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Gross domestic product and its correlation with shareprices in the Nordics 2000 - 2014

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The purpose of this thesis was to find out how the shares from different large cap companies in Nordics that are listed in stock exchanges correlate with the gross domestic product. The topic was chosen due to the personal interest to the issue.

The thesis consists of five theoretical parts. The first part is the theory about gross domestic product, the second is the theory of pricing the shares, the third is about gross domestic product and relation to investments, the fourth is about Nordic economies and the fifth is about correlation. Together with the study there is a research, which was conducted by Microsoft Excel, which allowed examining the information obtained from OMX Nordic website more easily.

The results of the study revealed that some of the industries and countries correlate better with the gross domestic product than the others and that this is due to the different business models and target market, which in some cases can be located in a different country.

Keywords	GDP, Nordics, Share Prices, OMX Nordic, stocks, correlation, investments, stock markets

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1   Introduction

Share prices and predicting the movements of the shares are something that many people working in the field of finance are likely to be interested in. Being able to predict the movements would bring nice extra money in the bank account if the person would be able to predict what might happen to the share of a company when the bad times come and which companies would be safe investments, unlikely to lose money. The same would apply also when the economy starts to grow again and returns in companies grow, but then the issue would rather be, which company or which share to invest the money in order to gain maximum return back. In this day, gross domestic product news are very common when watching news from television. Whether that will go up or down does not necessarily bother all of us, but being able to understand it and its movements and consequences of these can help to take right decisions when looking at things in the long term and even in a short term.

This applies also for the private people as many people want to make investments at some point of their lives. According to the study of Hing Lin Chan and Kai Yin Woo, the most people invest their money on two things, which are residential property and stock markets (Woo and Chan 2012).

The stock markets are especially interesting in this case as gross domestic product serves as a very important economic indicator and it can help identifying investment opportunities that in the long term would bring more wealth to investors than pure gambling in the stock markets. This study takes an approach to help predicting the movements of share prices of different companies from different industries in relation to gross domestic product. Finding a correlation, whether that be negative or positive, would help investors to identify individual shares or industries from which buying might be a good option when gross domestic product either grows or declines. This can prove to be beneficial for individual investors, who might sometimes in the future have to look after their pensions themselves and therefore have to consider different investment options, which usually include shares.

Not only does this study tell about what the correlation between the gross domestic product and share prices would be, but it also answers question why the results are as they are and what one might learn and benefit from those.

This study considers three of the economies in the Nordic region; Denmark, Finland and Sweden.

The research questions that I intend to answer would therefore be;

1. What is the correlation between share prices and correlation in Denmark, Finland and Sweden?

2. What is the correlation between share prices and gross domestic product in different industries?

3. What are the reasons behind these results and what can we learn from this?

2   Literature Review

Literature on correlation between stock performance and gross domestic product is very hard but not impossible to find, which means that there are several publications which touch the topic one way or another. Similar studies have been done about Hong Kong (Woo and Chan 2012), Norway (Aastveit and Trovik 2009) and very large analysis on 19 different major markets done by Eleroy Dimson, Paul Marsh and Mike Staunton in 2011. The results of the analysis of Dimson, Marsh and Staunton were published in Financial Times on 15. April 2013 and that made me more curious about what would the situation be with Finland and some other Nordic markets in general such as Sweden and Denmark. In their study they concentrated on 19 different big markets all over the world, but in this study, the emphasis is on Denmark, Finland and Sweden. In their study, Dimson, Marsh and Staunton found out that increasing gross domestic product is not as good as expected for equities. According to their study for example in China economic growth has been high, but equity returns have been actually negative, whereas for example in Mexico, the economic growth has been very small and the equity returns have been almost 15% between the years 1970 – 2011 annually (Dimson, Marsh and Staunton 2011).

2.1   Gross Domestic Product

Acronym GDP stands for gross domestic product. It is a way to measure the productivity in a specific economy such as Finnish economy or Swedish economy. It is calculated by adding together the total value of the goods and services produced in an economy in year, so in the other words the total output (Dawson, Anand & Athreye 2006: 23). The equation for calculating the gross domestic product is as follows: $GDP = C + I + G + (EX − IM)$. In the equation C stands for household spending on consumer goods, for example washing machine or computer. I stands for gross private domestic investment, which means spending by firms and households on new capital that could be for example inventory. G means the government expenditure and gross investment. $(EX − IM)$ means the exports minus imports or in the other words the spending by rest of the world on goods produced in the economy which gross domestic product is being measured (Case, Fair & Oster 2009: 450).

The data, from which the gross domestic product can be obtained from, highly relies on collecting data on output through surveys of firms. In order to avoid double counting the focus should be only on the value added by each firm. Therefore this means the value of each firm's output from which the value of the intermediate goods (those used to produce the output) is being deducted. When these values of each company are being summed together in specific economy, the result is gross domestic product. (Dawson, Anand & Athreye 2006: 205).

It could be simplified when thinking of a practical example from drilling oil (Case, Fair & Oster 2009: 450).

Stage of Production	Value of Sales	Value Added
(1) Oil drilling	€ 3.00	€ 3.00
(2) Refining	€ 3.30	€ 0.30
(3) Shipping	€ 3.60	€ 0.30
(4) Retail sale	€ 4.00	€ 0.40
Total value added		€ 4.00

Figure 1: Example of calculating Gross Domestic Product

The value added to the gross domestic product is being shown in the figure above, where it is possible to see that all stages of production do not add value as much as they add revenue for the single company. In each phase of the production the value added to the gross domestic product can be calculated by the formula $V_n - V_{n-1}$ (Case, Fair & Oster 2009: 450).

Gross domestic product is an economic indicator and it can tell how much more was produced in a specific economy in a year compared to the previous year. The difference to the previous year is generally measured in percentages in the form of equation as follows:

$$\frac{GDP_{n+1}}{GDP_n} - 1$$

Figure 2: Calculating the growth of Gross Domestic Product

In case the result of the equation is negative, the gross domestic product has declined during the measured period of time. In case the result of the equation is positive, it means that gross domestic product has increased during the measured period of time. Gross domestic product is very important tool for the economy. In the same way as the private companies measure the success or the failure of its business operations every quarter, the economy needs to asses itself. It is quick to see whether the demand for the goods produced in certain economy is going up or down, by just looking at the either increase or decrease of gross domestic product. The bigger the amount is, the more is being produced. This in turn creates jobs and welfare as there has to be people in place to actually produce the goods or services and in return for their efforts at the workplace they will receive a salary (Case, Fair & Oster 2009: 450).

Recession can be also measure by gross domestic product. When an economy has had two consecutive quarters of negative growth (decline) in real gross domestic product, it can be considered to be in a recession (Bade & Parkin 2013: 548). Not everyone agrees with this theory though and for example the National Bureau of Economic Research does not have a fixed definition to this economic activity. National Bureau of Economic Research includes also to their statement various other indicators for example such as economy-wide employment and real income (National Economic Research Bureau, 2014).

2.2   Share valuation

When talking about shares, people usually talk about common stock. It represents part ownership in a company, which is an equity claim, that is, a claim to all the assets and cash flow of a company once debt claimants have been paid. As an owner the common stockholder is entitled to a share of the company's revenue and profit but that is only paid after the employees, suppliers, government (in a form of taxes), creditors and the holders of preferred stock have been paid.

Pricing of different financial instruments is very different and for example the pricing of a bond is totally different from pricing a share. This happens because the cash dividends paid out to the shareholders by the company are not always the same; they can increase, decrease or stay the same or they may not be paid at all. Also when comparing the pricing of a bond to pricing of a share, the ending price is not set or known just like the maturity date. The number of dividend payments and the timing of the sale are also unknown factors that play a key part in pricing of a share (Brooks 2010: 181 – 191). This leads to the question, what actually increases the share prices and what declines those. In their book, Brealey, Myers and Allen (2006: 416-435) give out several reasons why the share prices can increase. The dividend forms a big part of what makes the share prices to either increase or decline. In his book Financial Management, Brooks introduces a simple concept, which can be used in case the company wants to evaluate shares. This is the dividend divided by the required rate of return, which – depending on the investor – can vary significantly and the result is a price of a share that the investor is willing to pay for a share (Brooks 2010: 181 – 191).

$$price = \frac{dividend}{r}$$

Figure 3: Calculating price of a share

According to this equation when the dividend would be bigger, the share price would automatically be higher as well, assuming that the required rate of return will stay the same. Also the share price would increase if the required rate of return would for some reason decline, for example due to the generally declining economic conditions such as lower inflation or lower cost of capital. Instead the share would become cheaper if the required rate of return would increase or in case that the dividend would decrease.

Share buybacks are also something that relatively often happens in the modern economy. Buying its own shares the company can avoid paying out big dividends, which would be money that cannot be recovered, not even a part of it. When buying back their own shares however, will allow them and option to reissue or resell those shares if the company would encounter a cash flow problem and would for some reason need more cash in order to better finance their operations (Brealey, Myers and Allen 2006: 418).

Also the mature profitable companies tend to use this as seen in United States banking industry. In 1997 large bank holding companies paid out the dividends which added up to only 40% of their earnings. There were also some profitable investment opportunities for the remaining income, but the banks did not want to commit themselves in the long run to any larger dividend payments as these would be lost money for the banks. Instead of returning the cash to shareholders by dividends, they ended up buying back their shares worth of $ 16 billion (Brealey, Myers and Allen 2006: 418).

According to the law of supply as presented by Case, Fair and Oster (2009: 89), when there is less supply in the market, it will create a scarcity as the potential buyers now have fewer options to choose from or either places to choose from and this is also the basis where the increasing share price by share buybacks increases. In this case the more shares is being bought off the market, the less is available for trading and a person willing to acquire that specific share has to now pay a bigger price for it as there are less people willing to sell the share. In reality it is possible that the share price could stay as it is, but usually it would boost the price according to the theory presented (Brealey, Myers and Allen 2006: 418).

There are also several other ways how an investor can evaluate the shares of companies. One of these models is generally known as the dividend valuation model or dividend growth model. The dividend valuation model states that the value of a share now, P_0, is the sum of the stream of future discounted dividends plus the value of the share as and when sold in some future year, n.

$$P_0 = \frac{D_1}{(1+k_c)} + \frac{D_2}{(1+k_c)^2} + \frac{D_3}{(1+k_c)^3} + \dots + \frac{D_n}{(1+k_c)^n} + \frac{P_n}{(1+k_c)^n}$$

Figure 4: Dividend growth model

Another model is called the constant dividend model. This model assumes that the dividend stream is constant, which would be the case with the preferred shares, but more rarely with common shares. It is therefore a present value annuity stream application:

Value of future dividends for specific period = dividend X PVIFA (Brooks 2010: 181 – 191)

$$\text{dividend stream X} \quad \frac{1 - \frac{1}{(1+r)^n}}{r}$$

Figure 5: Value of future dividends for specific period

Brooks introduces also the Gordon model in his book, which is also known as constant growth dividend model. This model applies to the new share buyers, so the persons, who have recently acquired the share. In this model it is assumed that the first dividend that the buyer will receive is one full period away, so for example for the shares of the companies that pay out the dividend annually, it would be one year away. Therefore when using the discounted cash flow approach, it gives out the equation

$$price_0 = \frac{div_0 X (1+g)^1}{(1+r)^1} + \frac{div_0 X (1+g)^2}{(1+r)^2}$$

Figure 6: Gordon model

In this equation g represents the annual growth rate in the dividends and r is the required rate of return of the share. This equation can be simplified to

$$price_0 = \frac{div_0 \times (1+g)}{r-g}$$

Figure 7: Simplified Gordon model

and moreover to

$$Div_1 = div_0 \times (1+g)$$

Figure 8: Simplified Gordon model

so this results another equation

$$price_0 = \frac{Div_1}{r-g}$$

Figure 9: Simplified Gordon model

This formula however requires the required rate of return to be bigger than the annual growth rate as this model and the formula do not work in case the required rate of return would be smaller than annual growth rate because the result of the $r-g$ would be negative (Brooks 2010: 181 − 191).

In case it would be assumed that the shareholder would like to sell the share at some point the previous equation can be applied to calculate the price of the share for finite period of time. In this equation n represents the number of future dividends. The focus in this equation is mainly in the right part and it calculates the percentage of the finite dividend stream that the owner will receive if he or she sells the share in the end of the nth year (Brooks 2010: 181 − 191).

$$price_0 = \frac{Div_0 \times (1+g)}{r-g} \times \left[1 - \left(\frac{1+g}{1+r} \right)^n \right]$$

Figure 10: Price of a share for finite period of time

One big issue with these models occurs in a case that the company does not pay out the dividend. This happens to some companies every once in a while and therefore the dividend valuation model and the constant dividend model would not work for valuating shares of these companies as according to these valuation methods, the company would not have value at all. However the same formula can be applied in another form where the dividend is being substituted by simply the earnings (Pike and Neale 2009: 453 – 475).

In this case it can be also expected that even though the company is not paying out dividend to its shareholders right now, it might do so in the future. For example, for several years Apple did not pay dividends to its shareholders at all, but in 2013, it paid out its first dividend since 1995 (The Telegraph 2012).

The shareholders of the companies which do not pay out a dividend do not have to live without a formula from which they can measure the performance of their share however. The total return of the shares is measured by formula called total shareholder return. This takes into account both dividend payments and the share price which either can increase, decrease or stay the same. This is very good way to measure also the performance of the shares of the companies that do not pay out a dividend. In this formula the (possible) dividend is added to the difference between share price between the moments P_{jt} which is the end price and P_{jt-1} which is a start price and it is then divided by the start price which in this case is P_{jt-1}. The result is a percentage, which can tell whether the stock has performed positively or negatively or been neutral over the time being measured (Pike and Neale 2009: 453 – 475).

$$R_{jt} = \frac{D_{jt} + (P_{jt} - P_{jt-1})}{P_{jt-1}}$$

Figure 11: Total Shareholder Return

In every formula there is the expected rate of return, which plays a key role in the figure. When investor's expectations are managed in the direction that is more favorable for the management of the company and that the expectations therefore are higher, the share price would also increase as people require a specific rate of return from their investment and when the returns go up, it means that they are ready to pay more for the single share so that the required rate of return would be eventually the same than it was before and it would therefore make the share price higher. This all is made happen by executive compensation, most of which is related to the performance of the company shares and this can be done for example by rewarding the executive management with options or futures as bonuses. This makes the executive management more willing to praise their company and try their best to make the share price go up. The bottom line of all this is that if someone thinks a share is going to bring him or her much money in the future, they are ready to pay more money about it. This is due to the expected return formula that investors frequently use, which is the average of possible returns weighted by their likelihood of occurring. For example the security with 12 chances out of 100 of showing a return of -22%, 74 chances of 100 showing a return of 6% and 14 chances out of 100 of showing a return of 16%, it is expected that the return would be 4% (Vernimmen, Quiry, Dalloccho, Le Fur & Salvi 2005: 393).

When these chances are being manipulated so that they would look better for the stock and the investors would be willing to pay more for a share it would mean that the share price would increase. This could be done by for example giving out too positive information by the executive management regarding the future of the share.

2.3 Gross domestic product and its relation to investments

As described previously and also according to the financial market theory presented by Gitman, Joehnk and Smart (2010) the intrinsic value of stocks can be expresses as the present value of future series of expected dividends or earnings, which are then discounted by a risk adjusted rate of return (Gitman, Joehnk and Smart 2010: 306 - 309).This theory is also what Laurence W. Franz bases his study on consistency of the stock market in anticipating economic cycles (Franz 2010).

During the recession in the economy that happens after two consecutive quarters of negative growth or decline in the real gross domestic product (Bade & Parkin, 2013: 548) when adjusting to the price level, the companies are not able to produce such profits than they were before the economic downturn. This happens because during the recession the nominal value of the goods and services produced (gross domestic product) in a specific economy declines. This means that the revenues of the companies (sales) also have to decline as less money is used to buy goods and services. This then has an impact on the profits that these companies potentially make and they might decline. This is natural due to the fact that less sales means less revenues, which means less money in to the company and this means lower profits measured in the amount of currency that is being used for example euros, because profits are generated from the profit margins of sold goods and services and the less is sold, the less profit can be made.

Investors tend to be less concerned about this, but will be more concerned of the return on investment (ROI). The book return on investment is the percentage, which investment X gains in a year compared to the original cost of the investment project, so for example if the company would invest € 100 million to project X and it would bring in the earnings of € 15 million. Then the ratio being applied would be 15 / 100 = 15%. Now if the cost of capital is below 15% the project is profitable. Should it be any ≥ 15% the project would be unprofitable from the financial manager's point of view and the company would be better off investing the money some other project (Bearley, Myears & Allen 2006: 310).

When the above regarding to recession is being applied to the financial market theory as presented by Gitman, Joehnk and Smart (2010: 231), when the future series of div-

idends or earnings goes down and the declining dividends or earnings are then being discounted by the risk adjusted rate of return, the result is lower than before the recession, which then makes the intrinsic value of stocks less than what it was before the recession. In the other words according to this theory the value of the shares would go down as the gross domestic product goes down due to the lack of sales to boost the financial performance of the company so one would normally reasonably expect GDP to have a positive correlation with stock prices (Gitman, Joehnk and Smart 2010: 231). Also this being applied even further, when the industrial sale decline, it also means less taxes paid to the government in forms of, lost value added tax for example, which would then mean that the government would have less money to spend on investments and projects and social costs. When the sales decline, companies sometimes also lay-off or fire employees which increases social costs for the state such as unemployment benefits.

As Knut Are Aastveit and Torres Trovik point out in their study about the asset prices in a small open economy, in particular equity prices react continuously to information about the current business climate for companies as well as about expected future cash flows (Aastveit and Trovik 2009). As these cash flows are likely to reduce during the recession, the asset prices are also likely to decrease.
When looking at the equation presented by Gitman, Joehnk and Smart (2010), there is one factor that is still not being discussed, which is the discounting by risk adjusted rate of return. As the recession hits the economy, the rates of return would usually increase as a result of increased risk that is now being imposed on the investment. In case it would stay the same the share price would still go down when expected dividends or earnings goes down and it would do so also when it goes down. Also the most investors would make changes to their risk adjusted rates of return, only after the significant movements in the market have happened (Gitman, Joehnk and Smart 2010: 231).

It can be also thought that when the share price goes down, and if the company still pays the same dividend as it did before the recession, the rate of return would be greater. However in case of the recession, the company might want to protect its future financially and will not choose to pay out dividend that would potentially boost the share in a short period of time but in the long period of time might turn out to be harmful for the company in forms of lacking cash or not getting credit from the bank

for example. This is why the dividends of the companies generally get smaller as the recession or even depression hits the economy. Also when the share price goes down, it is possible for the company to maintain the same rate of return when paying out a smaller dividend when the share price is lower. For example if a share of the company X would cost € 20 this year and it would pay out a dividend of € 2, the rate of return would be then 2 divided by 20 which equals 10%. If next year the share of the company X would cost € 10 instead, dividend of only € 1 is required in order to achieve the same rate of return as in a previous year.

It can be argued that the share lost 50% of its value during this time, and the rate of return would instead be $(10/20 + 1/20) - 1 = -0,45 = -45\%$. This would be true if the investor would not look only a dividend. This theory however applies only if the investor had held the investment throughout the year and would choose to sell immediately at that point. In the balance sheet of investment fund for example this would obviously look bad, but it does not necessarily mean that the share would not gain the value back ever.

2.4   Understanding Nordic Economy

This study considers three of the economies in Nordics, Denmark, Finland and Sweden. All these economies are very different and this is why the companies selected from these countries operate in different fields. According to the Oxford Analytica, the Nordic economies have been recently negatively impacted by the euro area recession and the more general slowdown that continued into early 2013. Until the beginning of recession in the euro area, all of the economies enjoyed rapid growth in their gross domestic product as seen in the diagrams below. It can be also clearly seen that when the Eurozone crisis struck and the global economic slowdown started in 2008, there was a decline in the gross domestic product of all of the countries being measured (Oxford Analytica 2013).

2.4.1   Finland

Finland has been a bit of an exception among the three countries being measured in this study. The growth in gross domestic product was steady all the way until 2008, which was when the global economic downturn began. Since then there has not being a big growth and even some decline in 2012 – 2013. This could be explained with the key industries of Finland being in troubles. Demand for the goods produced by paper industry, which is among the key industries in Finland, is declining and a bit same thing happened with another key industry in Finland, mobile phones. The decline in the paper industry has been going on for a longer time due to the internet and lower demand for newspapers in a paper format, but the decline in mobile phones was much more rapid. For many years Nokia formed a big share of the gross domestic product of Finland, but ever since Apple launched its iPhone 3G in 11. July 2008 and the touch screen technology came to the markets, there has been either a decline or slow growth in the gross domestic product of Finland as it can be seen in the Figure 12 below. Both of these industries had to adjust to new market conditions, as a result of people adopting the new technologies, which made the demand for paper to decline (online newspapers and e-books) and people started to move away from Nokia's products, which were non-innovative as a result of poor ability to innovate and this meant that products from companies such as Apple, Google and Samsung became more popular as they were innovative and represented the latest trends in the market. It meant that the companies had to cut their costs and lay off or fire many people as some of the biggest companies in Finland, Nokia, UPM Kymmene and Stora Enso did. Also as their revenues went down, their contribution to the gross domestic product of Finland reduced as

well. This impact to the economy of Finland gets even stronger when all the goods and services purchased by these people who are now laid off or fired would have been consumed, but now these individuals have to cut back in their spending as they cannot afford all same goods and services as they had done before getting laid off or fired (SAK, 2014).
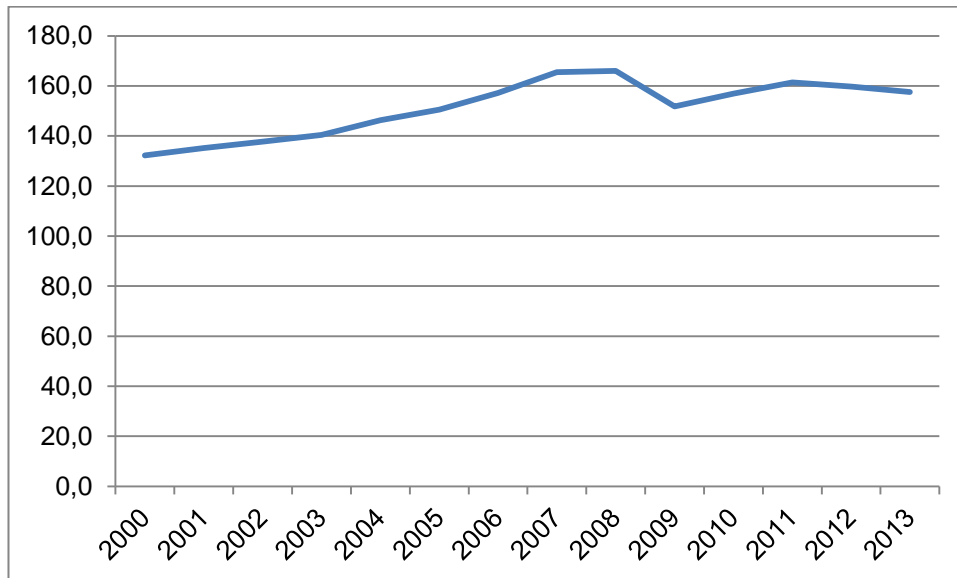
Figure 12: Gross domestic product growth of Finland 2000 – 2013 (Statistics Finland 2014)

It can be seen that the gross domestic product of Finland has recovered a bit since it declined heavily in 2008, but it also declined a little bit in the years 2012 – 2013. As one could imagine, it would be good for the export oriented industry of Finland to get the value of the euro lower than where it stands right now, but as this is not happening or has not happened so far, it is very damaging to the industries of Finland. Also the main trading partners of Finland include Russia with the share of 9,9%, which makes it the second biggest export partner for Finland (CIA World Factbook 2014). Recently the local currency, ruble has lost value against euro, so the purchases from the Finnish companies have become more expensive and less attractive to both Russian consumers and Russian companies. This can be observed in the diagram below, the other one being the gross domestic product of Russia and the other one being the

value of ruble compared to euro (European Central Bank 2014).
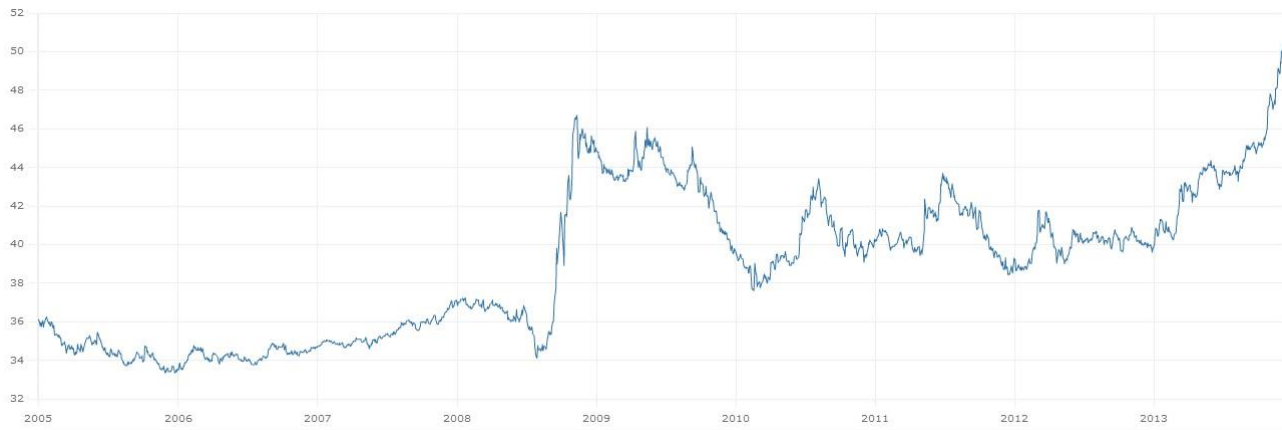
Figure 13: Value of ruble compared to euro (European Central Bank 2014)

2.4.2 Sweden

In the case of Sweden it is interesting to observe that excluding the small dip between years 2008 and 2009, the gross domestic product has actually grown throughout the 21st century so far. In the beginning of the 2000's Sweden was enjoying declining value of the krone, which made the Swedish products cheaper in the Eurozone and that was one of the reasons why Swedish companies generally remained competitive in comparison with their Eurozone competitors. This also helped to increase the gross domestic product, as the value goods and services produced that are being exported to other countries are added to the gross domestic product.
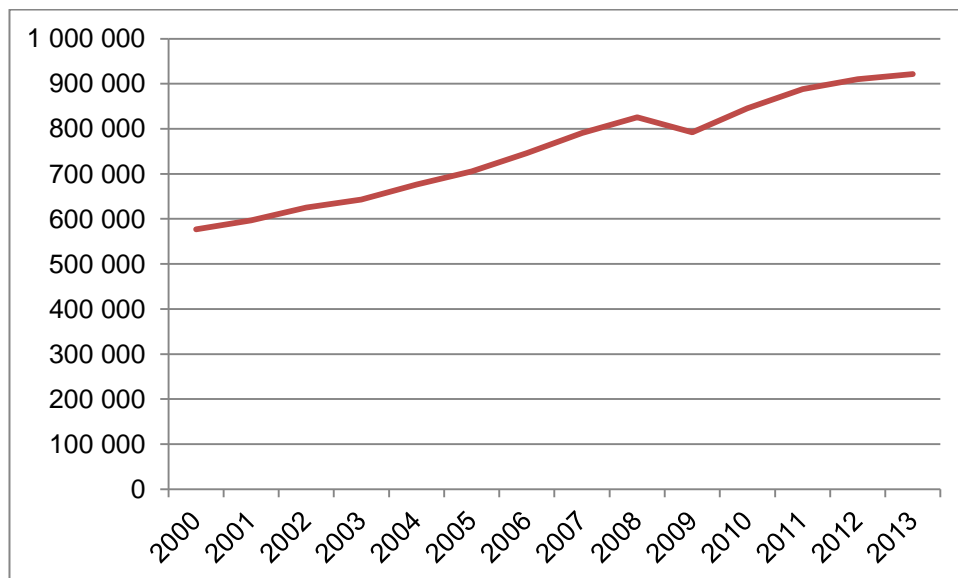
Figure 14: Gross domestic product growth of Sweden 2000 – 2013 (Statistics Sweden 2014)

Sweden still has its own currency, krona, and as it is very export oriented economy, it was hit very badly when the euro area crisis struck and the value of the Swedish krona started to rise. For many years Sweden had enjoyed the lowering value of krona against euro, making the goods and services produced in Sweden much more attractive for the foreign customers. However the gaining value against euro made the Swedish export products much more expensive for consumers from other European countries that were using Euro, when the value of Euro compared to krona declined. Among main trading partners of Sweden are Eurozone countries Germany, the Netherlands, Finland and France, which add up a percentage of 33,1% of the Swedish trade. This is one third of the trade that was affected with krona getting stronger against euro. For example Finland has 11,1% of its trade going to Sweden, 9,9% to Russia, 9,3% to Germany, 6,3% to the Netherlands, 6,2% to United States, 5,1% to United Kingdom and 4,6% to China, so when the value of euro declined it was in fact good for Finland as 36,9 % of the trade goes to countries which are not using euro, so this makes the Finnish products cheaper for them (CIA World Factbook, 2014).

According to the statistics of the Central Bank of Sweden, the value of krona was the cheapest in the first quarter of 2009 when for one euro you could buy 10,9443 kronas. Since then the krona has declined all the way up until third quarter of 2012 when for one euro you could buy 8,4447 kronas. This decline is significant when looking at the percentages how much value it has lost. Between the first quarter of 2009 and third quarter of 2012 it gained approximately 23% against euro, which means that products produced in Sweden were 23% more expensive for people using euro as their own currency. The last time when krona was this strong against euro was in third quarter of year 2000 (Central Bank of Sweden 2014).
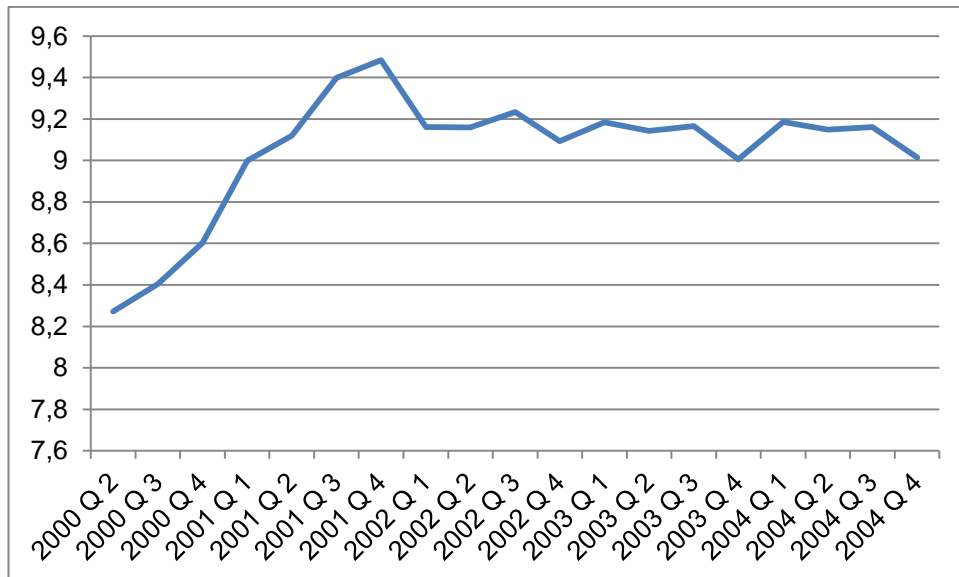
Figure 15: Value of Swedish krona Q2 2000 – Q4 2004 (Central Bank of Sweden 2014)
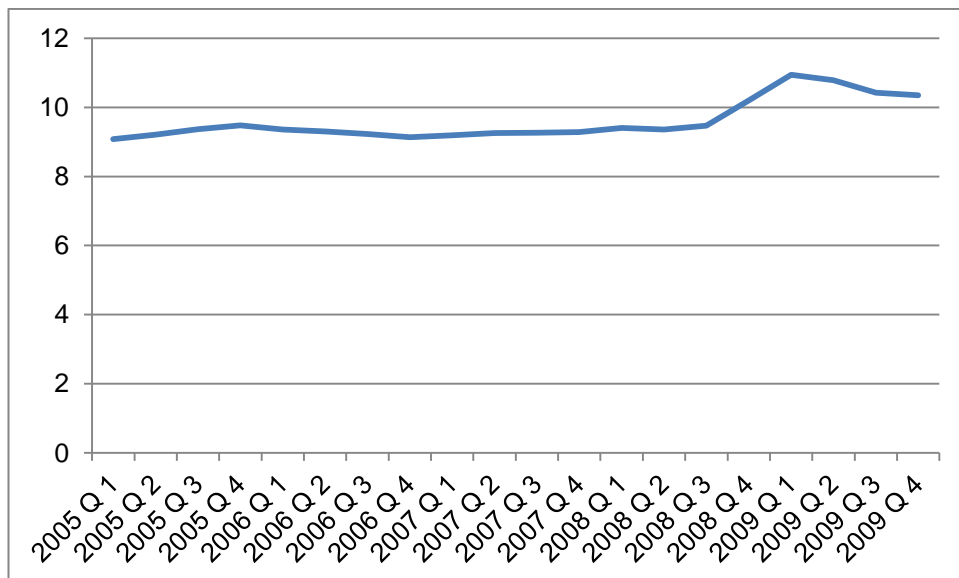
Figure 16: Value of Swedish krona Q1 2005 – Q4 2009 (The Central Bank of Sweden 2014)
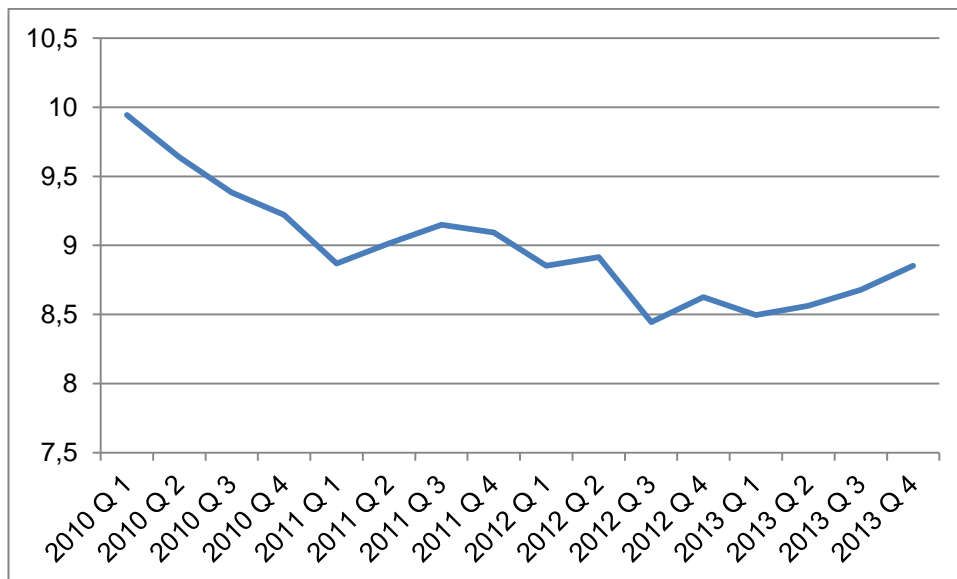
Figure 17: Value of Swedish krona Q1 2010 – Q4 2013 (The Central Bank of Sweden 2014)[1]

2.4.3 Denmark

The situation of Denmark is not very much similar with the story of Sweden as one would expect when hearing that Denmark still is using their currency, krone. As it is possible to observe from the diagram below from European Central Bank, Danish krone has kept its value against euro very well with very little movement staying in between 7,42 – 7,47. Denmark was more affected on the Eurozone crisis because its main trad-ing partners included Eurozone members such as Germany and the Netherlands and EU countries such as Sweden and United Kingdom (CIA World Factbook 2014).

It is true that none of these countries was in trouble especially during the Eurozone crisis, but their trade to the troubled countries was weakened and the overall slowing down in the economy of European Union was more of a fact that played a key role. As it is possible to observe from the diagram below, the gross domestic product of Den-mark declined shortly between 2008 and 2009, but started to increase after that just like happened in Sweden.

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[1] Due to the reasons beyond author's control the figures above could not be presented in combined figure.
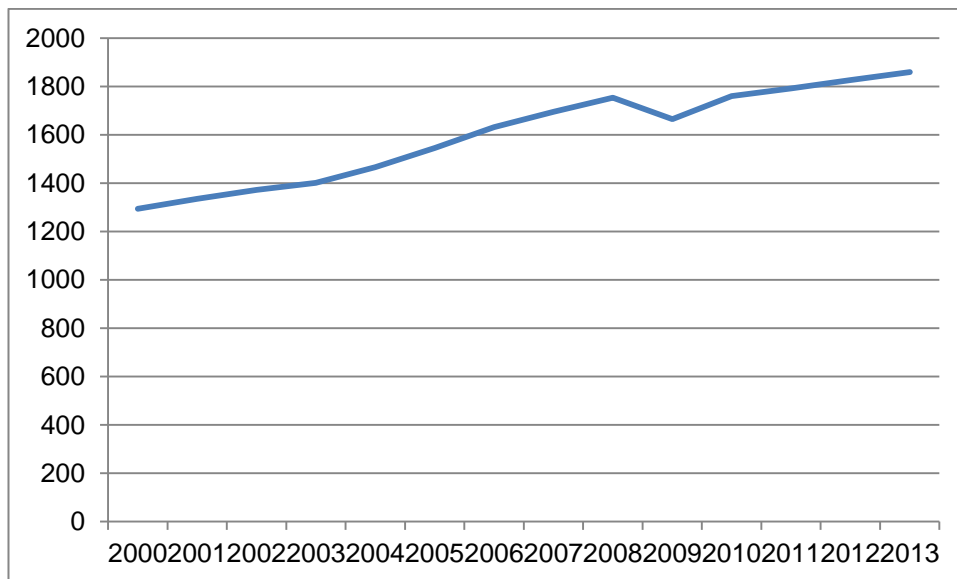
Figure 18: GDP growth of Denmark 2000 - 2013
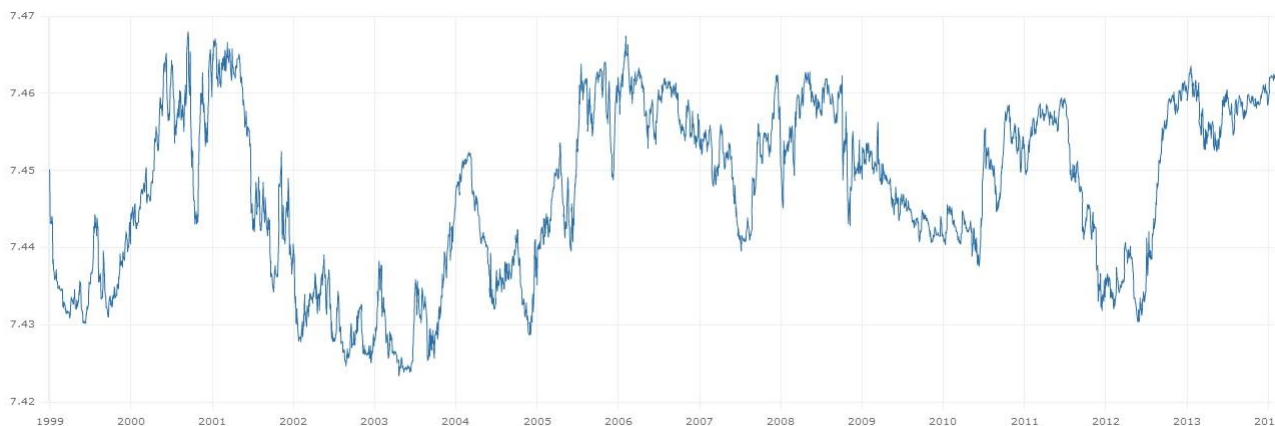
Figure 19: The value of Danish krone compared to euro (European Central Bank 2014)

The difference between what happened to the gross domestic products of Denmark and Sweden and to what happened to the gross domestic product of Finland is that Finland had only a few key industries and was more depended on only a few companies, whereas Sweden was able to grow as the key industries are more spread out than in Finland. This is partly due to having a bigger economy in general. Denmark had a gross domestic product of $324.3 billion, Finland $259.6 billion and Sweden being absolutely biggest with amount of $552 billion (CIA World Factbook 2014).

2.5   Correlation

When investigating relationships between two variables, there is a tool that helps to analyze the results which are being compared together. This tool is called correlation. It allows us to compare for example interest rates and inflation or as has been done in this thesis, comparing gross domestic product and share prices.

Correlation is measured between two variables X and Y, for example gross domestic product and changes in the share price as they are compared in this study. The correlation between X and Y is denoted by the small letter r. The precise formula for correlation is presented in the appendix below, but in this study Microsoft Excel is being used to calculate correlations (Koop 2004: 23 – 33).

The result of the correlation is a number between -1 and 1, which can be also expressed as $-1 \leq r \leq 1$. The positive value of r indicates that there is a positive correlation between X and Y. In the same way the negative values for r indicate that X and Y correlate negatively. r = 0 indicates that X and Y are uncorrelated, so in the other words they do not have correlation. The larger the positive value of r is, the stronger the correlation is between two variables and when $r = 1$ there is perfect positive correlation. In the same way smaller the negative value of r is, the less correlation there is between X and Y. Also when r = -1 there is perfect negative correlation (Koop 2004: 23 – 33).

3 Methodology

Companies to measure for this study were selected from the large cap list of OMX Nordic, which were present on the list on 6. March 2014 and countries to select from were Denmark, Finland and Sweden. All of these countries have their own stock exchange, Denmark in Copenhagen, Sweden in Stockholm and Finland in Helsinki.

They also have their own currencies that the reader has to keep in mind when looking at the figures in the Excel spreadsheet, Denmark and Sweden use their own Krona respectively and Finland uses the common European currency, Euro. The time period to study was selected to be from first quarter in 2000 until the fourth quarter in 2013. This selection was done as it would be pointless to look at the markets in the 1990's as most of the companies being measured in this study had not listed publicly in stock exchanges and that would lead to lack of information. As the size of the economies is very different between each of the countries measured in this study, the amount of companies from each country in the large cap list of OMX Nordic is different as well. OMX Nordic includes sometimes two different share groups of the company, for example Stora Enso has A share and more traded R share. In order to avoid double counting, only the more liquid share was being considered for this study. The more liquid share was also selected as the price information was better available, as for some companies the less liquid shares do not trade every day and therefore the price information would not be available for those specific days. OMX Nordic Large Cap section includes companies with market capitalization (current market share price multiplied by the number of outstanding shares of the company) equivalent to EUR 1billion or more (OMX Nordic 2014).

Moreover, not all of the companies have been listed in the stock exchange for the whole period of time, which in this case is between the years 2000 - 2013, which equals 14 years. In those cases where the price information was not available, the price information was replaced with N/A (Not available). Due to the small size of the markets, the author conducted this survey about large cap companies of three countries rather than concentrating solely on one country.

Denmark has 23 companies, Finland 26 and Sweden being the biggest has 63 companies in the list. Something about the size of these economies tells their gross domestic product in year 2013. Denmark had a gross domestic product of $324.3 billion, Finland $259.6 billion and Sweden being absolutely biggest with amount of $552 billion (CIA World Factbook 2014). The following diagrams illustrate better in which these economies are concentrated on and will help the reader to understand some differences in between them.

Something interesting is also the ownership structure of the companies from all of these countries. There are more companies with several different share classes in Denmark and Sweden than in Finland. This means that for example SEB share class C would have more voting power than the share series A, which is also less liquid.
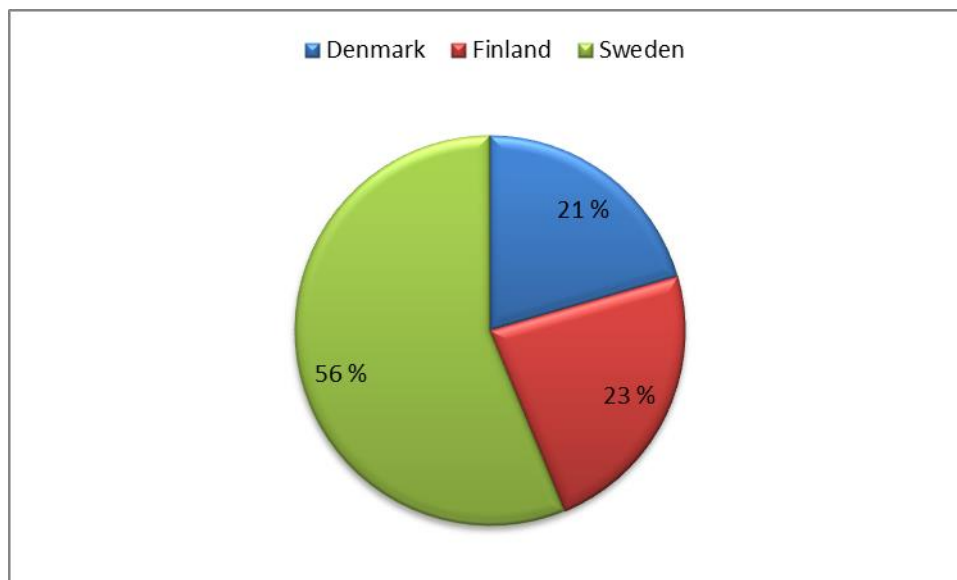
Figure 20: The share of each country in the analysis

The shares selected to this study were also categorized between consumer goods (12 shares), consumer services (7 shares), financials (25 shares), health care (15 shares), industrials (38 shares), materials (13 shares), oil and gas (5 shares), technology (5 shares) and telecom (6 shares). These categories were taken from OMX Nordic list, which categorizes companies to these industries.
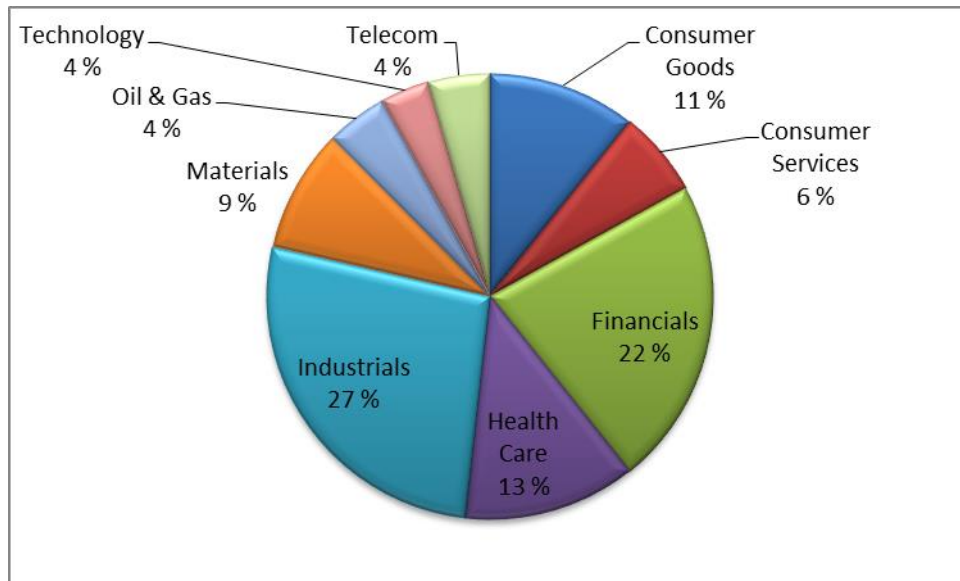
Figure 21: Share of different industries in the analysis

Moreover the economy of each country is very different and that is why some industries have a bigger proportion in some countries over the others. For example Denmark does not have any shares belonging to the consumer services segment, technology segment or materials segment. However they have 2 shares belonging to the consumer goods group, 5 shares in the financials, 8 shares in health care, 6 among industrials and one in the oil & gas and telecom industries respectively.
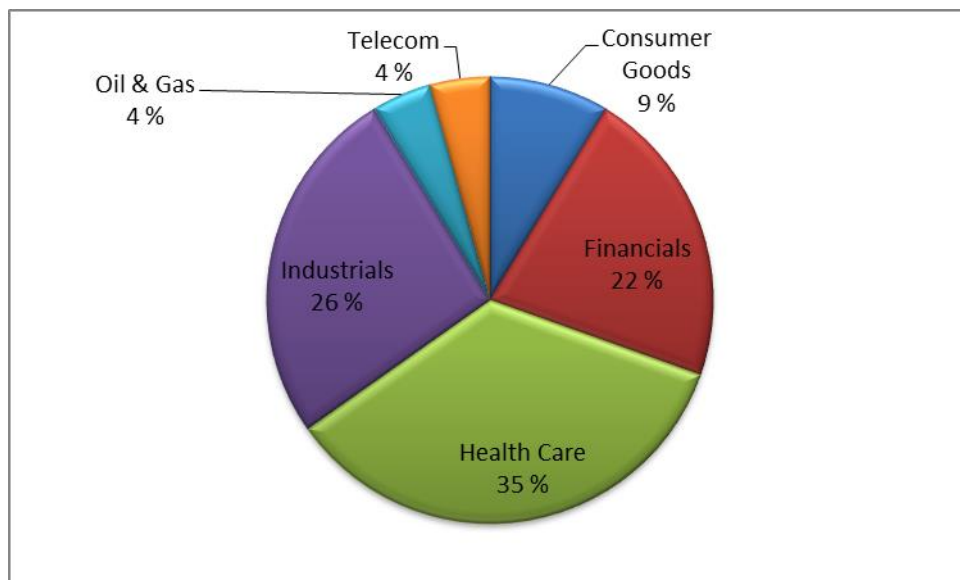
Figure 22: Share of different industries in Denmark

Finland in turn has 3 shares from the consumer goods segment, 3 from consumer services segment, 2 from the oil & gas segment, 8 from industrials segment, 1 from telecom segment, 2 from technology segment, 4 from materials segment, 1 from health care segment and 2 from the financials segment.
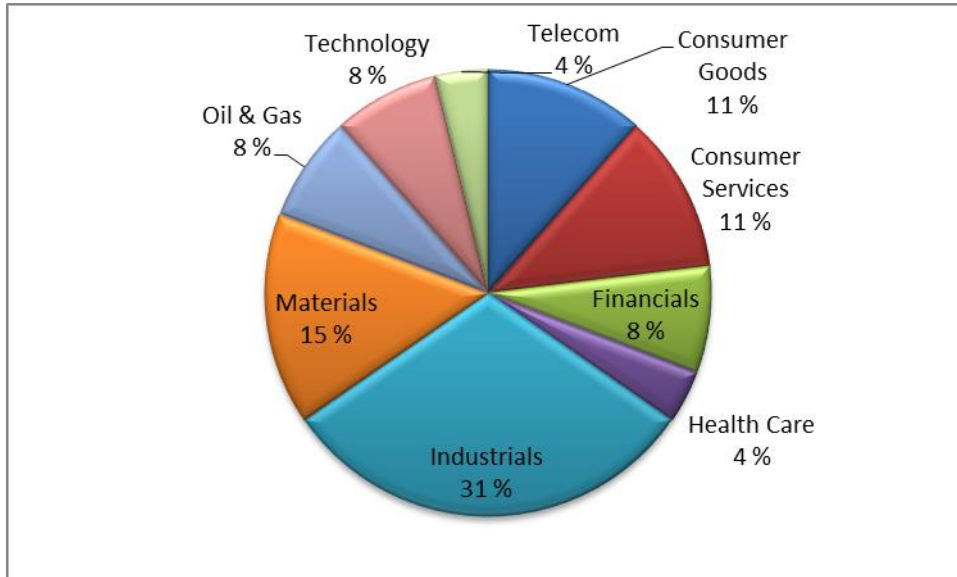
Figure 23: Share of different industries in Finland

In the list of large cap companies in OMX Nordic, Sweden is the absolute number one in terms of presence with 63 shares being listed to the large cap section. They are divided between industries as follows; 7 for consumer goods, 4 for consumer services, 18 for financials, 5 for health care, 16 for industrials, 6 for materials, 2 for oil & gas, 2 for technology and 3 for telecom.
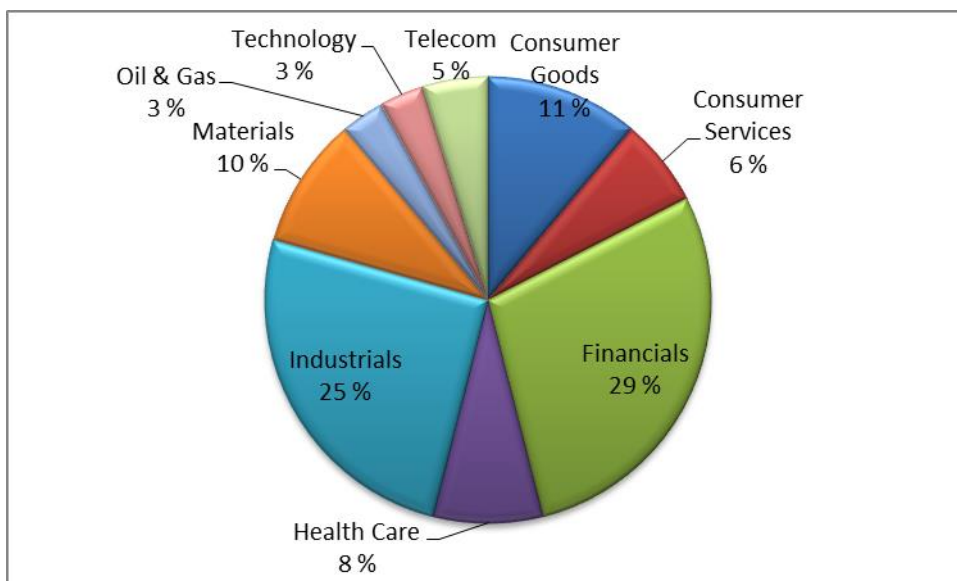
Figure 24: Share of different industries in Sweden

Once all data has been collected, the correlation between the different industries and countries and gross domestic product will be calculated in the Microsoft Excel by using the correlation function available there and the results will be analyzed by placing all numbers to the chart, from which it is easy to spot, which industries or countries correlate more and which correlate less with the increasing or decreasing gross domestic product.

4   Results and Analysing the Results

The price information was put to the Microsoft Excel in order to gain better and quicker understanding how these variables; gross domestic product and share prices actually correlate. All of the Excel spreadsheets used can be found as appendixes in the end of this study.

4.1   The Results

Following graph presents the results of the study in easily readable form. The results are shown as a column chart and the values below the X-axis are negative and those above the X-axis are positive and therefore would have negative or positive correlation respectively.
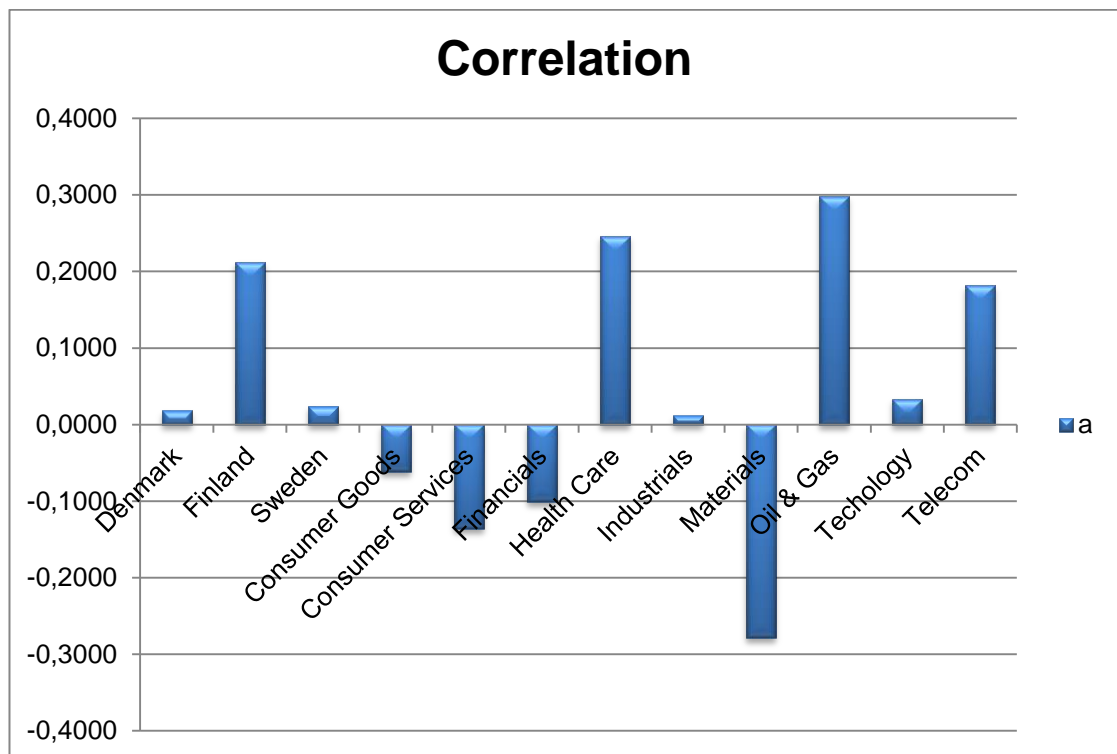
Figure 25: Results in the Bar chart

According to this Graph the best correlating shares come from the Oil & Gas industry with the correlation of 0,2987, from health care industry with the correlation of 0,2464 and from Finland with the correlation of 0,2122. It is interesting to see that industries which have negative correlation with the growth of gross domestic product include Materials with negative correlation of -0,2785, Consumer Services with the negative correlation of -0,1361, Financials with the negative correlation of -0,1010 and Consumer Goods with the negative correlation of -0,0621. These figures are also presented in the table below.

Table 1: Results in numbers

Denmark	0,0179
Finland	0,2122
Sweden	0,0239
Consumer Goods	-0,0621
Consumer Services	-0,1361
Financials	-0,1010
Health Care	0,2464
Industrials	0,0121
Materials	-0,2785
Oil & Gas	0,2987
Techology	0,0334
Telecom	0,1818

4.2 Analyzing of the Results

It is even a bit of surprising to see that so many industries correlate negatively with the gross domestic product. One explanation would be to see which companies actually belong to these industries and trying to analyze the outcome of this study based on that.

4.2.1 Countries

Denmark has the least companies represented in the study. The home of 5 569 077 people is also the home of 23 companies in the large cap section of OMX Nordic (CIA World Factbook 2014).The large cap companies listed in Copenhagen stock exchange achieve correlation average of 0,0179, which is a positive correlation, but very low positive one.

Sweden has relatively similar situation with Denmark. Sweden is the biggest country in OMX Nordic large cap list and it includes 62 different companies. Swedish companies correlate positively (though with low positive correlation) and are able to achieve the correlation of 0,0239, which is higher than for Denmark, but significantly lower than for Finland. Swedish companies include many exporters and due to the fact that they have their own currency, krona, which might benefit them in some situations, the correlation is lower than for Finland which is more depended on the value of euro, whereas Sweden can profit from declining value of krona compared to other currencies in its economy. This also makes the Swedish situation different from Denmark as the value of Swedish krona has been moving more than Danish krona in comparison to euro.

Finland has one of the strongest correlations between the share prices and the gross domestic product with the figure of 0,2122. Most of the companies in the Finnish list are actually exporters such as the paper companies UPM Kymmene and Stora Enso. The only non-export oriented companies with only little international touch in their business in the list are Elisa Oyj, (Telecom), Pohjola Pankki Oyj (Financials) and Sampo (Financials). All these companies concentrate their business mainly to Finland and though they have some operations internationally, the most activities done by the groups are still remain within Finland. For example Elisa Oyj is a leading telecommunications provider in Finland, which mainly operates in Finland.

Other companies included in the list are all very export oriented as is the whole economy of Finland. The relatively strong correlation with the gross domestic product and share prices in Finland can be explained with being so strongly export oriented. If the gross domestic product starts to decline it means that the value of the goods produced

within the specific economy starts to decline. As the companies in the Finnish list produce goods for exporting and not for domestic use and the gross domestic product falls, it means that these companies produce less goods and services as they did before. Finland is also in a different situation due to its currency, euro. As it cannot influence the movement of euro that much as it could when it still had its own currency, mark, it is more depended on what happens to big Eurozone economies such as Germany, France, Spain and Italy. When those countries are doing better economically the value of euro goes up and when those countries are doing worse, the value of euro is likely to go down and regardless its own economic situation, Finland will be affected by this more than what would happen to the value of euro in case Finnish economy would start declining heavily.

Something interesting is also the ownership structure of the companies from all of these countries. There are more companies with several different share classes in Denmark and Sweden than in Finland. This means that for example SEB share class C would have more voting power than the share class A, which is also less liquid. In Finland the ownership structure tends to be less concentrated and less controlled by a single entity, which could indicate that Finnish companies will seek more for the short term profitability than long term profitability in comparison to their Danish and Swedish alternatives. As a single entity, such as a family trust would have a significant stake in a company and hold the most shares with many votes, it would mean that this entity would be more concerned about the profitability of the company in a long term than more spread out investors who seek for quick profits. When applying the formulas that Brooks provides (Brooks 2010: 181 – 191) and keeping in mind that investors tend to set some price for the shares when they feel as if these shares would have gained enough value and then sell them, the combination of these two facts would make the Finnish stock market move more together with the economic conditions.

In case that a family trust owns a stake in a company, they usually aim to develop the activities in a longer term and aim to create value over the longer period of time, which means that the shares are less correlated with the economic cycles as for example when the recession hits the economy, it would not necessarily still sell the shares and lower the market value of the company by dumping the shares to the market, which would increase the offering and therefore according to the law of supply and demand

the price would decline as a result of the increased offering (Case, Fair and Oster 2009: 89).

In the other words, due to their own currency used and the concentrated ownership structure of the companies from Denmark and Sweden result that the correlation is significantly lower with the gross domestic product and the share prices as it is for the companies from Finland.

Table 2: Companies from Denmark

A.P. Moller - Maersk B	Denmark	Industrials
Carlsberg B	Denmark	Consumer Goods
Chr. Hansen Holding	Denmark	Health Care
Coloplast B	Denmark	Health Care
Danske Bank	Denmark	Financials
DSV	Denmark	Industrials
FLSmidth & Co.	Denmark	Industrials
G4S plc	Denmark	Industrials
Genmab	Denmark	Health Care
GN Store Nord	Denmark	Health Care
Jyske Bank	Denmark	Financials
Kobenhavns Lufthavne	Denmark	Industrials
Lundbeck	Denmark	Health Care
Novo Nordisk B	Denmark	Health Care
Novozymes B	Denmark	Health Care
Pandora	Denmark	Consumer Goods
Rockwool Int. B	Denmark	Industrials
Sydbank	Denmark	Financials
TDC	Denmark	Telecom
Topdanmark	Denmark	Financials
Tryg	Denmark	Financials
Vestas Wind Systems	Denmark	Oil & Gas
William Demant Holding	Denmark	Health Care

Table 3: Companies from Finland

Amer Sports Oyj	Finland	Consumer Goods
Cargotec Oyj	Finland	Industrials
Elisa Oyj	Finland	Telecom
Fiskars Oyj Abp	Finland	Consumer Goods
Fortum Oyj	Finland	Oil & Gas
Huhtamäki Oyj	Finland	Industrials
Kemira Oyj	Finland	Materials
Kesko Oyj B	Finland	Consumer Services
Kone Oyj	Finland	Industrials
Konecranes Oyj	Finland	Industrials
Metso Oyj	Finland	Industrials
Neste Oil Oyj	Finland	Oil & Gas
Nokia Oyj	Finland	Technology
Nokian Renkaat Oyj	Finland	Consumer Goods
Orion B	Finland	Health Care
Outokumpu Oyj	Finland	Materials
Outotec Oyj	Finland	Industrials
Pohjola Pankki A	Finland	Financials
Sampo A	Finland	Financials
Sanoma Oyj	Finland	Consumer Services
Stockmann Oyj Abp B	Finland	Consumer Services
Stora Enso R	Finland	Materials
Tieto Oyj	Finland	Technology
UPM-Kymmene Oyj	Finland	Materials
Wärtsilä Oyj	Finland	Industrials
Yit Oyj	Finland	Industrials

Table 4: Companies from Sweden

AarhusKarlshamn	Sweden	Consumer Goods
ABB Ltd.	Sweden	Industrials
Alfa Laval	Sweden	Industrials
Assa Abloy B	Sweden	Industrials
AstraZeneca	Sweden	Health Care
Atlas Copco A	Sweden	Industrials
Atrium Ljungberg B	Sweden	Financials
Autoliv SDB	Sweden	Consumer Goods
Axfood	Sweden	Consumer Services
Axis	Sweden	Technology
BillerudKorsnäs	Sweden	Materials
Boliden	Sweden	Materials
Castellum	Sweden	Financials
Electrolux B	Sweden	Consumer Goods
Elekta B	Sweden	Health Care
EnQuest PLC	Sweden	Oil & Gas
Ericsson B	Sweden	Technology
Fabege	Sweden	Financials
Getinge B	Sweden	Health Care
Hennes & Mauritz B	Sweden	Consumer Services
Hexagon B	Sweden	Industrials
HEXPOL B	Sweden	Materials
Holmen B	Sweden	Materials
Hufvudstaden A	Sweden	Financials
Husqvarna B	Sweden	Consumer Goods
ICA Gruppen	Sweden	Consumer Services
Industrivärden C	Sweden	Financials
Intrum Justia	Sweden	Financials
Investor B	Sweden	Financials
JM	Sweden	Financials
Kinnevik B	Sweden	Financials

Table continues on the next page.

Latour B	Sweden	Financials
Lundbergföretagen B	Sweden	Financials
Lundin Mining Corporation SDB	Sweden	Materials
Lundin Petroleum	Sweden	Oil & Gas
Meda A	Sweden	Health Care
Melker Schörling	Sweden	Financials
Millicom Int. Cellular SDB	Sweden	Telecom
Modern Times Group B	Sweden	Consumer Services
NCC B	Sweden	Industrials
NIBE Indutrier B	Sweden	Industrials
Nordea Bank	Sweden	Financials
Oriflame, SDB	Sweden	Consumer Goods
Peab B	Sweden	Industrials
Ratos B	Sweden	Financials
Saab B	Sweden	Industrials
Sandvik	Sweden	Industrials
SCA B	Sweden	Consumer Goods
Scania B	Sweden	Industrials
SEB A	Sweden	Financials
Securitas B	Sweden	Industrials
Skanska B	Sweden	Industrials
SKF B	Sweden	Industrials
SSAB A	Sweden	Materials
Sv. Handelsbanken A	Sweden	Financials
Swedbank A	Sweden	Financials
Swedish Match	Sweden	Consumer Goods
Swedish Orphan Biovitrum	Sweden	Health Care
Tele2 B	Sweden	Telecom
Teliasonera	Sweden	Telecom
Trelleborg B	Sweden	Industrials
Wallenstam B	Sweden	Financials
Volvo B	Sweden	Industrials

4.2.2   Consumer Goods

Consumer goods was one industry which according to this study was correlating negatively with the gross domestic product with negative correlation of -0,0621. When looking at the companies listed to this segment most of them seem to be exporting goods rather than just concentrating on domestic market. All of the companies operate internationally in Europe and also other parts of the world. A good example is Nokian Renkaat Oyj, which is a tire producer from Finland. According to the graphs presented in their website, not only do they operate in Finland, but they also export their goods to countries such as Russia and former Soviet Union countries, which form 34% of their revenue, Central and Eastern Europe forming 22%, Finland 14%, Norway and Sweden both forming 11%, North America 7% and others making up 1% of their revenues (Nokian Renkaat 2014).

This is a clear example of a modern Nordic company. As domestic markets eventually get too small for the companies, they have to seek business opportunities elsewhere and in the case of Nokian Renkaat, the former Soviet Union area is forming up more and more significant amount of their revenues, which means that the money that is being spent on tires there, does not appear in the gross domestic product statistics of Finland. However it does appear in the balance sheet of the company and the growing revenues from other countries will eventually boost the earnings per share and through that the dividend gets bigger and eventually that has an impact on the price of the share of Nokian Renkaat, which is likely to go up as a result of the better business results and bigger revenues. One might at this point ask a question "*but aren't the tires produced in Finland, which would then contribute to the gross domestic product of Finland?*". The answer is, it depends. In 2012 Nokian Renkaat opened its first factory in Russia (Taloussanomat 2011). It produces tires for the markets in the Central – and Eastern Europe, Russia and former Soviet Union area (Nokian Renkaat 2014).

This means that the production costs that would contribute to the gross domestic product of Finland, do not appear in Finland when a tire is being produced in the factory in Russia. It then contributes to the gross domestic product of Russia as the workers need to be paid, the raw material needs to be bought and other production related costs. Only the profits will then be directed to Finland and that money will then show as a figure in the cash flow statement and balance sheet of Nokian Renkaat and that

amount being increasing, it would mean that the share price would go up as the dividend goes, according to the share valuation models as presented by Brooks (Brooks 2010: 181 – 191).

Another good example could be Carlsberg from Denmark. The products of this beverage manufacturer giant can be found from all over the world, almost anywhere one would think of going. According to the annual report of the Carlsberg Group, Danish krona forms only 11% of the total net revenue in 2013 (Carlsberg 2014).

This would mean that roughly 11% of the sales would come from Denmark and the other 89% would come from somewhere else. Also the beverages produced in the other countries, which include for example Finland, would not appear in the statistics of Denmark, in the same way as described above the case of Nokian Renkaat. This is very general case with the consumer goods producers, which are export oriented and often a factory owned in the other country or either subcontractors in other countries contribute to the earnings per share of the company but do not make a significant change in the gross domestic product of the home country where the company is based in. Exception to this is Swedish Match due to the Laws regarding their products outside of their home country, which mostly ban selling these goods outside of Sweden. This company would be likely to suffer from the gross domestic product decreasing as almost all consumption is domestic and the reducing amount of money that the domestic customers spend on the products would show also in the balance sheet of Swedish Match. Based on this it could be expected that Swedish Match would have very high correlation with the gross domestic product of Sweden, but however the results show that the correlation is 0,08279 for this individual share. It could be thought that also consumers from the neighbor countries of Sweden will buy the goods from Swedish Match, which will partly contribute to the theory that the share is not correlating that well to the changes in gross domestic product. As the selling of the goods that Swedish Match produces (special kind of tobacco products) happen to be illegal to sell in for example Finland, the consumers will then buy them from Sweden.

Table 5: The shares from Consumer Goods segment

AarhusKarlshamn	Sweden
Amer Sports Oyj	Finland
Autoliv SDB	Sweden
Carlsberg B	Denmark
Electrolux B	Sweden
Fiskars Oyj Abp	Finland
Husqvarna B	Sweden
Nokian Renkaat Oyj	Finland
Oriflame, SDB	Sweden
Pandora	Denmark
SCA B	Sweden
Swedish Match	Sweden

4.2.3   Consumer Services

Consumer services segment is a bit smaller and includes companies only from Finland and Sweden. There are several retailers (Stockmann Oyj Abp, ICA Gruppen, Hennes & Mauritz, Kesko Oyj and Axfood) and the remaining two companies, Modern Times Group and Sanoma Oyj, are media companies. One might quickly think that these companies would operate domestically, but as seen with the previous examples of the consumer goods segment, in reality many of these companies are highly international and doing business in other markets than domestic, forms a significant part of their revenues. Therefore the correlation with the gross domestic product and these companies is actually highly negative with the negative correlation of -0,1361.

As an example Sanoma Oyj, the media company from Finland is best known for the biggest newspaper in Finland, Helsingin Sanomat. However the group has several significant stakes in foreign media companies as well. Their business operations in Netherlands and Belgium produced the revenues of € 705,8 million in the Netherlands and € 220,0 million in Belgium, whereas their operations in Finland only added up to € 682,4 million. Of course Finland forms a big portion of the income of Sanoma, but when looking at the figures, Netherlands is a little bit bigger market for Sanoma than Finland (Sanoma 2014).

The same applies also to the other companies in this segment. The retailers have significant markets also in other countries than their home country, for example the cloth retailer giant Hennes & Mauritz, is operating globally almost in every country and Stockmann Oyj Abp and Kesko Oyj have significant business operations in Baltics, Eastern Europe and Russia where more and more revenues are coming in from. Naturally due to the nature of their business for example Stockmann and Hennes & Mauritz sell imported goods which are being imported mostly outside of Finland and Sweden, these companies are just so called middle men in the markets where they make the goods available for the consumers and handle the sales activities themselves on behalf of the producer. This means that many of the products being sold in these retail stores do not contribute to the gross domestic products of their home countries, which means that the share can go up, even if the domestic consumption and gross domestic product would decline.

Table 6: The shares from Consumer Services segment

Axfood	Sweden
Hennes & Mauritz B	Sweden
ICA Gruppen	Sweden
Kesko Oyj B	Finland
Modern Times Group B	Sweden
Sanoma Oyj	Finland
Stockmann Oyj Abp B	Finland

4.2.4   Financials

As the reader might easily observe from the appendix of the finance companies, the most of these companies are based in Sweden. Only five of these companies are based in Denmark and two in Finland, which means that eighteen of these companies are listed in the Stockholm stock exchange. This naturally means that the changes in Swedish gross domestic product are better represented as it is more emphasized due to the large volume of Swedish companies in the list.

When thinking about the correlation between gross domestic product and financial companies, it is not necessarily usual that anyone would expect them to correlate negatively. However this is exactly what has been going on between the years 2000 – 2014 and they have a negative correlation of -0,1010.

The strong negative correlation for the industry that is generally thought to be very economically depended could be explained with the home countries of the companies from this segment. As most of them are from Sweden, they tend to have more concentrated ownership structure as described in the analysis of the results of the countries. Also as Sweden is using their own currency and it maintains its own monetary policy, it means that when the crisis struck to the Eurozone and the European Central Bank decreased the interest rates, Sweden went on with their stronger interest rate, which made the economies more interesting as investors could reach for better return on their investment from there. As seen in the literature review the gross domestic products of Sweden and Denmark declined during the European financial crisis but the interest rates of the central banks were still significantly better than those that European Central Bank had in place at that time according to statistics of Central Bank of Sweden, European Central Bank (2014). This is important because the most financials segment companies come from Sweden and that emphasizes more the Swedish economy than it does for Finland for example. When thinking about financial companies, it also has to be remembered that they invest money, sometimes to very exotic locations. When the gross domestic product declines in the Nordics, the value of their investments might increase somewhere else. For example Nordea offers mutual funds that invest to countries such as Russia, Latin America and Asia and these investments are not necessarily depended on development of Nordic economies (Nordea 2014).

Table 7: The shares from Financials segment

Atrium Ljungberg B	Sweden
Castellum	Sweden
Danske Bank	Denmark
Fabege	Sweden
Hufvudstaden A	Sweden
Industrivärden C	Sweden
Intrum Justia	Sweden
Investor B	Sweden
JM	Sweden
Jyske Bank	Denmark
Kinnevik B	Sweden
Latour B	Sweden
Lundbergföretagen B	Sweden
Melker Schörling	Sweden
Nordea Bank	Sweden
Pohjola Pankki A	Finland
Ratos B	Sweden
Sampo A	Finland
SEB A	Sweden
Sv. Handelsbanken A	Sweden
Swedbank A	Sweden
Sydbank	Denmark
Topdanmark	Denmark
Tryg	Denmark
Wallenstam B	Sweden

4.2.5   Health Care

The health care industry in Nordics is very different from many other industries investigated in this study. In this group of companies the most companies actually come from Denmark and there are eight of them. Sweden is the second most popular base for the health care countries with five of them based there and Finland is a home of one.

The shares of health care industry correlates positively with the gross domestic product with the positive correlation of 0,2464, which is the second highest achieved in this study.

Health care industry is –especially in the Nordics- very much operated by the governments and the most of the hospitals tend to be publicly owned. This is important because when the recession hits the economy, the government has less money available for investing and health care is not always necessarily the number one choice to invest in. Therefore the health care companies would be more likely to suffer from the economic downturns and in the other hand to benefit from the increase in the gross domestic product.

Table 8: The shares from Health Care segment

AstraZeneca	Sweden	Health Care
Chr. Hansen Holding	Denmark	Health Care
Coloplast B	Denmark	Health Care
Elekta B	Sweden	Health Care
Genmab	Denmark	Health Care
Getinge B	Sweden	Health Care
GN Store Nord	Denmark	Health Care
Lundbeck	Denmark	Health Care
Meda A	Sweden	Health Care
Novo Nordisk B	Denmark	Health Care
Novozymes B	Denmark	Health Care
Orion B	Finland	Health Care
Swedish Orphan Biovitrum	Sweden	Health Care
William Demant Holding	Denmark	Health Care

4.2.6   Industrials

Industrials group is the biggest single group of companies as sorted by the OMX Nordic. It includes several type of companies from the several different fields of business, logistics giants A.P Moller – Maersk and DSV and the construction companies NCC, Peab, Rockwool Int., Skanska and Yit Oyj. Heavy machine producers are represented in the list by ABB Ltd., Alfa Laval, Atlas Copco, Cargotec Oyj, FLSmidth & Co, Hexagon Kone Oyj, Konecranes Oyj, Metso Oyj, NIBE Indutrier, Outotec Oyj, Sandvik, SKF,Trelleborg and Wärtsilä Oyj. There are also several companies that operate in the security industry such as the lock producer Assa Abloy and security services providers G4S plc and Securitas. Saab, Scania and Volvo are all transportation vehicle producers based in Sweden, which is another sub group in this group. Products closer to consumers are offered by Huhtamäki Oyj, which produces disposable cups and packaging materials and Kobenhavns Lufthavne, which is the operator of the Kasturp airport in Copenhangen.

Out of the companies listed to this group 16 come from Sweden, 8 from Finland and 6 from Denmark, which equals the total of 30 companies in this group.
In the same way as mentioned previously with the case of Consumer Goods companies, most of these companies tend to be exporters of the goods and services rather than importers. Elevators produced by Kone Oyj can be found from all over the world in the same way as cars produced by Volvo. Also when going to the harbor, one might very likely see a ship or containers by A.P Moller – Maersk and DSV and also observe them being moved with the cranes produced by Cargotec Oyj and Konecranes Oyj. Also all of the construction companies represented in this list operate internationally at least in the Nordics, but in some cases also countries from Eastern Europe and Central Europe as Yit Oyj does for example (YIT, 2014).

In the same way as described in the cases of Consumer Goods segment companies, these companies are not necessarily dependent on domestic consumption as the international business operations reduce the market risk, which is significant when operating in just one market. Despite this fact the correlation with the gross domestic product for this industry is surprisingly positive figure of 0,0121. It is not very much compared to other industries such as health care, but it could be explained with the fact that the goods and services that these companies produce are very expensive and therefore

depended on economic cycles. Most of these companies sell goods from business to business so for example if less money is available for their customers, they are more likely to postpone or decline the investment proposals that are being submitted to the management, which could include for example new machinery, which is what significant amount of these companies produce. As a result of companies spending less money on the new investments, the logistic services needed by these companies in order to deliver the end product to the client is reduced and this would also affect the businesses of A.P Moller – Maersk and DSV.

Also from the individual point of view, the construction business, which builds new houses and offices, is also more likely to be depended on their customers' ability to buy new houses. In the recession where people are more careful about their spending, this does not necessarily happen. Even though it could be also said that as the recession hits the economy, the interest rates will usually go down as the central banks try to revive the economy and the consumption by allowing banks to borrow money to consumers more cheaply. This would, in theory, mean that the loans are given more easily to customers and it would be cheaper for the customers to take a loan, but in the reality the uncertainty of being able to pay the loan back might scare some of the potential customers away from the loans, so this is then reduced. Also the risk management sections of the banks are likely to investigate more carefully whether or not the customer applying for a big mortgage is able to pay the money back, in order to avoid the credit default.

These two factors combined, the low positive correlation of 0,0121 could be explained in this segment of the companies. Another thing to keep in mind is that the segment Industrials consists of many companies from many different business areas such as logistics, heavy engineering, security, construction and commercial vehicles for example. This means that some of these sub-industries might correlate better with the gross domestic product than the others and might counter those that do not.

Almost all of the companies in this segment use significant amounts of resources when producing their products. This means that the commodity prices affect the share prices very much. If the price of commodity, that is critical for the business, goes down, it benefits the company, but if it goes up, the company has to pay more for the re- sources and it decreases the profit margins in case that the company does not raise prices, which in turn would make it less competitive against alternative options. If the company plays this correctly, it means it has a significant advantage over the competi- tors. This could be done by trading commodities or futures or options of commodities. In case the company plays its cards wrong with this could have very bad consequences and the shares might slide down significantly, even against the gross domestic product growth, which would partly explain almost not having any correlation.

These companies are also very depended on foreign exchange rates as most of these companies are exporters. When the value of euro would go down against say dollar, the orders to Finnish companies would increase if the buyer would be most affected by the price of the product. This is also one reason why the companies have almost no correlation with their domestic country's gross domestic products. Exporters in fact benefit for the gross domestic product and at the same time value of the currency go- ing down as their products become cheaper for the international consumers. Finland is a bit of an exception in this case as it is part of the Eurozone, but as the value of euro has declined the Finnish producers have got many contracts abroad, for example ele- vator producer Kone, which has grown its business as it has taken advantage of weak- er euro and won many orders in Asia Pacific for example. (Turun Sanomat, 2012).

Table 9: The shares from Industrials segment

A.P. Moller - Maersk B	Denmark	Industrials
ABB Ltd.	Sweden	Industrials
Alfa Laval	Sweden	Industrials
Assa Abloy B	Sweden	Industrials
Atlas Copco A	Sweden	Industrials
Cargotec Oyj	Finland	Industrials
DSV	Denmark	Industrials
FLSmidth & Co.	Denmark	Industrials
G4S plc	Denmark	Industrials
Hexagon B	Sweden	Industrials
Huhtamäki Oyj	Finland	Industrials
Kobenhavns Lufthavne	Denmark	Industrials
Kone Oyj	Finland	Industrials
Konecranes Oyj	Finland	Industrials
Metso Oyj	Finland	Industrials
NCC B	Sweden	Industrials
NIBE Indutrier B	Sweden	Industrials
Outotec Oyj	Finland	Industrials
Peab B	Sweden	Industrials
Rockwool Int. B	Denmark	Industrials
Saab B	Sweden	Industrials
Sandvik	Sweden	Industrials
Scania B	Sweden	Industrials
Securitas B	Sweden	Industrials
Skanska B	Sweden	Industrials
SKF B	Sweden	Industrials
Trelleborg B	Sweden	Industrials
Volvo B	Sweden	Industrials
Wärtsilä Oyj	Finland	Industrials
Yit Oyj	Finland	Industrials

4.2.7 Materials

Materials segment consists of companies that produce materials, which are then being used to produce the final goods for the consumers. These companies include the paper companies BillerudKorsnäs, Holmen, Stora Enso and UPM Kymmene Oyj. Mining companies are also considered for this section and they are represented here by Boliden and Lundin Mining Corporation SDB. Hexpol is a global producer based in Sweden that produces materials such as polymer products and Kemira Oyj from Finland produces chemical products. There are also two steel producers; Outokumpu Oyj and SSAB, though it could be also said that Outokumpu Oyj operates also in the mining industry.

The shares of this segment achieve the highest negative correlation with gross domestic product that is achieved in this study and it is as much as -0,2785. This figure could be explained by taking a look at where these companies operate in addition to their home countries. Stora Enso runs its business operations all over the globe (Stora Enso 2014) and also Kemira Oyj has significant operations all over the world and 45 % of the revenues come from the areas such as North America, South America and Asia Pacific area. The remaining 55% comes from Europe, Middle East and Africa (Kermira 2014).

International operations are necessity for these companies as the domestic markets in all of the Nordic countries tend to be very small for the goods and services that these companies produce and it would not be very profitable to operate only in Finland or even Sweden.

As mentioned in the previous segment, the companies of the materials segment are also highly impacted by the prices of commodities as they produce materials from raw materials. The price movement of these commodities specific for each company might make them to move negatively in comparison with gross domestic product as the companies might very often use futures or options to acquire these goods. Being able to predict the movements would ensure that the companies could acquire the resources necessary for their production with cheaper price than the current market price and would have a positive impact on the business results regardless the economic situation of domestic country.

Table 10: The shares from Materials segment

BillerudKorsnäs	Sweden	Materials
Boliden	Sweden	Materials
HEXPOL B	Sweden	Materials
Holmen B	Sweden	Materials
Kemira Oyj	Finland	Materials
Lundin Mining Corporation SDB	Sweden	Materials
Outokumpu Oyj	Finland	Materials
SSAB A	Sweden	Materials
Stora Enso R	Finland	Materials
UPM-Kymmene Oyj	Finland	Materials

4.2.8 Oil & Gas

Oil and gas industry in the Nordics is very different compared to many other industries that are being investigated in this study. In fact this segment could be better named the energy sector, but due to the OMX Nordic naming it Oil & Gas, it shall be called that in this study too. Fortum Oyj, was added to this segment as it had its own category "Utilities" and would have been the only one there, so it was added to the category which was the most appropriate in writers point of view. The companies in this segment operate mostly either domestically or they import much of the energy sources for the domestic use from abroad. Therefore the shares in this segment achieve very high correlation with gross domestic products and the overall figure for the industry is 0,2987.

All of the companies in this segment are very depended on domestic consumption and as the demand domestically goes down, they would most certainly suffer from that. Also the oil price has a high impact especially on Lundin Petroleum and Neste Oil Oyj, which is critical factor which forms their results. When that would go up, it would decrease the demand for the oil in the countries and at the same time they would have to pay more for each barrel of the oil, which they need in order to produce the end product for the customers. Both of these factors combined would result that the margins of the company are being reduced. Also when considering that the oil price usually increases when the economy is doing better, there would be strong correlation between those two variables and it could be considered that these would have a straight impact on the oil companies.

It is true that some of these companies have operations abroad, but the fact that this study only considers years 2000 – 2013, makes it less valid for this study as the investments abroad have been relatively recent, for example Fortum Oyj opened its power plants in Tsheljabinsk, Tyumen and Tobolsk in Russia in 2011, which makes them to be considered for the study only for the 12 quarters out of the 56 quarters that are between the years 2000 – 2013 (Fortum 2014).

The only company out of the ones considered for this segment that exports the goods or services is Vestas Wind Systems from Denmark. It is the producer of the wind turbines and in addition to Denmark it sells the goods and services to 35 different countries (Vestas Wind Systems 2014).

Table 11: *The shares from Oil and Gas segment*

EnQuest PLC	Sweden	Oil & Gas
Fortum Oyj	Finland	Oil & Gas
Lundin Petroleum	Sweden	Oil & Gas
Neste Oil Oyj	Finland	Oil & Gas
Vestas Wind Systems	Denmark	Oil & Gas

4.2.9   Technology

The technology segment of this study is relatively small, compared to some of the other segments, some of which might be several times bigger than this segment. It only includes four companies from two different countries, two from Sweden and two from Finland. Now, it could be considered that Nordics would have very few technology companies, but in reality most of them are being listed in the small - and midcap sections of OMX Nordic, which makes them irrelevant for this study as it only considers companies from the large cap section.

However we will now use what we have in this section and the result of the correlation between technology shares and gross domestic products is 0,0334, which means it has positive correlation, however relatively low when compared to some other segments investigated in this study.

One big factor in this segment is the company that whole Finland was once proud of – Nokia. Its revenues were in 2011 worth of 20% of the gross domestic product of the whole Finland (Economist 2012).This means that even a slight decline in the revenues of Nokia could be very quickly seen when measuring the gross domestic product of Finland and it also makes Finland very depended on the success of Nokia. This also means that these companies, there being only four of them, Nokia and its dominance would grab a bigger share of the whole segments movements and therefore would have a big effect on the final outcome. When looking at the other companies on the list, they are not as big as Nokia is. Ericsson is the provider of IT solutions such as networks and Tieto works in the field of IT services, such as datacenters and Axis which also provides IT services such as cameras and products related to them.

Table 12: *The shares from Technology segment*

Axis	Sweden	Technology
Ericsson B	Sweden	Technology
Nokia Oyj	Finland	Technology
Tieto Oyj	Finland	Technology

4.2.10 Telecom

Telecom companies are in many ways similar to those in the Oil and Gas segment, when looking at the behavior of the share prices in relation to gross domestic product. All of them were set up to provide phone services locally, to the local customers, who then in turn owned a share of the company. For example this was done in case of Elisa Oyj and its predecessors, but nowadays situation is much more complex than that.

During the past decade, almost all of these companies have acquired companies from outside of their home country. For example when looking at TeliaSonera, it can be seen already from the name that it is a result of merging Swedish company Telia and Finnish company Sonera, which happened in December 2002 (TeliaSonera 2014). Since then TeliaSonera has acquired several other teleoperators in other countries than their domestic ones, for example from Azerbaidzan, Spain, Georgia, Kazahkstan, Latvia, Lithuania, Moldova, Nepal, Norway, Tadzikistan, Denmark, Uzbekistan and Estonia. It also owns significant stakes of the companies based in Turkey and Russia (TeliaSonera 2014).

The situation is the same with Elisa, though its main market of the operation remains in Finland, it has acquired a teleoperator in Estonia.
The Swedish Tele2 is no different form its two competitors, it indeed owns subsidiaries all over the world in countries such as the Netherlands, Germany, Austria, Croatia, Kazakhstan, Lithuania, Norway, Latvia and Estonia.

When looking at these countries where the teleoperators usually work, it is strange that their shares correlate so well with the gross domestic product in their domestic countries. This can be explained party by the revenue split which for example in the case of TeliaSonera, is divided so that 34,48% of the revenue comes from Sweden (TeliaSonera, 2014). Also the other thing to be kept in mind when comparing the telecom companies to for example heavy engineering companies is that these companies own subsidiaries in these countries where they operate. All of the heavy engineering products producers do not necessarily produce anything there, which makes the telecom industry very different. Even though TeliaSonera operates in many markets, Sweden still remains to be the main revenue source for the company.

This leads to another thing related to the operations in the foreign countries, which is the billing of the customer. In all these countries where TeliaSonera operates, the customers pay with the local currency, which creates a foreign exchange risks due to the currency fluctuation. For example if a Finnish customer of TeliaSonera would pay his or her bill in euros and the foreign exchange rate of euro would suddenly go up or down, it would mean significant changes in the revenues when measured in Swedish kronas. When the gross domestic product would increase, it would increase inflation too because the value of the money would go down as there would then be more money available in the economy. This would mean lower price for krona, compared to euro and when Finnish customer would pay as much as he or she did before, the amount measured in kronas would increase together with the gross domestic product even if the consumption would remain the same. All of these companies have some business activity abroad in countries where other currency than domestic currency is used, which creates them the forex risk described above.

Table 13: *The shares from Telecom segment*

Elisa Oyj	Finland	Telecom
Millicom Int. Cellular SDB	Sweden	Telecom
TDC	Denmark	Telecom
Tele2 B	Sweden	Telecom
Teliasonera	Sweden	Telecom

5 Conclusion and outcome

Even though the gross domestic product can be considered to be very accurate tool to measure the level of productivity within an economy, it still has some things that need to be kept in mind when thinking of correlations between gross domestic product and share prices.

Most companies which are publicly listed in the Nordic region tend to be operating or at least selling their goods and services abroad, which makes them less depended on one single economy, as the goods produced and sold abroad are not counted to contribute to the gross domestic product of the domestic country, but are counted to contribute to the financial results of the listed companies. When the revenue streams from abroad are added up to the domestic revenue, it will result the overall result. When applying the dividend valuation formulas as presented by Brooks (2010: 181 – 191) and Pike and Neale (2009: 453 – 475), the bigger the earnings are the higher the share would rise. So even if the domestic operations would not be profitable, the company can make profit from its operations abroad.

As seen in the gross domestic product formula by Case, Fair & Oster, the gross domestic product does not count the income to the economy that is coming from abroad (Case, Fair & Oster 2009: 450). It means that the profits or losses that the companies will make abroad are not calculated to the gross domestic product. However they are calculated to the gross national product, which is an indicator of the output of the country's enterprises. It does not specify whether the consumption is done domestically or in the foreign companies and the factories for example can be located abroad. However the statistics of gross national product remained unavailable for this study and therefore the gross domestic product was chosen as an economic indicator as despite its flaws, it still serves as an economic indicator which shows the state of the economics, whether the consumption there grows or does not grow.

The share prices are also affected by possible splits, mergers and acquisitions, which might move them around quite a bit and not having to do anything with the growth or decline of revenues or profit for example.

As a recommendation for the companies it could be said that having the international touch in the business operations is good, so that the company does not become too depended on one market, where the growth might be positive, but also negative. In the other words, not putting the eggs on a single basket is a good learning outcome in this case as well. Market risk reduction would also be easier to do by exporting the products to the foreign country, but at the same time, if the country uses a currency other than the one that is being used domestically, it exposes the company to the foreign exchange rate risk. In this case the company could use future contracts to sell the currency in the future with the current market price or simply and more cheaply just accept the foreign exchange rate risk and change the money to the domestic currency immediately once they receive that. Also the companies which use raw materials to produce goods will be affected by the commodity prices such as oil and metals for example. These prices have to be kept in mind when making investments to the companies, which produce goods. Of course if the both countries, domestic country and country where the company exports to are both members of Eurozone, the foreign exchange risk disappears.

As a recommendation for investors it could be said that investing based in this strategy does not guarantee quick profits. However it is supposed to give an indication of what has happened in the history if one would have owned equal portions of all of the shares listed in the segment. It also can give an indication to the future, but many things might change quickly so the author would not recommend relying solely on this study in order to create investment strategy to Nordics.

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