclusive, explanations for why companies hedge foreign exchange exposures is the focus on the firms cash flows and the objective of having smooth streams of cash inflows rather than them being jumpy and unpredictable. By adopting this cash flow point of view, it is fairly straightforward why a corporation could potentially benefit from having a well-matched revenue and liability situation. That way, cash flows from sales can possibly be used for repayments of debt without having to translate it to another currency and therefore be exposed to exchange rate fluctuations.

Based on these findings, the use of foreign debt and financial derivatives might act as complements and used simultaneously to control the exposures and maintain them at a desirable level for the company.

## **2.4 Achieving Preferable Liability Portfolio**

### **2.4.1 Foreign Currency Denominated Debt**

As previously stated, the focus of this thesis will lie in line with usage of foreign debt as a way of reducing exposure, a more long-term approach rather than short-term methodology. Much of the reasoning regarding taking on foreign debt or not, will be inspired by previous work. For one, Kedia and Mozumdar (2003) studied the determinants for using foreign debt as a hedging instrument at an individual, as well as an aggregated, currency level. The main findings in this empirical study was that corporations indeed use foreign currency denominated debt to hedge exposure, and that the currencies are chosen based on information asymmetries between foreign and domestic investors. In contrast to Brown (2000), Kedia and Mozumdar (2003) found:

*"[...] no evidence that tax arbitrage, liquidity of underlying debt markets, or legal regimes influence the decision to issue debt in foreign currency."*

Moreover, the authors thoroughly discuss to what extent different corporations are active in the foreign market, and conclude that extensive foreign operations lead to reduced information asymmetries which in turn positively affect the usage of foreign currency denominated debt as a hedging instrument. The paper further strengthens this fact by a significance test of correlation between foreign operations and issuance of debt, which results in positive correlation for all 10 tested currencies, and 6 out of 10 are statistically significant at 1%, 5% or 10% levels.

Aabo (2006), partly verified by Kedia and Mozumdar (2003), found a positive relationship between issuance of foreign debt and the parameters size, foreign currency exposure and costs of financial distress. Noteworthy, *information asymmetries* were found by the author to be negatively correlated and significant. That is, larger information asymmetries lead to less issuance of foreign debt.

Other related literature, primarily Gonzalez et al. (2010), take a different incorporate *capital structure theory* beside pure *hedging theory*, and therefore aim to provide a more informative explanation to why non-financial companies issue foreign debt. Hedging theory mainly focuses on reduction of exchange rate risk in relation to cash flows, however Gonzalez et al. (2010) find that usage of foreign debt might also be affected by access to cheap external funding and financial risks which are represented on the balance sheet.

Moreover, the work done by Gonzalez et al. (2010), was influenced by previous work done by a handful of experts, mainly Clark and Judge (2009), but also Judge (2003) and Aabo (2006). These studies have in common that they examined the usage of foreign debt and derivatives jointly; different times calls for different methods. Clark and Judge (2008) noted that studies excluding the usage of derivatives and focused solely on one method of hedging would become biased, which therefore inspired a similar approach by Gonzalez et al. (2010).

Articles which exclusively analyze usage of foreign debt are represented by, for example, Allayannis and Ofek (2001) and Kedia and Mozumdar (2003) (as mentioned before). These studies find significant results, however ,as Gonzalez et al. (2010) stated based on Clark and Judge (2009), the conclusions might be biased.

Nevertheless, Gonzalez et al. (2010) deduced different determinants that describe reasons for taking on foreign debt, such as *foreign currency exposure, economic sector, information asymmetries, foreign operations (subsidiaries), percentage of foreign sales, size of corporation* and *capital held by managers*. Also, they used further explanatory variables in the regressions, however the above mentioned variables were the ones found significant related to issuance of foreign debt.

A coherent conclusion from all the previous studies is that the strongest determinants for issuing debt, regardless if the studies have been done exclusively with foreign debt or jointly with derivatives, is the *size of corporation* and *foreign exchange rate exposure*.

#### 2.4.2 Currency Swaps

Furthermore, when discussing the mix of foreign debt in the liability portfolio, we also have to consider the case of *currency swaps*. Larger corporations might have foreign operations in many countries and in turn currencies but does not feel inclined to take on debt in every one of those currencies. There might be other solutions, such as issuing debt in one or two larger currencies and then *swap* into desired currency in order to achieve preferable liability portfolio mix.

Judge (2003) puts emphasis on the differences in usage between derivatives and foreign currency denominated debt. In the paper he scrutinize and conclude that all derivatives are not eligible to work as substitutes for foreign debt as hedging instrument with regard

to foreign activity. This is due to the fact that foreign operations are generally of a long term nature which thereof indicates that it would be more efficient to use an instrument with the matching structure and maturity, which foreign debt or a currency swap could provide.

Moreover, the author further discusses the impacts of taking on foreign debt versus currency swaps in order to achieve the preferred liability portfolio. Judge (2003) states that in terms of timing and efficiency one could be more flexible using currency swaps, since they are easier to reverse than natural foreign debt. Hence, with currency swaps a corporation could achieve long term nature of liabilities, with continuously rolling over swaps. Gonzalez et al. (2010) also mention different implications of using currency swaps and foreign and domestic debt in the following context:

*”With respect to currency swaps, if firms use them to translate domestic debt into foreign debt or foreign debt of one currency into foreign debt of another currency for asset liability matching, then issuing foreign debt in the currency of firms assets is a substitute strategy. On the other hand, if firms use currency swaps to convert foreign debt into domestic debt in order to currency match domestic assets with domestic liabilities then issuing foreign debt without the concomitant currency swap would not be a substitute strategy. It follows, therefore, that foreign debt does not necessarily substitute for the use of swaps in reducing foreign currency exposure.”*

Based on this statement from the authors, and also by Judge (2003), issuing foreign debt is not an alternative strategy in a hedging or exposure reduction sense for corporations that swap foreign debt into domestic debt, however they conclude; it is for firms swapping into foreign debt.

## **2.5 Balance Sheet Considerations and Net Investment Hedges**

While the majority of the traditional reasons have to do with straightforward costs affecting the Income Statement, corporations might find it worthwhile to consider possible currency exchange rate effects on the Balance Sheet. In this section, the topic of fair value hedging has to be introduced which can be defined as a mean of controlling the book values of a company's balance sheet items, i.e. assets and liabilities. As stated, hedging book values of a firm is merely a matter of accounting practices and in financial theory with the common assumption of perfect markets, value changes due to accounting standards should have no effect on overall firm value. Despite this, markets are rarely accepted as perfect and volatility in the balance sheet might affect investor attitudes and hence have real implications for a company. When acquiring foreign assets, a matching method to take on foreign debt in the same currency reduces the translation effect of exchange rate changes. This practice is what is called net investment hedging and when done correctly, it can effectively reduce volatility on the balance sheet stemming from currency movements and also under certain circumstances reduce volatility in the from an investor point of view important Earnings per Share ratio (Roncal, 2008). A will to protect balance sheet values might also be explained by pure managerial objectives in a Principal-agent scenario as it might help him/her to be successful in the mission to

make one appear indispensable. As one progress to analyze companies in a case study, this section might be useful to remember as it provides explanations for why it could make sense to have a degree of matching between assets and liabilities per currency as fair value hedges in order to reduce balance sheet volatility.

## 2.6 Corporate Governance and Financial Risks

The last couple of decades, the issue of Corporate Governance have gained increased popularity and attention among companies and global markets. The terms definition introduced by the Cadbury Committee report in 1992 is that Corporate Governance is the system by which companies are directed and controlled and the necessity of such a system roots from numerous historical unexpected bankruptcies, and even accounting frauds, despite what appeared to be sound financial reports. Implications of the introduction of Corporate Governance are that disclosure regulations have increased, as well as strengthened relationships between shareholders and stakeholders, i.e. the Board of Directors (BoD) and company management. The link between the Corporate Governance system and Risk Management practices is quite evident and clear-cut; it is the BoD together with management that outline financial policies and dictates mandates of what management can and cannot do in terms of risks. For example one can argue that management relatively rarely gets the go-ahead of engaging speculative trading in currencies, at least not publicly, and especially not in non-financial companies.

Regarding risk management and hedging strategies, the role of Corporate Governance becomes increasingly significant. According to capital structure theory, or more precisely, Jensen and Meckling (1976), taking on foreign debt, or domestic debt for that matter, instead of expatriating shareholder for equity, could be helpful in term of reducing occurrences of conflicts between shareholders and managers by shifting decisional freedom away from managers. This, since when taking on debt one enters into a legal contract and the debt holders have right to compensation if management default on interest payments. This can be expanded further by introducing the theory of the Principal-Agent dilemma. Problems can arise when owners of a business (shareholders, the BoD) as the principal hires and agent (manager) to daily operate the business and act on behalf of the principals interest. Two significant reasons to why problems can arise from such a setting is first the information asymmetry issue, the fact that the agent becomes an insider with access to more detailed knowledge about the operations and the increased rapidness of information received as compared to the outside principal. A second origin of potential problems is imperfect alignment between the principal and the agent when it comes to the matter of risk aversion. The principals will always want to take on projects that would maximize the value of the company and then accepts the risks that these projects bring. A manager on the other hand might be more risk averse, reject high risk projects that would be of benefit for the shareholders. Managers might instead act upon their own interests and choose a project with higher probability of success accompanied with less value creation in order to build up a good track record and make one appear irreplaceable. The way around these potential principal-agent issues is a well-functioned Corporate Governance system with principal monitoring, keeping the management on an arms-length distance, and satisfactory incentive schemes, incentivizing management

to follow the wishes of the shareholders and as such aligning objectives. Hereof, management becomes concerned about keeping their job and thus will manage the company as efficient as possible.

Gonzalez et al. (2010) measures this fact in their empirical study, and defines it as *managerial risk aversion*. The reasoning refers to the fact that if management are concerned for their jobs or hold equity themselves, they will be more inclined to hedge. In the article, Gonzalez et al. (2010), found a positive and significant relationship between taking on foreign debt and *percentage of shares held by managers*, which was used as a proxy in order to quantify risk aversion. For example, if managers enter into a new market with substantial investments in long-term assets, they would if being risk averse by means of being incentivized themselves, feel inclined to hedge, and as Gonzalez et al. (2010) observes, that hedge could be by using foreign debt.

Although not perfectly connected to the area of strategic hedging, the Corporate Governance issue is essential to consider when evaluating risk management practices. In the light of possible policy changes affecting the overall risk taking of the company one has to contemplate both managerial and shareholder objectives and the effects of different levels of risk. Furthermore, shareholders might be willing to take on higher individual company risk as they can they can reduce their overall portfolio risk through holding a well-diversified portfolio.

A final remark can be the organizational structure of a treasury department responsible for risk management. Irrespectively if a firm chose a front, middle and back-office approach or a more horizontal structure, one should consider how strict splits in areas of responsibilities should be. The objective with this paragraph is to introduce the importance of possible integration between different areas, with one example in relation to this thesis' topic being a close relationship and high awareness between funding and FX managers.

## 2.7 Motives for Determinants

In section 2.4 previous literature was examined in order to decide on important determinant for issuing foreign debt. As mentioned, the analysis in this thesis will be focused upon the factors; *size*, *economic sector*, *foreign currency exposure* and *foreign operations & information asymmetries*.

*Size* is a factor that influences whether the companies are suitable for the foreign debt hedging approach on a more general level. Gonzalez et al. (2010) describes and explain the factor in the following manner:

”As proposed by hedging theory, larger companies have greater access to foreign debt markets. According to capital structure theories, debt usage could reduce the conflict between shareholders and managers of larger companies, and firm size leads to easier access of foreign debt”

The importance of considering *economic sector* can be justified by experiences from highly technological firms where development of new technologies shifts consumer tastes and market standards. For these types of companies, it is important to always strive to

be in front of developments and try to foresee what will be appreciated among consumers. A famous example is the imaging company Eastman Kodak that failed to adapt to the introduction of digital cameras and lost its market leading position at that time. Hence, an evaluation of *economic sector* is appropriate to include as to whether a company is suitable for the foreign debt approach.

*Foreign currency exposure* is relatively self-explanatory in the sense of foreign debt hedging. Few companies tend to engage in speculative activities and hence there has to exist an underlying foreign currency exposure as to use foreign debt in hedging.

The level of *foreign operations* & *information asymmetries* also has to be addressed in relation to foreign debt hedging. When there is a positive net exposure that needs to be hedged, it makes sense to further analyze how operative a company is in the specific country. The need, and therefore the suitability, for hedging with foreign debt is naturally larger in countries where one is extensive in operations in terms of factories (non-current assets) and have a large proportion of its revenues, also mainly evaluated with a long term mindset. By issuing debt in a country where the level of foreign operations is high and hence reduce the risk of suffering from information asymmetries.

Finally, as the corporations' individual currency candidates of issuing foreign debt emerged stemming from the company specific results, the need for considering yet another factor materialized, namely *market stability*. The reason for this was in order to evaluate whether issuing foreign debt in an emerging market currency is particularly preferable.



### 3 Case Study

Part III will consist of a case study of three corporations, AstraZeneca, Nestlé and SKF, which in Part IV will work as a basis for the analysis in terms of empirical result for each corporation.

Initially, the aim is to briefly describe the specific companies and the industries in which they operate. Furthermore, we will perform an in-depth portrayal of the chosen corporations to infer the current currency structure of each liability portfolio, non-current asset portfolio, revenue distribution, and cost dispersion. The methods for the arbitrary dispersion of different items might differ between corporations due to the incoherently provided data regarding each company from public sources. The objective is to obtain a reasonable and realistic disposition of the companies which thus force one to make adjustments depending on the adequacy of collected data.

Key Words: Liabilities, Non-Current Assets, Revenue, Costs

## 3.1 Company Descriptions

To begin with, we will in the sections below introduce the companies that we have selected for analysis; provide very brief descriptions of the companies themselves and also what their own public statements say of foreign exchange risk management policies and practices.

### 3.1.1 AstraZeneca

The British pharmaceutical company AstraZeneca is the result of the merger of Swedish company Astra and the British company Zeneca. The company develops and produce prescription based drugs in several areas within medicine, with primary focus on *cardiovascular, neuroscience, gastrointestinal, oncology, infection and respiratory & inflammation*. The pharmaceutical industry records relatively high sales figures compared to other industries and AstraZeneca is amongst the top 10 in the industry based on revenues. Examples of AstraZenecas main competitors include American companies Pfizer and Johnson&Johnson, Swiss Roche and British GlaxoSmithKline. AstraZeneca is headquartered in London, UK, with US Dollar as its accounting currency.

Before turning to the concrete analysis of AstraZenecas liability portfolio, asset and revenue distribution and their exposures, it is both interesting and important to shed light on its public statements of how it embraces foreign currency exchange risk. In their *Financial risk management policies* and more specifically the description of the Treasury functions responsibilities, they write the following on the subject of exchange rates:

*"We do not currently hedge the impact on earnings and cash flow of changes in exchange rates, with the exception of the currency exposure that arises between the booking and settlement dates on non-local currency purchases and sales by subsidiaries and the external dividend"*

The citation above is in our view somewhat ambiguous, however the second part clearly imply that the company hedge exposures in foreign currencies that appear due to purchases and sales by subsidiaries.

Furthermore, we turn note 23 in the Annual Report labeled *Financial risk management objectives and policies* in order to clarify further how the company handle FX risks. Under the subject of translational exposures, AstraZeneca argue that although the exposures are significantly mitigated through currency cross-correlation, they are regularly monitored and actions might be undertaken if the need is considered. For the purpose of this thesis the following sentence, still under the translation exposure heading, is of particular interest:

*"Where there is non-US dollar debt and an underlying net investment of that amount in the same currency, the Group applies net investment hedging."*

This indicate that the company use foreign debt as a hedging instrument since it at some point has chosen take on debt to match an investment in a foreign currency. Moving on to the practices regarding transactional exposures, it is written:

*”One hundred percent of the Groups major transactional currency exposures on working capital balances, which typically extend for up to three months, are hedged, where practicable, using forward foreign exchange contracts against individual Group companies reporting currency.”*

This citation is fairly straightforward; the company hedges the relatively certain balance sheet items at the execution of these cash flows between the parent company and the subsidiaries using forward contracts.

### **3.1.2 Nestlé**

The Swiss company Nestlé SA is according to their own statement *The Worlds leading Nutrition, Health and Wellness Company* and, with their slogan *Good Food, Good Life*, they are undoubtedly among the top players in the food processing industry. For the full year 2011, *Sales* amounted to a figure of approximately 83.6 billion Swiss Franc (CHF) with an EBT of 12.05 billion CHF stemming from various popular brands and products such as *Nescafé* (coffee), *Perrier*, *San Pellegrino* (bottled water), *Kit Kat*, *Smarties* (Chocolate & Confectionery), *Nestea* (Drinks), *Häagen-Dazs*, *Mövenpick* (Ice Cream), amongst others.

When turning to the Nestlé Annual Report with the objective to scrutinize their official financial risk management practices, and in particular regarding foreign currency exchange rate risk, we find the information to be of fairly poor detail. In fact, it is essentially limited to the following paragraph:

*”The Group is exposed to foreign currency risk from transactions and translation. Transactional exposures are managed within a prudent and systematic hedging policy in accordance with the Groups specific business needs. Translation exposure arises from the consolidation of the financial statements of foreign operations in Swiss francs, which is, in principle, not hedged. The Groups objective is to manage its foreign currency exposure through the use of currency forwards, futures, swaps and options.”*

Apart from the fact that the company apparently employ a policy to manage foreign exchange risk, the level of useful descriptions of how the policy is carried out is virtually non-existent.

### **3.1.3 SKF**

SKF are active within the engineering industry, mainly with bearings, seals, lubrications, motion control system and related services worldwide. SKF are considered to be one of the leading corporations regarding providing goods and services within the above mentioned areas. During 2011 the company reached record sales mounting up to 62.216bn Swedish Crowns, an increase of 8.5 percent from 2010 stemming from increased demand in volume, restructuring changes from divesting or acquiring companies, and also a more efficient Price/mix<sup>1</sup>.

---

<sup>1</sup>That is, an increase in average price and more mixed sales of different products

In order to introduce the official foreign exchange risk practices of SKF we turn the companys Annual Report. Under the transaction exposure heading we find:

*”Currency exposure and risk is primarily, and to a large extent, reduced by netting internal transactions. [...] The currency flows between SKF companies managed by SKF Treasury Centre were reduced through netting from SEK 55,616 m (53,383) to SEK 5,753 m (5,338). This amount represented the Groups main transaction exposure excluding hedges.”*

Clearly, SKF consider itself to have an efficient netting system with purpose to reduce the foreign exchange risk exposure that has to be managed. Since no detailed information regarding the netting processes is provided, we are unable to reflect on the actual efficiency and are left with no other option than to leave it at this and progress to investigate the handling of the remaining exposure. The following sentence contains some information on how this exposure is managed:

*”The Group’s policy has been to hedge the currency flows from 3 to 12 months on average. Hedge accounting as defined by IAS 39 has been limited to USD only.[...] During 2011, forward exchange contracts were the derivative financial instruments used by the Group to hedge its foreign currency rate exposure.”*

Furthermore, SKF provide information regarding that they hedge some of its translational exposures through net investment and fair value hedges.

*”During 2011, net investments in foreign operations totalling EUR 1,142m (884) were hedged by the Group against changes in the EUR/SEK exchange rate. EUR loans for an amount of EUR 930m, a cross currency swap to buy EUR for an amount of EUR 112m to closing rate and a forward contract to buy EUR for an amount of EUR 100m were designated as hedge instruments.”*

Obviously, this paragraph is of particular interest for us given the main topic in this thesis namely that SKF are currently using some EUR denominated foreign debt together with cross currency swap to hedge EUR denominated investments, i.e. net investment hedging.

## 3.2 Industry Description

As previously stated, we purposely chose to study corporations from relatively widely different industries. In the coming sections, we will give very brief descriptions of the industries in which they operate, with the objective here being to provide some insights of how specific industry characteristics might influence for example cash flow streams and further aspects that might affect the choice of FX risk management practices. We are looking at characteristics such as, *barriers to entry*, *short/long-term investments* and *percentage of tangible assets*, where all characteristics, at high levels, lead to issuance of foreign debt. ((Aabo, 2006), (Gonzalez et al., 2010))

### 3.2.1 Pharmaceutical Industry

The global pharmaceutical industry can arguably be classified as an oligopoly, or perhaps oligopolistic competition. The main argument for this statement is the existence of extremely high *barriers of entry* due to factors such as for example economies of scale, distribution product differentiation, capital requirements and financial resources and regulatory policy (Castner et al., 2007).

The perhaps most striking feature of the pharmaceutical industry is the heavy regulation placed on companies in all steps of the developing process. As understandable as it is from the viewpoint of patient safety and ensuring efficiency in fighting serious diseases, the implication for companies in the industry is that the distance from initial research and development through numerous phases of trials to the endpoint of receiving sales approvals is relatively long, complicated and costly. According to journalist Berkrot (2011) at Thomson Reuters , only about 9% of all experimental drugs that entered into phase-1 trial turned out a success and reached the market during the years 2004-2010. A further implication of the difficulties in developing new drugs is that big players in the industry more often than before acquire smaller companies that have succeeded in bringing a drug to the market and hence grow through acquisitions. This results in, that pharmaceutical companies often have large cash reserves. Even so, companies in the pharmaceutical industry can be characterized by heavy investments in R&D activities since this is still the basis for future success by bringing new and more efficient drugs onto the markets. Despite the difficulties described above in the development process of a new drug, when a pharmaceutical company succeeds it is rewarded by a high potential in terms of sales due to the widespread use of patents. A patent though is valid for a limited time, for example in the US a patent can have a life time 20 years, and hence the time for a pharmaceutical company to capitalize on its investments and upbringing of the drug is limited. After a patent expires, competition from less expensive generic drugs appear more or less on the following day; seriously cutting back on the initial patented drugs' sales.

Further, we will use the R&D expense level as an indicator of the level of long-sightedness and stability in the industry under the factor *long versus short term investments* which for our purpose is important due to long term view point in relation to foreign debt issuance. Reportedly, the pharmaceutical industry is the highest in terms of R&D expenses and in 2011 mounted to roughly 88 EURbn in 2011 which was an increase of

6.3% compared to 2010 (EuropeanCommission, 2011). Thus, the industry can arguably be seen as adopting a long term perspective approach rather than short.

Finally, another interesting factor for our cause is the *level of tangible assets* since it provides an indication of long term approach in operations. In pharmaceutical companies, one would expect a relatively lower *level of tangible assets* than in other striking capital intensive industries. Looking at AstraZeneca as to illustrate this with an example, we found a figure of 60% of tangible assets (AstraZeneca, 2011).

### 3.2.2 Food Processing Industry

The food processing industry consists of a large number of firms, however, one might argue that the three largest Nestlé, Kraft Foods and PepsiCo constitute somewhat of an oligopolistic market structure(Vigilant-Citizen-Blog, 2011). In this respect, the largest and most important *entry barriers* in the industry is arguably the strength of product brands.

All individuals can in any way relate to the food and nutrition industry, we all have to eat and shop for groceries is one of several must-do's in everyday life. At the very instant one enters into a supermarket you as a consumer are bombarded with different goods, brands and prices and it is therefore easy to conclude that this industry is relatively competitive. Simple logic tells you that in order to be successful in an industry like this; the goods have to be of superior quality and/or offered at attractive prices and through this ensure high turnover figures for the company products.

Increased globalization during the last decades have had its effects in this industry with increased availability of products, large international companies that now offers its products worldwide through enhanced distribution channels. Today, two global issues perhaps most rooted in the western world that are topical are the environmental situation and global warming threats together with discussions of peoples' health and the fight against obesity. In the food processing industry, these matters of producing healthier food in a more environmental friendly way are central which can be seen from the surprisingly high investments in R&D, which is an adequate indicator of the company's *long term investments*.

Turning again to the *level of tangible assets* one might deduce that due to the importance of product brands, the successful companies in the industry will have substantial levels of *goodwill* and hence have a relatively lower percentage of tangible assets in comparison to other more heavy industries in terms of capital intensity. Looking at Nestlé as to illustrate this with an example, we found a figure of 66% of tangible assets (Nestlé, 2011).

### 3.2.3 Industrial Engineering Industry

Industrial Engineering is a costly industry which consequently makes it difficult to become a player of substantial size in the market. Most agents in the market are of the

larger kind because innovations needed to gain market shares are expensive, hereof research and development becomes an eminent part of the market. These *entry barriers* make it increasingly difficult for smaller start-ups to gain market shares in this industry.

Moreover, looking at the *long versus short term investments*, where a company is more inclined to use foreign debt when being long term committed in operations, one can argue that the engineering industry is indeed long term committed. Due to the industry being of the innovation kind, with new technology emerging in the market, all the market leaders have to follow that trends in the sense of trying to improve their products in the market, which is investing in long term investments, such as R&D, which works as a good indicator of the industrys long term commitment. In EuropeanCommission (2011), we can observe that the R&D investments for the industrial engineering industry mounted to approximately 16 EURbn for the whole industry which was an increase with 6.5% from 2010. This indicates that the industry is long term committed in investments, since if not, it would be unnecessary.

The *level of tangible assets* is also an industry factor promoting foreign debt usage, and in the case of engineering industry it becomes obvious that most of the firms are holding a substantial amount of tangible asset by definition. The engineering industry is a capital intensive industry where machinery is the foundation of each corporation, thus larger levels of tangible assets. Looking at SKF as to illustrate this with an example within the industry, we found a figure of 83% of tangible assets (SKF, 2011).

### 3.3 Company Results

In this section, we will be turning focus to the corporations actual figures that we have gathered and calculated; starting off by observing the *liability sides* followed by in turn *assets, revenues, net flows/exposures* and sensitivity analysis.

#### 3.3.1 Liability Portfolio Composition

The companies liability portfolio mix lie as the foundation for the purpose of this thesis. Naturally, we started off by gathering the required information in order to portray the distribution currency wise of the debt allocations. Apart from the pure foreign debts, we have where available incorporated information regarding cross currency interest swaps. Where information from Reuters is used, it was collected on March 20<sup>th</sup>, 2012.

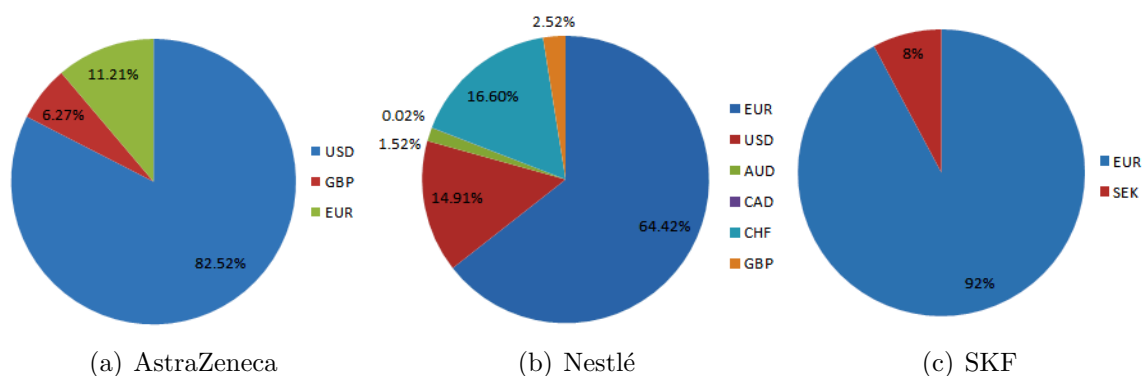


Figure 2: Liability Portfolios

*AstraZeneca.* We began the analysis of AstraZeneca by collecting company data of its debt structure from Reuters Xtra 3000<sup>TM</sup>. This information regarding the company loans and bonds were given in the face amounts in their respective currency denomination. In order to be able to make a depiction of the relative weights the AstraZeneca liability portfolio constitutes, the non-dollar debt amounts had to be translated to dollar, and in this task we used exchange rates for Euro-dollar and Pound Sterling-dollar rates from 2011-12-30. Figure 2 portrays the liability portfolio of total 8,846 m USD.

We see that the vast majority of the AstraZeneca debt is denominated in USD complemented by approximately 11% EUR denominated debt and just over 6% denominated in GBP. With USD being AstraZeneca's accounting currency, the foreign debt proportion is consequently small, accounting for only just over 17%. Further, the large USD proportion is not very surprising given the relatively strong position in the US and globally, also with the US market importance in mind. It is not surprising to observe GBP debt in place with AstraZeneca being a British company headquartered in London, nor is the evident EUR debt given the relative size of this market.

*Nestlé.* When looking at Nestlé's financial figures in order to analyze the company's revenues, currency exposures and liabilities, we started by collecting the debt structure from Reuters Xtra 3000<sup>TM</sup>. Hence, provided to us was a company record including loans and



bonds split by currency. Since all debt values initially were displayed in USD we translated the figures into the respective local currency in order to see the original facility amounts/outstanding amounts. Then in order to see the debt structure split by currency and their relative weights, we translated the Nestlé debt figures into their functional currency CHF, again using the exchange rates from 2011-12-30, giving it a total of 19.7 billion CHF is displayed in Figure 2.

From this, we can easily see that roughly 58% of Nestlé debt is denominated in EUR followed by close to 23% denominated in CHF, approximately 7% in USD and so forth.

However, in the Nestlé *Financial Statements* for 2011 the company discloses notes of cross currency interest swaps in place in relation to the individual bonds. This is an important aspect to take into consideration since it alters the rates and currencies that the company has continuous financial liabilities in. By identifying and matching the bonds in our list from Reuters to the respective list in the company publication and make adjustments to in which currencies the actual liabilities lie, the debt structure has to be updated and are depicted in Figure 2.

The implications of these adjustments are that the EUR and USD liabilities increase to about 64% compared to roughly 59% and to almost 15% now compared to the previous near 8% respectively. Also, the two bonds denominated in NOK have been eliminated in this second version since these liabilities were both swapped into EUR and USD. The AUD liabilities have decreased substantially due to swaps in place and further we suspect that a more true figure is even lower; now included is a 125 m AUD bond issued in 2012 which we feel in reality is also likely to swapped into EUR or USD in line with other AUD bonds of comparable size. In relation to corporate bonds issued by the subsidiary Nestlé Finance International Ltd, Luxembourg, it is stated that a number of bonds to a value of 2,25bn CHF are hedged, assumedly towards the subsidiary's functional currency EUR but we have still chosen to include this figure in the CHF liability share for the purpose of our analysis since the pure liability, as far as we see it, is still in CHF. This allocation of debts is not very surprising at this point with debts in CHF as a Swiss company, a majority of EUR debt due to the vicinity of and the strong presence in the Euro area, complemented with roughly 15% USD debt.

One final remark to the Nestlé debt structure is that the high EUR figure in both depictions above is compiled mainly of the companys two substantial loans of 5bn and 4,5bn EUR respectively.

*SKF*. By being a global corporation SKF is exposed to foreign exchange rate risk, through translation and economic exposure. Figure 2, illustrate the long-term commitments that SKF has undertaken in terms of debt. As one can observe SKF has a total of *Liabilities* equal to 12.96bn valued in SEK, however only dispersed between Euro and Swedish Krona. Deduced in Figure 2, we can observe that 92 percent of their total long-term debt is held in Euro and 8 percent in Swedish Crowns.

### 3.3.2 Non-Current Assets

When it comes to foreign currency debt as a hedging instrument, it can have different usages. One of these is when a company tries to match liabilities and assets by currency, either through net investment hedges or fair value hedges. Therefore, we obviously have to look at the companies' division of non-current assets by currency in order to at a later stage be able to analyze if, and to what degree, they possibly use foreign debt hedges.

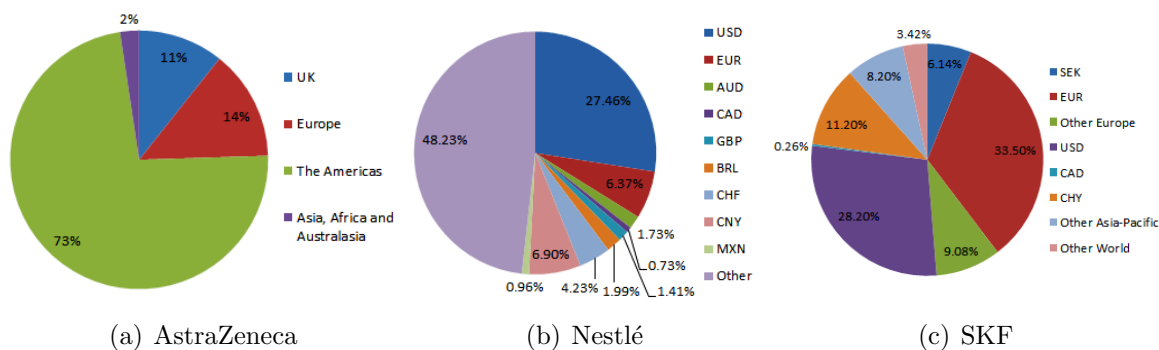


Figure 3: Non-Current Assets

*AstraZeneca.* The division of AstraZeneca's *non-current assets* as depicted below is taken straight out of the company's Annual Report (2011). As seen, the split is not on an individual country level but instead mainly on a continental equivalent. Although not being perfectly ideal for our purpose, the distribution suits us well enough and provides us with maximum asset values that can be denominated in the single largest individual currencies which we in turn can analyze in relation to the foreign debt proportions.

In Figure 3(a), we can see that *The Americas* accounts for the majority of AstraZeneca's *non-current assets* with USD in turn probably accounting for nearly all of it. *Europe* is reported to account for 14% and hence that is the maximum amount that *non-current assets* denominated in EUR can ever account for, however for example Sweden and other non-EUR countries will decrease the EUR part to some extent. *UK* accounts for 11% which we assume to be the true GBP proportion, and *Asia, Africa and Australasia* accounts for only 2% and hence the individual currencies in these countries are insignificant when it comes to *non-current assets*.

*Nestlé.* Turning to Nestlé's allocation of its *non-current assets*, defined as to include property, plant and equipment, goodwill and intangible assets, the available information was fairly limited. The only information disclosed was a declaration of *non-current assets* for what the company claims to be "the ten most important countries and the country of domicile".

In Figure 3(b), we find that the country with the highest relative weight of the total *non-current assets* is the US and consequently we attribute those 27% to USD. In line with the company's publicly stated objective to increase focus towards emerging markets, we see that China, CNY, corresponds to roughly 7%. As a result of the mentioned issue of "poor" information on this topic, the EUR figure consisting at the moment only of France, Germany and Italy, is severely underestimated. In the case we would have had

figures of *non-current assets* split by continent or something equivalent, we would have been able to make an arbitrary assessment of the EUR proportion but as this unfortunately is not the case, we cannot compute a reasonable estimation that would bear any real value. Hence, we will leave this knowingly that more than 6% of *non-current assets* in fact is denominated in EUR but we will not enter any guessing-game as to whether the true value is 10, 15, or 20%.

*SKF*. In Figure 3(c) we have depicted the distribution of *non-current assets* in which we have only represented specific currencies as given in the Annual Report (2011). That is, SEK, USD, CAD and CNY was given in exact numbers in the Annual Report (2011), whereas the displayed EUR item only consist of given values for France, Italy and Germany. Hence, *Other Europe* will most probably consist of more Euro making the true EUR value higher than depicted above. The *Other-Pacific* item will probably consist of e.g. JPY and AUD, however for our purpose we believe this distribution is sufficient since it portrays the overall picture; i.e. EUR, USD and CNY are the largest representatives of *non-current assets*. This disposition becomes relevant in the discussion regarding foreign currency denominated debt as an instrument when hedging balance sheet items.

### 3.3.3 Revenue Compositions

As a first step in order to estimate the companies' currency flows, we have to gather their reported distribution of revenues.

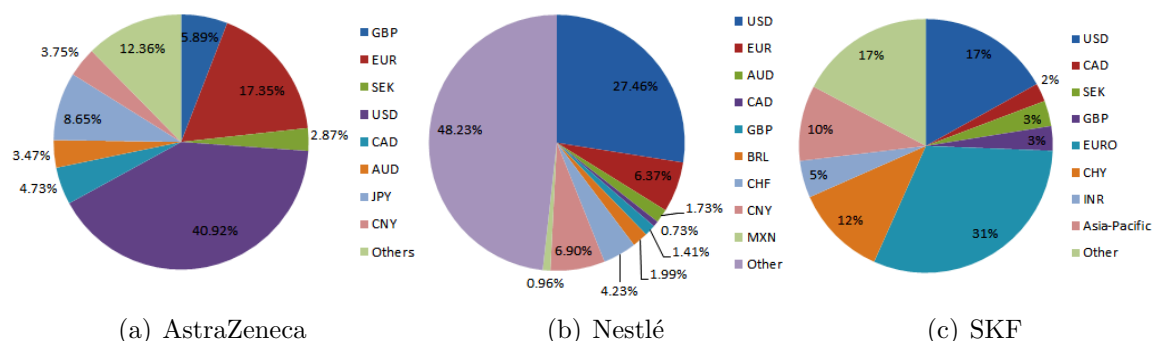


Figure 4: Revenue Composition

*AstraZeneca.* The breakdown of AstraZeneca's revenues for 2011 is based on the segment reporting in their Annual Report where the revenues are listed by geographical area with individual country sales displayed under each area. Thanks to this disclosed information, sales in each of the influential currencies are easily traced and the only important task left for us is to estimate the total EUR revenues based on the *Continental Europe* sales figure (8,229 m USD) less the given sales of France, Germany, Italy, Spain and a few others. We therefore for simplistic reasons listed the countries not explicitly accounted for in two columns, EUR denominated countries and non-EUR denominated countries and split the remaining sales figure equally among these. This procedure provided, in Figure 4(a), the revenue distribution for AstraZeneca in 2011 which we feel should be fairly close to reality.

As we can see, approximately 41% of AstraZeneca's sales were in the US denominated in USD, roughly 17% in EUR and close to 9% in JPY.

*Nestlé.* Turning to the disposition of Nestlé's revenues, the figures originate mainly from the company's 2011 Annual Report in which they disclose geographical segmentation of revenues by region and continent as well as for the three business segments *Nestlé Waters*, *Nestlé Nutrition* and *Other*. The company also displays a list of revenues stemming from the 10 largest countries plus Switzerland as the home country. Through this information base, the known sales from the 11 listed countries could be subtracted from the regional/continental sales amounts in order to estimate sales from unlisted countries. With that said, since the 11th largest country by sales is Russia with sales of approximately 1.7 bn CHF accounts for only just over 2% of total sales we argue that all individual sales currencies that are not on the top 11 list are of lesser importance for our purpose. Explicitly, this results in that what is left for us to estimate is the size of the EUR sales that is not accounted for by the top countries. The procedure for this was to use the *Total Europe Sales* (26,204 CHFm) as a starting point, consisting of *Western Europe* (12,397 CHFm), *Eastern Europe* (2,846 CHFm) and *Nestlé Waters Europe* part (2,438 CHFm), *Nestlé Nutrition Europe* part (1,525 CHFm), *Others Europe* part (6,998 CHFm) with the latter being the residual sum in order to get the *Total Europe*

*Sales* sum that we know with a degree of certainty. Next, a split was made so that we get a total division of *Western* and *Eastern Europe* amounts and the assumption made here is that the known *Western Europe* and *Eastern Europe* sales ratio is applicable for dividing *Nestlé Waters Europe* part, *Nestlé Nutrition Europe* part and *Others Europe* part. As we then have this division of European sales, from the *Western Europe* pot we obviously deduct the known sales for the large countries such as *France, Germany, Italy, Spain, UK, Switzerland* to get the sales figure for the countries that are unknown. For simplicity, that figure was then divided with the number of Western European countries not accounted for and each country was given an equal portion and through this we were able to obtain an approximation of additional EUR sales. The same procedure was applied for the *Eastern Europe* sales figure to find the proportion of this number that was EUR sales. The result of the distribution are displayed in Figure 4(b). One can see from the revenue dispersion above that close to 26% of Nestlé revenues are denominated in USD, approximately 20% in EUR, roughly 6% in BRL and then numerous currencies accounting for within the span of 2-4%. Bear in mind that even though the Other portion is substantial and accounts for close to 25% of total revenues, each individual currency included in this section is of lesser importance with 2% or less of total sales.

*SKF*. Now, we need to break down the SKF revenues streams coming from different currency regions; using a breakdown method similar to as for the other two companies above based on revenue figures from the Annual Report. This outcome is depicted in Figure 4(c). As we can see Euro accounts for 31 percent of the total revenues, also noteworthy is that US dollar corresponds to 17 percent of the revenue streams. These are the two largest revenue regions for SKF and in the liabilities portfolio they solely hold Euro and SEK, thus even though they have a large amount of USD revenue they have chosen not to undertake debt in USD.

### 3.3.4 Cost Breakdown

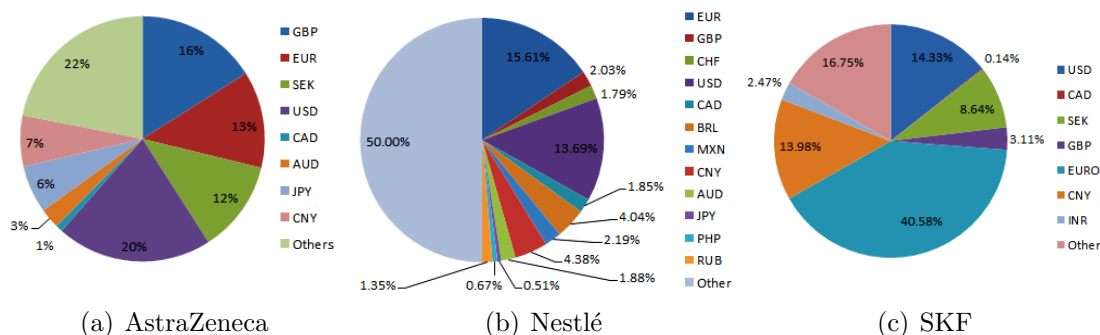


Figure 5: Cost Breakdown

*AstraZeneca.* In Figure 5(a) we have the summarized the cost breakdown for AstraZeneca. As the figure depicts, the company has its largest annual costs for 2011 in GBP (16%), EUR (13%), SEK (12%) and USD (20%); followed by the relatively costs in JPY (6%) and CNY (7%). Noteworthy, the item *Others* includes currencies which represent relatively small levels and/or are not represented on revenue side as a substantial income source.

*Nestlé.* When looking at Nestlé, the situation is quite different as they are less consolidated. In Figure 5(b), one can observe that the two major cost locations are represented by the EUR (16%) and USD (14%). Furthermore, the second pair of currencies corresponding to relatively fair levels, BRL (4%) and CNY (4%), yet not close to the levels of the prior two. In the case of Nestlé, the item *Other* represents 50% of the entire cost base, however due to it consisting of extremely small currencies in the sense of Nestlé not having any manufacturing or any other substantial expenditures they still become large when summed up, yet ignored for our purposes.

*SKF.* Moreover, in Figure 5(c) one can infer the cost distribution by currency for SKF. The figure clearly suggest that the company has the most substantial costs in EUR (41%), followed by CNY (14%) and USD (14%). In the accounting currency, SEK, SKF for 2011 experienced costs which correspond to 9% of total costs. Lastly, the GBP and INR represent 3 and 2.5 %, respectively. As in the case with AstraZeneca and Nestlé, an *Other* item appears, which again corresponds to smaller currencies which alone do not represent a larger percentage of the cost base.

## 4 Analysis

*N.B.: In the sections below we have chosen to include the respective accounting currencies for our three companies in the analysis. We are well aware that debt in these currencies is not to be seen as foreign debt, yet the reason for the inclusion and the similar analysis made of the accounting currencies is to evaluate the suitability of having a lot of debt in these currencies, not from a hedging point of view, but a pure cash flow perspective. This in turn provides us with an opinion whether or not to shift debt from the accounting currencies into foreign debt.*

### *Size*

Gonzalez et al. (2010) stated that as the size of a corporation increases, they are more inclined to use foreign debt as a hedging instrument. The positive significance between debt and size found by Gonzalez et al. (2010) comes with the argument that debt reduces the conflict of interest between managers and shareholders. That being said, larger corporations do not become large overnight and thus they are most often highly developed and stable corporations. Further, as a corporation grows larger, so does the possibility of conflict of interest between the principals and agents. A proxy in terms of total assets, give a good indication of size, nevertheless we believe non-current assets is more suitable for our purpose since when considering a long-term commitment as foreign debt, it is eminent to evaluate the long term assets. Holding large portions of total non-current assets in different currencies would thus indicate long term commitments and hedging these long term asset values with long maturity liabilities would result in a more preferable matching.

AZN holds a value of 27.468 USDbn in non-current assets dispersed among different currencies, which is a fairly large proportion of the 52.830 USDbn *total assets* (52%). Further, we find that the ratio of AZN's *property, plant and equipment* to *total assets* is 12%. This indicates a long term commitment in different regions and thus would stand in favor of using foreign debt to match certain long term exposures in terms of maturities, rather than derivatives which are of shorter term nature.

The size of NSA can be portrayed by the amount of its total assets and non-current assets, 114.091 CHFbn and 80.767 CHFbn respectively. We find that a very large portion of the company's assets are in fact of a long term nature; an indication that will be strengthened further below when analyzing the extent of NSA's geographical dispersion of factories and level of foreign operations. For example, NSA's ratio of *property, plant and equipment* to *total assets* is as high as 21%.

Looking at SKF's figures, we find that the company size is 59.374 SEKbn in terms of *total assets* and 26.026 SEKbn in terms of non-current assets. Further, the SKF ratio of *property, plant and equipment* to *total assets* is also very high, 22%. The large share of non-current assets indicate of a large long-term committed corporation and conflict of interest would arise from such setup.. That is, with SKF's substantial size, it would be a fair assumption making them eligible for foreign debt taking as an instrument of hedging.

We find in this section that NSA is the largest company of our chosen companies, followed

by in order AZN and SKF. We argue that given the size parameters introduced here they are all substantially large and could hence consider the option to use foreign debt in regards to hedging practices.

### *Economic Sector*

When looking at previous studies, such as Gonzalez et al. (2010), it becomes obvious that the economic sector in which the corporation is active works as a determinant of using foreign currency debt as a hedging instrument.

In the case of AZN, who is active in the pharmaceutical industry it provides some support in favor of foreign debt. According to Gonzalez et al. (2010), an increasingly stable and long sighted industry encourages foreign debt. Considering the pharmaceutical industry which is characterized by large investments in R&D - both domestic and abroad, re-occurring patents and high productivity, this leads to the indication of long term commitment in both domestic and foreign markets, especially for AZN. As previously stated, AZN is highly integrated abroad with developing, producing and selling its medicines, which raises the question; does the industry itself provides an environment which allows for issuance of foreign debt as a hedging tool? One can argue that based on our findings and the industry characteristics mentioned above, we have no reason to doubt the suitability of the pharmaceutical industry in relation to foreign debt use. Long-term commitments in foreign economic markets cause long-term incoming or outflowing capital, and in order to offset these discrepancies, especially coming from the revenue side (Kedia and Mozumdar, 2003), one could take on foreign debt and by natural hedges reduce risk exposure.

We then turn our attention to NSA to analyze the sector in which the company is operating; the food processing industry. As with the other two case studies it will come down to the main characteristics of the industry itself that is, hedging horizon, innovations, et cetera. The food processing industry is as previously described fairly stable one on one hand since there is and always will be demand for these products, and less stable on the other hand given fierce competition and rapidly changing trends and health challenges. However, in the case of NSA the question becomes if the company is large and stable enough. By observing the balance sheet for NSA it becomes obvious that they are indeed considered to be a large corporation with total assets mounting to 114.09 CHFbn out of which we consider 66.335 CHFbn being non-current assets. As previously shown NSA already hold substantial amounts of foreign debt. If this is because of the company using it as a hedging instrument or not, we do not feel certain enough to conclude. Nonetheless, it could be used as a hedging instrument and thus reduce risk exposure. In the case of NSA we feel that the economic sector aspect speaks less in favor of issuing foreign debt in comparison to the other two companies of investigation. However, the company itself, thanks to its market leading position, appears to be fulfilling the qualification of high and stable cash flows in order to use foreign debt as a hedging instrument.

In turn, SKF is active within the engineering industry, which is utterly characterized by engineering innovations, which arguably could make this a less favorable industry in which one issued foreign debt. If SKF were to take on foreign debt it should be with the utmost care and feel certain regarding its long term commitments, in this case incoming



cash flows represented by the currency facing the possible debt issuance. Ever changing industries is not, according to Gonzalez et al. (2010), suitable for any larger financial natural hedges such as taking on foreign debt. This is due to the fact of one cannot accurately forecast what comes next and thus making extensive long term commitments could be harmful. However, SKF becomes a difficult subject to analyze in terms of the economic sector, this due to SKF being one of the world leaders in R&D within the industry, which brings with the company having long term perspective on the future operations in the industry. Additionally for the time being, SKF holds patents on their major products which thus would be considered to be long term commitments in terms of production and sales. Hereof, we do believe that the industry itself would not be a perfect fit for taking on foreign debt; however regarding SKF it would be a possibility since it is one of the market leaders in the industry.

This part of the analysis was written in order to evaluate whether the companies' economic sector hinder the usage of foreign debt from a hedging perspective. We argue that all three companies have the option to issue foreign debt even though the economic sectors vary in terms of stability and endorsement. Due to the fact that the chosen companies are highly successful in their respective industry and in some cases arguably market leaders, the type of economic environment that they are facing arguably appears more stable than an isolated economic sector analysis would otherwise provide.

### Foreign Currency Exposure

As stated by Kedia and Mozumdar (2003) in their empirical study about using foreign currency denominated debt in order to lower risk exposure, the exposure must be stemming mainly from the revenue side, i.e. a positive net flow.

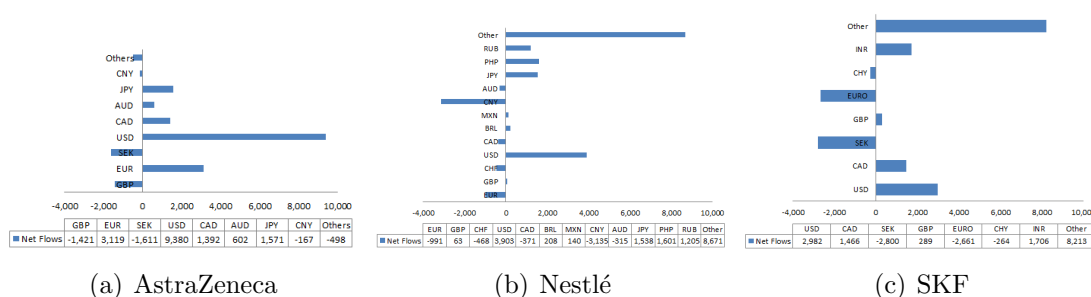


Figure 6: Net Currency Flows

AstraZeneca's revenues less costs can be seen in Figure 6(a) where we can observe that our net flow estimates indicate that the company would have significant positive exposures in mainly USD but also in for example EUR and JPY. On the other end, SEK and GBP show negative exposures which feels fairly reasonable and in line with the company's own statements about *major components of our cost base are located in the UK and Sweden, where an aggregate of approximately 26,7% of our employees are based*. The USD exposure might be overestimated due to underestimation of corporate costs denominated in USD, however since US Sales are very high mounting to almost 14 billion USD we can at least be fairly certain that the exposure is positive and most definitely substantially positive. The EUR estimation is compared to the other currencies potentially a bit more

uncertain since our method of assumptions and general splits enters the equation both on the revenue side as well as the cost side. However, since the estimated EUR exposure is rather substantially positive we can conclude that the likelihood for the real exposure to be positive is relatively high.

Looking at the figures for AZN and beginning the analysis with the case of GBP, roughly 6% of total revenues denominated in this currency resulting in a negative exposure, AZN hold GBP in their current liability portfolio and in order to reduce the risk stemming from negative exposure, one could lower the GBP debt or fully exclude it by rolling over to another currency where it potentially could come to better use. Considering the company's other negative exposure in Swedish Crowns, due to the higher costs in relation to revenues AZN cannot lower risk exposure by taking on SEK denominated debt and hence foreign debt in SEK is not suitable as a hedging instrument, as according to Kedia and Mozumdar (2003). The positive net flow currencies cannot be discarded as potential candidates for foreign debt issuance at this point and hence we have to consider other factors as to what extent AZN is operative in these currencies and how possible information asymmetries could affect structural decisions.

Based on Figure 6(b) above showing our estimated currency net flows for Nestlé, we can say that with a certain degree of likelihood that most of the company profits are denominated in USD and other minor currencies while a high level of geographical presence resulting in high costs indicate that the company has negative exposures in EUR, CNY, CAD and CHF. It is essential to critically analyze since we are aware of the fact that these estimations are based on only public information and are also the result of a few assumptions and general breakdown methods on our part. For example, looking at our USD exposure estimation we feel fairly certain that the exposure is positive thanks to the high USD revenue figure that is given in the Annual Report, however, the cost figure assigned to the US based on the 81 factories located in the country might be underestimated. Hence, the real USD exposure might be lower but probably still positive. Similar arguments can be made about the other currencies, like the CNY exposure where the costs might be overestimated since the average production and employment costs are generally lower in China than in many other countries. The sign on the exposure though is probably correct since the relative geographical presence in terms of number of factories is high and the given revenue figure for sales in China is relatively low. The CHF exposure is most certainly negative since 10 factories and roughly 9 700 employees (figure from Annual Report (2011)) is relatively high for such a small country and the costs associated with this are probably higher than the reported sales in Switzerland of 1 799 m CHF. The validity of the EUR exposure is a bit more ambiguous since our assumptions and general splits enter into the calculation not only on the cost side but also in terms of the level of revenues. Hence, the effect of possibly wrongfully assumptions made will potentially be larger but with this said the estimated negative exposure seems reasonable since the majority of the EUR revenues were given through France, Germany, Spain and Italy sales and the total of 90 factories located in EUR countries.

Analyzing the NSA figures, we would right away based on our estimations and together with related studies suggest that AUD and CAD are to be excluded in the liability portfolio. This, since they both pose negative exposures for NSA which therefore would suggest that they could shift obligations from AUD and CAD to other currencies and

thus lessen the risk stemming from negative exposures in AUD and CAD. Furthermore, the question whether NSAs home currency CHF is a suitable currency for taking on debt answers itself when observing the negative net flow. Although CHF debt in the NSA case is not foreign debt per se, the suitability of it as a debt currency based on the effect on exposure can still be applicable. Hence, with argumentative support of Kedia and Mozumdar (2003) we bear in mind that the CHF debt due to its current net flow might come to better use in another currency, however, we will not suggest a drop of CHF unless we find other factors pointing in that direction. After analyzing this *foreign currency exposure* factor, currencies in the NSA liability portfolio that remain for further investigation are EUR, USD, CHF and GBP.

Figure 6(c) displays net flows by currency for SKF's most influential currencies. However, the three currencies in which the company mainly operates within are EURO, SEK (accounting currency) and USD, as noted by the large revenue and cost streams. Due to SKF being a Swedish based corporation it is not surprising that it poses a negative exposure in Swedish Crown. Furthermore, SKF are also negatively exposed in the Eurozone with an estimated negative net flow. However, in the American market, SKF has an estimated positive net flow by having a larger part of revenues than costs. Moreover, we can observe a positive net flow in *Indian Rupees, Pound Sterling, Canadian Dollar and Other*. Lastly, they experience a small negative net flow in the Chinese Yuan, however fairly small in comparison. The item Other are composed of smaller currencies in which SKF's activity is relatively small in contrast to USD, SEK and EUR.

An important remark regarding the *net flows* is that the numbers we have obtained are estimates and might not be exact. Our purpose of this arbitrary breakdown is to obtain an overview of the *sign position* of each currency. Regarding the USD, one would expect a positive exposure since a substantial part of SKF's total revenues stems from the American market, given at 11,191 SEKm in the Annual Report (2011). However, total expenditures associated in the US are according to our estimations not equally large. The costs assigned to the United States were based on the number of facilities and number of employees.

Further, the Euro figure could for several reasons be incorrect in absolute numbers. This, due to the fact that we obtained no information regarding revenues or costs for the Eurozone countries, except for revenues in Germany, which accounted for approximately one third of total Western Europe. Thus the rest of the revenues were arbitrarily dispersed and the cost distribution was conducted based on employees and facility locations. Due to SKF being very concentrated towards manufacturing in Germany, Italy and France, this could indicate that too little weight was put onto the assignation of costs for the Eurozone countries, which therefore would have underestimated the costs in Euro, making net flows too small in absolute terms.

Regarding the net flows in SEK, we can observe that they have negative exposure in Swedish Krona. The revenues from Sweden were given in the Annual Report (2011), however the costs were not explicitly stated. Therefore, our distribution of costs could be a victim of over/under estimation. As Sweden is the home country of SKF, manufacturing is extensive which contributes to higher costs and due to the fact that SKF is headquartered in Sweden, one could assume that this implies additional costs. Hereof, we fear the costs of Sweden activities could be higher than presumed; leaving us with a

smaller estimated net exposure than in reality.

The last big manufacturing currency is the *Chinese Yuan*, which pose a small exposure of negative 360 SEKm. As with Sweden, we could obtain the revenues stemming from China (7,747 SEKm), however not the costs associated with the manufacturing. Given the estimated figures of China, they indicate that the costs sufficiently offset the revenue flows. However, as SKF has over 30 facilities located in China one could assume that costs would be fairly high. By this reasoning one could be led to believe that the costs in China are potentially underestimated. However, it is relatively cheap in terms of manufacturing and thus these two arguments could cancel out. Since SKF do not hold any debt in CHY and our estimated negative exposure is fairly small, we will not put further emphasis on the *Chinese Yuan* in the upcoming analysis.

We believe it to be important to critically evaluate our estimations and we acknowledge the fact that they might not be one hundred percent accurate. Nevertheless, we do believe that the estimations of *net flows* are of the right sign and relatively close to reality which thus do not hinder further analysis.

Turning to SKF and their estimated net flows, we find that it has a substantial estimated negative net flow in EUR is hence not optimal currency for issuing foreign debt from a hedging point of view. With positive net flow exposures in USD, INR and CAD we have to scrutinize other factors more closely whether or not they are suitable for foreign debt issuance. From the North American market the vast majority of the revenue streams stems from USA, and is in USD. Hereof, one could argue that the high level of revenues in USD gives evidence of it being a relatively secure currency to issue debt within. In addition, as we saw during the financial crisis, the American dollar worked as somewhat of a safe haven; the USD remained secure despite the economic downturn, due to the relatively low sovereign default risk. Despite the positive net flow in CAD the currency only accounts for 2 percent of SKF's total revenues. Hence, one might question the stability of these cash flows and the relative of this currency. When it comes to INR, only roughly 5 percent of total revenues are denominated in this currency which we argue is relatively insignificant in relation to the implied significance of foreign debt issuance.

#### *Foreign Operations & Information Asymmetries*

According to the AZN's publicly disclosed information, the largest positive net flows stems from the US, the Eurozone, Japan and Canada. Moreover, when looking at the overall activity in each region we observe that the company is being active within manufacturing and/or R&D wise in these mentioned regions. For example, according to the available information AZN has 4 R&D sites in the US and extensive manufacturing. Further, 73% of the total non-current assets is in The Americas and the majority of this figure is probably in the US. In the Eurozone, AZN has production and R&D activities in the large countries such as France and Germany. The non-current assets share for region Europe is 14%, however it is likely that UK and Sweden account for a relatively large proportion of this. As stated, indications of the level of foreign activities in Canada and Japan in terms of for example R&D together with the estimated positive net flows make these currencies foreign debt candidates. This together with the revenue figures, it provides convincing indications regarding extensive foreign operations in these regions, which is in line with conditions when deciding on undertaking foreign currency denom-

inated debt. One could argue that depending on the accuracy of our estimates, sign and semi-magnitude wise, AZN should through its extensive foreign operations be facing relatively low information asymmetries. When a corporation is highly active in a certain market, information regarding that market and driving forces becomes increasingly apparent and thus one could make more informative decisions. Bearing these results in mind, we believe AZN would both be eligible for foreign debt use and potentially benefit from a re-allocation of their liabilities portfolio.

Turning to NSA, since we consider the liability portfolio we have to bear a long term mindset when discussing possible liability mixes and the net currency flows deduced in Part III provides an indication of how exposed NSA is. However, this does not illustrate the complete picture given long term considerations and we must therefore reflect on the overall foreign operations before deciding on taking on, or excluding, foreign debt in the other specific currencies in order to shift risk exposure. The reason for determining the extent of foreign operations is because NSA should be able to make an informed choice regarding debt structure. That is, as Kedia and Mozumdar (2003) suggest, one could with foreign denominated debt hedge exposure stemming from the revenue side, however in this case; are the really informed and operational enough to take on debt in Russian Ruble, Philippine Pesos, Japanese Yen and/or US Dollar? In order to answer this, we have to consider the overall picture from each of the regions in terms of for example; number of facilities and the level of non-current assets. Hereof, we start looking at the Philippine Pesos and Russian Ruble, in which we note revenue streams of 1,851 and 1,704 CHFm, respectively, and thus are among of the smallest revenue streams of the selected currencies. Moreover, NSA has four established facilities in the Philippines which main focus lies towards importing and selling Nestl products, and thus suggests NSA not being extensively committed in manufacturing, in which most long-term assets are included. In Russia, NSA has established 8 facilities which according to the Annual Report (2011) are, as opposed to the Philippines, focused mainly towards product manufacturing. There were no available data regarding the non-current asset position in neither Philippines nor Russia, however the number of facilities and manufacturing/import mix, given in Annual Report (2011), one could make a relatively fair assumption that the Philippines Peso is not considered to be a suitable currency for undertaking debt, whereas Russia Ruble could be.

Furthermore, we still need to consider EUR, USD, JPY and CHF since NSA currently holds debt in EUR, USD and CHF, and since JPY appears as a candidate of issuing foreign debt. In the case of CHF, although it not being foreign operations but instead domestic, we can observe that NSA is highly operational, even though revenues are fairly low mounting to three percent in total. The reason for stating that NSA is active lies within the number of workers, facilities and the non-current asset position, which equals approximately 9,700 workers, 10 facilities and 4 percent of total non-current assets. Moreover, with the Japanese Yen the position of non-current assets in place is not available for us, which forces us to turn to number of established facilities in Japan. Given numbers in the annual report we could observe that they have 3 facilities established in Japan and according to the Annual Report (2011), they seem to have an equal split among manufacturing and solely importing Nestl products. Due to JPY having acted as a safe haven during the financial crisis of 2008 and are still considered being a stable and trustworthy currency, we do believe that issuing foreign debt could be suitable

for reducing exchange rate risk in JPY.

The two remaining substantial exposures, negative Euro (-991 CHFm) and positive US dollar (3,903 CHFm) also needs to be considered by the same reasoning. NSA extensively operates in both markets, with revenues corresponding to 20 and 26 percent of total revenues, respectively. Furthermore, both regions are extensive in manufacturing, which thus is reflected in each non-current asset position; 27 percent for USA and approximately 7 percent for the Euro. Seven percent might not be seen as a large number, however given the information provided we do believe that the correct value is substantially larger. We base this statement on local-manufacturing/import mix given in the Annual Report (2011), where we can see that Spain is a manufacturing intensive country, yet the corresponding non-current assets is not disclosed in the Annual Report (2011). Nonetheless, given the debt structure of Euro and US Dollar in the liability portfolio, we believe a reallocation could be performed and thus shifting obligations between the two, ergo possibly reducing risk exposure.

High and certain revenue streams is one side of the coin, however in addition we also have to consider SKF's overall foreign operations in the corresponding country. For example, the company currently has 24 facilities and approximately 4900 employees in the United States (given in Annual Report (2011)). This would logically provide a situation in which the corporation is very familiar with the foreign market itself, and thus reasonably increase the likelihood of issuing foreign debt. The basis for this reasoning lies in the power of information; symmetric vs. asymmetric information. Moreover, when we previously discussed the fact of being active in the foreign market in order to secure revenue streams, we considered facilities and employees. In addition to this we can observe that SKF has 28 percent of its total *non-current assets* in the US, which furthermore strengthen the fact of SKF being committed long term to its activities in the United States. Therefore, one could argue that the above reasons lie in favor of SKF considering issuing US dollar denominated debt since they seem to have extensive foreign operations in the United States and by our estimations thus could lower its risk stemming from the positive exposure. That is, SKF could through its extensive foreign operations stay highly informed relative to other smaller currencies and thus make an informative choice when taking on US debt. The Asset-view point described above can also be seen as an argument for foreign debt in the sense of protecting balance sheet items values, a so called fair value hedge.

When returning to analysis of the suitability of CAD, we observe that less than 1 percent of non-current assets is denominated in CAD. This finding together with the previously stated fact that a low percentage of company revenues is denominated in this currency, we will argue that CAD is not a suitable long term option for issuing foreign debt in terms of hedging despite its estimated positive net flow. Further, for the INR we lack information regarding the extension of the foreign operations in terms of non-current assets and hence cannot draw any conclusive conclusions regarding the level of foreign operations and the possible existence of information asymmetries.

In this section, we have analyzed the three companies' degree of foreign operations and whether they face any asymmetric information issues. It is evident that all companies have substantial operations in nearly all of the major currencies, i.e. the currencies which we consider in terms of suitability for issuing foreign debt. Worth noting is that

NSA is the company in our sample that has the highest degree of dispersion in foreign operations, the highest number of factories and operate on a more global level than the other two.

### *Market Stability*

We argue that the overall market stability in the country of a specific currency is an important factor to consider in the context of issuing foreign debt. In this context, we will focus on whether emerging market currencies are appropriate to issue debt in.

According to our knowledge and findings regarding AZN, the currencies in the current liability portfolio as well as potential foreign currency debt candidates are all developed countries where we argue relatively stable markets which does not hinder foreign debt issuance. Hence, as no emerging market currencies appeared as suitable candidates for issuing foreign debt no extensive market stability analysis had to be made.

In the NSA case where there arguably could be an emerging market candidate for issuing foreign debt, one has to consider the stability of the foreign currency in question. Russia is at the moment considered by NSA to be one of the leading emerging market countries, in terms of sales and growth, and thus could be an option for taking on foreign debt in the future. However, solely based on Russia being an emerging market country, NSA should be very hesitant to issue debt in RUB. The reasons for these lie in the stability, liquidity and belief in the market; the Russian market might be growing rapidly but at the moment it must still be considered to be too uncertain in terms of long-term commitments which follow undertaking debt in foreign currency. As stated previously in the thesis, one should be careful before spreading debt in foreign currencies and not shift risks to weaker and more unpredictable markets.

Turning the attention towards SKF and the emerging market currency candidate, one might question the appropriateness of issuing foreign debt denominated in INR as similar emerging market arguments as in the NSA case regarding the Russian Ruble can be made. Hence, we would not suggest issuing foreign debt denominated in INR from a hedging point of view.

In this section, we argue that the level of market stability is a factor that needs consideration in relation to foreign debt issuance. We find that in the AZN case, there were not any emerging market candidates appearing which makes this factor less influential in this case. However in the other two cases, NSA and SKF, we disqualify two currencies on the basis of this market stability, emerging market, factor namely the Russian Ruble and the Indian Rupee in the respective corporate cases.

### **Suggested Reallocations**

Hereof based on the results and the underlying estimates above, AZN could reallocate its liability portfolio in order to reduce risk exposure for a handful of currencies. With the result in Part III at hand, and the analytical approach in Part IV, we believe that a more beneficiary allocation could be to fully exclude the GBP liabilities and roll over to other currencies. Furthermore, they could lower their holdings in US dollar and distribute both these residuals to Canadian dollar, Euro and Japanese Yen. This would lead to increased exposure in USD but since it is AZN's accounting currency this increased risk might be acceptable. The exact allocation percentages regarding the liabilities we do

not possess the information needed to accurately define. Nonetheless, reallocating the liability portfolio by this token would shift the loan repayment obligation to EUR, CAD and JPY, thus lowering the risk stemming from the positive exposures. For GBP the risk exposure would also reduce in the sense of lifting the obligation to repay the loan in GBP, thus lowering the risk stemming from the negative exposures. By the same reasoning, the obligations would also decrease in USD, if shifting from 83 percent in the liability portfolio to a lesser percentage. This would lead to a risk exposure increase in USD, however since US dollar is the reference currency it carries very little real risk.

Taking all the reasoning regarding NSA above into account, a suggestion for the liability portfolio would be to reduce the mix of currencies to only include Euro, US dollar, Swiss Francs and GBP, thereof excluding AUD and CAD by rolling over to the other currencies. Moreover, it would be of the essentials to also shift the liabilities between USD and EUR, thus reducing the Euro part and increase the USD part in the portfolio. The GBP could stay the same, due to NSA not facing any substantial net flow exposure.

In the SKF case, one way of taking on more debt could be to lessen the amount of Euro debt (92% as of now), and roll over to USD debt. If we consider our sensitivity analysis and perform the suggested options we can by reasoning assume that the effects of exchange rate fluctuations become less severe. Thus, if decrease the debt in Euro which means a reduction in loan repayment obligations and instead shift it to USD, risk stemming from both these exposures could be decreased. Thereof, the suggested liability portfolio for SKF would include SEK, a reduced amount of EUR and issue USD debt.



## 5 Conclusion

In this thesis we have analyzed the liability portfolio compositions of three companies that operate in different industries given their respective currency wise revenue streams, non-current assets and net flows. The basis for this analysis is that several researchers have in their work shown that foreign debt as part of a hedging method together with derivatives can effectively reduce exposure and hence reduce foreign exchange risk. By accepting the validity of previous research, we used the determinants that had shown to be significant in issuing foreign debt and used these parameters in order to analyze the firms current liability positions and give rise to possible suggestions; adjusting the positions as to further align with theory and reduce risk stemming from positive net flows seen from a foreign exchange risk management perspective. Our results and estimations indicate that such adjustments should be considered.

AstraZeneca currently holds the majority of its debt in US Dollars and also has a proportion of Euro and Pound Sterling denominated debt. Factors such as *Size*, *Foreign Operations* and *Economic Sector* indicate that AstraZeneca qualifies as candidate to adopt a strategy involving foreign debt as a hedging instrument. Further, *Revenue* and *Net Flow* compositions show that the company should consider replacing the Pound Sterling denominated debt due to the relatively low revenues and negative cash flows and instead shift towards Canadian Dollar, Japanese Yen or increase Euro debt. Finally, AstraZeneca could also potentially lower its US Dollar debt slightly and issue debt in any of the three mentioned currencies.

SKF debt is distributed among merely two currencies, namely Euro and Swedish Crowns where the latter only accounts for a small fraction. In the analysis of SKF, the critical factors to assess were the same as with AstraZeneca due to both being highly focused towards developed countries and its current relatively consolidated liability portfolio. Our case study show that SKF should contemplate a reallocation of their liability portfolio by shifting a proportion of its Euro denominated debt into US Dollar due to their respective net flow positions and the strong US presence and US Dollar revenue side.

Nestlé's current liability portfolio is less consolidated in relation to the other firms of investigation however with the by far highest percentage denominated in Euro followed by Swiss Franc and US Dollar. As opposed to the other two investigated companies, it was of great importance to assess market stability in emerging markets due to Nestlé's higher degree of diversified streams of income and net flows from these countries. Our performed analysis show that given the selected factors, the company should consider whether the Australian and Canadian Dollar debt is preferable and further possibly reallocate some of its Euro debt into US Dollar.

As previously stated, we have in this thesis analyzed three companies' liability portfolio by currency and assessed its eligibility in relation to the distributions of revenues, non-current assets and net flows seen from a foreign exchange risk management point of view. This has been done on the basis of previous research claiming that the issuance of foreign debt as a hedging instrument to manage FX exposures has shown the desired effect. Although not being the only aspect to consider when deciding upon debt structure, we believe it to be of great importance. A potential outcome of this thesis is to further

raise awareness on the importance of dynamic Treasury operations and collaborations between different areas of responsibility, as in this case between Funding and FX risk management.

## References

- Aabo, T. (2006). The importance of corporate foreign debt in managing exchange rate exposures in non-financial companies. *European Financial Management* 12(4), 633–649.
- Allayannis, G. and E. Ofek (2001). Exchange Rate Exposure, Hedging and the Use of Foreign Currency Derivatives. *SSRN eLibrary*.
- Ammon, N. (1998). Why Hedge? - a critical review of theory and empirical evidence. ZEW Discussion Papers 98-18, ZEW - Zentrum für Europäische Wirtschaftsforschung / Center for European Economic Research.
- AstraZeneca (2011). Annual report.
- Azarmi, T. (2009, May). Lecture on transaction & translation exposures. <http://azarmi.info/wp-content/uploads/2009/05/4-transaction-and-translation-exposure.pdf>. [2012-03-05].
- Berkrot, B. (2011). Success rates for experimental drugs falls - study. <http://www.reuters.com/article/2011/02/14/pharmaceuticals-success-idUSN1121064320110214>. Thomson Reuters.
- Boyatali, O. and B. Toktay (2004). Operational hedging: A review with discussion. Working paper series, INSEAD.
- Brown, G. W. (2000, May). Managing foreign exchange risk with derivatives. Online. The University of North Carolina at Chapel Hill.
- Brown, G. W. and K. B. Toft (2002). How firms should hedge. *Review of Financial Studies* 15(4), 1283–1324.
- Carter, D. A., C. Pantzalis, and B. J. Simkins (2003). Asymmetric Exposure to Foreign-Exchange Risk: Financial and Real Option Hedges Implemented by U.S. Multinational Corporations. *SSRN eLibrary*.

- Castner, M., J. Hayes, and D. Shankle (2007). The global pharmaceutical industry. <http://www.duke.edu/web/soc142/team2/social.html#barriers>. Duke University, [2012-05-28].
- Clark, E. and A. Judge (2009). Foreign Currency Derivatives versus Foreign Currency Debt and the Hedging Premium. *European Financial Management* 15(3), 606–642.
- Cowan, K., E. Hansen, and L. O. Herrera (2005). Currency Mismatches, Balance-Sheet Effects and Hedging in Chilean Non-Financial Corporations. *SSRN eLibrary*.
- de Jong, A., J. Ligterink, and V. Macrae (2006). A firm-specific analysis of the exchange-rate exposure of dutch firms. *Journal of International Financial Management & Accounting* 17(1), 1–28.
- Dodds, R.-M. (2008, Dec). Hedging foreign exchange translation exposure: The dilemma. <http://www.gtnews.com/article/7499.cfm>. [2012-02-26].
- Döhring, B. (2008). Hedging and invoicing strategies to reduce exchange rate exposure - a euro-area perspective. European Economy - Economic Papers 299, Directorate General Economic and Monetary Affairs, European Commission.
- European Commission (2011). Monitoring industrial research: The 2011 eu industrial r&d investment scoreboard. <http://iri.jrc.ec.europa.eu/research/docs/2011/SB2011.pdf>. [2012-05-28].
- French, K. R., M. N. Baily, J. Y. Campbell, J. H. Cochrane, D. W. Diamond, D. Duffie, A. K. Kashyap, F. S. Mishkin, R. G. Rajan, D. S. Scharfstein, R. J. Shiller, H. S. Shin, M. J. Slaughter, J. C. Stein, and R. M. Stulz (2010). *The Squam Lake Report: Fixing the Financial System*. Princeton University Press.
- Gonzalez, L. O., M. V. Bua, S. F. Lopez, and P. D. Santomil (2010). Foreign debt as a hedging instrument of exchange rate risk: a new perspective. *European Journal of Finance* 16(7), 677–710.
- Hagelin, N. and B. Pramborg (2004). Hedging foreign exchange exposure: Risk reduction from transaction and translation hedging. *Journal of International Financial Management & Accounting* 15, 1–20.

- Huchzermeier, A. (1991). *Global manufacturing strategy planning under exchange rate uncertainty*. University of Pennsylvania.
- Jensen, M. C. and W. H. Meckling (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Michael C. Jensen, A THEORY OF THE FIRM: GOVERNANCE, RESIDUAL CLAIMS AND ORGANIZATIONAL FORMS*, Harvard University Press, December 2000.
- Judge, A. (2003). How firms hedge foreign currency exposure: Foreign currency derivatives versus foreign currency debt. Middlesex University Business School.
- Kedia, S. and A. Mozumdar (2003). Foreign currency denominated debt: An empirical examination. *The Journal of Business* 76(4), 521–546.
- Lind, M. (2011). Strategic or natural hedging is the trend. <http://blog.magnus-lind.com/2011/11/strategic-or-natural-hedging-is-trend.html>. [2012-02-26].
- McGrath, B. (2011, March). Exposed! <http://online.wsj.com/article/SB10001424052970203731004576045680094212132.html>. [2012-02-26].
- Meulbroek, L. K. (2002). A senior manager's guide to integrated risk management. *Journal of Applied Corporate Finance* 14(4), 56–70.
- Miccolis, J., P. Brehm, K. Dickson, B. Franklin, G. Kirschner, J. Kollar, D. Mango, F. Morin, C. Nelson, and T. Zubulake (2003, May). Overview of enterprise risk management. Online - Casualty Actuarial Society. [2012-03-03].
- Nestlé (2011). Annual report.
- Roncal, J. D. (2008). A strong balance sheet: What does it mean? <http://www.financialspeculation.com/index.php/speculation-101/1-speculation/28-a-strong-balance-sheet-what-does-it-mean>. [2012-03-22].
- SKF (2011). Annual report.
- Smith, C. W. and R. M. Stulz (1985). The determinants of firms' hedging policies. *Journal of Financial and Quantitative Analysis* 20(4), 391–405.

Vigilant-Citizen-Blog (2011). Irrational consumerism (or the few companies who feed the world). <http://vigilantcitizen.com/vigilantreport/irrational-consumerism-or-the-few-companies-who-feed-the-world/>. [2012-05-28].