# Peer Group Benchmarking

**Master Thesis**
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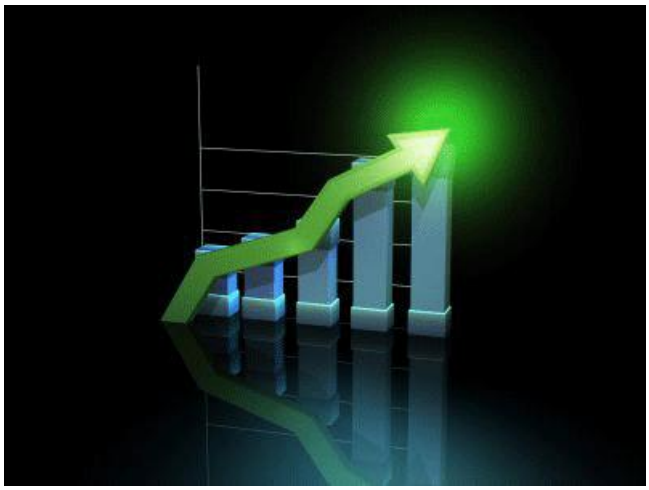

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# 1. Introduction

## 1.1 Abstract

This master thesis was motivated by the ongoing debate relating to application of relative benchmarking. It brings light to the most commonly applied valuation tool; Peer Group Benchmarking (PGB). The thesis´ investigation moves from describing the preferences in the industry, found from questionnaires, through theoretical recommendations to a final empirical analysis, which evaluates and compare the two former.

Initially, the thesis describes the valuation models applied on the Danish stock market, it pins down the input characteristics, strengths and weaknesses and finally their popularity among analysts. Subsequently, the thesis presents two cases of Peer Group models from an investment bank. It shows that the models constructed for PGB are heavily dependent on preferences of the analyst, company specifications and externalities to the company under speculation, referred to as the target company. Furthermore, the thesis provides an in debt analysis of the analysts preferences and interpretations of PGB. It is the impression that analysts on the Danish stock market apply PGB very other to forecast fundamentals or as a valuation model. The tendencies manifest that analysts choose peers solely from similarities in the industries in which they operate.

The theoretical point of view is obtained from Sanjeev Bhojraj and Charles M. C. Lee in "Who is my peer", which is considered the most relevant article to this thesis. The authors recommend the selection of peers based on similarities in the financial characteristics which drives a certain multiple or fundamental. This is in steep contrast to the findings from questionnaires, and thus the following two hypotheses regarding PGB is constructed to take out the empirical analysis. Hypothesis 1) "P*GB is an inefficient tool in valuating Danish companies"* and 2) *"Choosing companies based solely on similarities in the industry in which the target company operates is an inefficient approach to forecasting fundamentals and valuating companies with PGB.*

The empirical investigation generally rejects hypothesis 1) which is against prior expectations. PGB show good visual similarities and correlation between Danish target companies and different constructed PG´s. General uncertainty is acknowledge as high due to the fact that data stems from

the past 20 years and that peers and target companies´ developments in the financial statements can occur from one-off gains/losses and thus bias the results.

Hypothesis 2) is accepted in two stages of the analysis, both when dealing with forecasting of fundamentals and valuating directly with PGB. Valuating Danish companies through PG´s that contain firms solely picked from similarities in industries is not expected to be accurate. The findings supported the statements of the theoretical recommendations as PG´s constructed with peers based on similarities in the fundamentals showed equally good results as the former.

Overall, the thesis brings light to a niche within valuation tools and presents the trends of application on the Danish stock market. It analyses and explains various extends of PGB and compares theoretical recommendations with the actual applications found from questionnaires. Finally, it evaluates the concepts overall and extend to which it works most efficiently/least inefficiently.

### 1.2 Preface

The dynamics of the stock market are characterized by the actors desire to gain economically on lucrative exploitation of legal public knowledge. According to the mainstream financial media, 2008 market the start of the "bear"[1] market. Some theorists[2] spotted the end of the "Bull[3]" days in 1999, immediately ahead of the dot.com scandal in 2000.

The theorists are from Elliot Wave International, the world´s largest market forecasting firm, and they argue that the bear market has been present since 2000, as only falsely leveraged investments has kept market conditions reasonable growing till 2008, when the mainstream media recognized what they now view as the beginning of the Bear market: "*The five-year advance since 2003 was not the product of currency inflation, but rather CREDIT inflation. Stocks flew too high on the "borrowed" wings of every debt-related vehicle under the acronym-esque sun: ARM, ARS, SIV,*

[1] Period with descending market prices.

[2] http://www.elliottwave.com/freeupdates/archives/2009/01/12/When-Did-The-Bear-Market-REALLY-Begin-.aspx

[3] Period with rising market prices

*CDO, and on. And, once the confidence in that elaborate system of leverage evaporated, the entire system collapsed*[4]*"*

Is Elliot Wave International thus capable of foreseeing major developments on the financial markets? In 1999 they published an article where they stated: *"The evidence of a major, indeed, historic downturn [and bear market] has piled up to the ceiling. It's better to be early, even years early, than one day too late."*[5] As this quote were publicised ahead of the bear market and thus constitutes an argument for Elliot Wave international to be a superior market forecaster, it is mentioned rapidly on the company´s webpage. Nevertheless, one true forecast is never proof of extraordinary forecasting capabilities, yet the numerous references to the statement is a good argument for the marketing value that it generates.

Elliot Wave International too, is a product of the bull markets. The demand for financial advisory fluctuates with the performance of the market itself. With rising market conditions the financial advisory houses expand and for the period of Bull market, they capitalise heavily on the conditions. But when the market turns, they need adjustments to keep business away from heavy damage. Cutting down on the expensive analysts is one effectively way of cutting costs, but they are generally not believed to be reduced proportionally with the markets descending rate. The result is a financial market with an overflow of analysts in every imaginable extend, each trying to outperform each other. The analysts´ fight over market shares gives birth to numerous valuation tools that claim to be edge giving. This paper deals with one of the most applied and commonly accepted valuation tools present.

The birth of new valuation tools got boosted by a business, that seems to have fundamental leaks in the incentive structure of the payment between clients and the investment banks. The majority of investment banks earn commission based on the trading volumes and not the performance of their recommendations. One could fairly accuse the stock brokers for publishing controversial reports with content that suggests large potential stock increase or decrease; as such reports could raise the trade volumes among their clients on the short run and raise the commission earned at the office. Valuation tools can help analysts to take a controversial stand on a stock in order to intimidate

[4] http://www.elliottwave.com/freeupdates/archives/2009/01/12/When-Did-The-Bear-Market-REALLY-Begin-.aspx

[5] December 9, 1999 *Elliott Wave Theorist*

clients to trade. On the long run the structure still is supposed to require for the analysts to perform edge giving analyses rather than simply focusing on revenue (maximizing clients trade volumes). If an analyst constantly applies valuation tools, with the purpose of pointing a target price of a company in a desired direction (to maximize trade volume of clients), rather than thoroughly investigating the company's future, he is not expected to perform as well as with the latter. This would be an argument against the leaks of the current incentive structure in the business.

Under the current crisis the desperate stock brokers and analysts took a shorter view, in order to keep trade volumes from descending even more drastically. There is no reference supporting this point, but is believed by the author and so, argued to be one of the main reasons behind the birth of many nonsense valuation tools. Rumours in the business says the culmination of the turn towards short run focused analysts were a statement by the top management of a London investment banking office a Monday morning when crisis had really hit: "This week I will not accept ANY investment reports, with HOLD recommendations"[6].

HOLD recommendations advice clients neither to raise nor reduce their proportion of a given stock and basically, this force the analysts to change their forecasts and recommendations of such, because of the managements desire to encourage the clients to trade. One of the main tools an analyst easily can implement to affect an investment case in a desired direction is Peer Group Benchmarking.

### 1.3 Problem statement

Based on the preface the following has been stated to both focus and delimitate the scope of the thesis:

*What is the role of Peer Group Benchmarking in the modern Danish investment society; is it applied in theoretical accordance and has it proven to be an efficient valuation tool over the past 20 years?*

In order to answer the problem statement, the following research questions will be examined:

[6] Anonymous investment bank.

- What are the characteristics of the valuation models applied in the modern investment society?
- What are the analysts preferences with regards to the valuation models applied?
- What does a Peer Group model look like and how does it work?
- How well do the analysts covering the Danish stocks manage to construct Peer Group models?
- What are the analysts preferences with regards to PGB?
- What does theory recommend with regards to Peer Group Benchmarking and the creation of a Peer Group model?
- Based on the last 20 years, what has been the preferable way of picking Peer Group Companies for a Peer Group to a Danish target company?
- How well have the Peer Groups managed to contribute with input to valuation models in the past 20 years?
- As a direct valuation model, how well has PGB performed on the Danish stock market?

### 1.4 Contributions

The contributions from this master thesis are several. The investigation of the local Danish investment society reveals preferences and tendencies with regards to the application of PGB; the most common investment tool[7]. The interviews in the market are performed anonymous allowing the analysts to answer questions, they would be likely to refuse, if engaging in the interview with name and company highlighted. Furthermore, this thesis investigates a unique dataset of 134 companies from 9 different industries. Conclusions are drawn on the effectiveness and significance with which, the PGB tools can be implemented on the Danish stock market, based on the success shown in the past 20 years[8].

[7] Figure 9 page 20

[8] Sanjeev Bhojraj and Charles M. C. Lee; (2001)

### 1.5 Delimitation

The concept of Peer Group Benchmarking is commonly known and well applied in various extends. This thesis delimitates itself to the use of PGB in two economic variations; 1) as a direct valuation model that uses PG multiples to reach the value of a target firm, and 2) as a tool to calculate the growth rate of input variables to the cash flow based valuation models. Investigating the two above extends of PGB application, this thesis is delimitated from PGB use in empirical research of academics attempting to isolate a variable of particular interest, through the implementation of comparable firms.

Besides the above, it has been necessary to delimitate the thesis from treating a number of conditions. A comprehensive list is provided below:

- Only Danish target companies are considered. As the scope of this thesis is a local investigation of the role of PGB on the Danish stock market it has been chosen only to use Danish target companies traded on the CSE.
- The thesis will be delimitated to focus on PGB applications in modern stock valuation. This means that other applications of PGB, such as competitor benchmarking, management remuneration, etc., will not be considered.
- With regards to forecasting fundamentals through PGB, the thesis delimitates to the investigation of the accuracy to which it does forecast the fundamentals and thus not the significance to which the valuation models are accurate under the appliance of PGB. This is due to other factors affecting the total valuation which will blurry the significance test of PGB.
- The thesis also delimitates from considering other companies than the 134 listed. Other studies of similar concepts[9] conduct analysis' encompassing financials from all the listed companies in the world. This obviously raises the level of significance but as the scope of this thesis is to measure efficiency of using PGB on Danish stocks and comparison of such methods, 134 companies are believed to fully cover the data need of this thesis.

[9] Sanjeev Bhojraj and Charles M. C. Lee; (2001)

- When constructing the PG´s, modern theory suggests companies to have similar risks in the future[10]. Risk-management is a very subjective and uncertain size, and is therefore avoided to deal with in this report in order to keep within the scope of PGB. This will obviously cast a shadow over some results and should be considered a source of danger, which can interrupts with some results. Nevertheless, it is not expected to be of decisive importance to the final conclusions.
- When referring to growth-based and profitability-based peers, these are peers that have not only shown a similar growth or profitability in the past, but are also expected to show such in the future.

### 1.6 Scientific approach

This section will discuss the creation of knowledge and cognition in order to qualify the choice of paradigm and perspective that is given by the scientific approach to this thesis. Theorists have stated that *"Knowledge is something we all have, and thus take for granted"*[11] and the definition of knowledge is: *"A substantiate, true conviction"*[12]. Knowledge is more than persuasions and apprehensions and should be true and justified before referred to as knowledge. Consequently, perceptions may be contemplated untrue or unjustified and thus considered pseudo-knowledge.

Going forward in this thesis, we must define what is considered knowledge in order to separate knowledge from pseudo-knowledge. In order to do so we set up a scientific paradigm. Generally, scientists vow to either natural science or social constructivism. Natural science uses the paradigm *naïve epistemological realism.* According to this paradigm, knowledge is created through direct and trustworthy access to sense data. With the social constructivism paradigm, referred to as *epistemological anti-realism*, knowledge about physical reality is considered a social construction, which means that science is a result of social factors.

[10] Sanjeev Bhojraj and Charles M. C. Lee; (2001)

[11] Wenneberg (2000); p. 444

[12] Wenneberg (2000); p. 444

In between the two paradigms lies a third, referred to as the *balanced epistemological realism*. This paradigm allows one to be a realist in a nuanced fashion, recognizing both the natural and social factors. The *balanced epistemological realism* indicates that scientific convictions to some extend are results of reality itself, but that it can be influenced by social or subjective factors.

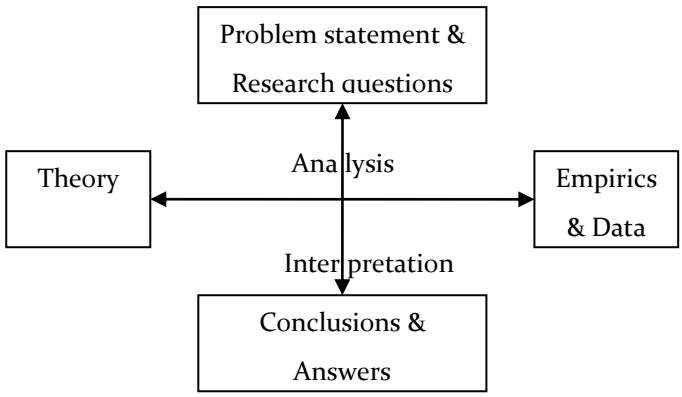
With the chosen paradigm, one recognizes the social constructivists' opinion of the importance of subjectivity and sociality, while upholding the realism and rationality. This thesis applies quantitative data and quantitative interviews in both the surroundings of -and directly in the empirical analysis. The disadvantage is potential lack of flexibility and depth. Analyst interviews or other qualitative methods could bring light over some questions arising during the empirical analysis; however, dishonourable motives among the analysts could influence the answers and thus bring the dataset in danger of being pointed in a desired direction of the analyst interviewed. The methodology, structure and knowledge production process is further evaluated in the subsequent section.

### 1.7 Methodology and thesis structure

In carrying out this thesis it was strived to establish an optimal balance between theory and empirics. The empirical study is based on quantitative data. This data takes two forms. The first is questionnaires in the industry, where more than 40 analysts were asked to their preferences in various aspects all relying to PGB. The second is a thorough excel model holding yearly company financials of 134 companies for a 20 year period. The data collection and the analysis approach will be subject to an in-depth discussion in later chapters[13]. An important point to emphasize with regards to the data, is that various uncertainties can arise from approximations, round-offs and elimination of outliers. One should bear in mind, that the results of research are only as good as the quality of the data.[14] Figure 1 shows the knowledge creation processed applied in this thesis.

[13] Chapter 5

[14] Gujarati (2003); p. 30



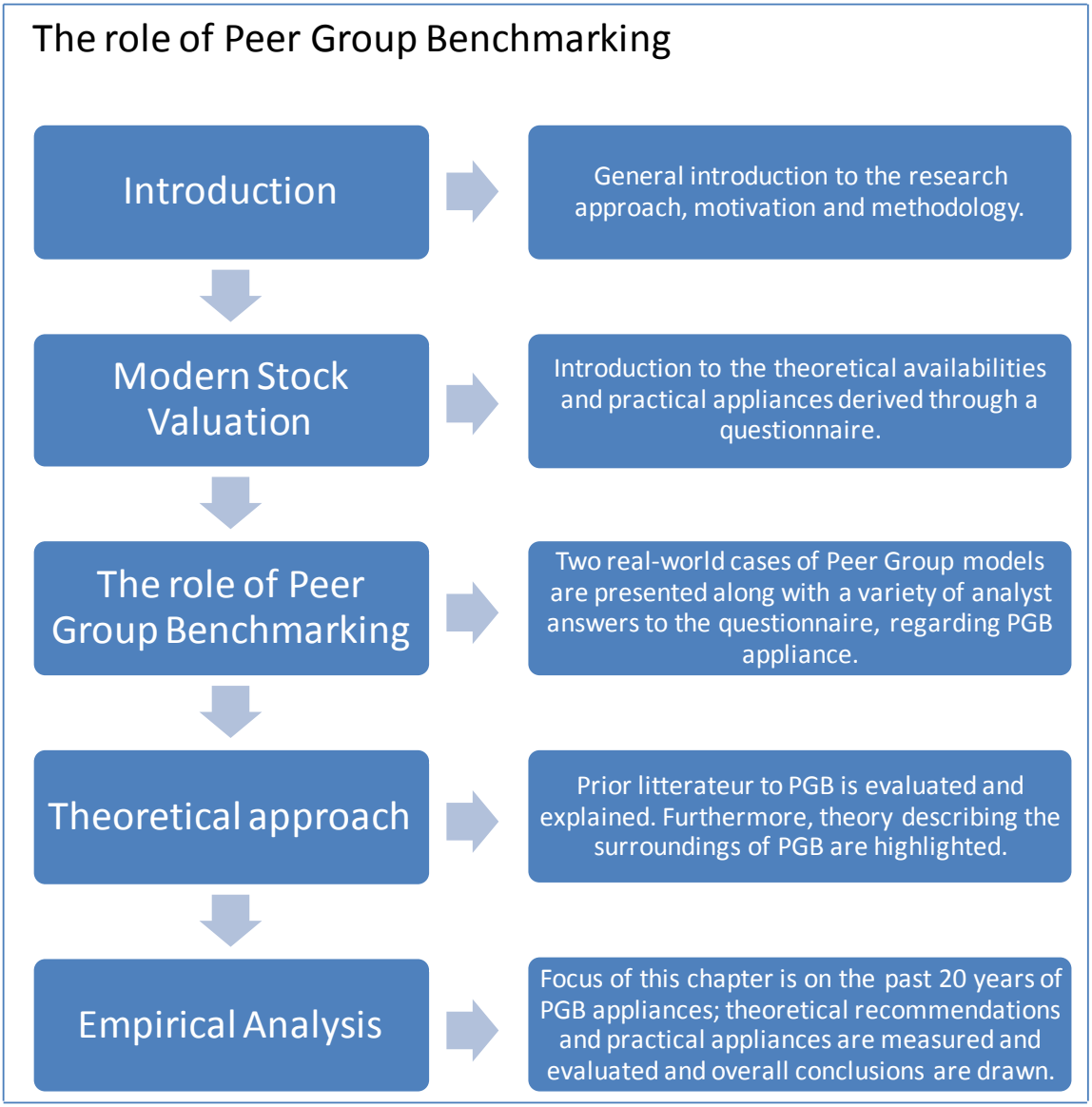

**Source: Andersen (2003); p. 29**

The problem statement was established and motivated through the preface of the thesis. Chapter 2 presents the modern stock valuation and the valuation models that is applied and recommended by theory. These valuation models are the starting point as it is with these PGB is used; either as a helpful tool or a direct valuation model. The trends and theories intend to set up a mutual framework for further analysis.

Chapter 3 introduces the concept of PGB. It presents two real-world cases of PGB models, followed by analysis of the purposes, thought-processes and general intentions that could be found from the constructions of such models. Furthermore, chapter 3 presents figures created on questionnaire answers from more than 40 analysts. The finding from these answers gives an idea of how the local Danish stock market works with PGB. Chapter 4 introduces prior literature that relates directly to PGB and additional literature which relates to economic surrounding that plays an important role to PGB and valuation tools in general.

Chapter 5 holds the empirical analysis. Three approaches are used to establish a measure of the general performance of PGB. The performance-measure will be of relative character as it not only evaluates the effectiveness of PGB overall but also analyses the different applications of that recommended by theory and what was found in the answers from the questionnaire responds from analysts. Concluding remarks compare the research questions with the results.

Figure 2 – The thesis structure.



## 2. Modern Stock Valuation

Peer Group Benchmarking (PGB) is a financial toolbox with a broad variety of equipment. The most well-known purpose of PGB is forecasting financial figures for use in cash-flow or earnings-based valuation models. The valuation models available to the analyst and investor differ with regards to input requirements, dynamics, strengths and weaknesses, etc. A brief overview of the most common valuation models is accompanied by an investigation of how and to what extent these models are used today; in modern stock valuation.

### 2.1 Theoretical valuation models

The first valuation model is commonly believed to be the most disseminated and trusted valuation model in the modern investment society. The Cash-flow based "Discounted Cash-flow"[15] model focuses on cash generation and ignores other assets and liabilities. When evaluating a stock with the DCF one needs to identify and estimate two parameters: The free cash-flow (FCF) to the company in the budget period and the discount rate [16](wacc)[17], with which the future free cash-flows are calculated into present value. The free cash-flow represents the cash in-flow of the core operations of the company investigated. Accounting wise, the FCF is NOPAT (net operating profit after tax, or EBIT after tax) less the total capital invested in the firms operating activities. The FCF can be calculated from the financial statement as[18]:

$$\begin{aligned} FCF_t &= NOPAT_t - \Delta IC_t \\ &= NOPAT_t + D\&A_t - \Delta WC_t - CAPEX_t \end{aligned}$$

Where: IC: Invested Capital, D&A: Depreciation & Amortisation, WC: Working Capital, NOPAT: Net Operating Profit after Tax and CAPEX: Capital Expenditures. Hence, to estimate the future FCF one needs to estimate the above inferred numbers from the financial statement for the budget period in consideration.

[15] Brealy/Myers/Allen, eight edition, p. 61.

[16] Brealy/Myers/Allen, eight edition, p. 456-462.

[17] Weighted Average Capital Costs.

[18] Andreas Schreiner, (2007) p. 24

The second parameter to estimate is the wacc. The general formulary for wacc is: $WACC = \frac{IBD}{EQUITY} * k_d * (1-T) + \frac{EQUITY}{IBD} * k_e$ with $k_d$ being the interest rate, $k_e$ the required return from investors (cost of debt and cost of capital) and IBD being the interest-bearing debt. With regards to input requirements one needs to estimate the cost of debt and the cost of equity. The cost of debt is generally defined as $k_d = (r_f + r_s) * (1-t)$, where $r_f$: Risk-free interest rate, $r_s$: Company specific risk and t: company tax rate. The cost of equity is calculated in a similar yet more theoretical emphasized manner: $K_e = r_f + \beta_{equity} * (r_m - r_f)$ known as CAPM[19]. $r_m$ represents the market return which makes the parentheses $(r_m - r_f)$ in CAPM the market premium. The $\beta_{equity}$ describes how fluctuating the market price of the equity in the company under consideration is believed to be, in relation to that of the market. Thus, if $\beta_{equity}$ is above one, the risk associated with the company is higher than the market risk, and investors expect to be compensated for the risk exploitations accompanied by this stock.

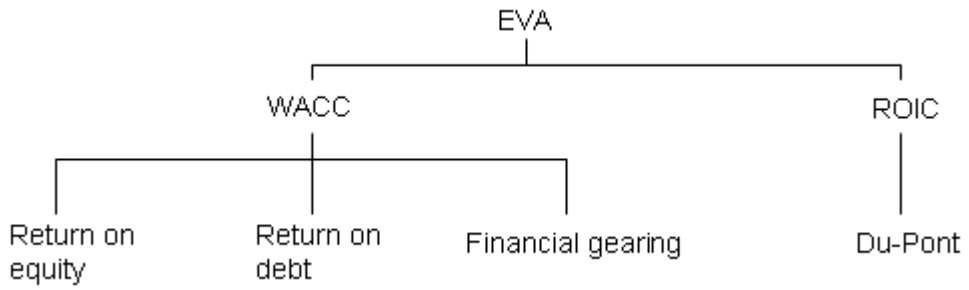
The DCF model is the preferred valuation model among the majority of analysts and investors, yet it has weaknesses. First, in businesses where the separation between operating, investing and financing is blurry it can be hard to determine whether to treat i.e. deposits as part of core business. Secondly, management can manipulate with CAPEX, by delaying new investments in such a way that short-run future earnings can seem stronger than what is actually the case.

The dissemination of the next model is also considered to be large. The Economic Value added (EVA)[20] is an earnings based valuation model that distinguishes itself from the DCF by not taking account for any cash-flow considerations. The EVA model measures the total *Value Added* of a company´s operations, i.e. the cash generated in excess of claimholders required return. EVA is the difference between the return on invested capital and wacc:

[19] Brealey, Myers, and Allen; (2005) p. 189-199.

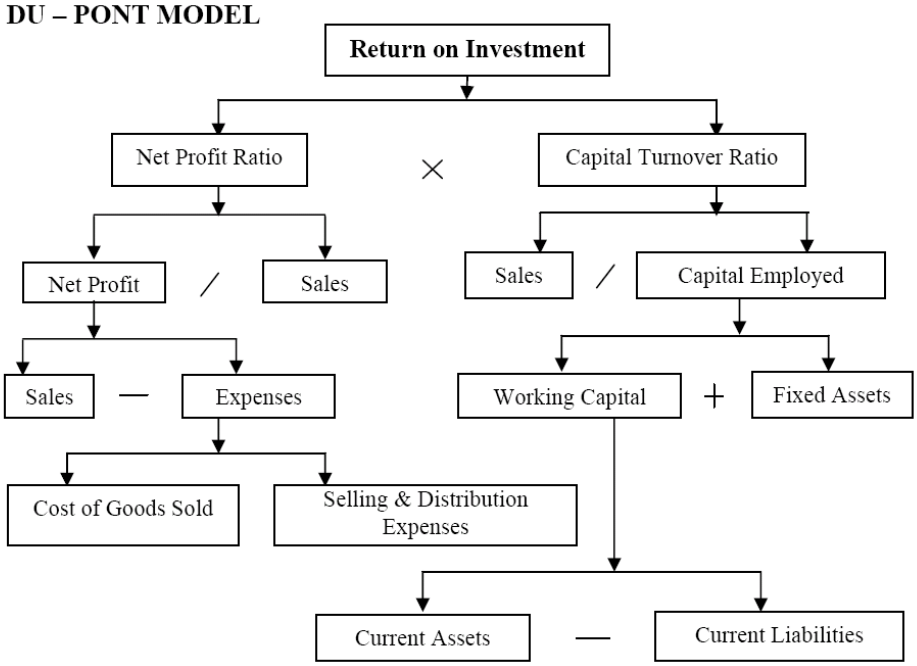
[20] Brealey, Myers, and Allen; (2005) p. 310-313.

Figure 3




The Du-pont pyramid[21] visualizes the valuation steps of the ROIC:

Figure 4




The input requirements of the EVA model are the same for wacc as with the DCF. Therefore the only new input parameters to investigate are those affecting the ROIC of the company under consideration. ROIC is defined as: $ROIC = \frac{NOPAT}{INV.CAPITAL} * 100$. The input required to calculate the NOPAT for the years under consideration are as mentioned EBIT (Sales minus operating expenses) and the company tax rate. Invested Capital is defined[22] as: $INV.CAPITAL =$ Operating

[21] Brealey, Myers, and Allen; (2005) p. 796-798.

[22] Brealey, Myers, and Allen. (2005)

Net Working Capital + Net PP&E[23] + Capitalized Operating Leases + Other Operating Assets + Operating Intangibles – Other Operating Liabilities – Cumulative Adjustment for Amortization of R&D[24].

The strengths of the EVA model is the visibility that the valuation steps generates. Besides calculating the "true value" of a firm it pins down its strengths and weaknesses as seen in figure 4. ROIC is a measure of relative profitability. All company projects that take place must generate a higher return relative to the capital employed, than the WACC. Accounting profits does not necessarily imply value creation. If a firm invests internal in projects that hold a higher return on the capital employed than WACC, value creation is considered to take place. The identification of value generation is both a strength and weakness with the EVA model. Firms operating in some industries can be hard to see through if i.e. they invest heavily in internal projects, with a long investment horizon and numerous start-up years with deficit. This can cost EVA to occur to be of rather low value though investments have a high NPV.

This next valuation model applies Peer Group Benchmarking directly in the model. "The standard multiples valuation method"[25] determines a firm´s equity value based on how market price comparable firms. The multiple valuation method consists of four steps. First, one must determine which multiples to price the company on. The most common used multiples in modern stock analysis are P/E, P/B, P/SALES and EV/Sales, EV/EBITDA, EV/Net Profit[26] because they scale the market price of common equity/enterprise value by the most important numbers from the financial statements. Step two involves identification of the comparables. For relative valuation to make sense, it is extremely important that the peer group chosen represents a basket of firms or corporate transactions, whose expected future free cash flows, risks and growth rates are comparable to the target firm´s profile. The third step involves calculating the industry multiples. Average growth, profitability and risks are all essential measures to perform the multiples needed in the valuation. Step four is the final calculating step. When relevant multiples have been calculated they are applied to the company under investigation to reach the value of that firm. We name the Peer Group

[23] Property, Plant And Equipment

[24] Reseach & Development

[25] Andreas Schreiner; (2007) p. 49-52

[26] Andreas Schreiner; (2007) Multiples p. 49.

multiple: $\lambda_{i,t}^{equity}$ and implement it in the following equation to reach the value of the firm: $P_{i,t}^{equity} = \lambda_{i,t}^{equity} \bullet \chi_{i,t}$. $P_{i,t}^{equity}$ is the value of the common equity of firm *i* at time *t.* The right hand side of the equation multiplies the peer group multiple with the value driver, $\chi_{i,t}$, of firm *i* at time *t*[27].

The strengths and weaknesses with the standard multiples valuation method are to some extent obvious. The mathematical approach is very simple and the valuation process is easy. In the modern investment society this is among the premium model choice of investors[28] when screening the stock market, as the multiples gives a quick overview of which firms are over- and underpriced. Secondly, the analysts can implement the multiples in research reports as they are easy to understand and simple to present[29]. A third strength is the accessibility of firm multiples in newspapers, magazines, etc. This allows for the investor to make a quick comparison between the multiples and target multiples in a given research paper and those from available medias. Turning to the weaknesses the first obvious choice is the fact that the underlying assumptions are believed to be too simplistic. Compressing all the key value drivers of a firm in to one single multiple is fundamentally believed to be too inaccurate. Secondly, a multiple is only a snapshot of a firm at a certain point and assumes key value drivers to be consistent over time. Naturally the multiples cannot capture ongoing development of businesses and competition[30]. The final weakness to emphasize is the fact that multiples, because of their relative nature, reflects the "mood" of the market. This means that in bear markets[31], they tend to underestimate and vice versa when in bull markets[32].

The last valuation method is "option based valuation"[33]. The name is somewhat similar to the well-known option pricing or option valuation. An option on the financial markets is a speculative derivative that allows for investors to either buy and sell rights or commit to buying or selling a

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[27] Andreas Schreiner; (2007) p. 49-53.

[28] Figure 6 page 16

[29] Andreas Schreiner; (2007); p. 53-56

[30] Andreas Schreiner, (2007); p. 54

[31] descending market prices

[32] Growing market prices

[33] Brealey, Myers, and Allen; (2005). P. 565-589.

given stock at a given price and time. The principle however is applied in other parts of financial valuation. A proper example would be the APM Maersk stock. With a majority of its capital employed in the shipping business, buying, selling and leasing large container-carriers is an area exposed to intensive speculation. The large container carriers have a delivery time of up to 20 years which makes it very hard for the management to time their float of ships to the demand for trade in a current year. This causes the market for 2nd hand container carriers to be of a speculative character. If the demand for container trade rises like it did during the bull markets after 2000 the 2nd hand container carriers witnesses a steep price increase. In most cases the 2nd hand container carriers are more expensive than a new container carrier because it allows the shipping companies to meet a certain demand (the delivering time of a new container can be up to 20 years). Due to the fluctuating demand on the trade lanes of the world, the shipping companies hesitate to order new ships. Instead they buy call-options that allow them to buy a certain ship at a certain time and at a certain price. These options can over time become of high value if the international trade increases. Estimating the value of the shipping options constitute great important to the analysts covering stocks in, among other, the shipping business.

The following figure sum up modern stock valuation:

Figure 5:

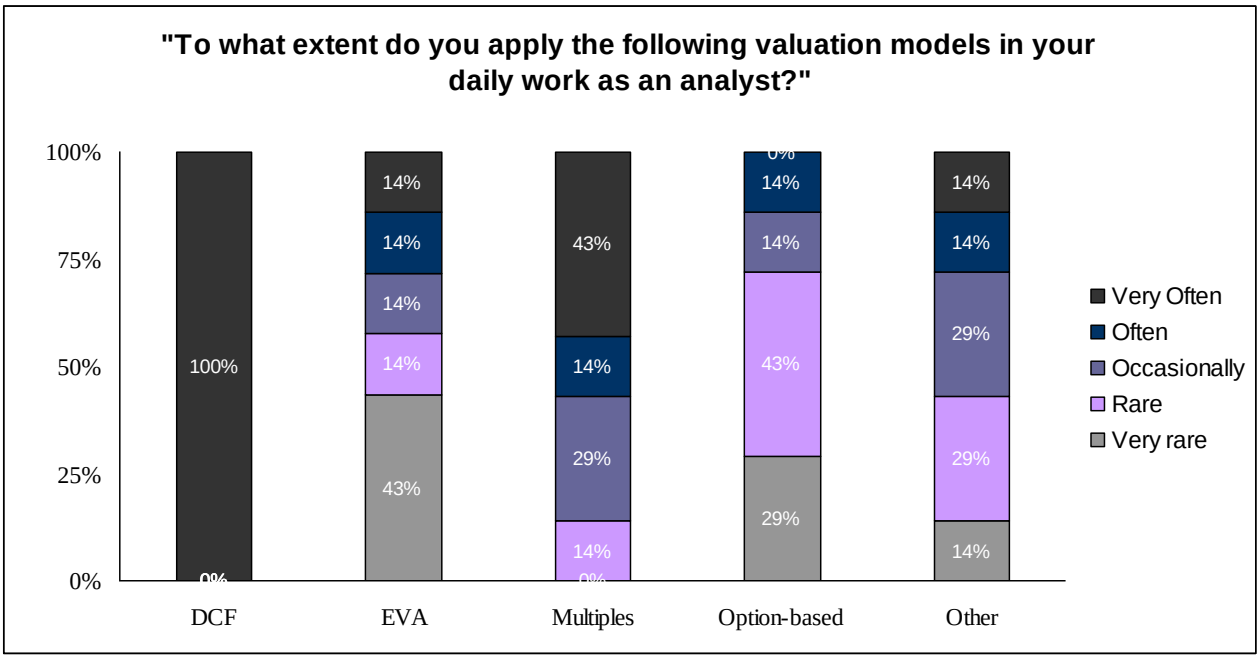
| Modelnam | Strengths/weaknesses | Inputrequirements | Dynamics |
|---|---|---|---|
| DCF | The DCF model is widely disseminated; Relies on cash-flows and heavily on its input assumptions. It is also extremely sensitive to the perpuety rate and the discount rate. Management can manipulate with CAPEX, by delaying new investments to create a higher fair value for the stock. Finally it fits only long term investing and does not help if speculating in short-term stock climbs, etc. | Free Cash-flow from operations, cost of equity, cost of debt and growth rate. The cash-flows are inferred from the accounts, the cost of equity a combination of market fluctuations vs. Stock fluctuations (risk), cost of debt is a combination of the risk-free rate and the specific company risk, growth is an unknown size determaned by the analyst. | Enormous. The DCF valuation model is extremely complex and imply constant care. On a daily basis it needs adjustments and add-ons to keep up with the development on the financial markets. It requires for the analyst to forecast almost every account in the company under notice for a 3-5 year period. |
| EVA | Valuation steps generates visability; solid measure of relative profitability; Long investment horizon and various start-up years with deficit can cause investments to seem more unattractive than could be the case. | ROIC and WACC, hence NOPAT, INV.CAPITAL, Cost of Equity and Cost of debt. | This valuation model is less dynamic than the DCF as it requires only a couple of key figures to do the math. These are easily adjusted when company changes occur. |
| Std multiple valuation | Easy to understand and present; gives a quick overview; underlying assumptions are to thin; assumes key value drivers to be consistent over time is unrealistic and compressing these into one variable is assumed to be to simplistic. | Extremely few and depends on the respective multible. | Hardly any, the multibles are easily calculated and applied. |
| Option based | Dependent on valuation case | Dependent on the valuation case. | Dependent on the valuation case. |

The models that are available to the modern analysts are numerous. What model to apply depends on the valuation profile and preference of the analysts at work in the modern investment society and that can change over time and in between financial markets. As all stock analysts strive to have and edge on the market all alternatives are at some point in play and it is therefore a matter of how and how much the alternatives are applied. In the following is an empirical analysis based on answers from more than 40 modern stock analysts.

### 2.2 The application of valuation models in the modern investment society

Recognizing the valuation models available, we turn the focus to the investment world as it is today. From a questionnaire that includes answers from more than 40 professional analysts the framework is set for understanding their preferences and tendencies. Two of the questions concerned the choice of valuation model and the degree of appliance of various inputs. The first graph shows the extent to which the analysts apply the valuation models described in the previous chapter.

Figure 6

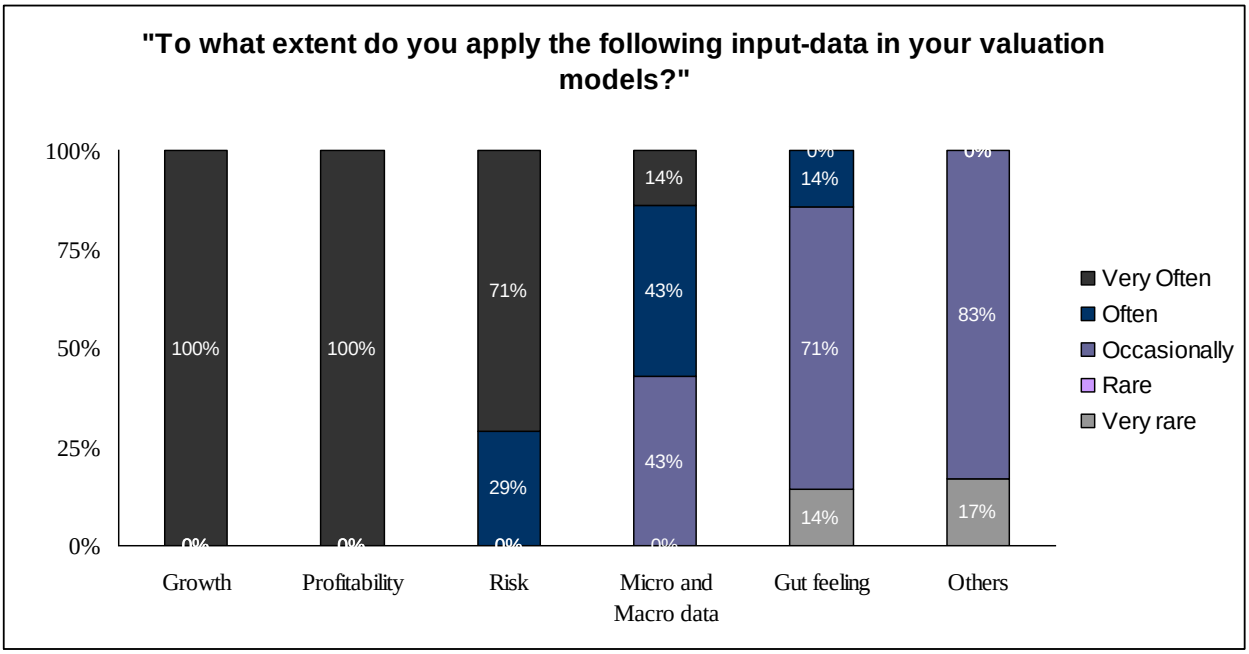



As expected, all the analysts choose "Very often" when asked about their use of the Discounted Cash-Flow (DCF) model. The use of the Economic Value Added (EVA) seems less disseminated than assumed in the above part of this chapter. The original impression was that EVA was an obvious second opinion to DCF, yet almost half the analysts do not seem to apply the model. Multiples are used in several ways with various purposes. In the everyday work of a professional

analyst, it appears to be used often – more than 80% of the analysts use the model for valuation "occasionally", "often" or "very often". Option-based valuation models often used to evaluate the value of rights or contracts in the future is used occasionally by almost 50% of the analyst. Few (14%) answered "Very often" and these would often be expected to cover industries and companies like APM Maersk that rely on options. Below 30% of the analysts uses other valuation models "often" or "very often", the majority of the analysts choose "occasionally" or "rare". It is a fair assumption that the general use of other valuation models is limited as only a few analysts cover special companies that require for special valuation models.

Knowing the investment societies preferences for valuation models gives an idea of what valuation input might be most applied in modern stock valuation. The next graph shows what the analysts answered when asked about the extent to which they apply different valuation-inputs. This is of particular interest as one of the motives of this thesis is to investigate the level at which PGB performs as an input forecaster:

Figure 7




The main input in the DCF model is Growth, Profitability and Risk. As expected these inputs are the ones most widely applied. Recall from the previous graph that 100% of the analysts use the DCF model "Very Often" in their valuation process. Micro and Macro data is also applied on a regular basis as half uses the data "Often" or "Very Often" and the other half uses the data "occasionally". The "Gut feeling" places the majority of analysts in the middle. The "Gut feeling"

can be 6th sense feelings of analysts or certain circumstances can trigger it. Company announcements in the media are an example of this. Depending on the characteristics of the announcement, it can often leave analysts guessing. In addition analysts often hold private meetings with top-management of the target company and the management is by law, obligated not to reveal any information that could give the analyst an insight on their company and thereby an edge on the stock market. Still every analyst does his/hers best to figure out unrevealed company information from body language, general mood, etc. These signs apparently work as valuation input "Occasionally" for 71% of the modern stock analysts. The majority of analysts "Occasionally" apply other input data in the valuation process. The characteristics of those data are heavily dependent on the target company's business area, strategic profile, etc, and beyond the scope of this thesis.

### 2.3 Modern Stock valuation sum-up

Theory does rarely change. Even in a dynamic environment as the investment business the same models still constitute a starting point for valuation. Knowing the models' theoretical characteristics , input requirements and the degree to which they are applied/approved in the modern investment world is important. Specifically when dealing with a concept as Peer Group Benchmarking as it is applied to modern stock valuation in different valuation steps and in various ways.

# 3. The role of Peer Group Benchmarking in modern stock valuation

The modern investment society show preferences for cash-flow based models and input requirements that are highly collectable from the company reports. Discussing the role of PGB, it is important to recognize, that both the input that it can generate to the cash-flow based valuation models and relative valuation (multiple valuation), has shown severe demand on the Danish stock market up to this point. But what is the definition of Peer Group Benchmarking and where, how and when is it implemented in the daily work of an analyst? Accompanied by figures from the questionnaire and 2 real world cases, a deeper analysis of the concept is conducted in the following.

## 3.1 Definition of Peer Group Benchmarking

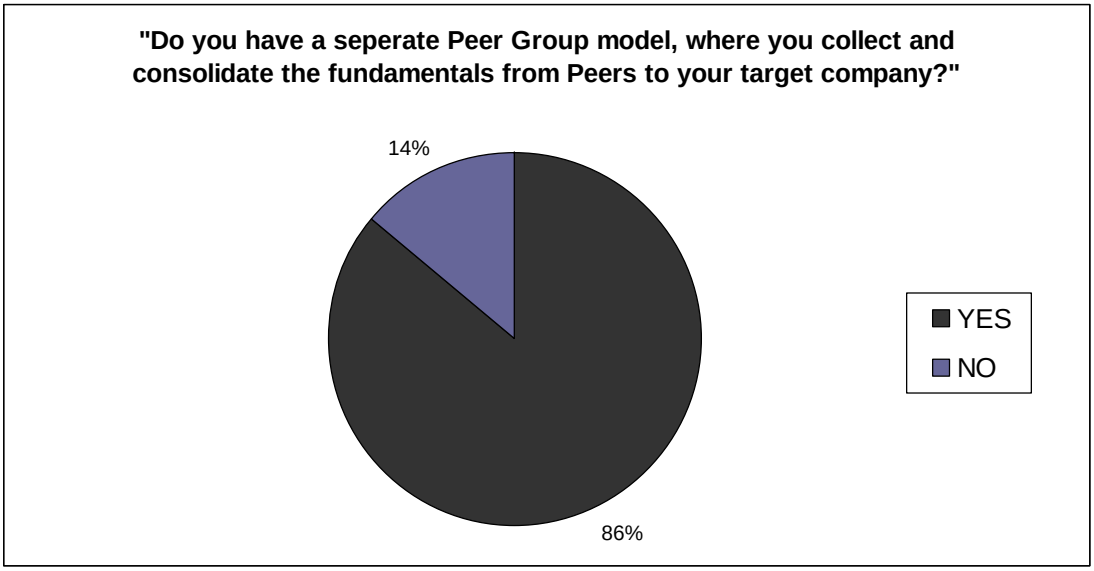
Peer group Benchmarking is applied in various everyday situations. Peer group companies are so to speak "look-a-like" companies to a target company. Most analysts agree that it makes perfect sense to implement developments of Peer Group companies in the analysis of a target company, in which the analyst is speculating. How companies should look alike, is a very ruling discussion in modern investment banking. Later in this chapter, graphs[34] encompassing analyst's preferences will show how the trends are today but for now, settle for the fact, that the peers must be as highly comparable as possible, to the target company.

Peer Group Benchmarking can generally be used in two ways when applied on the stock market. The first is a direct and straight-forward valuation model. This valuation approach was mentioned in the last part as "Valuation using the standard multiple" method. The challenge with this model is the discussion of which peers to include, which not to include and how many. The second way to use Peer Group Benchmarking is as an input estimator for other valuation models. The DCF needs an in-depth financial forecast for a 3-5 year period on the income statement, cash-flow statement, etc. A way to obtain knowledge on development in Revenue, EBIT, CAPEX and other financials is to look at a Peer Group. If a well consolidated Peer Group shows a certain trend in the past many analysts believe this could be applied to the target company. Hence if the Peer Group to a company experiences an average increase in sales of 9% over the past 5 years this could be applied as the target company´s growth rate going forward. At first glance the method seems unreliable. Each

[34] Figure 15 page 31.

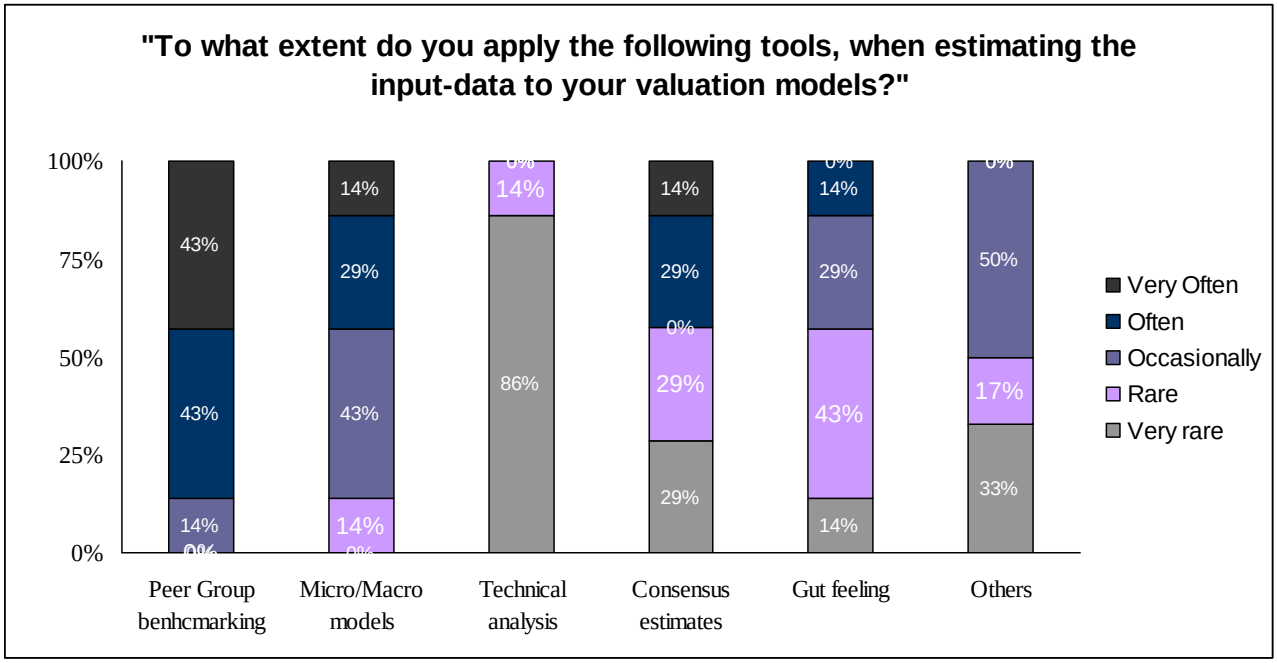
company is individual, it has a unique company culture, strategy and the employees´ degree of motivation, their strength & weaknesses should be among the drivers of future growth. Nevertheless, companies how i.e. operates in the same industry could be argued to be exposed to the same supply-demand developments dictated by the market. If the peers also have close to identical key figures, like Return on Net Operating Assets, one could believe the target company and the peer companies, to follow an identical business strategy, paying of identically. Despite these hypotheses, uncertainty and lack of reliability has an overweight in a lot of people's minds with regards to the PGB. But as the following figure shows, a lot of analysts have a model for consolidation of Peer Group numbers:

Figure 8




Not shocking, the majority of analysts have a model that consolidates financial figures from peer group companies. Later in this chapter two cases show how these models are created and applied. Still the proof of existence do not guarantee that it is used, which is what the next graph will show. This graph sketches the analysts´ answers with regards to the application of different tools, when estimating the input data for their valuation models:

Figure 9




An enormous 86% of the analysts use Peer Group Benchmarking "often" or "Very Often" as a tool to calculate and estimate their input data. This places Peer Group Benchmarking as the most widely used input-forecasting tool. The Micro/Macro model is the secondly most applied tool. The micro/macro models deals with the effects of a company's surroundings and environmental issues such as: oil price, currency sensitivity, etc. Consensus estimates represents the average estimates of other analysts and to some extent corresponds to copy/pasting others' work. Gut feeling and technical analysis is rarely used. Technical analysis concerns with recognition of patterns of movements and is a very unreliable and non-proven way of forecasting.

### 3.2 How is PGB applied in modern stock valuation?

The form of PGB will be described with two real world cases. The PG models are attached on a CD-ROM following this thesis. The model creators are two experienced analysts who have been in the industry for more than 15 years each. They cover different industries and they have a different approach and way of using PGB in their daily work. Whether this is because of personal preferences or business differences in their target companies will be examined in the following.

### 3.2.1 Case 1 – Royal Unibrew Peer Group model

Case 1 takes its starting point in the Danish brewery company Royal Unibrew listed on the Copenhagen stock exchange (CSE). Royal Unibrew is not a CSE top 20 company which means it is paid *relatively* less attention too. In terms of peer group valuation, this means that the model is not obligated to encompass figures for instant comments to short term peer group changes to as large a degree as with other companies. The argument is the fact that the stock is relatively illiquid and therefore not exposed to as intensive speculation as it is the case with CSE top 20 companies. The platform on which the PG model is constructed is taken from another investment bank by the analyst who used to work there. The platform has also been used in the investor relations department at a large Danish company as a competition surveillance tool.

#### Construction

The model has 7 sheets, yet only one sheet where the raw data of the peers is entered. The remaining 6 sheets are for consolidation and analyzing purposes only. The first sheet of the model is the input sheet and holds all the data that is downloaded from various data warehouses or manually typed in from company reports of the peers[35]. This part encompasses rolling quarterly and rolling half year data. A rolling quarter, defined as: Rolling Q2 2007 = Q2 2007 + Q1 2007 + Q4 2006 + Q3 2006. The same procedure is used with rolling half year data. The input sheet is followed by a sheet that consolidates the currencies in which the peers report. This sheet, called the FX sheet consists of exchange rates for the respective currencies that the peers report in, and services a comparison purpose for output data[36] with regards to weighted average figures. When weighting each peer´s influence on the PG average based on i.e. sales volumes, numbers must be present in similar currency (often USD). The main sheet for consolidation[37] holds an enormous amount of data. Within this sheet, all input data is consolidated to ease the process of creating value-adding output[38]. All data is linked to the "input data" sheet and the "fx" sheet to adjust for exchange rates. After the consolidation sheet, follows a sheet where approximately 90 pct. of all the models output data is to be found. The sheet is called "figures" and here four graphs[39] show the turnover-weighted

[35] Enclosure X – snapshot of a random peer in the "input data" sheet

[36] Enclosure X – snapshot of the "FX" sheet

[37] Enclosure X – The "consolidation sheet"

[38] Enclosure X – snapshot of consolidated sales numbers

[39] See figure 10 page 24

industry performance and also a broad range of other company specific graphs for each of the peers. A lot of publicized material uses graphs from this sheet. The "simulation" sheet follows and is constructed with a complexity that allows the user to look up consolidated data for a specific peer. The process is very handy and easy to use. When working in this sheet[40], type a company´s initials in the red cell and the simulation sheet collects all the data back in time, both rolling and steady numbers for the respective company. The sheet is extremely flexible and very useful when applying new figures to reports. The sheet is followed by a "modeling" sheet which is only used to drag-and-drop drafts. Finally the model holds a "Calendar" sheet which is used to keep track of peer publication dates. The sheet is simple and ensures that the analyst is aware of important company dates and enables him/her to keep the model up to date.

Input Data

The input data in the Royal Unibrew PG model is 100 pct. financial. The analyst could have included operational PG data in the model, but have chosen not to. Following here is a description of what is to be found within the PG model´s input sheet. The input is similar for each of the 8 peer companies in the model. For each company the financial data is distributed into 5 categories:

The income statement

The income statement contains financials such as: Income per region, Gross profit, R&D[41], EBITDA, EBIT, Pre-tax profit and a couple of others. All numbers from the income statement are either found in the financial reports of the peers or downloaded from a financial warehouse and easily typed into the model.

The balance sheet

In the balance sheet the analyst has chosen mostly standard posts, such as: Goodwill, Tangible assets, Net working capital – *narrow*, Net working capital – *broad*, Invested capital ex. Goodwill, Capital employed and Net debt. A post in the models balance sheet - the net working capital - is divided into two numbers: "Net working capital (NWC) – *narrow*" and "Net working capital – *broad*". The difference between these two is the way they are calculated. The "narrow" edition of net working capital is defined as: NWC Narrow = Inventories + trade receivable – trade payable.

[40] Enclosure X – snapshot of the simulation sheet

[41] Research and Development

The "broad" edition of NWC is defined as: NWC Broad = Inventories + current receivables – (short-term liabilities + debt to financial institutes). The broad edition was invented in order to deal with data access mainly with the quarterly financial reports. If unable to extract trade payables or trade receivables on quarterly basis one can use the alternative – or "*broad*" definition of NWC. Capital employed is calculated as: Net debt + Equity including minorities.

The cash-flow statement

This PG model seeks only limited information in the peers' cash-flow statement. The first of few posts is Cash-flow from operations (CFFO). From the CFFO number, the model adds capital expenditures (CAPEX) and acquisitions to come up with CFFO after CAPEX and acquisitions. This number represents the core or adjusted free cash-flow to the desired company.

Top-line growth drivers

This category allocates growth to three main areas of origin: Organic growth, Mergers & acquisitions (M&A) and exchange rate fluctuations. Top line growth is what analysts refer to when speaking of growth in the turnover or revenue. But these numbers can often vary if one-of gains or -losses occur. What the model does here is to move from top-line growth to organic growth while highlighting the affect of mergers, acquisitions and currencies. Organic growth represents the core increase in growth due to either increase in sales or price. The top-line effect of mergers, acquisitions and currencies are in some cases mentioned in the company reports along with the development of organic growth. In other cases the organic growth and the highlighted possible disturbances (currency, M&A activity) are hidden by the company and thus impossible for the analyst to estimate correctly.

Key financial ratios

This category holds three financial ratios: Turn times[42], Gearing (debt to equity) and return on net operating assets (RONOA). The RONOA used in the model is calculated as: EBIT / (tangible assets + NWC - narrow[43]).

[42] Rate of turnover.

[43] If the narrow definition of NWC is impossible to extract, the broad definition is used.

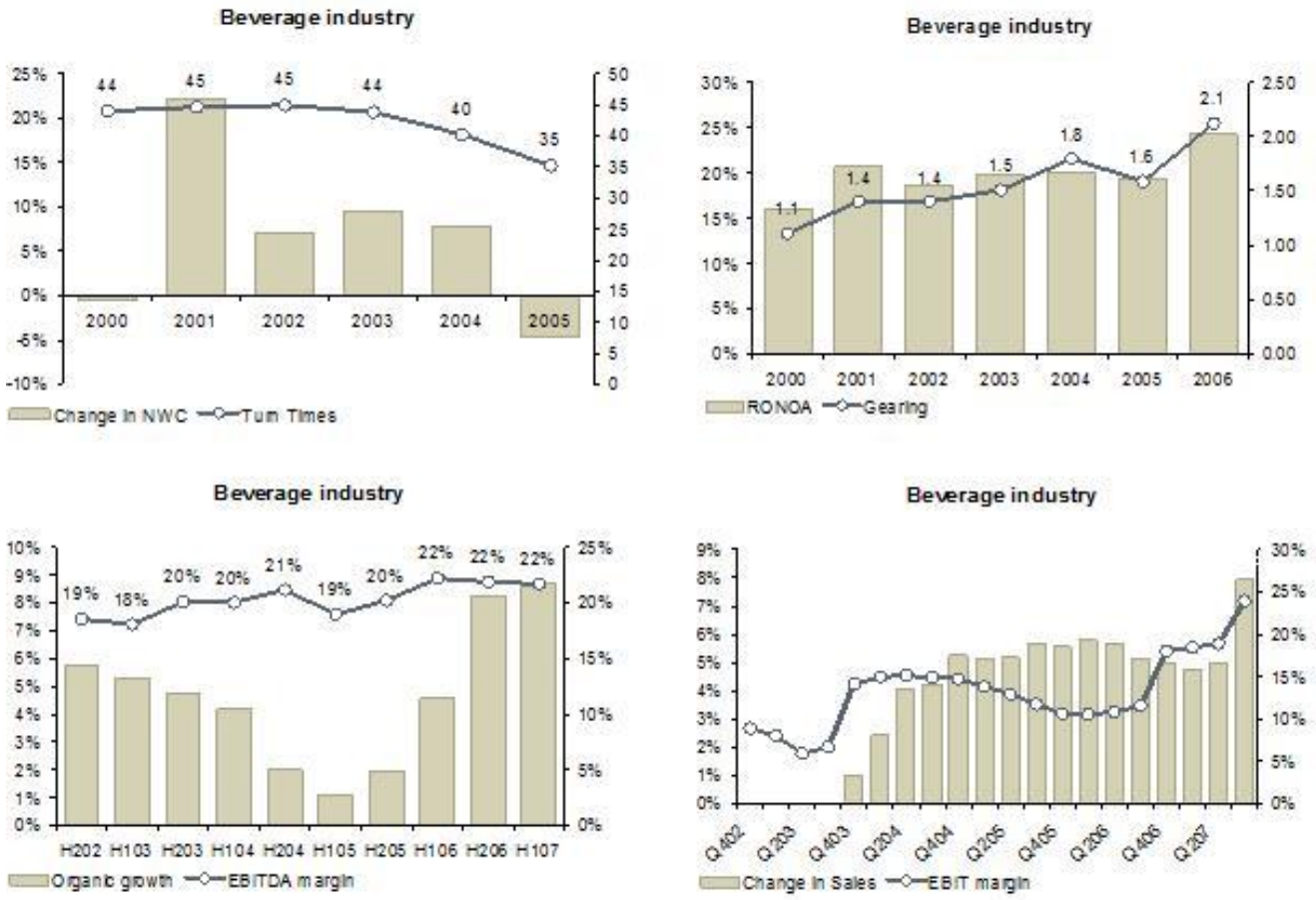
Data availability

The level to which each of the 8 peers service investors with information varies a lot. The yearly financial reports often offer almost all the information required by the model, but interim and quarterly reports tend to be slightly less informative. As mentioned earlier, some alternative calculation methods are implanted in the model to break the data barrier often seen with the interim and quarterly reports. Some of the peers to Royal Unibrew do not publicize quarterly reports and that leaves the analyst with no options but to exclude such in the model.

Output

The output of the model is split into two categories. A range of standard figures used on a regular basis and a group of less used individual figures for each of the peers. The standard figures which the analyst believes captures the industry's performance, consists of four figures:

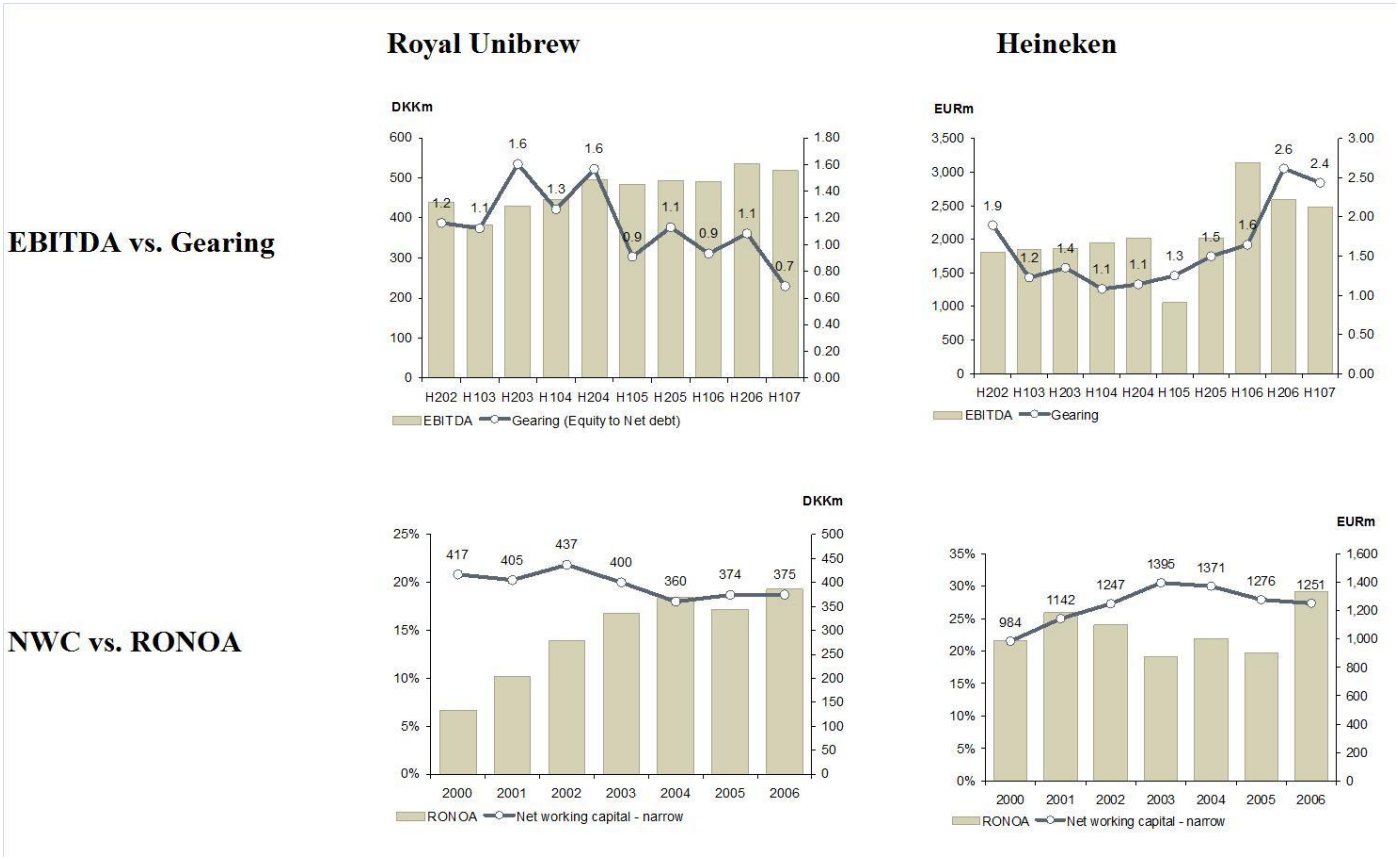
Figure 10 – The four industry figures:



The industry figures are turnover-weighted. Royal Unibrew is a small company measured on turnover, yet the peers that are the largest has the most significant effect on the industry figures, which are used to estimate Royal Unibrews financials. The discussion of pro´s and con´s revenue weighting peers is elaborated in chapter 5.2.1 page 51. Notice that the two upper industry figures have yearly observations on the X-axis. This is due to limited data availability. In the down right corner, quarterly observations are included because "Sales" and "EBIT" are basics in a publicized quarterly report.

The individual graphs are many and new graphs are added rapidly. The following shows a few:

Figure 11 – The individual figures:




Notice that the graphs are sorted as a diagram. On the vertical side is a description of what the graphs show while on the horizontal side one can look up each PG company. An appropriate solution, as new figures are added continuously.

Dynamics

The Royal Unibrew PG model requires quarterly updates of company financials, exchange rate movements, excel-references, etc. It is a very dynamic and complex model with a huge amount of

input data. With regards to resource allocation, the model requires 6-10 hours / week and is easy delegated to a student employee to save on costs and time.

Sum-up

The Royal Unibrew PG model is very flexible and offers financial complexity. The analyst can show almost every angle of financial development within the industry or to a specific peer group company. It consolidates and visualizes important industry developments and captures the most important financial fluctuations of both the industry as a whole and the individual companies. Based on the financial data available, this model performs very well. The model does not offer any operational figures as i.e. a relationship between a financial and the price of a commodity. The operational figures could turn to be rather relevant, as the beverage industry is very dependent on commodity prices. This could constitute a potential add-on to the model. Further discussions hereto are avoided due to the scope of this thesis.

### 3.2.2 Case 2 – APM Maersk Peer Group model

APM Maersk is currently the largest company listed on CSE and speculative investors constantly evaluate their position in the stock. In comparison to Royal Unibrew, APM Maersk is very reacting towards short-term PG changes. On almost a weekly basis, the APM Maersk stock price reacts to news such as profit warnings or updates of one or more peer group companies. This fact of course intensifies the requirements to the peer group model. In this particular market investors are also very concerned with operational figures such as freight rates and trade volumes on the transport lanes which APM Maersk operates or could operate as these are of severe importance to APM Maersk. This of course adds another task to the PG model, which was not seen with Royal Unibrew. Finally, recall that this model is created by another analyst who could have alternative preferences.

Construction

Despite the high requirements to the PG model the construction is very simple. Unlike the Royal Unibrew model which contained different sheets with different analyzing or consolidation purposes, this model has a sheet for each of the companies in the PG. Besides the company sheets there is a calendar sheet, a modeling sheet for instant comments and finally a summary sheet. Each of the

company sheets[44] looks identical and contains the same type of data, if available. The company data is exchange rate regulated and divided into financial and operational data. The model enhances a total of 11 companies and there is an overweight of Asian peers. The summary sheet[45] consolidates all financial and operation numbers from the individual companies and gives an overview of the industry. There are no turnover weighted industry numbers available. Next to the summary sheet, there is a calendar identical to the one from case 1. All figures created in the model are to be found in the "instant comment" sheet[46]. The sheet holds a broad range of graphs and tables ready for input from PG companies and the analyst uses the figures in his monthly reports but also to react flexible towards news in the market. Whatever output one seeks, this is the sheet where it is to be found.The construction is simple with no data specific complexity and no industry weighted figures. The analyst estimates the company future performance based on a range of operational figures such as Revenue per TEU[47] and volume development in the trade lanes.

Input data

The data input in the APM Maersk PG model is surprisingly limited. The financial data consists of the following: Revenue, Costs, EBITDA, EBIT and Net income. The operational data consists of 2 numbers: Number of employees and container volumes measured in TEU on each of the trade lanes. Both numbers are often mixed with financial numbers to achieve operating ratios such as: Revenue pr. TEU, Costs pr. TEU, etc. Across the limited range of financial data, some other ratios and growth rates are calculated, but with regards to input data, this is all there is.

Data availability

There are two reasons behind the limited input data. The first reason is the fact that most peers to APM Maersk are Asian and generally publicize less company data than European companies due to lower requirements on the stock exchange at which they are listed. The second is the analysts desire to keep the model simple.

[44] Enclosure X – snapshot of the company sheet "Hanjiin shipping"

[45] Enclosure X – snapshot of summary sheet

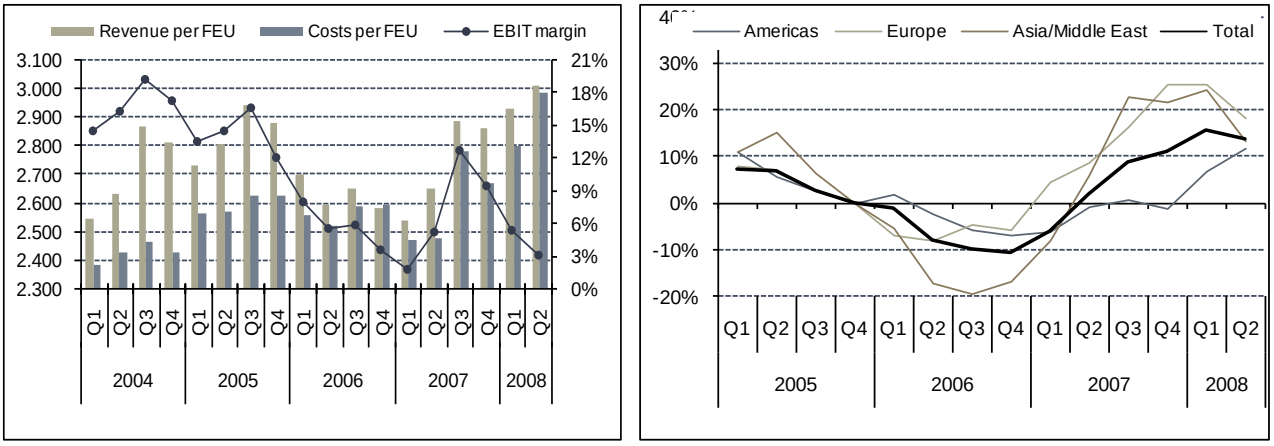
[46] Enclosure X – snapshot instant comment sheet

[47] Twenty feet equivalent unit

Output

The output material in the APM Maersk model is relatively broad, if one keeps in mind how limited the input data is. A couple of examples show the output and when it is applied i.e. in big APM Maersk reports and instant comments to market reactions or news that require any follow-up from the analyst:

Figure 12




Here is an example of standard output used repeatedly in reports and other stock-recommendation material by the analyst. The left-side figurer gives an indication of the development in revenue and costs relatively to the amount of transported FEU[48]´s and also revenue relatively to costs (EBIT[49]-margin). The right-hand side shows development of revenue pr. FEU on the respective trade lanes over time.

Figure 13

| NOL - Liner activities (APL) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Actual numbers (Yen bn)** | **2006** | **2007** | **Q2'07** | **Q3'07** | **Q4'07** | **Q1'08** | **Q2'08** |
| Revenue | 5.947 | 6.852 | 1.468 | 1.814 | 2.048 | 2.019 | 1.924 |
| EBITDA | 566 | 719 | 126 | 247 | 262 | 164 | 112 |
| - margin | 5,8 % | 7,8 % | 5,2 % | 12,8 % | 9,6 % | 5,3 % | 3,1 % |
| EBIT | 344 | 533 | 77 | 232 | 196 | 108 | 60 |
| - margin | 5,8 % | 7,8 % | 5,2 % | 12,8 % | 9,6 % | 5,3 % | 3,1 % |
| | | | | | | | |
| Utilisation | 96,0% | 96,0% | 98,0% | 99,0% | 93,0% | 95,0% | 98,0% |
| Volume growth | 7,8% | 12,4 % | 12,4% | 11,7% | 15,5% | 13,9% | 11,8% |
| Growth in revenue per TEU (USD) | -7,4 % | 4,1 % | 2,2% | 8,8% | 10,9% | 15,6% | 13,7% |
| Growth in costs per TEU (local curr.) | 1,8 % | 1,4 % | -1,8 % | 7,3 % | 2,8 % | 13,2 % | 20,8 % |

This table is an example of how the APM Maersk PG model is used in a situation, where a peer is reporting its quarterly result. The grey area is where the analyst fills in the data the second numbers

[48] Forty food equivalent unit

[49] Earnings before interests and depreciation

are publicized. The company in the figure, NOL is a Singaporean shipping company and the analyst has in this situation chosen to show a small sample of the financials, shipping volumes and capitalization, which is the percentage to which containerships are filled when leaving a terminal, which is a measure of efficiency. The last three numbers are year to year growth figures for volume and revenue/costs relative to volume. The figures shown are only a small pick of what output the model contains, yet the content pretty much covers all of what the model offers. There are various graphs and tables each and everyone showing practically the same in slightly different ways. This is again due to the data limitation.

Dynamics

The dynamics of the APM Maersk PG model is fast. There is often news in the market that relates to the PG, which the analyst considers important and comments on, either through telephone-calls to investors or through a chat-service that most investment banks offers the in-house stockbrokers. Besides instant comments, the model needs quarterly updates of each of the peers, and as there are a total of 11 peers in the model, this requires a lot of attention.

Sum-up

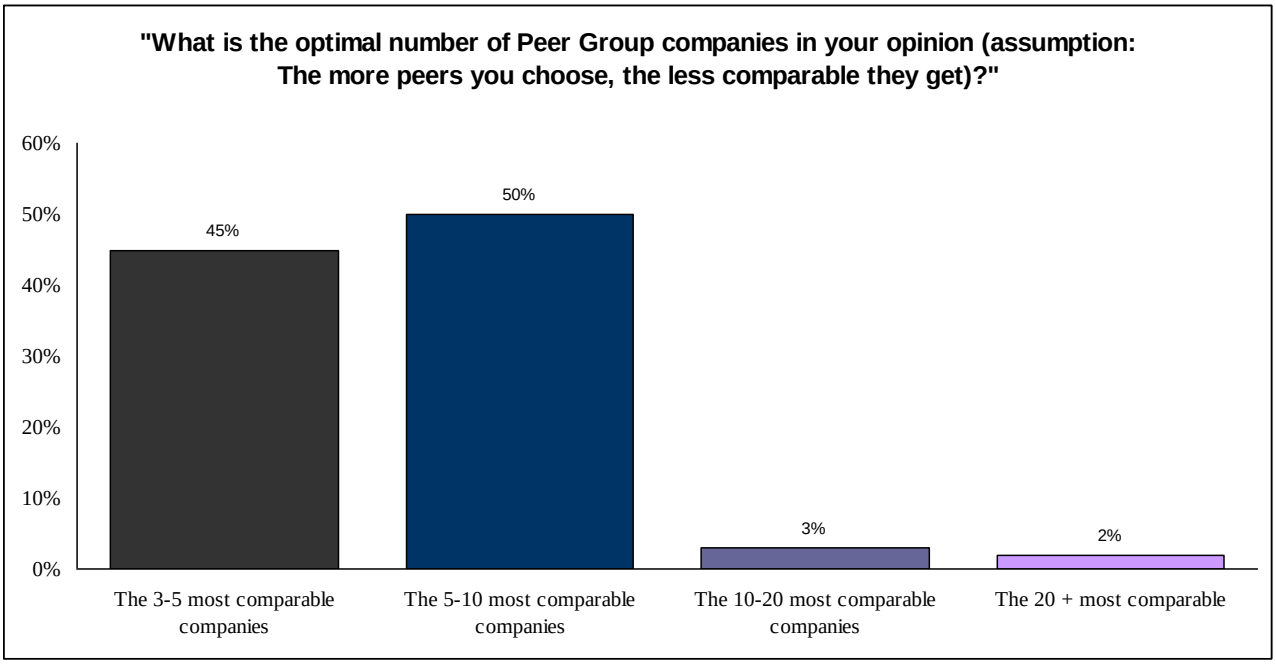
This model reflects the demand for rapidly comments on market changes. The data input is very limited, the setup rather messy and there is not the framework for in-debt analysis as we saw with the Royal Unibrew model. This PG model holds surprisingly limited data especially when one takes into account that APM Maersk is the largest company traded on the CSE. On the other hand it enables the analyst to react flexibly to market news.

### 3.3 General preferences from the industry

The two cases are considered to constitute a realistic picture of what the PG models used on the Danish stock market looks like. The general preferences with regards to the PG models are examined through a questionnaire. The analyst can choose from an infinite number of peers, yet the more he/she chooses the less comparable they get. It is a balance between getting closer to the truth and exposing yourself to risk. With a few number of peers, very close to the target company the industry weighted numbers should be a great platform to estimate future financials for the target company. But with a low number of peers the industry figures are highly sensitive to movements in each of the peers meaning that if a peer experiences a steep climb with a figure that relates to

something specific for that company, the industry figure reacts steeply. The problem can be avoided by including a larger number of peers, but including more companies apart from the closest will move the industry figure further away from the “truth”. The preferences of the analysts with regards to this subject are the following:

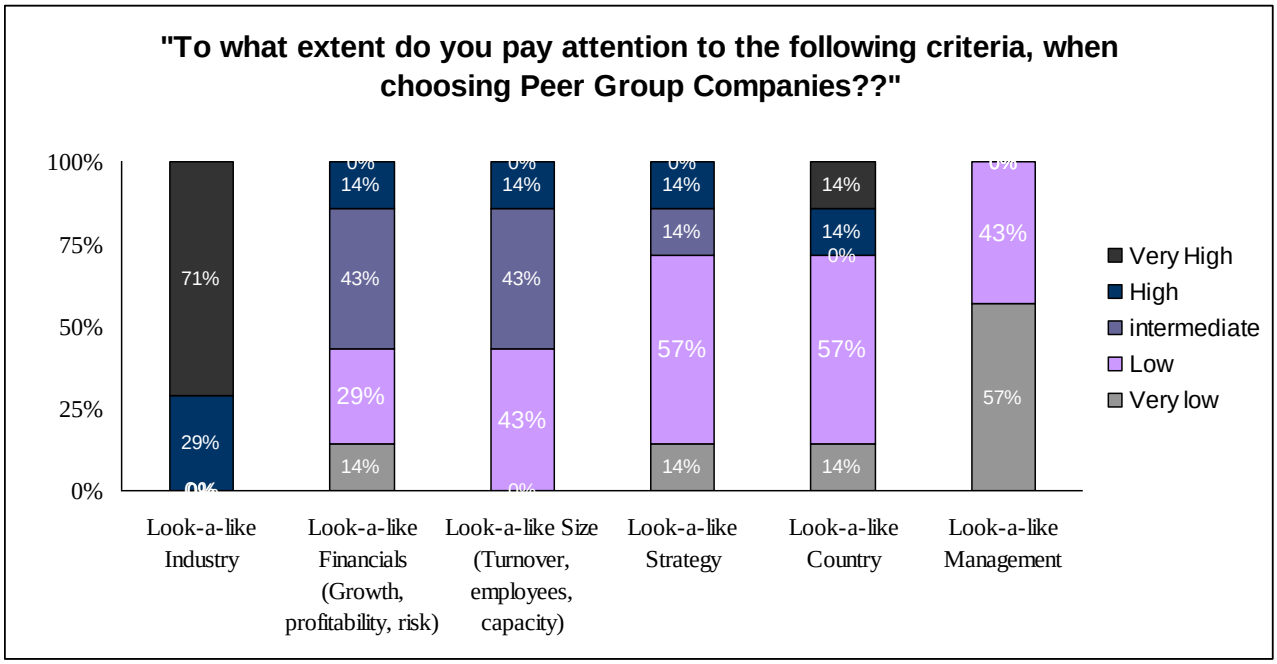
Figure 14




Only a limited number of analysts expressed preferences for 10 or more peers in their PG models. The reason behind this could as mentioned be the fact that the more peers, the less comparable. In addition analysts could also be intimidated by the fact that more peers take more work. Later examinations strive to test the hypothesis of these differences. Which format is the best is expected to be a matter of preferences, and thus the purpose of the tests is to emphasize the differences assumed.

Knowing the analysts preferences and the assumed reason behind their choice of few peers, the comparison-platform is under notice. Peers can be comparable in various ways i.e. strategy, financial ratios, industry, size, number of employees, etc. In the questionnaire the analysts were asked to list how they preferred their peers to look alike:

Figure 15




Before commenting on the answers of the analysts a leading management consulting firm is quoted: *"Yet multiples are often misunderstood and, even more often, misapplied. Many financial analysts, for example, calculate an industry-average price-to-earnings ratio and multiply it by a company's earnings to establish a "fair" valuation. The use of the industry average, however, overlooks the fact that companies, even in the same industry, can have drastically different expected growth rates, returns on invested capital, and capital structures."*[50] The price/earnings ratio (PE) shows the price of a company relative the amount of earnings, and is a commonly used multiple in the stock valuation process. An analyst uses it to get a quick idea of how a company is priced in comparison to the industry, hence comparing with an industry-based PG multiple to find out whether the company according to the ratio, is over- or underpriced. But the price of a company encompasses expectations and risks towards the future, which as the quote highlights, has to be alike. And even then can there be problems: *"Even when companies with identical prospects are compared, the P/E ratio itself is subject to problems, since net income commingles operating and nonoperating items."* [51] In the denominator of the multiple, earnings can constitute a source of error, as not all earnings are operational. From the figure it comes clear, that all analysts prefer peers that operate in the same industry as the target company, which is in line with the quotes of *McKinsey on Finance*. Slightly

[50] Marc Goedhart, Timothy Koller, and David Wessels; (1999) page 7.

[51] Marc Goedhart, Timothy Koller, and David Wessels; (1999) page 7.

less than half of the analysts questioned, pays "low" or "very low" attention to look-a-like financials. Close to 60% of the analysts pay attention to the size of the peers and less than half show interest in look-a-like strategy, country or management. Throughout the empirical analysis this figure will be a returning point of comparison. From the article of *McKinsey on Finance,* it seems as if the industry basis of picking peers is inevitable. Prior theoretical studies[52] on this subject are few, yet those that exist argue both for and against the statement from *McKinsey on Finance*. They argue for the importance of financial similarities among the peers, but in contrast to *McKinsey on Finance,* they do not assume industry similarities to be a must (chapter 4 deals with a discussion of this).

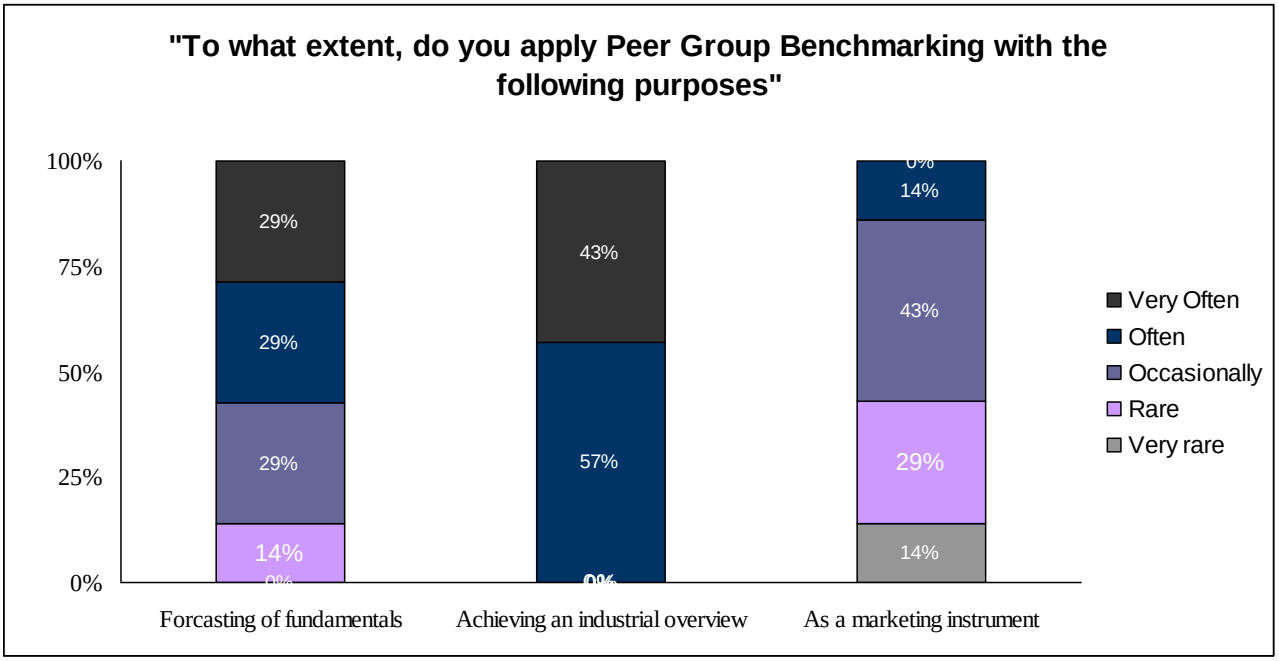
From two real world cases and examination of the analysts´ preferences it seems clearer how PGB is used in modern stock analysis. The model dynamics, content and output relies heavily on the analyst. The general preferences in the market call for a low number of very comparable peers, which most importantly are within the same industry. This was backed by an article from *McKinsey on Finance* which expressed similar preferences, yet with modifications, regarding the importance of financial similarities between the industry-based PG and the target company. Finally, the analysts showed slightly more interest in the peers being comparable in size rather than in financials.

### 3.4 To what extent is PGB applied in modern stock valuation?

The previous figures all related to the general use of PGB, meaning both in forecasting fundamentals and in valuation through multiples. Figure 6 on page 16 showed that the majority of the analysts use multiple valuation. To isolate the extent to which PGB is used in order to forecast fundamentals the following figure leaves out the opportunity of choosing multiple valuation. This should give an idea of how broadly used the concept is in this respect.

[52] Chapter 4.

Figure 16



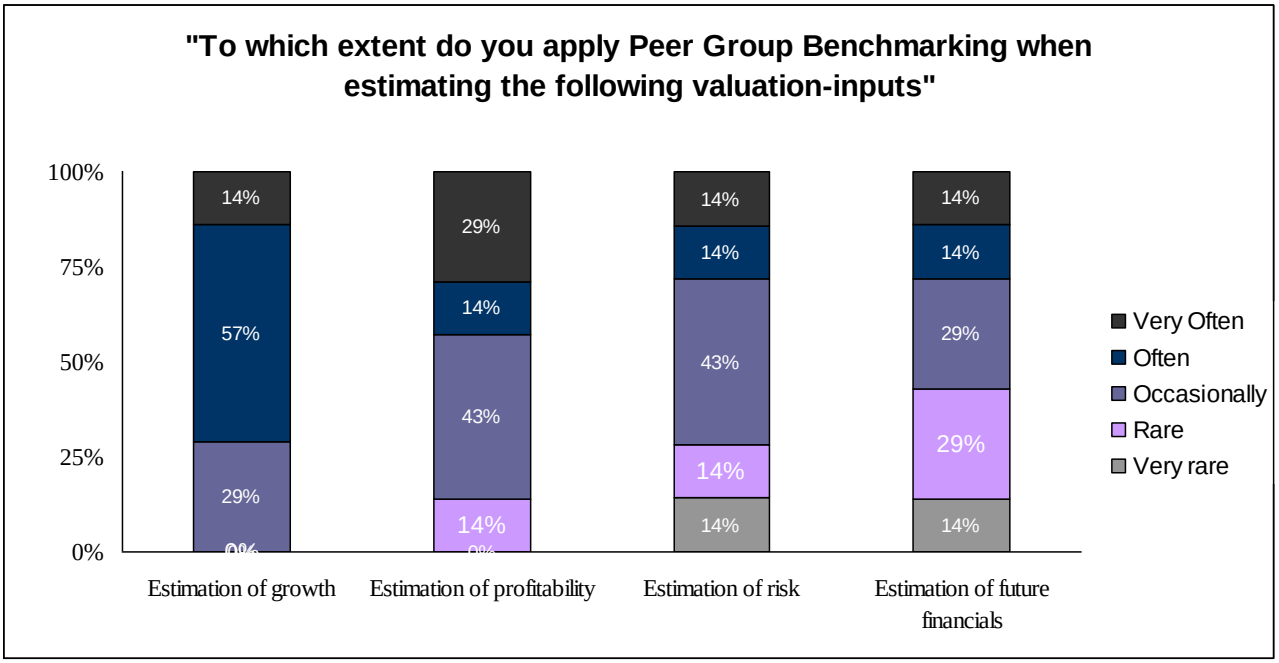

The attempt to achieve an industrial overview is the superior purpose of implementing PGB. In other businesses than then investment business, this is referred to as competitor surveillance. Forecasting of fundamentals is used often or very often by approximately 60 pct. of the analysts' while 90% uses it occasionally, often or very often. This underlines an important fact as the empirical analysis deals with the efficiency of financial forecasting through constructions of PG´s in various extents. In the empirical analysis to come, performance of tests will bring light to this issue and at a certain level explain if forecasting fundamentals through PGB makes sense. Regardless of the findings, one could accuse analysts of having unethical motives with the performed PGB analysis. Turning to the third question, 57 pct. of the analysts answered anonymously that they perform PG analysis occasionally or often as a marketing instrument. With more than 50% of the analysts using PGB to promote their investment cases and make them more attractive, there is believed to a good argument for executing empirical analysis on the efficiency such a valuation tool.

### 3.5 How may PGB contribute to Modern Stock Valuation?

From the answers of more than 40 analysts it stands clear, that the majority uses the DCF model for valuation, PG models for estimating input data to the DCF model and that when applying PGB its often with the purpose of forecasting fundamentals and in other cases to make a report look good.

Having set the definition, the way PGB is used and to which extent it is used leads to "What valuation input may it provide useful information to?"

Figure 17



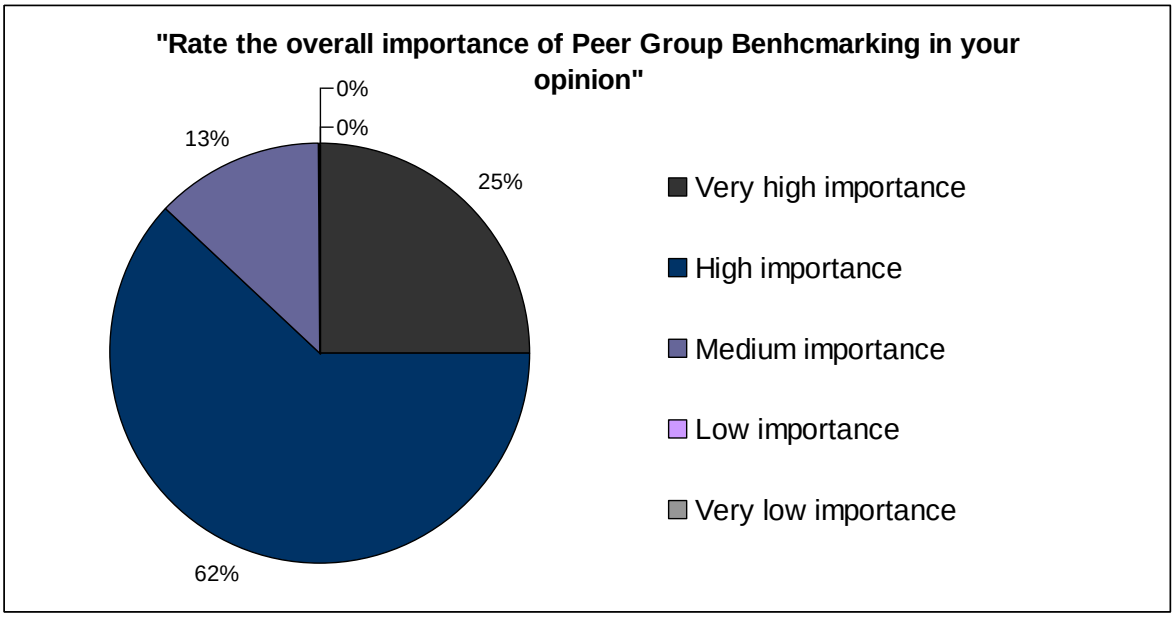

The analysts use PGB to a wide extent when estimating growth. Profitability, risks and future financials are applied less in the order mentioned. Generally the answers seem more blurry than the previous and the reason for this is probably the fact that analysts apply PGB when estimating all the above inputs to their valuation models. All the inputs can be deducted from the financial statements, and the fact that these inputs are used frequently emphasizes why PGB is used as much as figure 16 page 32 showed.

### 3.6 Part conclusion

From chapter 3 it is a fair assumption that PGB is a widespread valuation tool as more than 40 analysts have recognised it as a valuation tool the apply frequently. Close to all the analysts own a PG model for consolidation of PG data. When estimating input data to the valuation model of their choice, the most common tool is PGB. The preferences when applying the model is few peers that, most importantly are in the same industry and of the same size. The most widespread purpose of implementing PGB is for either achieving an industrial overview or forecasting fundamentals. The preferences when forecasting with PGB are growth, profitability and risks but also other future

financial are estimated through PGB. Before heading to a final comment on the concept a last graph illustrates what the analysts answered when asked how important they rate PGB overall:

Figure 18




In empirical research to come, the findings from this chapter will be matched with the findings from the theoretical chapter in continuation of this. The purpose of this is to construct a mutual framework to analyse the differences and similarities in using PGB, of the analysts covering the Danish stocks and theoretical recommendations from the upcoming chapter.

# 4. Theoretical PGB approach

Before heading to the empirical investigation, focus is turned to previous works on the subject of PGB. These have been the author of this research's starting point and so they set a stage for further research. The previous academic constructions on the subject are very limited. In fact, two authors who did engage in research on the topic initiated their latest article, "who is my Peer": *"Given their widespread popularity among practitioners, market multiples based valuation has been the subject of surprisingly few academic studies."*[53]

The authors precede their article with a note on the dissemination of PGB: *"There are at least three situations in which comparable firms are useful. First, in conducting fundamental analysis, we often need to make forecasts of sales growth rates, profit margins, and asset efficiency ratios. In these settings, we typically appeal to comparable firms from the same industry as a source of reference. Second, in multiples-based valuation, the market multiples of comparable firms are used to infer the market value of the target firm. Third, in empirical research, academics seek out comparable firms as a research design ..."*[54] This thesis´ research and the theoretical framework revolve around the two first applications. This chapter emphasizes theoretically proven use of PGB and works as a bridge between the findings in the interviews from the previous chapter and the actual empirical investigation to come. Furthermore it seeks to compare the theoretical recommendation with the actual appliance in the Danish investment community, found from the interviews while the empirical investigation, tests whether or not it makes sense to apply the tool and how it is most efficiently used in this local stock market.

## 4.1 Efficient market hypothesis

If a competitive market does not follow a random walk, price changes could be predicted in the future and investors would be expected to profit from that. In the case of a competitive market, the investors will take advantage of easy profits and thereby adjusting the prices immediately. The obvious result from the competitiveness is that yesterdays price will be reflected in today's price

[53] Sanjeev Bhojraj and Charles M. C. Lee; (2005)

[54] Sanjeev Bhojraj and Charles M. C. Lee; Source; (2005)

rather than tomorrow´s price, making it impossible for investors to benefit on this, meaning that a price change in period $t_0$ is independent of a price change in period $t_{-1}$.

The discussion could be extended to including all other public information besides just the price patterns. If all investors have access to all the information of a company (Fundamental analysis, Technical analysis, etc) the same should account. If this is the case, stocks will be fairly priced and no matter what information an analyst might have, it will not make him able to outperform the market in the long run, as the security returns will be unpredictable.

A detailed discussion of the above is referred to as the efficient market hypothesis[55]. There are three defined levels of market efficiency which differ in the degree of information reflected in the stocks, or other traded assets. The first level is called *weak* form of market efficiency. In weak efficiency markets prices will follow a random walk and it is impossible to consistently outperform others by studying past price movements, often referred to as Technical analysis. The second form of market efficiency is semi-strong market efficiency. In the semi-strong market, prices adjust immediately to all public information, as the ones mentioned above. The last form of market efficiency is the strong market efficiency. In the strong market, it is impossible to outperform the market in any sense and we can only refer to analysts as either lucky or unlucky.

The most commonly believed degree of efficiency is the semi strong market efficiency and is also what is believed in throughout this thesis. All public information is therefore believed to be incorporated in the stock which means that it is impossible to outperform the market consistently. This is another argument, why PGB should not prove to give the analysts an edge over market, despite the various ways of appliances. Even if PGB proves a helpful forecasting tool or a good valuation model, it is expected that the market already knows and that it is impossible to benefit from this.

[55] Brealey/Myers/Allen, Corporate Finance Eight edition P. 337.

### 4.2 Relation to prior PGB literature: Making multiples reliable

The basics[56] of multiples are very simple The complex part consists of two main steps. Constructing a PG of highly comparable firms and determining how many to include. Both steps are highly relevant for the empirical studies to come, but only the first part has been dealt with by theorists in the past. In earlier stages of this report, peer picking points have been lined up, backed from the article *McKinsey on Finance,* 2005[57].

A more thorough theoretical work, "Who Is My Peer?" by Sanjeev Bhojraj and Charles M. C. Lee, argues that PG companies should be chosen from similarities in the variables, which drive the multiples: "*Specifically, we argue that the choice of comparable firms should be a function of the variables that drive cross-sectional variation in a given val- uation multiple. For example, in the case of the enterprise-value-to-sales multiple, comparable firms should be selected on the basis of variables that drive cross-sectional differences in this ratio, including expected profitability, growth, and the cost-of-capital.*"[58] The EV/Sales is a commonly used multiple. A firm´s growth holds n periods and is followed by a constant growth in perpetuity. Given that, a firm's enterprise-value- to-sales ratio can be expressed as:

$$\frac{EV_t}{S0} = E_t\left[ PMxkx\left[ \frac{(1+g_1)\left(1-\left((1+g)^n/(1+r)^n\right)\right)}{r-g_1} + \frac{(1+g_1)^n(1+g_2)}{(1+r)^n(1+g_2)} \right]\right]$$, where $EV_t$ is the total enterprise value (debt plus equity) at time t, St = total sales at time t; Et[] = expectation based on information available at time *t*; *PM* is operating profit margin; *k* is a constant payout ratio; *r* = cost of capital; $g_1$ is the initial earnings growth rate, which is applied for n years; and $g_2$ is the constant growth rate applicable from period $n+1$ onwards. This equation shows what variables a firms EVS multiple is a function of. This is the starting point of interesting findings, as the authors turn to an analysis of the degree to which variation in a multiple can be explained by certain variables.

The first step in finding the right comparability platform between a target company and its peers is referred to as the "warranted multiple"; a multiple created for each firm with starting point in the variables that drives the multiple, recall the equation on top of this page. The dependent variables

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[56] See chapter 2 for elaboration.

[57] Chapter 3.5

[58] Sanjeev Bhojraj and Charles M. C. Lee; (2005)

are the two multiples investigated in the study: Enterprise value to sales (EVS) and Price-to-book (PB). Explanatory variables are the following:

- *Indevs:* Harmonic mean of the EVS ratio for firms in the industry (based on 2-digit SIC[59] code).
- *Indpb*: Harmonic mean of the PB ratio for firms in the industry (based on 2-digit SIC code).
- *Adjpm*: Firm profit margin-median industry profit margin; where profit margin is operating profit after depreciation/Net Sales.
- *Losspm*: Adjpm * Indicator variable; where Indicator Variable = 1 if firm profit margin is less or equal to 0, and 0 otherwise.
- *Adjgro*: Consensus analyst forecast of long-term growth for the firm from IBES-median consensus analyst forecast in the industry.
- *Lev*: Total long term debt/Total stockholders equity.
- *Rnoa*: (Operating Income after depreciation/(Net property plant and equipment + Total current assets - Total current liabilities)) * 100.
- *Roi*: Net Income before extraordinary items/Common equity * 100.
- *R&D*: Research and development expenses/Net Sales.

Through these nine explanatory variables a firm's warranted multiple can be determined. In the regression tests in the article the significance level of the variables of course differ but they all have p-values that make them significant at a minimum 5% level. The strongest six explanatory variables are Indevs, Adjpm, Losspm, Adjgro, Rnoa, and R&D and with r-square figures averaging 72%[60] the variables seem to explain a very high proportion of variance in the warranted multiples. Now, the goal of the article is to find the set of comparable firms, that will best describe the target firms future multiple. The authors set up a range of explanatory variables and test the degree to which they explain variation in the current and future multiples. The variables are: **EVSn**, where n=0,1,2, and 3. This is the current, one-, two-, and three-year-ahead EVS ratio and also the dependent variable. **IEVS** is the harmonic mean of the industry EVS. This variable shows the degree of how important industry comparability is. **ISEVS** represents the harmonic mean of the actual EVS ratio for the four firms from the same industry with the closest market capitalization. This variable in addition to IEVS also captures the importance of comparable size between PG companies. **WEVS** is the warranted EVS ratio. This variable is computed using the estimated coefficients from the

[59] Standard Industrial Classification.

[60] Sanjeev Bhojraj and Charles M. C. Lee; Source; (2005)

prior year's regression (recall the equation on top of this page) and accounting or market-based variables from the current year. **COMP** is the actual EVS ratio for the closest comparable firms. This variable is the harmonic mean of the actual EVS ratio of the four closest firms based on their "warranted" multiple the authors constructed this variable by ranking all the firms each year on basis of their WEVS and then constructed the harmonic mean for the actual EVS of the four closest companies. **ICOMP** is the actual EVS ratio for the closest comparable firms within the industry. This variable is the harmonic mean of the actual EVS ratio of the four firms within the industry with the closest warranted multiple. Essentially, this is the COMP variable with the firms constrained to come from the same industry. These five variables allows us to see the significance with which they explain variation in the given EVS multiple. Two variables, IEVS and ISEVS represent look-a-like industries and look-a-like size respectively. The rest of the multiples incorporate all the inputs mentioned when dealing with the warranted multiple. The empiric results are all interesting with the most interesting findings being:

Figure 19

| **Panel A: Enterprise-value-to-sales** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current year *EVS* | | | | | One year ahead *EVS* | | | | | |
| Inter | 0.24 | 0.22 | 0.06 | 0.00 | 0.00 | 0.24 | 0.23 | 0.07 | 0.01 | 0.01 | 0.27 |
| *IEVS* | 1.19 | 1.02 | 0.08 | −0.27 | −0.26 | 1.19 | 1.05 | 0.16 | −0.17 | −0.16 | 1.18 |
| *ISEVS* | | 0.16 | 0.14 | 0.16 | 0.13 | | 0.14 | 0.12 | 0.14 | 0.12 | |
| *COMP* | | | 0.89 | 0.16 | | | | 0.83 | 0.13 | | |
| *WEVS* | | | | 0.98 | 0.83 | | | | 0.93 | 0.80 | |
| *ICOMP* | | | | | 0.33 | | | | | 0.27 | |
| *r*-sq | 22.94 | 23.46 | 54.71 | 61.68 | 62.99 | 20.75 | 21.24 | 46.14 | 51.97 | 53.23 | 18.37 |
| **Panel B: Book-value-to-sales** | | | | | | | | | | | |
| | Current year *PB* | | | | | One year ahead *PB* | | | | | |
| Inter | 0.40 | 0.35 | 0.07 | −0.06 | −0.07 | 0.46 | 0.40 | 0.15 | 0.04 | 0.05 | 0.57 |
| *IPB* | 1.19 | 1.04 | 0.26 | −0.09 | −0.07 | 1.17 | 1.00 | 0.38 | 0.12 | 0.12 | 1.16 |
| *ISPB* | | 0.16 | 0.11 | 0.10 | 0.07 | | 0.18 | 0.14 | 0.13 | 0.10 | |
| *COMP* | | | 0.81 | 0.35 | | | | 0.65 | 0.29 | | |
| *WPB* | | | | 0.77 | 0.71 | | | | 0.59 | 0.51 | |
| *ICOMP* | | | | | 0.44 | | | | | 0.40 | |
| *r*-sq | 11.80 | 12.34 | 35.21 | 41.94 | 43.20 | 7.62 | 8.02 | 19.91 | 22.94 | 23.38 | 5.01 |

What is worth noticing here is the development of r-square as more variables are added to the model. When adding the "COMP" variable to the model, which represents the actual EVS ratio of the four closest firms based on their "warranted" multiple, the r-squared increases significantly from 23% to 55%. Recall, that when comparing multiples on the warranted multiple, this refers to the financials driving the multiple. In the case of EVS, this would be growth, profitability and risk. The article states the following with regards to hereto: *"These results confirm prior evidence on the usefulness of industry-based comparable firms. However, they also show that the valuation accuracy of industry-based EVS ratios leaves much to be desired. In fact, industry-size based comparable firms explain less than 20% of the variation in two-year-ahead EVS ratios."*[61] This underlines the fact that industry-based PG´s are recognized as useful, yet less than 20% of the two-year-ahead EVS ratio variation is explained. The authors precede this statement with the following: *"The predictive power of the model increases sharply with the inclusion of variables based on the warranted EVS ratio (WEVS). On average, a model that includes IEVS, ISEVS, and COMP explains over 40% of the cross-sectional variation in two-year-ahead EVS ratios"*[62]. This argues the case of collecting comparable firms based on the financials. From the previous chapter, it was found, that

[61] Sanjeev Bhojraj and Charles M. C. Lee; (2005)

[62] Sanjeev Bhojraj and Charles M. C. Lee; (2005) P 426

the majority of the analysts preferred to include companies that was close on industry. This is not in line with the recommendations of Sanjeev Bhojraj and Charles M. C. Lee but not necessarily wrong, as the analysts interviewed all work on Danish stocks and one could fairly argue that the above findings, due to its global focus are irrelevant to the Danish stock market. Despite this, the theoretical findings of Sanjeev Bhojraj and Charles M. C. Lee will be the thesis´ theoretical conviction and thus referred to throughout the empirical analysis going forward. The following empirical research seeks to apply similar test for the local investment community of the analysts interviewed.

The above article is the theoretical conviction and thus the chosen theoretical platform with which to compare the findings from the questionnaires. Despite the relatively low attention paid to the subject of picking peers a few other theoretical works on the subject exists. Some of the most relevant to this study argue in contrast to Sanjeev Bhojraj and Charles M. C. I.e. Andrew W. Alford argues that having chosen peers within the same industry, further similarities with regards to financials will not improve valuation results[63]. Additionally P. Zarowin shows that historical earnings growth and risk is less important to multiple valuation compared to forecasted long term growth in earnings. With regards to this thesis P. Zarowin moves beyond the assumptions applied to keep within the scope of this thesis and is thus regarded useless going forward in this thesis. The last theorist to mention are Boatsman and Baskin[64]. In the article "*Asset Valuation with Incomplete Markets"* they argue that the value from valuation through industry-based PG models increases when picking the industry companies with the closest historical earnings-growth. Despite their preference of peers being in the same industry, they recognize the potential valuation gains from acknowledging the role of financial similarities among peers.

[63] Alford, Andrew W.; (1992)

[64] Boatsman J. R. and E. F. Baskin; (1981):

# 5. Empirical Analysis

The purpose of the empirical analysis is to investigate two hypotheses. Both hypotheses deal with the use of PGB in the Danish investment community. The motivation is twofold. First of all PGB has been subject to surprisingly few theoretical studies. Interviews in this report have shown that it is the most frequently used financial tool among the Danish analysts. The miss match between theoretical exposure and in practice use of PGB motivates for a study of the degree to which the method is effective. Thus hypothesis 1) "P*GB is an inefficient tool in valuating Danish companies"*. In continuation hypothesis 2 deals with the differences between theory and the everyday use of PGB. Prior theoretical studies have shown support to both cases. With an empirical analysis inspired by Sanjeev Bhojraj and Charles M. C. hypothesis 2) is: *Choosing companies based solely on similarities in the industry in which the target company operates is an inefficient approach to forecasting fundamentals and valuating companies with PGB.* While Hypothesis 1 could prove PGB to be an inefficient tool for evaluating Danish companies, Hypothesis 2 will evaluate in which form it works most efficiently/least inefficiently.

## 5.1 The Data Collection

In creating the dataset for testing PGB on the Danish stock market, analysts from the Norwegian investment bank, ABG Sundal Collier have been asked to pick the stocks exposed most heavily to speculation in their office. Among the companies presented by ABG Sundal Collier, 9 target companies where chosen all differing in the industry in which they operate. The reason behind this, is to collect data from a broad range of PG companies from different industries, countries etc.

### 5.1.1 The framework

The 9 Danish companies under consideration are referred to as the "target companies". In the daily work of the Danish analysts the goal is to get the closest possible to the true values of these companies. Initially, peers from similar industries to the target firms have been listed. Through internet sources[65] and interviews with the analysts in ABG Sundal Collier, 125 PG companies have been chosen. The industries, target companies and sources are as follows:

[65] www.containization.com, www.danisco.com, www.infinancials.com

Figure 20

| Industry | Target Company | Source | |
|---|---|---|---|
| Container Shipping | *APM Maersk* | ABG Sundal Collier | www.containization.com |
| Food & Beverages | *Carlsberg* | ABG Sundal Collier | |
| Medicin Equipment | *Coloplast* | ABG Sundal Collier | |
| Dry Bulk | *DS TORM* | ABG Sundal Collier | |
| Ingrediens | *Danisco* | ABG Sundal Collier | www.Danisco.com |
| Road Freight | *DSV* | ABG Sundal Collier | www.infinancials.com |
| Construction | *FL Smith* | ABG Sundal Collier | |
| Medicin | *Novo Nordisk* | ABG Sundal Collier | |
| Energy | *Vestas Wind Systems* | ABG Sundal Collier | |

The framework which holds data for the 9 target companies and the 125 PG companies show 10 financial fundamentals on a yearly basis in the period 1989-2008. A snapshot of the framework illustrates the data setup that repeats for each of the 9 target companies and their respective peers. The snapshot only contains a small part of the raw data, to see the whole model, turn to the enclosed CD ROM:

Figure 21

| **Industry 3: MEDICINAL EQUIPMENT** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **YEAR** | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
| Target Company | | | | | | | |
| COLOPLAST | 622559 | 726965 | 817397 | 991102 | 1121879 | 1301845 | 1449237 |
| Peer group companies | | | | | | | |
| AMBU - CAPEX | 120359 | 135474 | 147914 | 180764 | 191300 | 200627 | 209081 |
| BOSTON SCIENTIFIC - CAPEX | #NA | #NA | #NA | #NA | 315165 | 380061 | 448948 |
| C R BARD - CAPEX | 757500 | 777800 | 785300 | 876000 | 990200 | 970800 | 1018200 |
| COVIDIEN - CAPEX | #NA | #NA | #NA | #NA | #NA | #NA | #NA |
| RESMED - CAPEX | #NA | #NA | #NA | #NA | #NA | #NA | #NA |
| SMITH & NEPHEW - CAPEX | 597900 | 710100 | 729700 | 791700 | 831900 | 931200 | 949900 |
| ELEKTA 'B' - CAPEX | #NA | #NA | 200954 | 254578 | 332904 | 506195 | 699000 |
| GETINGE - CAPEX | #NA | #NA | #NA | #NA | #NA | 919800 | 1103900 |
| Q-MED - CAPEX | #NA | #NA | #NA | #NA | #NA | #NA | #NA |
| SECTRA 'B' - CAPEX | #NA | #NA | #NA | #NA | #NA | #NA | #NA |
| WILLIAM DEMANT HLDG. - CAPEX | #NA | #NA | #NA | #NA | #NA | #NA | 750289 |

Besides the sheet with raw data the framework contains several other sheets. Some for further consolidation and some for analyzing purposes. The consolidation sheets services an overview function for the user and makes up a good starting point for the analysis.

### 5.1.2 DataStream VS. Company reports

The input source for the financial fundamentals of the target companies and its peers is DataStream. The modern analysts continuously turn to the software and internet data warehouses to collect the data needed for specific analyses. First of all collecting data from an internet database can be done fast To collect 10 financial fundamentals for 134 companies on a yearly basis in the period 1989-2008 would require for the analyst to collect an enormous amount of company reports and type in an almost infinite number of data. This is obviously a costly process. In addition, the margin of error from typing data manually is generally believed to be high. Therefore the obvious choice for the majority of analysts is DataStream or alternative data warehouses. But also the internet databases have pitfalls. The definitions of fundamentals can be blurry and unclear to the user. The majority of the databases often deviate from what can be found in the company reports, because of definitions used by the data supplier. Furthermore, the data warehouses constitute a source of error as not all numbers are correct. Relying on others´ work is never comfortable, nevertheless when choosing between typing in manually and using the data warehouses the latter is rarely picked. This depends on the amount of data to collect, but this research requires for such a large amount of data that picking manually is out of the question.

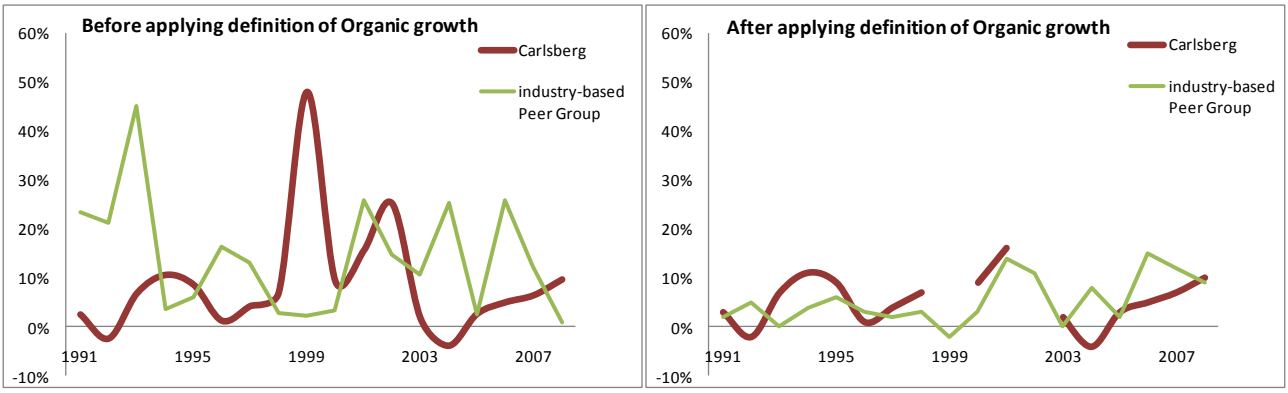
### 5.1.3 Data adjustments

Working with large amounts of financial data collected from the data warehouse requires for certain adjustments. Some companies report in staggered financial year. The consequence for the financial analysts is comparison of staggered year's data. This leads to incorrect results and less effective analysis. To avoid this to occur in this report, companies who gives financial staggered details has been adjusted. From the income statement the math is pretty straight forward. Assume that a company reports its 2005 result from earnings in the last 6 months of 2004 and first 6 month of 2005. To obtain the 2005 calendar year earnings the 2005 result is divided by 2 and summed with the 2006 result also divided by 2. This is the best approximation of the real 2005 result unless the company under consideration reports its half year results. In that case the analyst can easily track down the calendar half year result and sum.

Another crucial adjustment which plays a significant role in the dataset is the author's definition of the term "organic growth". Organic growth refers to the real growth in a company's revenue that origin from development in sales volume from core business or development in prices of goods.

That is price of gods sold and the supply/demand relationship. Two elements disturb the organic growth rate. If a company merger, acquirer or divest parts of its business the result is revenue developments that does not origin from the core business. When analyzing revenue developments the analysts wishes to obtain an idea of how successful the target company is, in selling its product or services at the highest possible price to the largest possible amount of customers. The way to obtain high organic growth stems from success full marketing, superior market positioning, execution of profitable strategies, etc. The Danish freight company DSV announced an acquisition of the German freight company Frans Maas in 2006. This had a significant effect on the turnover of DSV as Frans Maas is a large company. The turnover grew from 23 billion DKK in 2005 to almost 32 billion DKK in 2006 an annual growth rate of approximately 40%. This is a good example of the conflict when dealing with organic revenue growth. In some cases, companies who has undertaken acquisitions or divestments informs the stock market and publicize their organic growth rate, adjusted for the corporate transaction. In other cases companies do not separate what income comes from the acquired company and what comes from organic growth. Secondly, the organic growth rate is disturbed by exchange rate movements. The magnitude of the exchange rate influence is in most cases not possible to estimate as few global companies publicize the rates at which they cased in earnings. Some companies publicize their organic growth, but they are not obligated to by law. Dealing with 125 peers and 9 target companies in obtaining and idea of the yearly organic growth rate for each of the companies, this is a hard task. The way this report gets around it bears the mark of the huge uncertainty that is associated with this issue. Hence, each of the company's growth rates is only considered organic if not exceeding 25% of increase or decrease. The definition omits the effect of a company's growth if it contains extraordinary heavy fluctuations. Downsides with this definition are the fact that in some cases, high organic growth or decline will be excluded from the results even though not coming from corporate transactions. In addition, growth rates between -25 % and 25% is not a guarantee of them stemming from increase in sales/price of goods sold. Despite the magnitude of potential pitfalls with such a definition, the alternative of ignoring the origin of growth in sales, is believed to be worse. The following figure illustrates an example of the consequence of defining organic growth:

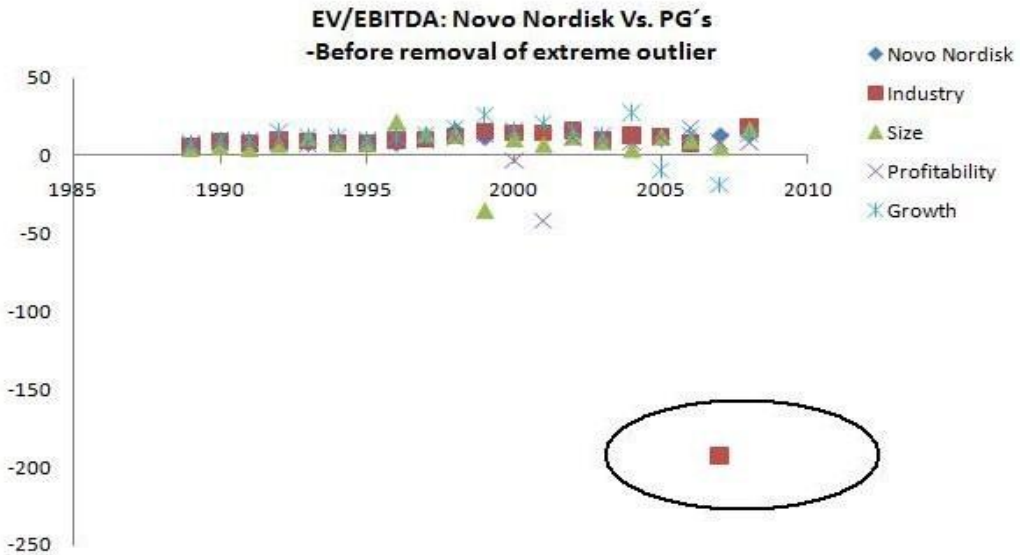
Figure 22 – Growth in sales before and after implementing the thesis´ definition of organic growth




To illustrate the magnitude of the difference the Y-axis's have been set equally (-10% to 60%). The result show what influence peers have on the average growth rate of the industry-based PG and which effect the definition of organic growth has. In the latter of the two graphs Carlsberg omits two numbers in 1999 and 2002, respectively. This is due to them being higher than the defined 25% or lower than -25%.

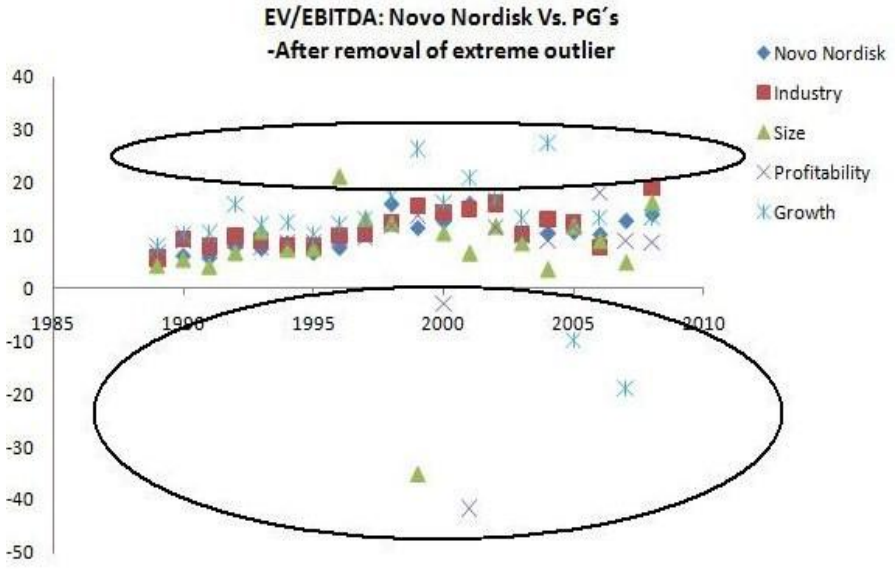
In continuation of dealing with the fluctuations in the growth rates of sales, similar data adjustments have been used on the market multiples. The multiples EV/Sales, EV/EBITDA and EV/NetProfit show extreme outliers in some cases. In large samples the outliers have a smaller role on the final result but as this case deals with 20 observations it is crucial to eliminate the effect of such. The procedure of eliminating outliers is as follows:

Figure 23 – elimination of extreme outlier



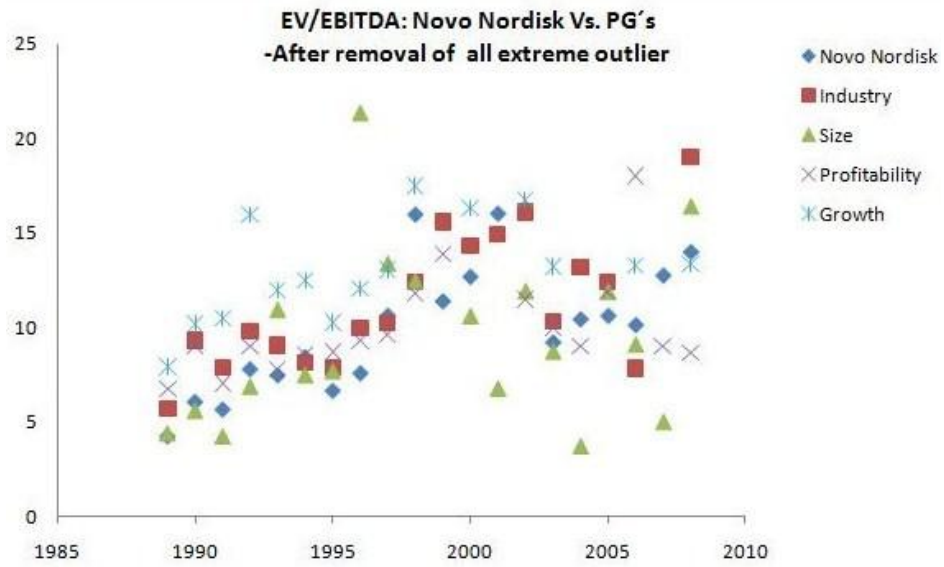
The extreme observation is circled. Because of its presence the Y-axis is between 50 and -250 which makes it hard to discover any less extreme outliers. After elimination of the extreme observation the data is reentered and graphically performed to see whether other outliers can be detected.

Figure 24 – Detection of other outliers




It is a subjective task to eliminate outliers and there is no correct way of doing it. The figure above show which has been eliminated in the case of EV/EBITDA with Novo Nordisk. After elimination of the chosen outliers this is what the graph looks like:

Figure 25 – visual overview of the EV/EBITDA multiple Novo Nordisk Vs. PG´s after elimination of outliers



When all chosen outliers have been removed the data show less variance. It is easier to analyze, but it also includes a risk of being wrong due to the exclusion of outliers. The line between eliminating outliers and directly manipulate the dataset in the direction that fits the researcher best can be thin. In this report only the most extreme outliers have been removed and the dataset kept as intact as possible. This point is emphasized by the multiples being in the wide range of 5-25.

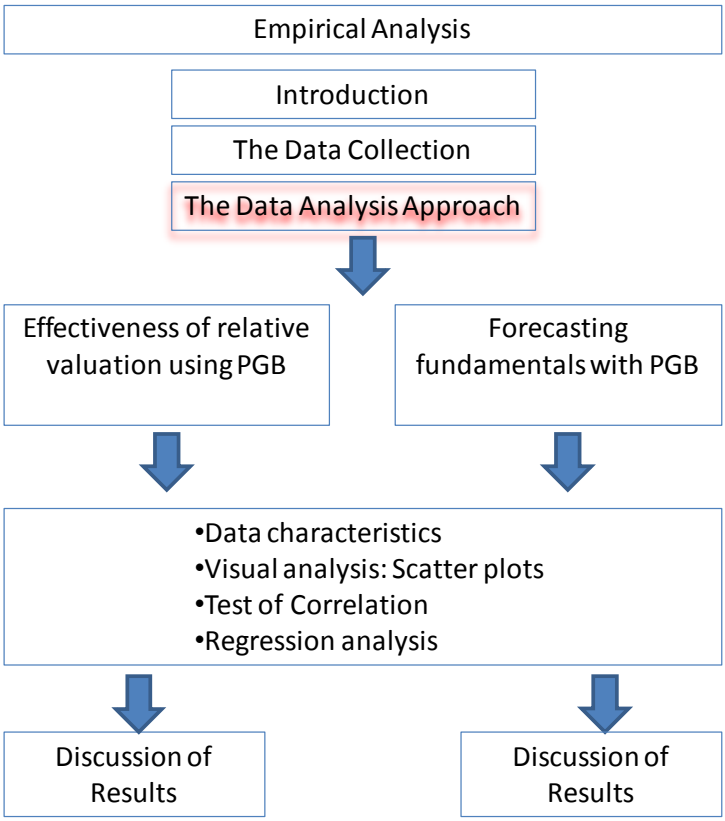
#### 5.1.4 Target Companies and the Peers

The target companies are due to the local focus of the study all Danish. The peers chosen are a "random" sample of all the companies in the world. Together these 134 firms are considered the available companies for financial benchmarking. This means that if ranking the 10 firms most equal to a target company on i.e. revenue growth, the top 10 stems from the constructed world of 134 companies. Because of the differentness in industries, country of origin, etc these 134 companies are believed to be a good sample of the worlds companies.

### 5.2 The Data Analysis Approach

The analysis of data behavior strives to explain the degree to which PGB is effective. According to the study´s analysis of PGB from interviews, the Danish analysts uses PGB mainly with two purposes; as a valuation tool using multiples or as a tool to forecast input fundamentals of cash-flow based valuation models. This empirical analysis compares PGB performance of 2 applications: The theoretical recommendations of Sanjeev Bhojraj and Charles M. C. Lee (S&C) and the practical use of Danish analysts. Because of the low theoretical work on the subject and the fact that the investigation is local, it is likely (but not necessarily MOST likely) that the application of the local analysts will prove to be the most efficient. Before engaging in the two-piece analysis a virtual overview is provided. :

Figure 26




The analysis of the two PGB applications, multiple valuation and forecasting of fundamentals, follow the same routine with few deviations. The main purpose of the analysis is to reach an understanding of four conditions of PGB.

1. Generally, how do the PG´s correlate with their target company.
2. Which PG´s performs the best.
3. What are the consequences of encompassing more or less companies in the Peer Group.
4. What are the differences in industries with regards to the efficiency of applying PGB.

From the problem statement recall the last phrase: *"....is it applied in theoretical accordance and has it proven to be an efficient valuation tool over the past 20 years?"*[66]. Condition 1 tests the degree of efficiency over the past 20 years, while condition 2 & 3 tests for theoretical accordance. In doing so it compares the theoretical recommended selection criteria of S&C with those found in the interviews. Condition 4 is constructed to recognize the effect of a target company´s industry when applying PGB. The procedure of analyzing the two PG appliances moves from recognizing the data characteristics through visual analysis and correlation matrix´s to constructing regression

[66] Page 4.

models and evaluating the model output. The first two steps are straight forward, but the second two require for elaboration in order to understand the reason for the chosen procedure. Correlation analysis is conceptually very different from regression analysis. The primary objective with correlation analysis is to measure the strength and degree of linear association between two variables. In this case, movements between a target company and its PG´s. Linear regression analysis estimates or predicts future variables based on the fixed value of explanatory variables. In this case linear regression is used to make up a model for forecasting fundamentals through peers or estimate company values through relative valuation. A more detailed presentation of the statistical approach is provided in later stages of this chapter.

### 5.2.1 Creating Peer Groups

Each of the nine companies has a total of 12 Peer Groups. The PG´s are created from 4 selection criteria's, which are: growth rate, profitability, industry and size. For each of the four PG´s created from the selection criteria, there are three sizes of PG´s. 5, 10 and 20 companies. The presumption is that the more companies one include in the PG the less accurate results. On the other hand, more companies insure more stable results and make the PG measures less vulnerable to fluctuations. The following model shows an example of the PG´s created to Carlsberg:

Figure 27

| | Target Company: **Carlsberg** 5 Companies | 10 Companies | 20 Companies |
|---|---|---|---|
| Peers with the closest ***Growth*** | METSO<br>BUCYRUS INTERNATIONAL<br>GIVAUDAN 'N'<br>INTL.FLAVORS & FRAG.<br>BRISTOL MYERS SQUIBB | HEIDELBERGCEMENT<br>WAN HAI LINES<br>METSO<br>BUCYRUS INTERNATIONAL<br>GIVAUDAN 'N'<br>INTL.FLAVORS & FRAG.<br>BRISTOL MYERS SQUIBB<br>MITSUI OSK LINES<br>MOLSON COORS BREWING 'B'<br>MCCORMICK & CO | LAFARGE, NOVOZYMES, FLSMIDTH & COMPANY 'B', DSV, ROYAL UNIBREW, HEINEKEN, SANOFI-AVENTIS, HEIDELBERGCEMENT , WAN HAI LINES, METSO, BUCYRUS INTERNATIONAL, GIVAUDAN 'N', INTL.FLAVORS & FRAG., BRISTOL MYERS SQUIBB, MITSUI OSK LINES, MOLSON COORS BREWING 'B', MCCORMICK & CO, CHINA SHIPPING DEV.'H', ASTRAZENECA, WYETH |
| Peers with the closest ***Profitability*** | LAROX 'B'<br>WAN HAI LINES<br>ANGLO AMERICAN<br>TATE & LYLE<br>GIVAUDAN 'N' | FMC<br>SYMRISE<br>METSO<br>LAROX 'B'<br>WAN HAI LINES<br>ANGLO AMERICAN<br>TATE & LYLE<br>GIVAUDAN 'N'<br>CAMILLO EITZEN & CO<br>ASSOCIATED BRIT.FOODS | DANISCO, AMBU - CAPEX, GAMESA CORPN.TEGC. , BHP BILLITON, FLSMIDTH & COMPANY 'B', ROYAL UNIBREW, KAWASAKI KISEN KAISHA, FMC, SYMRISE, METSO, LAROX 'B', WAN HAI LINES, ANGLO AMERICAN, TATE & LYLE, GIVAUDAN 'N', CAMILLO EITZEN & CO, ASSOCIATED BRIT.FOODS, HYUNDAI MERCHANT MARINE, ROYAL DSM NV SPN.ADR 4:1, NIPPON YUSEN KK |
| Peers with the closest ***Industry*** | ROYAL UNIBREW<br>HEINEKEN<br>ANHEUSER-BUSCH INBEV<br>SABMILLER<br>MOLSON COORS BREWING 'B' | N/A | N/A |
| Peers with the closest ***Size*** | ATLAS COPCO 'A'<br>MERCK KGAA<br>BOSTON SCIENTIFIC - CAPEX<br>METSO<br>NOVO NORDISK | SABMILLER<br>COVIDIEN - CAPEX<br>ATLAS COPCO 'A'<br>MERCK KGAA<br>BOSTON SCIENTIFIC - CAPEX<br>METSO<br>NOVO NORDISK<br>HANJIN SHIPPING<br>KERRY GROUP 'A'<br>DSV | HEIDELBERGCEMENT, SANDVIK, NEPTUNE ORIENT LINES, SCHERING-PLOUGH, ROYAL DSM NV SPN.ADR 4:1, KAWASAKI KISEN KAISHA, MOLSON COORS BREWING 'B', SABMILLER, COVIDIEN - CAPEX, ATLAS COPCO 'A' , MERCK KGAA, BOSTON SCIENTIFIC - CAPEX, METSO, NOVO NORDISK, HANJIN SHIPPING, KERRY GROUP 'A' , DSV, TATE & LYLE, VESTAS WINDSYSTEMS, HYUNDAI MERCHANT MARINE |

See appendix 6 for a detailed example of the PG selection procedure.

Two of the 12 PG´s could not be produced, as there are only 5 peers among the 134 companies that are in the Food & Beverages (FB) business, in which Carlsberg operates. Other industries are Transport, Energy, Medicine and it is an impossible task to determine which of those are the closest to the F&B business. When comparing the potential peers on growth, the chosen peers are those with the closest average yearly growth rate over the past 20 years. The same counts for the PG´s constructed with peers chosen from profitability and size.

The creation of dataset for further analysis is conducted from average yearly development in each of the peers. These numbers are averaged or added to each other in the order a specific PG dictates. Danisco´s PG based on growth similarities and few companies i.e. contain five companies' fundamentals. These give an average number for each year for each fundamental. When averaging

five companies some analysts prefer to sales-weight them. The argument for weighting the peers effect on the PG average lies in the fact that the larger companies represent a larger part of the PG. By weighting the companies on sales, their contribution to the PG average depends on their sales volumes. The discussion of this has been dealt with in earlier parts and the choice is not tosales weight peers and thus each company represents one unit of the PG, affecting the PG averages similarly. This discussion is not the subject of any theoretical studies and therefore not supported by past statements regarding whether or not to weight the peers.

### 5.2.2 Statistical approach

Besides the visual overview, two statistical approaches are taken to emphasize strengths/weaknesses of results and fully cover the potential of the dataset. The first analysis implemented is correlation analysis. Correlation coefficients measure the degree of linear relationship among a set of variables. These coefficients are used to explain the direction and strength of associated variance of a sample mean. The correlation coefficient (r) between two variables is: $r = \frac{\sum_i (x_i - \bar{x}) * (y_i - \bar{y})}{n * s_x * s_y}$, where: $\bar{x}$ and $\bar{y}$ are the means of the variables x and y with the individual values $x_i$ and $y_i$, while "n" is the number of observations and $s_x$ and $s_y$ are the standard deviations of the distributions of x and y, respectively. The level of the correlation coefficient is always between -1 and 1. A negative correlation coefficient means that the two variables are inverse correlated and vice versa with positive correlations. The correlation is symmetrical in nature and independent of the origin and scale[67].

To asses linear relationships in a more complex manner focus is turned to regression analysis. With regression analysis, there is to some extent asymmetry in the way the dependent and the explanatory variables are treated. The assumptions of regression analysis is that the dependent variable has a probability distribution (stochastic), while the explanatory variables are assumed to have fixed values (non-stochastic) in repeated sampling. Correlation analysis does not distinguish between dependent and explanatory variables and both of the variables are assumed to be random[68]. The outcome from the regression analysis is more complex and offers the researcher a broader

[67] Gujarati (2003); p. 86-87

[68] Gujarati (2003); p. 23

framework to draw conclusions from[69]. With regression models, correlation coefficients are utilized to showing the direction and strength of the linear association between the dependent variables and the explanatory variables.

The more explanatory variables a linear regression model encompassed, the more complex it becomes in nature. No matter the number of explanatory variables, regression analysis deals with the dependence of one variable, the dependent variable, on one or more explanatory variables ($X_i$), with the purpose to estimating the mean value of the former in terms of the know or fixed values of the latter[70]. In this study, several multiple regression models will be constructed, implying that more than one explanatory variables is perceived to influence the respondent variable. These regression models take the following form:

Multiple linear regression model:

$$Y_i = \beta_0 + \beta_1 * X_{i1} + \beta_2 * X_{i2} + \beta_3 * X_{i3} + \mu_i ,$$

Where $Y_i$ represents the dependent variable, that is dependent on a number of explanatory variables, $X_i$. The β-coefficients are the slope of each of the explanatory variables and those to be estimated through the analysis. $\mu_i$ is the residual term and interpreted as the part of the dependent variable that cannot be described by a linear function of the explanatory variables. The β-coefficients build on the null hypothesis that β=0 meaning that the $X_i$ to come with it has not explanatory effect on the value of $Y_i$ and therefore could have been excluded.

Multiple linear regression models are followed by a number of assumptions that relates to the classical linear regression model, CLRM[71]. The models must be linear in the parameters and the x-variables (explanatory variables) must be no-stochastic; this was mentioned in the beginning of this chapter. A simple way to control this assumption is by plotting the X variables against the standardized residuals. The plot should be scattered around zero. Other assumptions relates to the residual term, $\mu_i$. The mean of the residual term, $\mu_i$, is assumed to be zero, given the value of $X_i$ meaning that $VAR(\mu_i) = \sigma^2, i = 1,...,n$. This means that the residuals are expected to be distributed

[69] http://dss.princeton.edu/online_help/analysis/interpreting_regression.htm

[70] Gujarati (2003); p. 18

[71] Gujarati (2003); p. 65

with equal deviations around the CLRM and to be independent of $X_i$. In contrast, if the residuals are not distributed randomly giving a mean of zero, the regression is exposed to *heteroscedasticity*[72]. Controlling for *heteroscedasticity* can be done by plotting the residual terms against the Y-values. Again, the plots should be scattered around zero. Another assumption also dealing with the residual term is *no autocorrelation*. *No autocorrelation* means that $COV(\mu_i, \mu_j) = 0, i \neq j$, implying that the value of a given $\mu_i$ must not rely in any way to the rest of the residual terms. Controlling for this is done by plotting the residual terms against time. Plots should be scattered around zero. The assumption of *no autocorrelation* will only be relevant if dealing with time-series analysis. In addition the CLRM assumes that the residual terms are normally distributed, this means: $\mu_i \sim N(0,\sigma^2)$, i=1,…,n.

One last assumption that is noticeable is the assumption of *no multicolinarity* (MUCO). If MUCO is presents it means that the explanatory variables to some extend is correlated. There are several ways to test for MUCO. One could make a model that regressed one X variable on the remaining X variables to see if there is a linear relationship. This referred to as an *auxiliary regression*[73]. Another way to detect MUCO is to notice if the $R^2$ is high, but the beta parameters are very insignificant (low p-values).

### 5.2.3 Expectations prior to results

Some analysts claim to have a unique understanding of the psychological mechanisms of the stock market while others believe they are capable of spotting market trends ahead of their competitors. Some just argue they read and analyse company reports and management interviews superiorly to others. Whatever the strength of the analyst is he or she has to prove themselves on a weekly basis with stock recommendation reports. The leading analysts who´s recommendation are the closest to the truth, believe themselves to be edge possessing to others; some believes it's just pure luck, depending on how one perceives market efficiency. Whatever one's opinion is, it is certain that they operate under tough circumstances. All information available stems from the past and the approaches and frameworks to analyse the information is infinite. In addition, the market is

[72] Gujarati (2003); p. 69

[73] Gujarati (2003); p. 361

assumed to be of semi-strong[74] character which means that all publicized knowledge is included in the stock prices. It is not expected that input forecasting through development in PG numbers an efficient method. Neither is it expected that valuation through PG based multiples will prove to enable analysts to estimate future multiples correctly. In the first case we should recall the delimitations[75]. The scope of this report focuses on the performance of PGB and not the direct effect and success on the stock market. If market is of semi-strong character and PGB show to be a efficient tool for forecasting fundamentals, then it is expected to be used by enough analysts to be incorporated in the market prices. Results from using PGB as recommended by S&C are expected to outperform the application preferences found in the interviews. The financial industry is a global business, and it would not be expected to see local trends of PGB use outperforming the recommendations originated from global tests. These expectations should not be interpreted as critic of the analysts, rather recognition of the complex task in which they are engaged.

### 5.3 Effectiveness of forecasting fundamentals using PGB

The process of forecasting fundamentals is an extremely important part of using cash-flow based valuation models. Estimating future growth, risk and profitability is key elements in reaching the true values of stocks. In chapter two it was seen that the majority of the analysts on the Danish stock market prefer the DCF model in the valuation process. Furthermore, chapter three showed that the majority of the analysts (76%) apply PGB often or very when forecasting the input fundamentals for their valuation models. The preferred theoretical paradigm "*who is my peer"* by S&C in chapter 4 suggested PG selection based on financial similarities rather than industrial, which is currently the most disseminated selection criteria on the Danish market[76]. The investigation to come, seeks to find out how good a measure of future financials, forecasting through PGB is. The findings from S&C regarded multiple valuation, yet it is applied when forecasting company fundamentals in this chapter. The reason behind this, is that the fundamentals investigated are extremely important input variables in the EV/Sales multiple and thus, when the theoretical findings showed increase in efficiency when choosing comparable companies based on these, this is expected to be applicable her as well. In addition the investigation will also compare several PG performances to determine

[74] Chapter 4

[75] Chapter 1

[76] See chapter 15 page 31

which of the selection criteria performs the best. Finally the analysis of empirics deals with the variation in the behaviour of PG´s of different sizes (5,10,20 peers).

### 5.3.1 Data characteristics

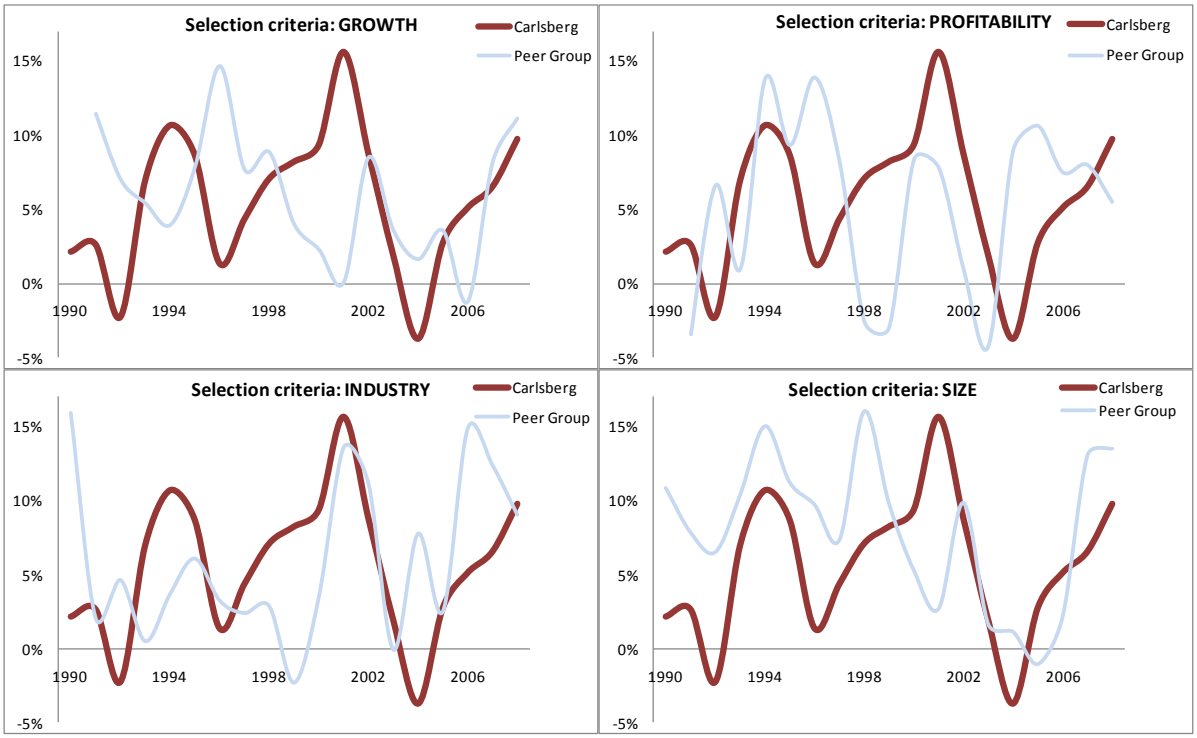
Recall, that when analysts forecasts fundamentals using PGB they apply the average annual growth rate for the past 5 years of the Peer Group as the growth rate for the years to come for the target company. When computing a dataset to test the effectiveness of applying that method it has been necessary to create YoY[77] growth rate numbers for each of the peers in each of the PG´s. The respective PG´s average 5-year growths are then calculated from the latter. The time perspective is very important in this investigation, as the calculations seeks to show comparability between the PG´s average growth in period $t_{-5}$ to $t_0$ and target company´s growth rate in period $t_{+1}$. In other words, the dataset compares the past five years´ annual average growth rate of the PG´s with the growth rate in first year to come for the target company.

### 5.3.2 Visual overview

The first plot to look at is a simple graph showing the behaviour of growth rates in sales between one of the target companies, Carlsberg, and its 4 PG´s. Intentionally this should show how the growth in sales corresponds with the PG´s chosen on the 4 selection criteria: Growth, Profitability, Industry and size. The PG of companies with similar growth in sales could be expected to be behave most alike the target company, nevertheless, the PG is based on similar average growth in the period 1998 – 2008 and the behaviour in each year easily differ.

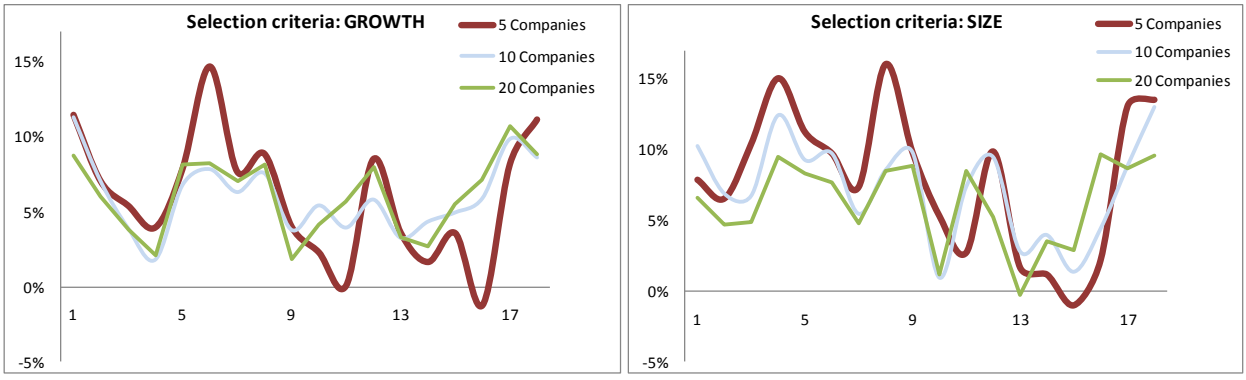
[77] Year On Year

Figure 28: Annual Sales growth rates; Carlsberg Vs. PG´s




None of the PG´s growth rates in sales follows that of Carlsberg to any particular degree. Thus, the scatter plots do not confirm general similarities in movements between the target company and its PG´s. Neither do there seem to be any of the PG´s moving more or less alike the target firm. The data implemented in the above figures has not been consolidated in the matter explained in data characteristics constituting only a visual overview. None of the other 8 target companies show movements reviling more than figure 28. The PG´s constructed for the above figure all consists of 5 companies. The following figure shows the behaviour of similar based PG´s with 5, 10 or 20 companies.

Figure 29 Growth based PG´s to Carlsberg.

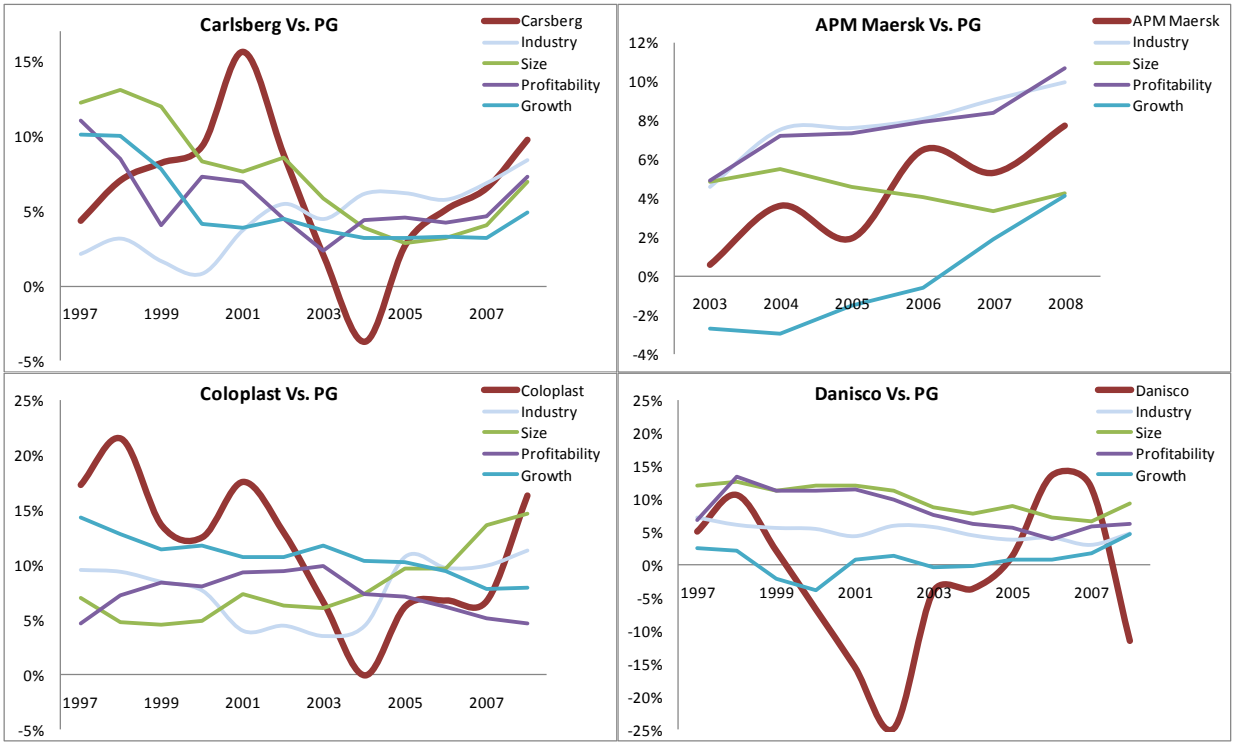



The graphs show the expected. The more companies the less fluctuation. Recognize the fluctuating behaviour of the red line representing the PG with 5 peers. This PG is holding only the closest

comparables and is often the most precise. On the other hand it is sensitive to fluctuations in each peer. Which PG strategy to apply is very much dependent on the risk aversion of the analyst. The risk aspect consist of the fact that valuation input has a higher risk of being exposed to extraordinary circumstances, and thereby very wrong, but it also has a chance of being very close to the truth. A second aspect is the time consumption. Fewer peers require fewer hours of work. The majority of analysts preferred few companies[78] which correspond with earlier discussions of the miss-match in the incentive structure of investment banks. A more fluctuating PG (holding fewer peers) could result in controversial estimates which could encourage clients to trade.

Before turning to the correlation analysis a scatter plot of the consolidated date is provided. Recall the construction applied from Data characteristics[79]:

Figure 30 – Growth rates in Sales; lagged PG averages Vs. Target Companies´ current.




The plots above show similarities in the movements to a degree far better than when just plotting the yearly growth in sales of target companies vs. PG´s. From top left corner to the down right, the figures are placed with the best fit first. Carlsberg show great comparability in the years 2005 – 2008 meaning that in this period, forecasting fundamentals through PG´s has made good sense. All

[78] Chapter 14 page 30

[79] Chapter 5 page 51

of the PG´s show great trends in this respect, with the best fitting being the industry-based PG (blue line). APM Maersk experiences the same similarities, but in its whole period between 2003 – 2005. Data before 2003 does not exist due to its business development[80]. Except from the Size-based PG the general increase in growth rate is captured with the industrial- and profitability-based PG´s being the closest match. The general impression with the target companies in figure 30 is that the defined organic growth rate has not captured all revenue disturbing one-off gains or losses. All 4 target companies show a degree of fluctuating behaviour which one could suspect not to stem from organic growth.

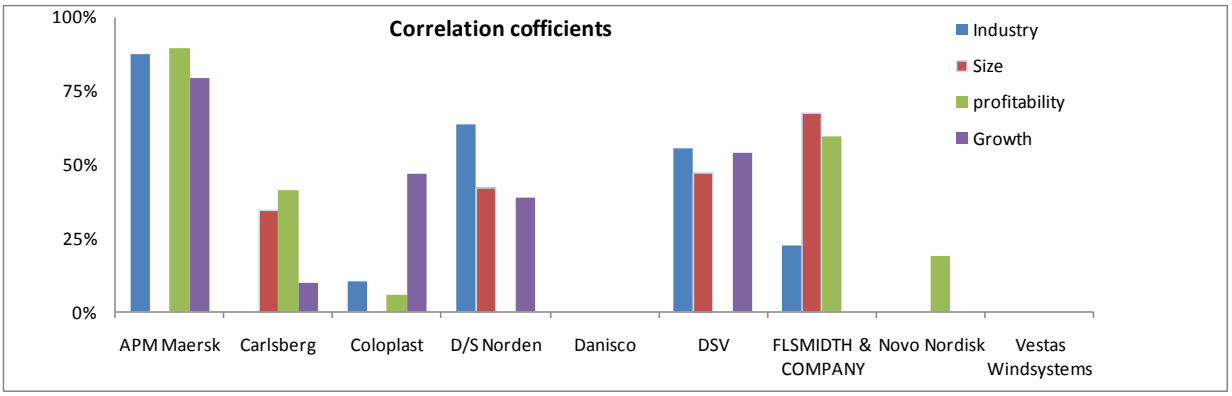
The visual overview and specially figure 30 generally proves two points; 1) The PG´s based on industry have slightly outperformed other PG´s with regards to forecasting fundamentals on the Danish stockmarket and 2) the statement earlier with regards to the number of peers to include seems very fair, as figure 29 page 57 showed that the number of peers and the variance of results are inverse proportional.

### 5.3.3 Test of correlation

From the statistical approach recall that the correlation coefficient is always between -1 and 1 each representing exact linear or inverse linear relationship among two variables. In this case negative correlation coefficients will be ignored both analytically and graphically. It makes absolutely no sense that yearly sales growth rates in a given company should correlate negatively with the average growth rate for the past 5 years of its PG´s. Negative correlation coefficients will be interpreted as random fluctuations, caused by the nature of the data, but the fact that they are not positive will be interpreted as a sign of hypothesis 1 being true. Thus, the analytical approach distinguishes between either positive correlation coefficients or no positive correlation. In the graph to be shown, negative correlation coefficients have therefore been set to zero in order to keep the graph targeting what is important: the degree of positive correlations:

[80] See www.maersk.com for more info

Figure 31 – Correlation coefficients between target company and PG sales in the period 1997-2008. See "Data characteristics" for further elaboration on the constructed dataset for this graph.



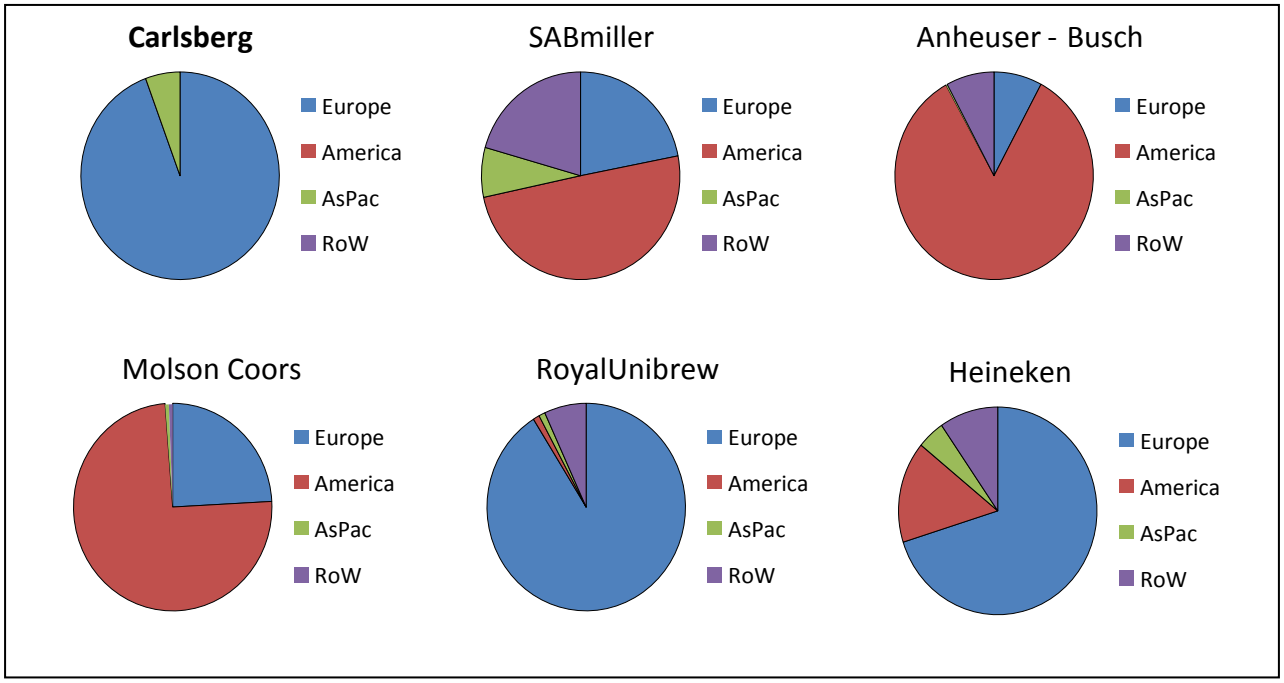

APM Maersk show surprisingly high correlation coefficients with all of its PG´s except for the size-based. The profitability-based PG´s show an impressing 89% of linear alignment, with both the industry- and growth-based PG´s being close. In chapter three it was shown that a majority of the analysts preferred the industry-based PG´s while S&C in chapter four explains arguments for choosing financial-based PG´s. With a company under heavy speculation as is the case with APM Maersk it is interesting to see that PG´s constructed under the recommendations of S&C slightly outperforms the constructions used by the analysts engaged in daily coverage of the stock. The results from the correlation coefficients and the consolidation of the data applied by ahead of the analysis constitute a truer picture of reality, as the visual analysis only is what the name prescribes. The visual overview showed that the movements between target companies and the PG´s were most alike when the peers were chosen based on industry, yet because of the correlation analysis´ superiority in comparison to the visual overview, we believe in the last finding of profitability based PG´s to be the best. There is huge uncertainty following the results and the outcome bears the mark of that. The profitability-based PG´s outperformance of the industry-based is thus a fact and an interesting yet uncertain found. There are no business characteristics that imply the results above as APM Maersk is a large conglomerate. With the core business being fleet transportation APM Maersk operates in other businesses such as Banking, retail, fast moving consumer goods and oil drilling. The core business´ sales is dependent on fleet rates measured in USD/TEU[81] and oil prices and not exposed to as heavy fluctuations as it is with other businesses. The high correlation coefficients between APM Maersks sales in the year going forward and the average of the previous five years of its PG´s is therefore not surprisingly the best fit of the 9 target companies. Instead the

[81] TEU: Twenty feet Equivalent Unit

level of correlation has to a large extend exceeded the prior expectations of them being positive, but low.

Carlsberg supplies a simple product in comparison to i.e. medicine, electricity, etc. which are exposed to numerous externalities and risk factors. Despite this fact, Carlsberg show surprising results with the industry-based PG having no positive correlation. Due to the simple nature of the product that Carlsberg supply the expectations to the correlation coefficients of Carlsberg and its PG´s where among the highest of the 9 target companies. The profitability-based PG shows close to 50% linear alignment which is very much in accordance with prior expectations. The reasons for the industry-based PG showing no positive correlation could be found in the constellation of the PG. Analysts generally believe in the industry-based PG because of the fact, that the peers it encompasses operates on the same markets and therefore are exposed to the same risks, supply-demand challenges and other external facts as the target company. In the following figure a geographic breakdown of sales show what could make the industry-based PG unreliable:

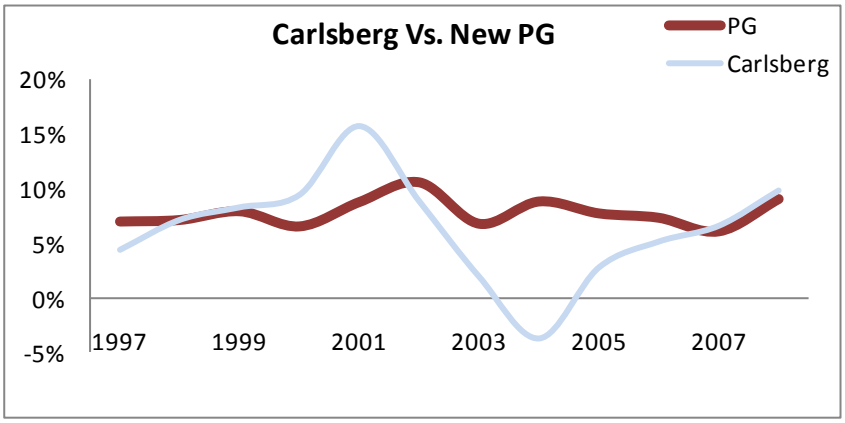
Figure 32 – Sales break-down in regions; Europe, America, AsPac (Asian Pacific) and RoW (Rest Of the World). 2006 numbers.




The figure shows that 3 of the 5 peers to Carlsberg (SABmiller, Anheuser-Busch and Molson Coors) have allocated the majority of its sales outside of Europe, obviously due to the companies' American origin. To investigate the consequence of their presence a new industry-based PG is constructed. The new PG only contains the two peers, Royal Unibrew and Heineken, as they operate mainly in the same regions as Carlsberg. The findings are interesting. From negative

correlation in the "old" industry-based PG, the "new" PG showed a positive correlation coefficient of 18%. Graphically this is what it looks like:

Figure 33 – Carlsberg and the new PG.




The "new" industry-based PG corresponds better visually and shows positive correlation. With regards to expectations[82] this is more in line. Little, but positive correlation and some visual similarities. The case with Carlsberg shows why many theorists dislike choosing peers based on industry. Despite being in the same industry, peers might be operating in other regions, and thus exposed to different externalities.

In three of the target company´s cases, little or no positive correlation has shown. The companies are: Danisco, Novo Nordisk and Vestas Windsystems. The characteristics of their products cause sales to be unreliable and heavily dependent on governmental approving, legal rights, etc. Danisco is an exception, as their end market is food & beverages; nevertheless Danisco has been subject to heavy M&A activities[83], which have had an effect on the numbers above. Despite this, analysts still apply PGB in order to forecast the company´s sales and other fundamentals. From this investigation it is concluded that there is a high risk, that appliance of PGB in these cases makes no sense no matter what criteria the PG´s are based on.

The last four companies are in between the first and second. Coloplast, DSV, D/S Norden and FLSmidth show varying correlation coefficients. The products they supply are different but similar in the sense that they are not exposed to as high revenue risks/fluctuations as is the case with the second group treated. In three of the four cases the growth-based PG performs well with correlation

[82] Chapter 5 page 53

[83] Divestment of sugar department in 2006; www.danisco.com

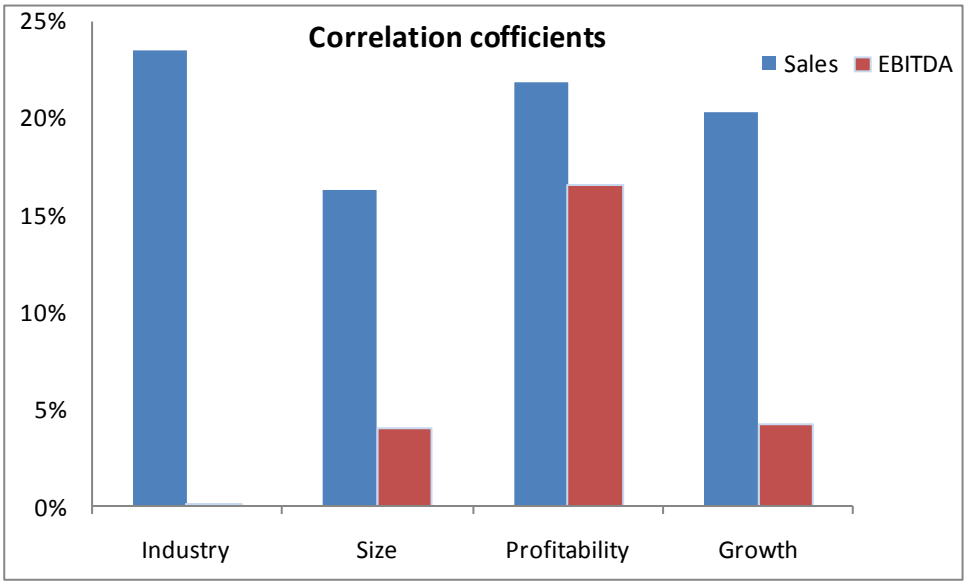
coefficients in the range of 30%-55%. The same is the case with the industry-based PG which in three cases performs correlation coefficients in the range of 25%-75%. The profitability-based PG shows a 55% positive correlation with FLSmidth. The numbers in this third category of companies are generally doubtful. It underlines the probability of PGB use being heavily dependent on the industry in which the target company operates. The PG based on size show impressing correlation coefficients in some cases which is surprising giving the fact that none of the prior studies recommended it and that it was the analysts second choice. The fact that the size-based PG showed negative correlation coefficients with APM Maersk could be a sign of uncertainty implying that positive correlation in a few cases of the size-based PG is only a result of "data noise". Recognizing the uncertainty associated with the investigation, this positive correlation in some of the cases is not given any particular credit.

In general, the correlation coefficients of the 9 target companies´ growth rate in sales of a current year and the PG´s average past five years showed reasonable results. In some cases, i.e. APM Maersk, the PG´s showed very high correlation coefficients. Other companies showed lower correlation coefficients with certain PG´s than expected and possible explanations for this could be the constructions or characteristics of those specific companies encompassed in the model. Companies with revenues that depend heavily on external factors showed the worst correlation coefficients which did not come as a surprise. The investigation of the constructed correlation coefficients proved three important points. First of all, forecasting fundamentals through PGB is associated with very high uncertainties. Based on the investigation it is not recommended to apply PGB as a stand-alone measure and one should be aware of the huge uncertainties associated with such a risky measure. Secondly, when applying this tool the peer-picking task is important. One case (Carlsberg) has shown possible gains of being thorough when choosing the companies for the PG. Finally, correlation coefficients show such a high variance, that the above results do not indicate strong signs of efficient appliance. Despite this, it is important to keep the alternatives in mind. Guessing future sales and other fundamentals is hard and there are no real alternatives, besides the obvious implementation of company prospects and related public material.

A look at how the correlation coefficients perform on average across the 9 target companies is provided to state which peer picking method in general is the best. The average performance of

PG´s overlooks the fact that industry and company specifications play a role and thus only provides an overview.

Figure 34




The PG´s sales show a 15%-25% correlation with their target companies which is much in line with expectations. As it was seen earlier, some companies show very high correlations while other very low or negative correlation. In estimating future sales of a target company, the industrial similarities among the peers results in the most accurate PG model, relatively to the alternatives. Looking at the average correlation coefficients when estimating EBITDA the numbers are weaker. This could be due to the uncertain nature of the fundamental. The profitability-based PG performs best when using the EV/EBITDA on the Danish stock market but the general low levels of the average correlation coefficients makes us trust more in the outcome from the EV/Sales multiple.

### 5.3.4 Modelling Peer Group Benchmarking

The procedure of modelling PBG seeks to create regression models in which the PG´s are the explanatory variables and the target firms are the dependent variables. The concept is in many extents similar to the one used by Sanjeev Bhojraj and Charles M. C. Lee[84]. From the visual overview and the correlation analysis the 4 PG´s are rated in order to see which explanatory variables fits the target companies the best. The explanatory variables´ order of performance are

[84] See chapter 4.2

argued with starting point in the two previous investigations and not to any point directly proved. This does not play an important role, as they are each implemented in the regression model, but in the order found. When adding the PG´s, starting with the "worst" first, the development of mainly three parameters will be observed:

- P-values: The *p-value* measures the exact probability that the *null hypothesis* is true, in this case the *null hypothesis* is $H_0$ : $\beta(x) = 0$ and thus $H_1$: $\beta(x) \neq 0$.
- Adj. $R^2$: Adjusted $R^2$ shows the correlation coefficient between Y and the explanatory variable(s).
- β-values: The $\beta$ value represents the slop and effect on the dependent variable and the sign of $\beta$ is of particular interest.

From figure 34 page 63 the average correlation coefficients showed that the worst fitting on average of the four PG´s was the Size-based. After the size-based came the growth-based, the profitability-based and finally the industry-based PG, that showed the best match. Taking industry and company specifications into account, the profitability-based PG was believed and argued to be the best, yet the starting point is the average correlation coefficients implying the industry-based to be the best. In this respect, four models have been constructed:

Model 1: $Y_i = \beta_0 + \beta_1 * X_{i1} + \mu_i$

Model 2: $Y_i = \beta_0 + \beta_1 * X_{i1} + \beta_2 * X_{i2} + \mu_i$

Model 3: $Y_i = \beta_0 + \beta_1 * X_{i1} + \beta_2 * X_{i2} + \beta_3 * X_{i3} + \mu_i$

Model 4: $Y_i = \beta_0 + \beta_1 * X_{i1} + \beta_2 * X_{i2} + \beta_3 * X_{i3} + \beta_4 * X_{i4} + \mu_i$, Where β1 is the Size-based PG, β2 is the Growth-based PG, β3 is Profitability-based PG and β4 is the Industry-based PG while the $\mu_i$ is a residual term, which represents the part of the respondent variable that cannot be described by a linear function of the explanatory variables. $Y_t$ is the dependent variable, and thus the target company.

Running these four regression models and studying the regression output and its development, as the PG´s are added as explanatory variables, should show in which form PGB performs the best on the Danish stock market; yet there are various uncertainties. As the data available amounted to 20 years back in time, the number of observation is limited to relatively few. Because of the fact that the explanatory variables are 5-year averages the first observation starts in 1997, meaning that the

regression analysis is based on only 12 observations. One could have included more, but as this investigation strives to extract information on the role of PGB in the *modern* investment society, it is beyond the scope to go further back in time. In addition, there is the definition of organic growth from the data characteristics. This will play a role, not because it omits some observation but rather because it does not capture all model-disrupting observations. Eliminating outliers beyond what the organic growth rate does, could expose the investigation seriously to data manipulation, and is therefore avoided. The output is summed in the following figure, to see the actual outcome from the regressions, turn to appendix 3.

Figure 35 – Regression output to Coloplast and four explanatory variables.

| | | 1 Variable model | 2 Variable model | 3 Variable model | 4 Variable model |
|---|---|---|---|---|---|
| | Explanatory Variables | Size-based PG | Size-based PG<br>Growth-based PG | Size-based PG<br>Growth-based PG<br>Profitability-based PG | Size-based PG<br>Growth-based PG<br>Profitability-based PG<br>Industry-based PG |
| Statistic Parameters | P-value | 0,60 | 0,35<br>0,13 | 0,11<br>0,04<br>0,13 | 0,32<br>0,21<br>0,86<br>0,10 |
| | Adjusted R-squared | -0,07 | 0,09 | 0,25 | 0,44 |
| | Beta Coefficient | 1,09 | 1,91<br>0,91 | 3,82<br>2,15<br>-3,68 | 2,15<br>1,25<br>-0,47<br>1,34 |

On the left side there are three statistical parameters. On the top of the figure, the four models´ explanatory variables are highlighted. Starting from the bottom with the beta coefficients, the first important thing to notice is the sign of the parameters. The majority of the coefficients are positive. Positive Beta coefficients means, that when the explanatory variable growth, the value of the dependent variable grows. In this case, a positive beta coefficient means that if the growth rate of a PG increases, so does the target firms; in this case Coloplast. Surprisingly, the profitability-based PG show negative signs in both the 3-variable and 4-variable (-3,68 and -0,47, respectively) regression models that it is implemented in.

All the P-values indicate insignificant β´s on a 0,05 significance level, except from the growth-based PG in the 3 variable model. The high P-values underline the fact that the results are very

uncertain. The second lowest P-value is the industry-based in the 4 variable model, which is significant on a 0,10 significance level.

The most interesting part of the regression output is the development of the Adjusted $R^2$. This parameter represents the correlation coefficient of the dependent and the explanatory variables, adjusted for the number of explanatory variables. For each variable added, the Adjusted $R^2$ increases. Starting with the worst PG´s from the average correlation analysis it was expected that the Adjusted $R^2$ would increase even after adjusting for the number of explanatory variables. When adding the two best correlated PG´s the 2 variable model goes from an Adjusted $R^2$ of 0,09 (9%) to 0,44 (44%) in the 4 variable model. This is a serious development in the figures and a good argument for these two PG´s to be the best-performing.

The regression model output sums up the findings regarding efficiency of PGB when estimating future financials on the Danish stocks. Peers within the industry raises the level of significance from results. The Danish analysts who vow to this measure when picking peers are from these findings not proved wrong. Nevertheless, the profitability-based PG´s have throughout the empirical analysis proved to be rather close and in some cases outperforming the industry-based PG´s.

The overall findings from the analysis proved 4 points. First of all, the theoretical foundation applied from S&C did in general prove to be efficient, even though it was constructed on basis of multiple valuation. Throughout the analysis the growth-based and the profitability-based PG´s have showed correlation coefficients and visual similarities both close to and higher than those of the industry-based PG models. Secondly, the number of peers included in the model showed the expected effect; the more peers the less fluctuating results. As mentioned it is a subjective matter to decide how many to include, as the PG with few peers compensate for the higher risk with results having a higher possibility of being true. Thirdly, the overall degree to which the PG´s were efficient in forecasting fundamentals was higher than the expectations. Recall hypothesis 1) *"PGB is an inefficient tool in valuating Danish companies"*. With regards to forecasting fundamentals we *reject* hypothesis 1. PGB *is not* considered to be an inefficient tool when forecasting sales of Danish target companies. Correlation coefficients between lagged PG´s and the respective target companies showed levels which supports arguments for applying them. The results in addition showed that one must be extremely cautious when applying them, as non-organic growth rates and other disturbances constitute a serious danger to the results. Besides the discussion of which foundation to

base the peers on, examples with Carlsberg, showed that the thorough analyst can benefit from being careful in picking peers, no matter what method he/she uses. Finally, hypothesis 2) *Choosing companies based solely on similarities in the industry in which the target company operates is an inefficient approach to forecasting fundamentals and valuating companies with PGB* is *accepted.* In a competitive market it is required to be sharp in the construction of PG´s if one want to avoid misleading clients. As the findings from this chapter proved that peers based on similarities worked equally well as the industry-based peers it would be an inefficient PGB approach to choose peers based solely on industry.

### 5.4 Effectiveness of relative valuation using PGB

The test of the effectiveness of relative valuation through PGB on the Danish stock market takes starting point in earlier examinations. From interviews with the Danish analysts chapter 2 proved that multiple valuation is the 2nd most frequent valuation approach on the Danish stock market. Furthermore chapter 3 showed preferences for picking peers within the same industry as the target company. In chapter 4 S&C found that multiple valuation works most efficiently when peer picking procedures encompasses similarities in growth rates and profitability. Therefore the investigation to come seeks to show how efficient PGB is overall and in the various extends preferred by analysts and S&C.

The objective with investigating the match of target companies´ multiples and their PG´s, is to show the degree to which they have behaved alike over time. Knowing that the nine Danish companies in general have identical multiples as their respective PG´s supports the analyst´ case of using them as direct valuation models. If the results, against prior expectations, show that the nine Danish companies have had close to identical multiples as one or more of the constructed PG´s, it is likely, but not sure, that one could profit from this in the future. This would mean, that if a target company deviates from its PG one could, on the long run, profit from either buying or selling shares, depending on the PG multiple being higher or lower than the target company´s.

#### 5.4.1 Data characteristics

The following investigation seeks to show how well, relative valuation through PG´s has performed on the 9 Danish target companies for the past decade. In doing so, data has been collected and consolidated for analyzing the subject. Three multiples have been generated for both

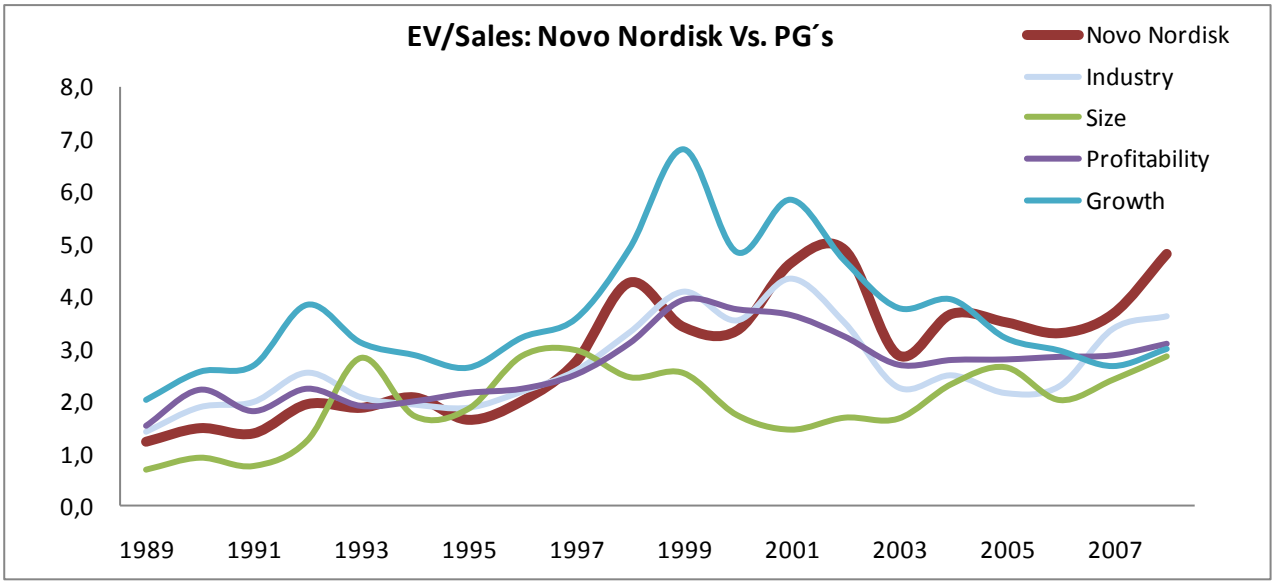
the target companies and the 125 peers: EV/Sales, EV/EBITDA and EV/Net profit. The target is the same with all three multiples. To show how successfully an analyst can apply a PG´s multiple on a target company to extract its corporate value. In contrast to the financial fundamentals, these multiples are not lagged or averaged over time, as the investigation wish to show how precisely the PG multiples can be transferred directly to the target companies to achieve a fair value.

All three multiples are entity multiples and not equity multiples, meaning that in the nominator of the multiples both the value of equity and debt is encompassed. Entity valuation multiples are generally less affected by different capital structures among the comparable firms. The reason behind this is the fact that if two companies with different capital structures and identical earnings are compared on the P/E multiple, noise in the nominator can occur. The fact that one company has a higher debt to equity ratio than the other would decrease the market capitalisation of equity of that company, and thus result in a smaller P/E multiple. This, however would not be a good argument for this company to be under-priced, but rather an example of the P/E multiple not encompassing the role of the debt efficiently. On the other hand, estimating the market value of debt adds noise to the estimation of entity value multiples, yet it is not considered as large as with the equity value multiples.

### 5.4.2 Visual overview

The first graph to give an illustrative overview of the similarities in movements between a Danish company´s multiple and its PG´s is based on the medicinal company, Novo Nordisk. The revenues of a medicinal company are believed to be fluctuating by nature, as mentioned earlier. When dealing with multiples, this is often not the case, as the level of the Enterprise value (EV) and Sales develop somewhat accordingly. Figure 36 show the case of Novo Nordisk and its 4 PG´s.

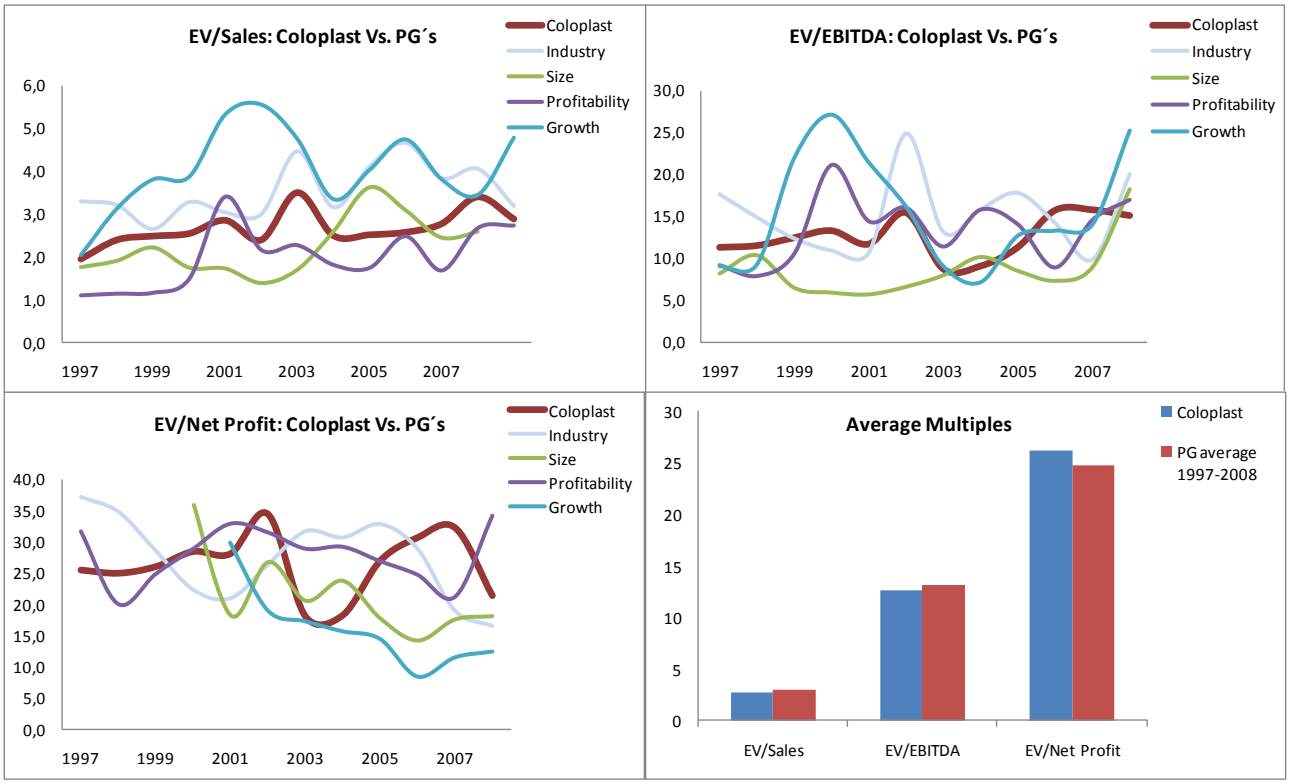
Figure 36 – EV/Sales of Novo Nordisk and 4 corresponding PG´s.




It stands clear that all of the PG´s in Novo Nordisk´s case show identical multiple levels as Novo Nordisk. From the graph it seems the best performing PG is the industry-based. From the graph it seems that the year 2008 shows a significant outlier as the EV/Sales multiple for Novo Nordisk is 5,0 while the PG´s is in the range of 2,8 – 3,5. There could be many explanations for this. New company specific circumstances lowering the operational risk of the business could explain why Novo Nordisk trades at 5 times its Sales, rather than in the range of its PG´s. Also, future company specific expectations of growth and profitability could raise the enterprise value in relation to the company revenues. Finally, Novo Nordisk could be overpriced. If the EV is proportionally higher than its sale when compared to the PG´s it could be argued that Novo Nordisk is too expensive. Hence, the analyst could use this figure as an argument for a "sell" recommendation.

One more figure will provide an overview of the data movements. Coloplast is a Danish company operating in the medicinal equipment business and its EV/Sales, EV/EBITDA and EV/Net Profit is plotted against its PG´s and in the last figure the averaged multiple is emphasized to show how the PG´s on average trade compared to this target company.

Figure 37 - Multiples of Coloplast Vs. PG´s.




All of Coloplast´s PG´s move more or less in accordance in all of the three multiples. In addition, the sum-up figure shows that each of the multiples on average fits Coloplast´s. From plotting the past years´ multiples the tendency is close match overall. Both of the examples have proved similar levels on average and also similarities in the movements over time.

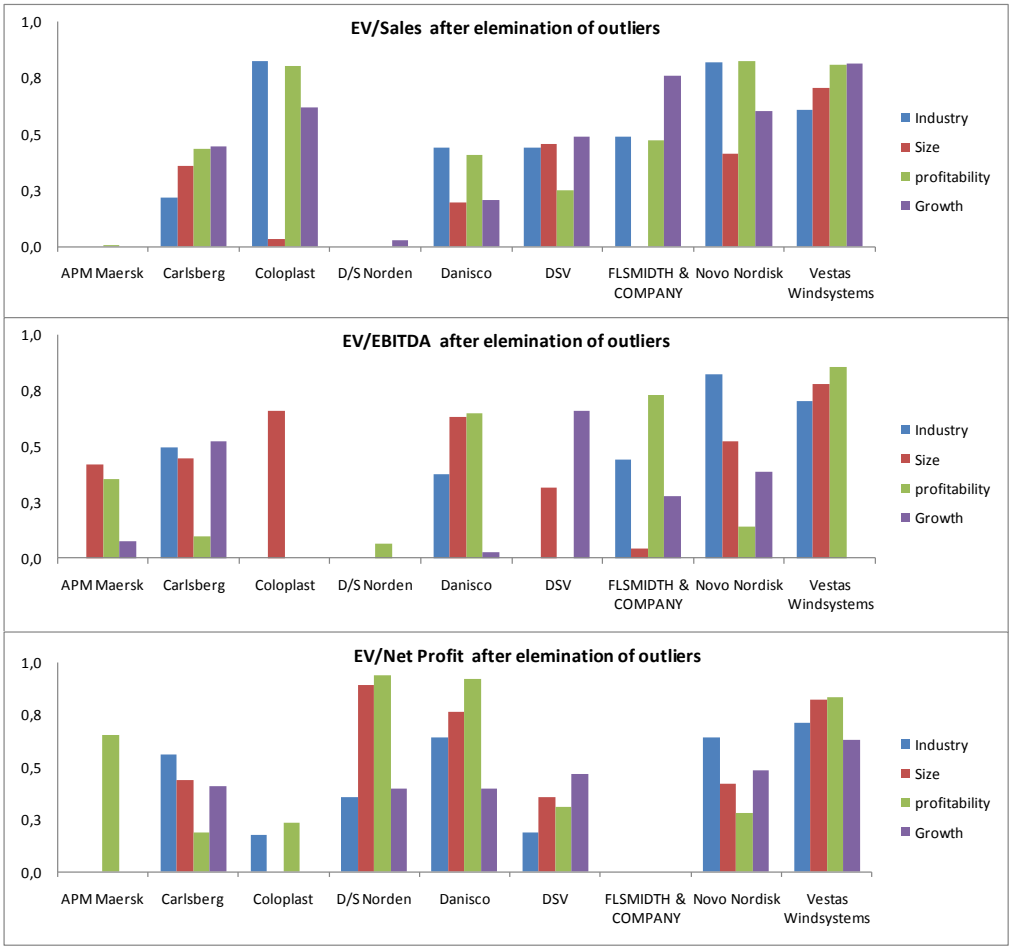
If relative valuation is efficient, and the Danish market competitive, then the multiples of the peers and target firms will adjust over time, meaning that if a company trades at a lower multiple in i.e. 2000 relatively to the peers, then the market is expected to adjust trading the company upwards. To see if this is the case on the Danish market, 5 figures[85] showing the EV/Sales multiples in the period 2004 to 2008 of APM Maersk and its peers were constructed. The figures generally show that 2 of the three peers to APM Maersk consistently are trading on below average multiples. This indicates that one cannot profit from buying stocks in companies with low multiples relative to its peers.

[85] See Appendix 7

5.4.3 Test of correlation

Correlation coefficients describe movements in the data set. From the visual overview it was showed that the level of the target companies and its PG´s are close. Further investigation applying correlation analysis, is implemented to show how well the movements between a Danish target company and its PG´s multiple are alike. The following figure shows the target companies and their PG´s correlation coefficients on 3 multiples: EV/Sales, EV/EBITDA and EV/Net profit, after elimination of outliers.

Figure 38 – Multiples of Danish target companies and the PG´s, after elimination of outliers




The results differ among the target companies. Novo Nordisk´s correlation coefficients are relatively high in all the 3 multiples. This is in accordance with what was found in the visual overview, where the multiples showed movements much alike over time. Vestas Windsystems also show extremely high correlation coefficients with all of its PG´s. In contrast hereto, APM Maersk has no positive correlation with any of its PG´s in the EV/Sales multiple. Uncertainty is a possible explanation and the fact that they differ in movements not necessarily mean they differ in general

levels of the multiples. The following figure proves this point as it shows APM Maersk EV/Sales multiple´s level in the period 2004 – 2008.

Figure 39 – EV/Sales multiple of APM Maersk Vs. PG´s.

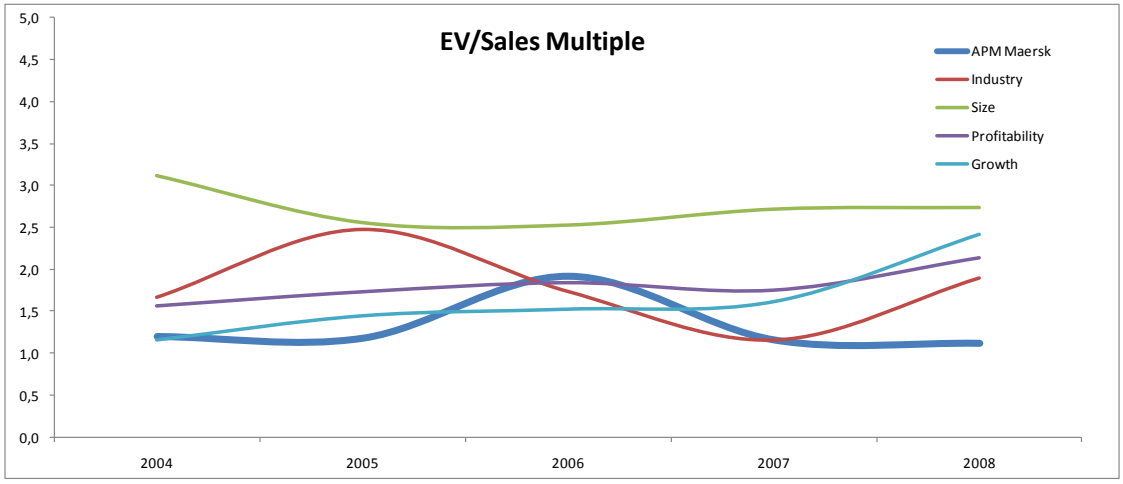



Figure 39 shows, that despite no positive correlation coefficients between the target company and its peers there still can be a good match in the levels at which the companies trade. With APM Maersk, this figure could be an argument for multiple valuations to be a good supplement to the cash-flow based valuation models as they over the past five years have traded at reasonable similar levels. On the other hand, one should be aware of applying PG movements in the multiple directly to APM Maersk, as the past have not shown such. The figure and the correlation coefficients acknowledges the method, yet warns against over-applying in terms of drawing any conclusions based on movements in the PG used.

To determine which PG performs the best according to correlation analysis average correlation coefficients for the PG´s have been computed.

Figure 40 – Average correlation coefficients between 9 Danish target companies and their respective PG´s multiples.

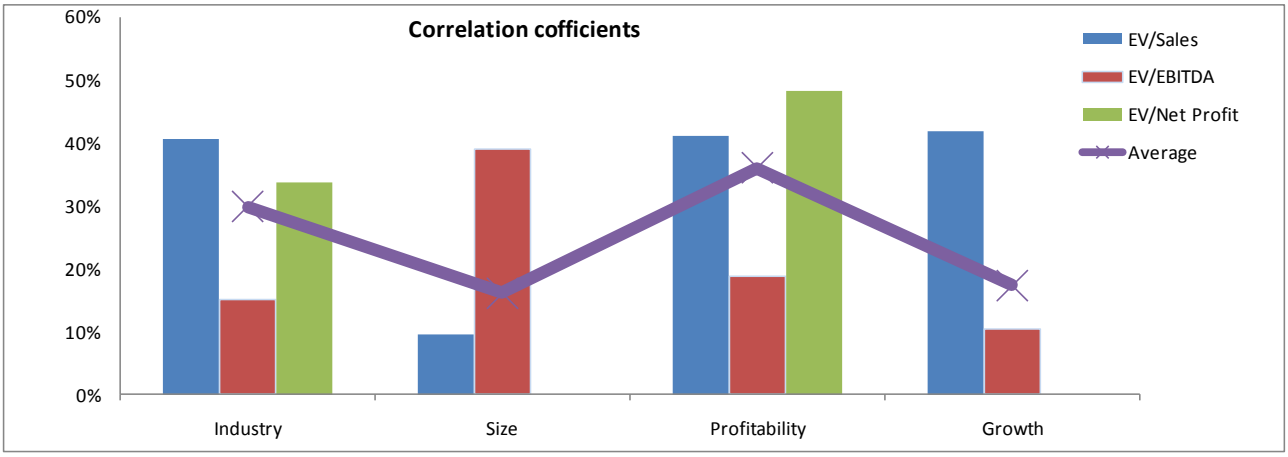


Figure 40 shows the top two PG´s with regards to general multiple movements, to be the industry- and profitability-based. The average correlation coefficients of the profitability-based PG´s were slightly higher than that of the industry-based underlining the point of S&C regarding the importance of similarities in the financials.

In the initial part of this report, McKinsey on Finance were quoted with their latest take on multiple valuation approach[86]. Having generated a local investigation of 9 target companies and responding peers, it is interesting to see that the figure actually corresponds with both the statements from McKinsey on Finance from chapter 3.5, but also with what was recognized in the theoretical approach-chapter of S&C; that collecting peers with identical financials is a key element to success. Having said that, the second best performing PG is in fact the industry-based which supports arguments from analysts, of the supply-demand role in an industry, to be of high importance when applying multiple valuations.

### 5.4.4 Modeling Peer Group Benchmarking

In the following, PGB is treated with the purpose of constructing a linear regression model, which describes a target company´s multiple through a range of PG´s multiples. The procedure is the same as when modeling PGB in the financial forecasting section. From the theoretical chapter recall this quote, underlining one of the most important findings in the article "Who Is My Peer?" by Sanjeev Bhojraj and Charles M. C. Lee: *"Specifically, we argue that the choice of comparable firms should be a function of the variables that drive cross-sectional variation in a given valuation multiple. For example, in the case of the enterprise-value-to-sales multiple, comparable firms should be selected on the basis of variables that drive cross-sectional differences in this ratio, including expected profitability, growth, and the cost-of-capital."*.[87] In the discussion of the following regression output this particular statement will be referred to, as it represents the theoretical foundation applied with regards to peer selection.

The order of explanatory variables is the same as with foresting fundamentals, despite the fact that the average correlation coefficients, proved the profitability-based PG to outperform the industry-

[86] Chapter 4 page 37

[87] Bhojraj and Charles M. C. Lee; Source; (2005); P 408

based. This has no important effect on the final results, as the output *development* is observed when adding new explanatory variables to the model. The following figure shows the EV/Sales multiple of the 4 PG´s multiples regressed on the Danish company FLSmidth, a leading supplier of equipment and services to the global cement and minerals industries. To see the model output for each of the models in detailed versions, turn to appendix 4.

Figure 41 – FL Smidth and PG´s; EV/Sales.

| | | 1 Variable model | 2 Variable model | 3 Variable model | 4 Variable model |
|---|---|---|---|---|---|
| | Explanatory Variables | Size-based PG | Size-based PG<br>Growth-based PG | Size-based PG<br>Growth-based PG<br>Profitability-based PG | Size-based PG<br>Growth-based PG<br>Profitability-based PG<br>Industry-based PG |
| Statistic Parameters | P-value | 0,72 | 0,66<br>0,16 | 0,85<br>0,14<br>0,25 | 0,87<br>0,10<br>0,54<br>0,43 |
| | Adjusted R-squared | -0,05 | 0,14 | 0,04 | 0,02 |
| | Beta Coefficient | -0,55 | 0,08<br>0,12 | -0,04<br>0,48<br>-0,29 | 0,40<br>0,61<br>-0,18<br>-0,22 |

The regression output is recognized as very insignificant. No P-values below 5% and 4 negative signs in the beta coefficients, argues the case that based on this data, no conclusions can be drawn on whether a target multiple can be estimated through PG´s or not. Nevertheless, the models´ output can argue the case of S&C who stated that: "*comparable firms should be selected on the basis of variables that drive cross-sectional differences in this ratio"*. The most obvious basis to select peers from under these recommendations in the case of EV/Sales would be growth in sales. From the figure it is thus noticeable that when moving from the 1 variable model to the 2 variable model adding the growth-based PG, the adjusted R-squared moves from -0.05 to 0.14. In addition, the P-values of the growth-based PG model are 0.16, 0.14 and 0.10, respectively and non of the signs of the beta values are negative. These 3 arguments constitute a good argument that the findings from S&C to some degree apply on the Danish stock market. To compare, the effect from adding the industry-based variable in the model, actual descends the adjusted R-square (0.04 to 0.02). The fact that it descends is not expected to be caused by anything but various uncertainties and thus noise. The influence to the model points in the direction of S&C being right when emphasizing the importance of financial similarities and not just industrial alignment among peers.

The "top two" PG´s (profitability-based and industry-based) have a negative impact on the adjusted R-square, but there is not believed to be any reasonable explanation hereto, except from variance in the empirical dataset. In general, the results from the two-variable model are best in line with what we could hope. It is the best of the models showing a model correlation coefficient of 14% and no significant parameters on the 0,05 significance level. P-values are "rather low" (8% and 12%) allowing the researcher to acknowledge that there is a fair chance, the Beta values are different from zero and thus, the PG´s multiples *could* have an effect on the target company´s on the Danish stock market.

One more example of the above will be showed. The goal is the same, but the multiple and the target company is different. The current figure applies the same procedure on the Danish Medicinal equipment company, Coloplast. The multiple under notice is the EV/EBITD. As S&C argued that the peers should be picked based the drivers of the multiple we expect the profitability and growth-based PG´s to perform the best, as with EBITDA these are the main drivers. The figure shows the following results. To see each of the models output, turn to appendix 5.

Figure 42 – regression model output to the EV/EBITDA multiple of Coloplast and its 4 multiples.

| | | 1 Variable model | 2 Variable model | 3 Variable model | 4 Variable model |
|---|---|---|---|---|---|
| | Explanatory Variables | Size-based PG | Size-based PG<br>Growth-based PG | Size-based PG<br>Growth-based PG<br>Profitability-based PG | Size-based PG<br>Growth-based PG<br>Profitability-based PG<br>Industry-based PG |
| Statistic Parameters | P-value | 0,30 | 0,72<br>0,48 | 0,67<br>0,44<br>0,00 | 0,63<br>0,49<br>0,00<br>0,53 |
| | Adjusted R-squared | 0,07 | -0,02 | 0,64 | 0,62 |
| | Beta Coefficient | 0,21 | 0,10<br>0,17 | 0,07<br>-0,12<br>0,95 | 0,08<br>-0,11<br>0,87<br>0,06 |

The profitability-based PG performs extremely well in this case. Significant P-values in both cases where it is represented (2 variable model and 3 variable model). Furthermore it has a serious effect on the overall correlation coefficient of the models raising the adjusted R-squared from -0,02 to 0,64 in the 3 variable model. Based on the previous investigations and keeping the relatively low amount of observations in mind, we don't draw heavier conclusion on these numbers, than to recognize that regression analysis point in the direction of possible PG influence to the target

companies market price. Again we see negative signs of a couple of parameters and the growth-based PG to have a negative impact on the overall correlation coefficient of the 2 variable regression model. As with figure 41 page 75 this figure also backs the point of S&C. The profitability-based PG outperforms the remainder, showing highly significant parameters and raising the adjusted R-squared. In addition, the profitability-based PG also shows positive Beta values.

3 points were proved when dealing with multiple analysis on the Danish stock market. The visual analysis proved that the levels of multiples of Danish target firms and their PG´s were similar with only few exceptions. The analysis of correlation coefficients of Danish target companies and the PG´s showed varying results. The general impression from the correlation analysis was that applying movements in PG multiples to the target company would be an efficient approach. With regards to hypothesis 1: "P*GB is an inefficient tool in valuating Danish companies"* the analysis of multiple valuation *rejects*. Multiple analysis *is* considered an efficient tool in valuating Danish company, despite the pitfalls detected. Furthermore, hypothesis 2: "*Choosing companies based solely on similarities in the industry in which the target company operates is an inefficient approach to forecasting fundamentals and valuating companies with PGB"* is *accepted*. Regression analysis, even though showing generally insignificant parameters, supported the statements of S&C as the PG´s based on the value drivers of the multiples increased the adjusted R-square of the model and showed the most significant/ least insignificant beta´s. Overall the analysis of PGB as valuation model on the Danish stock market pointed in the direction, that the appliances found from interviews could be improved by taking the theoretical recommendations of S&C into account. The industry-based multiples showed *relatively* good results, but the general output pointed in the direction of room for improvement.

# 6. Conclusion

The objective of this thesis has been to examine the role of Peer Group Benchmarking in the Danish modern stock market. Through questionnaires, data consolidation and theory the thesis has brought light over a niche within investment tools used by analysts in the local investment community. Thus, the problem statement: *What is the role of Peer Group Benchmarking in the modern Danish investment society; is it applied in theoretical accordance and has it proven to be a significant valuation tool over the past 20 years?*

The problem statement has been split into a number of research questions in order to break down the process to smaller fractions. The examination of the overall role of PGB in the Danish modern investment society was initiated through a study of the valuation models to which it generates input. The most frequently used valuation model in the Danish investment society was found to be the DCF. From a theoretical description of the model, it was pointed out that the main inputs are Growth, Profitability and Risk.

Two PG models were examined and it was found that the PG models´ appearance depends on the analysts engaged in the daily work with them and the company specification of the target company. The Royal Unibrew model held surprisingly complex financial data and consolidation functions while the APM Maersk PG model appeared less advanced and held fewer data from the financial statements. On the other hand the APM Maerks PG model had consolidation sheets which allowed for the analyst to act fast to market news.

A questionnaire followed up on the examination of PG models. More than 40 analysts were anonymously confronted with their preferences on PGB applications. The main findings from the questionnaires were 1) The analysts prefer peers within the same industry and the second most frequently used parameter to choose peers from is size in terms of revenue. 2) The preferable amount of peers in a peer group was 5-10 companies. 3) The main purposes with which the Danish analysts uses PGB (when leaving out the possibility of relative valuation) is to achieve industrial overview and forecast to fundamentals. The third opportunity was as a marketing instrument and more than 50% uses PGB in order for their investment cases to appear more interesting. 4) The input forecasted through PGB showed to be profitability and growth, which also was recognized as

the value drivers of the most frequently used valuation model, DCF. 5) Overall, the Danish analysts view PGB as an important valuation tool.

In contrast to the answers from the analysts engaging in daily coverage of the Danish stocks, prior studies and thus recommendations of how to apply PGB presented contradictions with regards to the basis on which to pick peers. A study by S&C showed increasing valuation efficiency, when peers were based on the drivers of the multiples in which they were used. This meant that with multiples holding i.e. sales in the denominator, the peers having similar growth rates in sales would be a superior measure to picking randomly peers from the target company´s industry.

The two-fold empirical analysis tested the efficiency of PGB as an input forecaster to valuation models and as a direct valuation model. Two hypotheses apply in both cases. The general two hypotheses are 1) "P*GB is an inefficient tool in valuating Danish companies"* and 2) *"Choosing companies based solely on similarities in the industry in which the target company operates is an inefficient approach to forecasting fundamentals and valuating companies with PGB"*. Based on the behaviour in sales and EBITDA of 9 target companies and their respective peers hypothesis 1 was rejected. Generally, forecasting fundamentals through PGB overall showed visual similarities on scatter plots and acceptable correlation coefficients. Furthermore, 4 regression models including the PG´s as explanatory variables showed an increasing degree of explanation of the dependent variable; the target firms´ sales/EBITDA. This leads to hypothesis 2, as the development in both the P-values of the Beta´s and the adjusted R-squared increased when adding PG models based on financial similarities. Subsequently, the industry-based PG raised the degree of explanation, yet hypothesis 2) is accepted. Output from the regression models generally showed that choosing companies solely based on industry is inefficient.

Relative valuation through multiples showed relatively equal levels between target companies and the PG´s. Hypothesis 1) was thus rejected as multiple valuation based on PG´s did makes sense in several cases. The visual overview showed that in general the multiples of the PG´s and the target companies were relatively close. The preferences from S&C in general constituted a god prescription of superior PGB application when tested with the regression models. Two examples proved that when choosing peers from similarities in the drivers of the multiple the adjusted R-

square increases. Subsequently the analysis accepts hypothesis 2) meaning that multiple valuation with PG´s based only on similarities in industry is inefficient.

This thesis found that PGB is a frequently used valuation tool on the Danish stock markets. The PG models are constructed differently reflecting the analysts' preferences and purposes with the model. When applying these on the Danish stock market the tool has over the past 20 years shown to be effective in both forecasting fundamentals and valuation through multiples. The construction of PG´s have shown to have a significant effect on the accuracy of results from using PGB and prior studies on the subject recommends appliance that differ from what is preferred in the industry today. Implementing the theoretical recommendations of PGB on the Danish stock market could improve the efficiency of future analysis.

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## 9. Appendix list

Appendix 1: Snap-shot from the APM Maersk model

Appendix 2: Snap-shot from the Royal Unibrew model

Appendix 3: Regression output from model 35

Appendix 4: Regression output from model 41

Appendix 5: Regression output from model 42

Appendix 6: Peers selection procedure

Appendix 7: Development of multiples over time

Appendix 1

| MOL - Container activities | | | |
|---|---|---|---|
| **FY 08/09 guidance (Yen bn):** | **2007/08A** | **2008/09** | **+/-** |
| Revenue | 687 | 750 | 9% |
| Ord. Income | 7 | 10 | 43% |
| Margin | 1,0 % | 1,3 % | |

| MOL - Container activities | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Actual numbers (Yen bn)** | **Q3'06** | **Q4'06** | **Q1'07** | **Q2'07** | **Q3'07** | **Q4'07** | **Q1'08** | **Q2'08** |
| Revenue | 145 | 147 | 144 | 162 | 180 | 178 | 169 | 174 |
| Operating profit | 0,4 | 0,4 | -0,6 | -0,3 | 4,9 | 0,7 | -4,0 | -3,4 |
| Ordinary income | 2,9 | -0,3 | 2,5 | 0,8 | 7,0 | 1,1 | -2,1 | -2,2 |
| Operating margin | 0,3 % | 0,3 % | -0,4 % | -0,2 % | 2,7 % | 0,4 % | -2,4 % | -2,0 % |
| | | | | | | | | |
| Utilisation | 74,4 % | 74,2 % | 75,1 % | 78,0 % | 76,8 % | 74,4 % | 73,4 % | 75,2 % |
| Volume growth | 29,0 % | 18,1 % | 19,6 % | 20,3 % | 8,5 % | 15,4 % | 9,6 % | 8,3 % |
| Capacity growth | 33,9 % | 13,8 % | 17,1 % | 14,5 % | 5,0 % | 15,0 % | 12,1 % | 12,2 % |
| Growth in revenue per TEU (local curr.) | -1,4 % | -16,5 % | -0,5 % | 1,3 % | 14,5 % | 4,7 % | 7,0 % | -1,1 % |
| Growth in costs per TEU (local curr.) | 14,0 % | -10,0 % | 0,6 % | 4,1 % | 15,3 % | 4,9 % | 6,6 % | -2,8 % |

| K-line - Container activities | | | |
|---|---|---|---|
| **FY 07/08 guidance (Yen bn):** | **Previous** | **Revisions** | **+/-** |
| Revenue | 1300 | | |
| Ord. Income | 128 | | |
| Margin | 10% | | |

| K-Line - Marine Transportation (Container, bulk and tanker activities) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Actual numbers (Yen bn)** | | **Q2'06** | **Q3'06** | **Q4'06** | **Q1'07** | **Q2'07** | **Q3'07** | **Q4'07** |
| Revenue | | 219 | 232 | 246 | 248 | 276 | 301 | 304 |
| Ord. Income | | 7 | 10 | 12 | 17 | 28 | 26 | 34 |
| Margin | | 3,1 % | 4,3 % | 4,8 % | 6,8 % | 10,2 % | 8,5 % | 11,3 % |
| | | | | | | | | |
| Utilisation | | na | na | na | na | na | na | na |
| Volume growth | | na | na | na | na | na | na | na |
| Capacity growth | | na | na | na | na | na | na | na |
| Growth in revenue per TEU (local curr.) | | na | na | na | na | na | na | na |
| Growth in costs per TEU (local curr.) | | na | na | na | na | na | na | na |

## MOL

| YENm | 2005 Q1 | Q2 | Q3 | Q4 | Y | 2006 Q1 | Q2 | Q3 | Q4 | Y |
|---|---|---|---|---|---|---|---|---|---|---|
| **Revenue (containers only)** | 98.000 | 104.000 | 114.000 | 149.000 | **465.000** | 121.000 | 133.000 | 145.000 | 147.000 | **546.000** |
| - growth | 18% | 16% | 11% | 38% | **21%** | 23% | 28% | 27% | -1% | **17%** |
| **Cost** | 85.800 | 92.900 | 94.700 | 143.200 | **416.600** | 122.700 | 136.100 | 144.600 | 146.600 | **550.000** |
| - growth | 13% | 16% | 6% | 59% | **24%** | 43% | 47% | 53% | 2% | **32%** |
| **EBITDA** | | | | | | | | | | |
| - growth | | | | | | | | | | |
| **Operating profit (containers)** | 12.200 | 11.100 | 19.300 | 5.800 | **48.400** | -1.700 | -3.100 | 400 | 400 | **-4.000** |
| - growth | 74% | 11% | 38% | -68% | **-1%** | -114% | -128% | -98% | -93% | **-108%** |
| **Ordinary profit** | 12.500 | 11.600 | 19.700 | 6.600 | **50.400** | -500 | -2.000 | 2.900 | -300 | **100** |
| - growth | | 16% | 41% | -65% | **17%** | -104% | -117% | -85% | -105% | **-100%** |
| Operating margin | 12% | 11% | 17% | 4% | **10%** | -1% | -2% | 0% | 0% | **-1%** |
| Growth in revenue per TEU | 2% | 4% | 0% | 28% | 9% | 7% | 8% | -1% | -16% | -2% |
| Growth in costs per TEU | -26% | -19% | -26% | 6% | **-16%** | 20% | 19% | 14% | -10% | **8%** |
| Volume growth | 16% | 11% | 11% | 8% | 11% | 15% | 19% | 29% | 18% | 20% |

| USDm | 2005 Q1 | Q2 | Q3 | Q4 | Y | 2006 Q1 | Q2 | Q3 | Q4 | Y |
|---|---|---|---|---|---|---|---|---|---|---|
| USD/YEN | 104,51 | 107,54 | 111,16 | 117,27 | **110,12** | 116,86 | 114,38 | 116,16 | 117,72 | **116,28** |
| **Revenue (containers only)** | 938 | 967 | 1.026 | 1.271 | **4.222** | 1.035 | 1.163 | 1.248 | 1.249 | **4.696** |
| - growth | 21% | 18% | 9% | 24% | **19%** | 10% | 20% | 22% | -2% | **11%** |
| **Cost** | 821 | 864 | 852 | 1.221 | **3.783** | 1.050 | 1.190 | 1.245 | 1.245 | **4.730** |
| - growth | 16% | 18% | 5% | 44% | **22%** | 28% | 38% | 46% | 2% | **25%** |
| **EBITDA** | | | | | | | | | | |
| - growth | | | | | | | | | | |
| **Operating profit (containers)** | 117 | 103 | 174 | 49 | **440** | -15 | -27 | 3 | 3 | **-34** |
| - growth | 79% | 13% | 36% | -71% | **-3%** | -112% | -126% | -98% | -93% | **-108%** |
| **Ordinary profit** | 120 | 108 | 177 | 56 | **458** | -4 | -17 | 25 | -3 | **1** |
| - growth | | | 39% | -69% | **15%** | -104% | -116% | -86% | -105% | **-100%** |

| Operational | 2005 Q1 | Q2 | Q3 | Q4 | Y | 2006 Q1 | Q2 | Q3 | Q4 | Y |
|---|---|---|---|---|---|---|---|---|---|---|
| **Revenue (YENm)** | | | | | | | | | | |
| Transpacific | | | | | | | | | | |
| EU - ASIA | | | | | | | | | | |
| Transatlantic | | | | | | | | | | |
| Intra asia & other | | | | | | | | | | |
| **Total** | 98.000 | 104.000 | 114.000 | 149.000 | 465.000 | 121.000 | 133.000 | 145.000 | 147.000 | 546.000 |
| | | | | | | | | | | |
| **Capacity (TEU/'000)** | | | | | | | | | | |
| Transpacific | 241 | 258 | 281 | 278 | **1058** | 250 | 267 | 297 | 269 | **1083** |
| EU - ASIA | 174 | 170 | 168 | 184 | **696** | 178 | 196 | 225 | 200 | **799** |
| Transatlantic | | | | | | | | | | |
| Intra asia & other | 270 | 298 | 311 | 379 | **1258** | 389 | 433 | 496 | 488 | **1806** |
| **Total** | 685 | 726 | 760 | 841 | **3.012** | 817 | **896** | **1.018** | **957** | **3.688** |
| | | | | | | | | | | |
| **Volume (TEU/'000)** | | | | | | | | | | |
| Transpacific | 159 | 174 | 187 | 172 | **692** | 171 | 187 | 209 | 188 | **755** |
| EU - ASIA | 138 | 141 | 138 | 145 | **562** | 142 | 151 | 169 | 155 | **617** |
| Transatlantic | | | | | | | | | | |
| Intra asia & other | 226 | 246 | 262 | 284 | **1.018** | 288 | 327 | 379 | 367 | **1.361** |
| **Total** | **523** | **561** | **587** | **601** | **2.272** | **601** | **665** | **757** | **710** | **2.733** |
| | | | | | | | | | | |
| **Revenue per TEU (YEN/TEU)** | | | | | | | | | | |
| Transpacific | | | | | | | | | | |
| EU - ASIA | | | | | | | | | | |
| Transatlantic | | | | | | | | | | |
| Intra asia & other | | | | | | | | | | |
| **Total** | **187** | **185** | **194** | **248** | **205** | **201** | **200** | **192** | **207** | **200** |
| | | | | | | | | | | |
| **Revenue/TEU growth** | | | | | | | | | | |
| Transpacific | | | | | | | | | | |
| EU - ASIA | | | | | | | | | | |
| Transatlantic | | | | | | | | | | |
| Intra asia & other | | | | | | | | | | |
| **Total** | 2% | 4% | 0% | 28% | **9%** | 7% | 8% | -1% | -16% | **-2%** |
| | | | | | | | | | | |
| **Volume growth** | | | | | | | | | | |
| Transpacific | 5% | 9% | 13% | -4% | **5%** | 8% | 7% | 12% | 9% | **9%** |
| EU - ASIA | 8% | 4% | 1% | 7% | **5%** | 3% | 7% | 22% | 7% | **10%** |
| Transatlantic | | | | | | | | | | |
| Intra asia & other | 32% | 17% | 15% | 16% | **19%** | 27% | 33% | 45% | 29% | **34%** |
| **Total** | 16% | 11% | 11% | 8% | **11%** | 15% | 19% | 29% | 18% | **20%** |

## Calendar

| (dd.mm.yyyy) | Q1/08 | Q2/08 | Q3/08 | Q4/08 |
|---|---|---|---|---|
| | | | | |
| **APM PEER GROUP** | **Q1/08** | **Q2/08** | **Q3/08** | **Q4/08** |
| MOL | 25.04.2008 | 25.07.2008 | End of October | |
| NOL | 14.05.2008 | 07.08.2008 | 29.10.2008 | |
| TUI | 15.05.2008 | 14.08.2008 | 14.11.2008 | |
| COSCO | 30.04.2008 | 27.08.2008 | October | |
| K-Line | 25.04.2008 | 25.07.2008 | | |
| NYK-line | 25.04.2008 | 25.07.2008 | End of October | End of January |
| HMM | | | | |
| CSCL | 22.04.2008 | | | |
| OOCL | | 31.07 2008 | | |
| Hanjiin | | | | |

Appendix 2

## FINANCIAL STATEMENT INPUT

| CODE | NO | Company | 2000 | 2001 | Q1/02 | Q2/02 | 6M/02 | Q3/02 | 9M/02 | Q4/02 | 2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RU | 1 | Royal Unibrew | | | | | | | | | |
| | | **Income Statement (DKKm)** | | | | | | | | | |
| | | VestEuropa | 2.061 | 2.391 | 625 | 544 | 1.169 | 552 | 1.721 | 620 | 2.341 |
| | | ØstEuropa | 160 | 207 | 70 | 76 | 146 | 101 | 247 | 61 | 308 |
| | | RoW | 115 | 126 | 4 | 63 | 67 | 4 | 71 | 57 | 128 |
| | | Ikke-fordelt | 0 | 0 | 40 | -40 | 0 | 120 | 120 | -120 | 0 |
| | 1,01 | **Sales** | 2.335 | 2.724 | 739 | 643 | 1.382 | 777 | 2.159 | 619 | 2.778 |
| | 1,02 | **Gross profit** | 1.112 | 1.346 | 274 | 421 | 695 | 410 | 1.105 | 312 | 1.418 |
| | 1,03 | **R&D** | - | - | - | - | - | - | - | - | - |
| | | VestEuropa | - | - | - | - | - | - | - | - | - |
| | | ØstEuropa | - | - | - | - | - | - | - | - | - |
| | | RoW | - | - | - | - | - | - | - | - | - |
| | | Ikke-fordelt | - | - | - | - | - | - | - | - | - |
| | 1,04 | **EBITDA** | 334 | 369 | 53 | 158 | 211 | 154 | 365 | 74 | 439 |
| | | VestEuropa | - | - | - | - | - | - | - | - | - |
| | | ØstEuropa | - | - | - | - | - | - | - | - | - |
| | | RoW | - | - | - | - | - | - | - | - | - |
| | | Ikke-fordelt | - | - | - | - | - | - | - | - | - |
| | 1,05 | **EBITA** | 142 | 171 | 4 | 100 | 104 | 113 | 217 | 62 | 279 |
| | | VestEuropa | 191 | 247 | - | - | - | - | - | - | 291 |
| | | ØstEuropa | -20 | -8 | - | - | - | - | - | - | -14 |
| | | RoW | 10 | 2 | - | - | - | - | - | - | 13 |
| | | Ikke-fordelt | -53 | -45 | - | - | - | - | - | - | -38 |
| | 1,06 | **EBIT** | 128 | 106 | 1 | 96 | 97 | 110 | 206 | 46 | 252 |
| | 1,07 | Pre-tax profit | 190 | | | 87 | 72 | 104 | 177 | 57 | 234 |
| | 1,08 | Net profit | 135 | | | 58 | 47 | 68 | 115 | 42 | 157 |

**Alfa:**
Varebeholdninger +
Tilgodehavender fra Salg
Leverandørgæld

# FINANCIAL STATEMENT INPUT

| CODE | NO | Company | 2000 | 2001 | Q1/02 | Q2/02 |
|---|---|---|---|---|---|---|
| RU | 1 | Royal Unibrew | | | | |
| | | **Income Statement (DKKm)** | | | | |
| | | VestEuropa | 2.061 | 2.391 | 625 | 544 |
| | | ØstEuropa | 160 | 207 | 70 | 76 |
| | | RoW | 115 | 126 | 4 | 63 |
| | | Ikke-fordelt | 0 | 0 | 40 | -40 |
| | 1,01 | **Sales** | 2.335 | 2.724 | 739 | 643 |
| | 1,02 | **Gross profit** | 1.112 | 1.346 | 274 | 421 |
| | 1,03 | **R&D** | - | - | - | - |
| | | VestEuropa | - | - | - | - |
| | | ØstEuropa | - | - | - | - |
| | | RoW | - | - | - | - |
| | | Ikke-fordelt | - | - | - | - |
| | 1,04 | **EBITDA** | 334 | 369 | 53 | 158 |
| | | VestEuropa | - | - | - | - |
| | | ØstEuropa | - | - | - | - |
| | | RoW | - | - | - | - |
| | | Ikke-fordelt | - | - | - | - |
| | 1,05 | **EBITA** | 142 | 171 | 4 | 100 |
| | | VestEuropa | 191 | 247 | - | - |
| | | ØstEuropa | -20 | -8 | - | - |
| | | RoW | 10 | 2 | - | - |
| | | Ikke-fordelt | -53 | -45 | - | - |
| | 1,06 | **EBIT** | 128 | 196 | 1 | 96 |
| | 1,07 | Pre-tax profit | 190 | | 6 | 87 |
| | 1,08 | Net profit | 135 | | 4 | 58 |

**Alfa:**
Varebeholdninger +
Tilgodehavender fra Salg
Leverandørgæld

## FX RATES

| NO | Average | FY/00 | FY/01 | FY/02 | Q1/03 | Q2/03 | HY/03 |
|---|---|---|---|---|---|---|---|
| 0 | USD | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 |
| 1 | GBP | 1,5 | 1,4 | 1,5 | 1,6 | 1,6 | 1,6 |
| 2 | EUR | 0,9 | 0,9 | 0,9 | 1,1 | 1,1 | 1,1 |
| 3 | JPY | - | - | - | - | - | - |
| 4 | CHF | 0,6 | 0,6 | 0,6 | 0,7 | 0,8 | 0,7 |
| 5 | DKK | 0,1 | 0,1 | 0,1 | 0,1 | 0,2 | 0,1 |
| 6 | MXN | - | - | - | - | - | - |
| 7 | BRL | 0,5 | 0,4 | 0,4 | 0,3 | 0,3 | 0,3 |
| 8 | THB | - | - | - | - | - | - |
| 9 | AUD | 0,6 | 0,5 | 0,5 | 0,6 | 0,6 | 0,6 |

**Rolling Quarters**

| NO | Average | Q402 | Q103 | Q404 | Q105 | Q205 | Q305 |
|---|---|---|---|---|---|---|---|
| 1 | GBP | 1,5 | 1,6 | 1,8 | 1,8 | 1,9 | 1,8 |
| 2 | EUR | 1,0 | 1,0 | 1,2 | 1,3 | 1,3 | 1,3 |
| 3 | JPY | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| 4 | CHF | 0,6 | 0,7 | 0,8 | 0,8 | 0,8 | 0,8 |
| 5 | DKK | 0,1 | 0,1 | 0,2 | 0,2 | 0,2 | 0,2 |
| 6 | MXN | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| 7 | BRL | 0,3 | 0,3 | 0,3 | 0,3 | 0,4 | 0,4 |
| 8 | THB | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| 9 | AUD | 0,5 | 0,6 | 0,7 | 0,7 | 0,8 | 0,8 |

**Rolling Interims**

| NO | Average | H202 | H103 | H206 | H107 | H207 | |
|---|---|---|---|---|---|---|---|
| 1 | GBP | 1,6 | 1,6 | 1,9 | 1,9 | | |
| 2 | EUR | 1,0 | 1,1 | 1,3 | 1,2 | 1,3 | 1,3 |
| 3 | JPY | 0,0 | 0,0 | 0,0 | 0,0 | | |
| 4 | CHF | 0,7 | 0,7 | 0,8 | 0,8 | | |
| 5 | DKK | 0,1 | 0,1 | 0,2 | 0,2 | | |
| 6 | MXN | 0,0 | 0,0 | 0,0 | 0,0 | | |
| 7 | BRL | 0,3 | 0,3 | 0,5 | 0,5 | | |
| 8 | THB | 0,0 | 0,0 | 0,0 | 0,0 | | |
| 9 | AUD | 0,6 | 0,6 | 0,8 | 0,8 | | |

**Raw input data**

**INCOME STATEMENT**

| No | Sales | Local | 2000 | 2001 | Q1/02 | Q2/02 |
|---|---|---|---|---|---|---|
| 1 | Royal Unibrew | (DKKm) | 2.335 | 2.724 | 739 | 643 |
| 2 | Heineken | (EURm) | 7.986 | 9.212 | 0 | 0 |
| 3 | Scottish & New castle | (GBPm) | 0 | 0 | 0 | 0 |
| 4 | Grolsch | (EURm) | 255 | 279 | 0 | 0 |
| 5 | Carlsberg | (DKKm) | 0 | 34.419 | 7.572 | 9.951 |
| 6 | InBEW | (EURm) | 5.657 | 7.303 | 0 | 0 |
| 7 | Budw eiser | (USDm) | 0 | 0 | 0 | 0 |
| 8 | SABmiller | (USDm) | 0 | 4364 | 0 | 0 |
| 9 | Molsom Coors | (USDm) | 2414 | 2430 | 746 | 1048 |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |

| No | Sales | Converted | 2000 | 2001 | Q1/02 | Q2/02 |
|---|---|---|---|---|---|---|
| 1 | Royal Unibrew | (USDm) | 288 | 326 | 86 | 82 |
| 2 | Heineken | (USDm) | 7336 | 8463 | 0 | 0 |
| 3 | Scottish & New castle | (USDm) | 0 | 0 | 0 | 0 |
| 4 | Grolsch | (USDm) | 235 | 256 | 0 | 0 |
| 5 | Carlsberg | (USDm) | 0 | 4116 | 884 | 1264 |
| 6 | InBEW | (USDm) | 5197 | 6507 | 0 | 0 |
| 7 | Budw eiser | (USDm) | 0 | 0 | 0 | 0 |
| 8 | SABmiller | (USDm) | 0 | 4364 | 0 | 0 |
| 9 | Molsom Coors | (USDm) | 2414 | 2430 | 746 | 1048 |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
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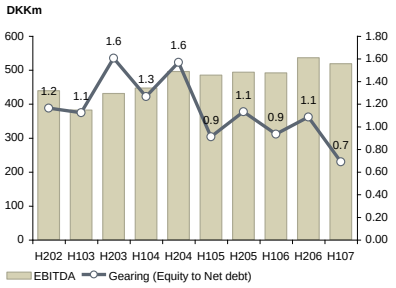
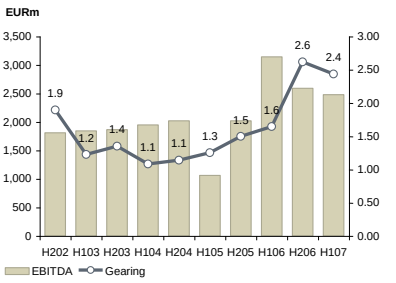
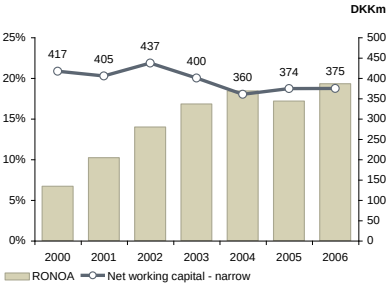
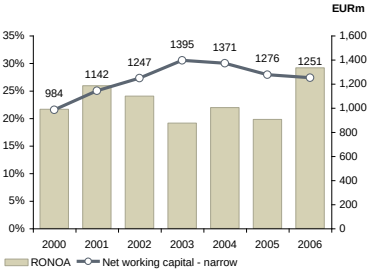
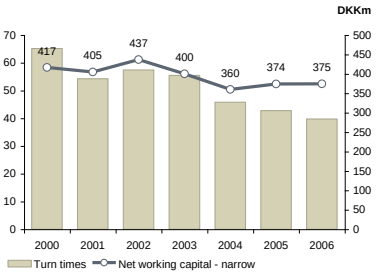
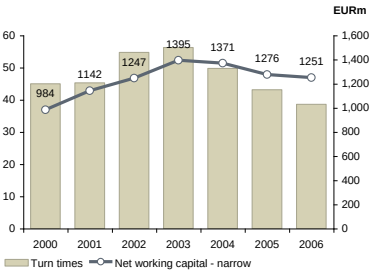
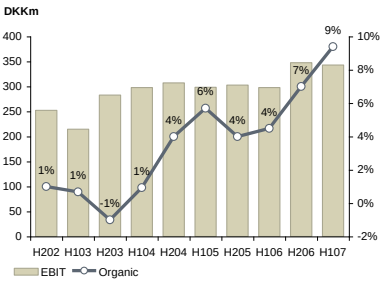
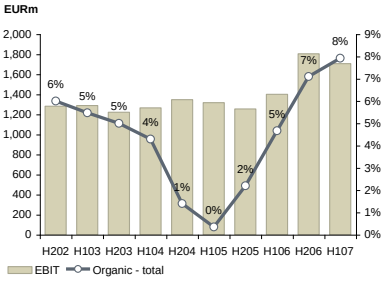
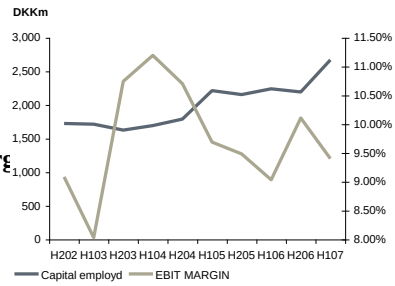
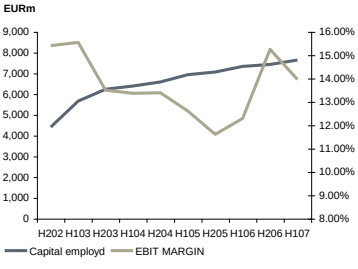
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |
| | - | | | | | |

| | Royal Unibrew | Heineken |
|---|---|---|
| **EBITDA vs. Gearing** |  |  |
| **NWC vs. RONOA** |  |  |
| **NWC vs. Turn Times** |  |  |
| **EBIT vs. Organic Growth** |  |  |
| **Capital Employd vs. EBIT marg** |  |  |

| | SIMULATION MODEL | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | *INSERT COMPANY INITIALS* | HE | | | |
| Konto | Company | csm | 2000 | 2001 | Q1/02 |

| 0,00 | Heineken | 2 | 2000 | 2001 | Q1/02 |
|---|---|---|---|---|---|
| 0,01 | Sales | EUR | 7.986 | 9.212 | 0 |
| 0,02 | Gross profit | EUR | 0 | 0 | 0 |
| 0,03 | R&D | EUR | 0 | 0 | 0 |
| 0,04 | EBITDA | EUR | 0 | 1.601 | 0 |
| 0,05 | EBITA | EUR | 921 | 1.226 | 0 |
| 0,06 | EBIT | EUR | 921 | 1.226 | 0 |
| 0,07 | Pre-tax profit | EUR | 914 | 1.099 | 0 |
| 0,08 | Net profit | EUR | 621 | 767 | 0 |
| 0,09 | Goodw ill | EUR | 0 | 0 | 0 |
| 0,10 | Tangible assets | EUR | 3.276 | 3.592 | 0 |
| 0,11 | Net w orking capital - broad | EUR | 110 | 187 | 0 |
| 0,12 | Invested capital ex. goodw ill | EUR | 3.386 | 3.779 | 0 |
| 0,13 | Net debt | EUR | 442 | 152 | 0 |
| 0,14 | Equity(excl. Minorities) | EUR | 2.396 | 2.758 | 0 |
| 0,15 | Minorities | EUR | 124 | 381 | 0 |
| 0,16 | Total assets | EUR | 6.289 | 7.195 | 0 |
| 0,17 | CFFO | EUR | 1.035 | 1.165 | 0 |
| 0,18 | Cash flow after capex & acquisitions | EUR | -468 | 382 | 0 |
| 0,19 | Organic - total | EUR | 0,00% | 5,00% | 0,00% |
| 0,20 | Total | EUR | 0,00% | 13,00% | 0,00% |

| Sorted by date | mar-08 | apr-08 | maj-08 | jun-08 | jul-08 |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | Royal U FY 07 | | | | |
| 4 | | | | | |
| 5 | | | Carlsberg Q1 | | |
| 6 | | | Molson Coors Q1 | | |
| 7 | | | | | |
| 8 | | | InBev Q1 | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | Heineken AGM | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| 21 | | | | | |
| 22 | | | | | |
| 23 | | | | | Budweiser Q2 |
| 24 | | | | | |
| 25 | | | | | |
| 26 | | | | | |
| 27 | | | | | |
| 28 | | Royal U AGM | | | |
| | | Royal U Q1 | | | |
| 29 | | | | | |
| 30 | | | | | |
| 31 | | | | | SABMiller Q208 |

Appendix 3

| Coloplast one-variable | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| *Regressionsstatistik* | | | | | | | | |
| Multipel R | 0,166747824 | | | | | | | |
| R-kvadreret | 0,027804837 | | | | | | | |
| Justeret R-kv | -0,06941468 | | | | | | | |
| Standardfejl | 0,058140061 | | | | | | | |
| Observatione | 12 | | | | | | | |
| | | | | | | | | |
| ANAVA | | | | | | | | |
| | *fg* | *SK* | *MK* | *F* | *Signifikans F* | | | |
| Regression | 1 | 0,00096676 | 0,000967 | 0,286001 | 0,604481514 | | | |
| Residual | 10 | 0,03380267 | 0,00338 | | | | | |
| I alt | 11 | 0,03476943 | | | | | | |
| | | | | | | | | |
| | *Koefficienter* | *Standardfejl* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *ledre 95,0%* | *Øvre 95,0%* |
| Skæring | 0,031488013 | 0,16383135 | 0,192198 | 0,851434 | -0,33355098 | 0,396527 | -0,33355 | 0,396527 |
| Size | 1,092484261 | 2,04282771 | 0,53479 | 0,604482 | -3,45921951 | 5,644188 | -3,45922 | 5,644188 |

| Coloplast two-variable | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| *Regressionsstatistik* | | | | | | | | |
| Multipel R | 0,508333751 | | | | | | | |
| R-kvadreret | 0,258403202 | | | | | | | |
| Justeret R-kv | 0,093603914 | | | | | | | |
| Standardfejl | 0,053525585 | | | | | | | |
| Observatione | 12 | | | | | | | |
| | | | | | | | | |
| ANAVA | | | | | | | | |
| | *fg* | *SK* | *MK* | *F* | *Signifikans F* | | | |
| Regression | 2 | 0,00898453 | 0,004492 | 1,567987 | 0,260468558 | | | |
| Residual | 9 | 0,02578489 | 0,002865 | | | | | |
| I alt | 11 | 0,03476943 | | | | | | |
| | | | | | | | | |
| | *Koefficienter* | *Standardfejl* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *ledre 95,0%* | *Øvre 95,0%* |
| Skæring | -0,13276836 | 0,17997222 | -0,73772 | 0,479479 | -0,5398938 | 0,274357 | -0,53989 | 0,274357 |
| Size | 1,908285567 | 1,94288876 | 0,98219 | 0,351671 | -2,48683414 | 6,303405 | -2,48683 | 6,303405 |
| Growth | 0,906662396 | 0,54197613 | 1,672883 | 0,128679 | -0,31937279 | 2,132698 | -0,31937 | 2,132698 |

Coloplast three-variable

| *Regressionsstatistik* | |
|---|---|
| Multipel R | 0,674114481 |
| R-kvadreret | 0,454430334 |
| Justeret R-kv | 0,249841709 |
| Standardfejl | 0,048694383 |
| Observatione | 12 |

ANAVA

| | *fg* | *SK* | *MK* | *F* | *Signifikans F* |
|---|---|---|---|---|---|
| Regression | 3 | 0,01580028 | 0,005267 | 2,221191 | 0,163187847 |
| Residual | 8 | 0,01896914 | 0,002371 | | |
| I alt | 11 | 0,03476943 | | | |

| | *Koefficienter* | *Standardfejl* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *ledre 95,0%* | *Øvre 95,0%* |
|---|---|---|---|---|---|---|---|---|
| Skæring | -0,17052341 | 0,16523544 | -1,032 | 0,332258 | -0,55155703 | 0,21051 | -0,55156 | 0,21051 |
| Size | 3,820314957 | 2,0966602 | 1,822095 | 0,105912 | -1,01459213 | 8,655222 | -1,01459 | 8,655222 |
| Growth | 2,145976822 | 0,88172142 | 2,433849 | 0,040956 | 0,11272359 | 4,17923 | 0,112724 | 4,17923 |
| Profitability | -3,68429635 | 2,17308432 | -1,69542 | 0,128439 | -8,69543776 | 1,326845 | -8,69544 | 1,326845 |

Coloplast four-variable

| *Regressionsstatistik* | |
|---|---|
| Multipel R | 0,800383831 |
| R-kvadreret | 0,640614278 |
| Justeret R-kv | 0,435251008 |
| Standardfejl | 0,042250334 |
| Observatione | 12 |

ANAVA

| | *fg* | *SK* | *MK* | *F* | *Signifikans F* |
|---|---|---|---|---|---|
| Regression | 4 | 0,02227379 | 0,005568 | 3,11942 | 0,090218576 |
| Residual | 7 | 0,01249564 | 0,001785 | | |
| I alt | 11 | 0,03476943 | | | |

| | *Koefficienter* | *Standardfejl* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *ledre 95,0%* | *Øvre 95,0%* |
|---|---|---|---|---|---|---|---|---|
| Skæring | -0,26219003 | 0,15123388 | -1,73367 | 0,126571 | -0,61980134 | 0,095421 | -0,6198 | 0,095421 |
| Size | 2,151395459 | 2,0192882 | 1,065423 | 0,322048 | -2,62346238 | 6,926253 | -2,62346 | 6,926253 |
| Growth | 1,248674131 | 0,8985018 | 1,389729 | 0,207206 | -0,87594502 | 3,373293 | -0,87595 | 3,373293 |
| Profitability | -0,46958226 | 2,53078485 | -0,18555 | 0,858061 | -6,45393749 | 5,514773 | -6,45394 | 5,514773 |
| Industry | 1,335411797 | 0,70125422 | 1,904319 | 0,098578 | -0,32279093 | 2,993615 | -0,32279 | 2,993615 |

Appendix 4

| FlSmidth on-variable | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| *Regressionsstatistik* | | | | | | | | |
| Multipel R | 0,085205 | | | | | | | |
| R-kvadrere | 0,00726 | | | | | | | |
| Justeret R- | -0,04789 | | | | | | | |
| Standardfe | 0,220236 | | | | | | | |
| Observatio | 20 | | | | | | | |
| | | | | | | | | |
| ANAVA | | | | | | | | |
| | *fg* | *SK* | *MK* | *F* | *ignifikans F* | | | |
| Regressior | 1 | 0,006385 | 0,006385 | 0,131633 | 0,72097 | | | |
| Residual | 18 | 0,87307 | 0,048504 | | | | | |
| I alt | 19 | 0,879455 | | | | | | |
| | | | | | | | | |
| | *Koefficiente* | *Standardfej* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *ledre 95,0%* | *Øvre 95,0%* |
| Skæring | 0,770734 | 0,318684 | 2,41849 | 0,026404 | 0,101204 | 1,440264 | 0,101204 | 1,440264 |
| Size | -0,05544 | 0,152806 | -0,36281 | 0,72097 | -0,37647 | 0,265593 | -0,37647 | 0,265593 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| FlSmidth two-variable | | | | | | | | |
| | | | | | | | | |
| *Regressionsstatistik* | | | | | | | | |
| Multipel R | 0,343111 | | | | | | | |
| R-kvadrere | 0,117725 | | | | | | | |
| Justeret R- | 0,013928 | | | | | | | |
| Standardfe | 0,213641 | | | | | | | |
| Observatio | 20 | | | | | | | |
| | | | | | | | | |
| ANAVA | | | | | | | | |
| | *fg* | *SK* | *MK* | *F* | *ignifikans F* | | | |
| Regressior | 2 | 0,103534 | 0,051767 | 1,134189 | 0,344851 | | | |
| Residual | 17 | 0,775921 | 0,045642 | | | | | |
| I alt | 19 | 0,879455 | | | | | | |
| | | | | | | | | |
| | *Koefficiente* | *Standardfej* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *ledre 95,0%* | *Øvre 95,0%* |
| Skæring | 0,22869 | 0,483327 | 0,473157 | 0,64212 | -0,79104 | 1,248422 | -0,79104 | 1,248422 |
| Size | 0,079439 | 0,174697 | 0,454722 | 0,655062 | -0,28914 | 0,448017 | -0,28914 | 0,448017 |
| Growth | 0,118602 | 0,081294 | 1,458935 | 0,162813 | -0,05291 | 0,290117 | -0,05291 | 0,290117 |

FlSmidth three-variable

| *Regressionsstatistik* | |
|---|---|
| Multipel R | 0,436091 |
| R-kvadrere | 0,190175 |
| Justeret R- | 0,038333 |
| Standardfe | 0,210981 |
| Observatio | 20 |

ANAVA

| | *fg* | *SK* | *MK* | *F* | *ignifikans F* |
|---|---|---|---|---|---|
| Regressior | 3 | 0,16725 | 0,05575 | 1,252451 | 0,323895 |
| Residual | 16 | 0,712205 | 0,044513 | | |
| I alt | 19 | 0,879455 | | | |

| | *Koefficiente* | *Standardfej* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *Nedre 95,0%* | *Øvre 95,0%* |
|---|---|---|---|---|---|---|---|---|
| Skæring | 0,382793 | 0,494383 | 0,774284 | 0,450054 | -0,66525 | 1,430837 | -0,66525 | 1,430837 |
| Size | -0,03816 | 0,198558 | -0,19219 | 0,850009 | -0,45909 | 0,382763 | -0,45909 | 0,382763 |
| Growth | 0,476324 | 0,309585 | 1,538589 | 0,143445 | -0,17997 | 1,132614 | -0,17997 | 1,132614 |
| Profitability | -0,29118 | 0,243375 | -1,19642 | 0,248963 | -0,80711 | 0,224754 | -0,80711 | 0,224754 |

FlSmidth four-variable

| *Regressionsstatistik* | |
|---|---|
| Multipel R | 0,473988 |
| R-kvadrere | 0,224664 |
| Justeret R- | 0,017908 |
| Standardfe | 0,213209 |
| Observatio | 20 |

ANAVA

| | *fg* | *SK* | *MK* | *F* | *ignifikans F* |
|---|---|---|---|---|---|
| Regressior | 4 | 0,197582 | 0,049396 | 1,086615 | 0,398212 |
| Residual | 15 | 0,681873 | 0,045458 | | |
| I alt | 19 | 0,879455 | | | |

| | *Koefficiente* | *Standardfej* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *Nedre 95,0%* | *Øvre 95,0%* |
|---|---|---|---|---|---|---|---|---|
| Skæring | 0,118187 | 0,595431 | 0,19849 | 0,845327 | -1,15094 | 1,387318 | -1,15094 | 1,387318 |
| Size | 0,03594 | 0,220209 | 0,16321 | 0,872532 | -0,43342 | 0,505305 | -0,43342 | 0,505305 |
| Growth | 0,611856 | 0,35413 | 1,727774 | 0,104554 | -0,14295 | 1,366666 | -0,14295 | 1,366666 |
| Profitability | -0,17718 | 0,282783 | -0,62655 | 0,540374 | -0,77991 | 0,42556 | -0,77991 | 0,42556 |
| Industry | -0,21964 | 0,26888 | -0,81685 | 0,426797 | -0,79274 | 0,353469 | -0,79274 | 0,353469 |

Appendix 5

Coloplast one-variable

| *Regressionsstatistik* | |
|---|---|
| Multipel R | 0,24323 |
| R-kvadrere | 0,059161 |
| Justeret R- | 0,006892 |
| Standardfe | 3,155015 |
| Observatio | 20 |

ANAVA

| | *fg* | *SK* | *MK* | *F* | *ignifikans F* |
|---|---|---|---|---|---|
| Regressior | 1 | 11,2666 | 11,2666 | 1,131853 | 0,301445 |
| Residual | 18 | 179,1741 | 9,954118 | | |
| I alt | 19 | 190,4407 | | | |

| | *Koefficiente* | *Standardfej* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *ledre 95,0%* | *Øvre 95,0%* |
|---|---|---|---|---|---|---|---|---|
| Skæring | 8,51468 | 2,169155 | 3,925344 | 0,000992 | 3,957455 | 13,0719 | 3,957455 | 13,0719 |
| Size | 0,21073 | 0,198076 | 1,063886 | 0,301445 | -0,20541 | 0,626871 | -0,20541 | 0,626871 |

Coloplast two-variable

| *Regressionsstatistik* | |
|---|---|
| Multipel R | 0,29453 |
| R-kvadrere | 0,086748 |
| Justeret R- | -0,02069 |
| Standardfe | 3,198533 |
| Observatio | 20 |

ANAVA

| | *fg* | *SK* | *MK* | *F* | *ignifikans F* |
|---|---|---|---|---|---|
| Regressior | 2 | 16,5203 | 8,260149 | 0,807395 | 0,462404 |
| Residual | 17 | 173,9204 | 10,23061 | | |
| I alt | 19 | 190,4407 | | | |

| | *Koefficiente* | *Standardfej* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *ledre 95,0%* | *Øvre 95,0%* |
|---|---|---|---|---|---|---|---|---|
| Skæring | 7,781087 | 2,425674 | 3,207805 | 0,00516 | 2,663363 | 12,89881 | 2,663363 | 12,89881 |
| Size | 0,095336 | 0,257398 | 0,370383 | 0,715672 | -0,44773 | 0,638398 | -0,44773 | 0,638398 |
| Growth | 0,16987 | 0,237047 | 0,716608 | 0,483345 | -0,33026 | 0,669995 | -0,33026 | 0,669995 |

Coloplast three-variable

| *Regressionsstatistik* | |
|---|---|
| Multipel R | 0,832495 |
| R-kvadrere | 0,693049 |
| Justeret R- | 0,635495 |
| Standardfe | 1,911414 |
| Observatio | 20 |

ANAVA

| | *fg* | *SK* | *MK* | *F* | *ignifikans F* |
|---|---|---|---|---|---|
| Regressior | 3 | 131,9847 | 43,99489 | 12,04183 | 0,000224 |
| Residual | 16 | 58,45606 | 3,653504 | | |
| I alt | 19 | 190,4407 | | | |

| | *Koefficiente* | *Standardfej* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *Nedre 95,0%* | *Øvre 95,0%* |
|---|---|---|---|---|---|---|---|---|
| Skæring | 2,730102 | 1,705428 | 1,600831 | 0,128971 | -0,88524 | 6,345449 | -0,88524 | 6,345449 |
| Size | 0,067237 | 0,1539 | 0,43689 | 0,66803 | -0,25902 | 0,39349 | -0,25902 | 0,39349 |
| Growth | -0,11951 | 0,15072 | -0,79291 | 0,439428 | -0,43902 | 0,200004 | -0,43902 | 0,200004 |
| Profitability | 0,948498 | 0,16872 | 5,62172 | 3,82E-05 | 0,590827 | 1,306169 | 0,590827 | 1,306169 |

Coloplast four-variable

| *Regressionsstatistik* | |
|---|---|
| Multipel R | 0,83734 |
| R-kvadrere | 0,701139 |
| Justeret R- | 0,621443 |
| Standardfe | 1,94791 |
| Observatio | 20 |

ANAVA

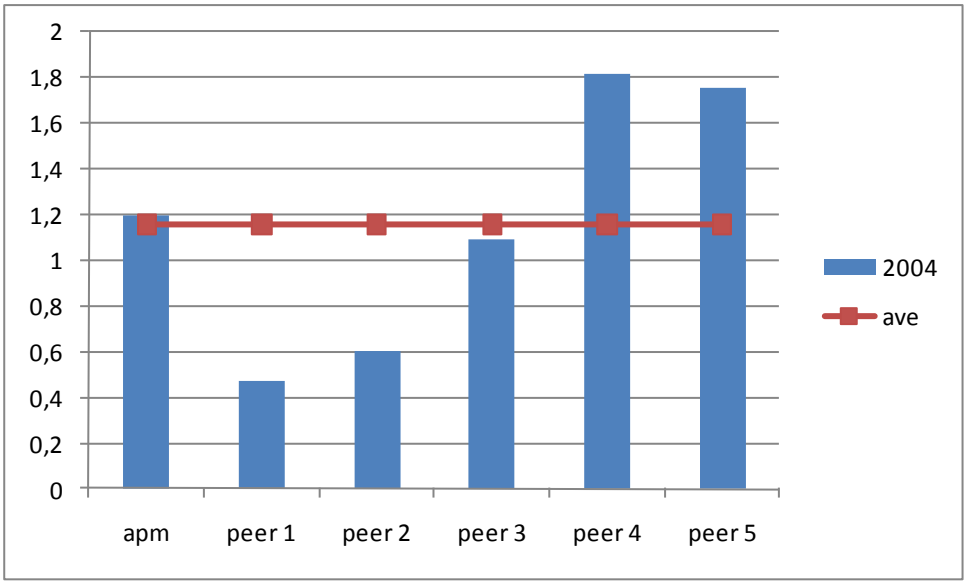
| | *fg* | *SK* | *MK* | *F* | *ignifikans F* |
|---|---|---|---|---|---|
| Regressior | 4 | 133,5254 | 33,38135 | 8,797635 | 0,000729 |
| Residual | 15 | 56,91533 | 3,794355 | | |
| I alt | 19 | 190,4407 | | | |

| | *Koefficiente* | *Standardfej* | *t-stat* | *P-værdi* | *Nedre 95%* | *Øvre 95%* | *Nedre 95,0%* | *Øvre 95,0%* |
|---|---|---|---|---|---|---|---|---|
| Skæring | 2,264894 | 1,885096 | 1,201474 | 0,248195 | -1,75309 | 6,282881 | -1,75309 | 6,282881 |
| Size | 0,077336 | 0,157637 | 0,490593 | 0,630813 | -0,25866 | 0,413331 | -0,25866 | 0,413331 |
| Growth | -0,11044 | 0,154256 | -0,71592 | 0,485037 | -0,43922 | 0,218354 | -0,43922 | 0,218354 |
| Profitability | 0,874092 | 0,207841 | 4,205583 | 0,000764 | 0,43109 | 1,317095 | 0,43109 | 1,317095 |
| Industry | 0,060624 | 0,095138 | 0,637229 | 0,533582 | -0,14216 | 0,263405 | -0,14216 | 0,263405 |

Appendix 6

| Closest match on profitability to APM Maersk | | | | |
|---|---|---|---|---|
| FOREST LABS. | 24,78% | FPL GROU | 8 | 14,78% |
| PFIZER | 24,32% | GETINGE - | 9 | 14,71% |
| EDF ENERGIES NOUV. | 23,48% | HEINEKEN | 7 | 14,66% |
| TEEKAY | 23,25% | MITSUI OS | 6 | 14,56% |
| NOVARTIS 'R' | 23,05% | TDG HOLD | 6 | 14,05% |
| GOLDEN OCEAN GROUP | 22,79% | KOMATSU | | 13,95% |
| JINHUI SHIP.& TRSP. | 22,25% | RESMED - CAPEX | | 13,60% |
| SABMILLER | 22,23% | BRISTOL MYERS SQUIBB | | 13,34% |
| MEDA 'A' | 21,49% | SUZLON ENERGY | | 13,24% |
| NOVOZYMES | 20,91% | BUCYRUS INTERNATIONAL | | 13,22% |
| NOVOZYMES | 20,91% | BOSTON SCIENTIFIC - CAPEX | | 13,09% |
| SCHERING-PLOUGH | 20,64% | ABB 'R' | | 12,91% |
| C R BARD - CAPEX | 19,98% | E ON | | 12,72% |
| SMITH & NEPHEW - CAPEX | 19,42% | OUTOTEC | | 12,23% |
| UCB | 19,40% | ORIENT OVERSEAS (INTL.) | | 12,22% |
| JOY GLOBAL | 19,23% | WILSON | | 11,96% |
| STALLERGENES | 19,23% | SECTRA 'B' - CAPEX | | 11,94% |
| SANOFI-AVENTIS | 18,85% | COLOPLAST | | 11,86% |
| ODFJELL 'A' | 18,80% | MCCORMICK & CO | | 11,83% |
| LAFARGE | 18,50% | MOLSON COORS BREWING 'B' | | 11,74% |
| EDP ENERGIAS DE PORTUGAL | 18,47% | ALK-ABELLO | | 11,68% |
| ELI LILLY | 18,40% | SOLVAY | | 11,39% |
| SANDVIK | 17,67% | STOLT NIELSEN (BER) | | 11,39% |
| ATLAS COPCO 'A' | 17,64% | BAYER | | 11,35% |
| RWE | 17,25% | KHD HMB.WDG.INDL.SVS. | | 11,17% |
| INTL.FLAVORS & FRAG. | 16,77% | ELEKTA 'B' - CAPEX | | 11,17% |
| CEMEX '1' | 16,62% | ABBOTT LABORATORIES | | 10,82% |
| SINCERE | 15,70% | HANSEN TNSMS.INTL.(DI) | | 10,47% |
| BOART LONGYEAR | 15,24% | EXEL INDUSTRIES | | 10,47% |
| **APM MAERSK** | **14,87%** | HAYS | | 10,38% |

Appendix 7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0,6
0,4
0,2
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apm
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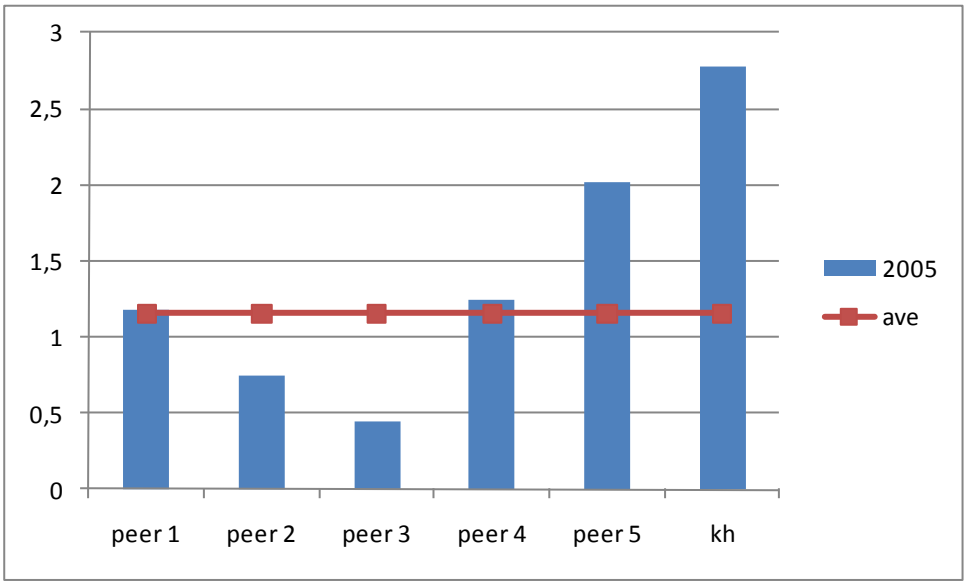
peer 2
peer 3
peer 4
peer 5
2004
ave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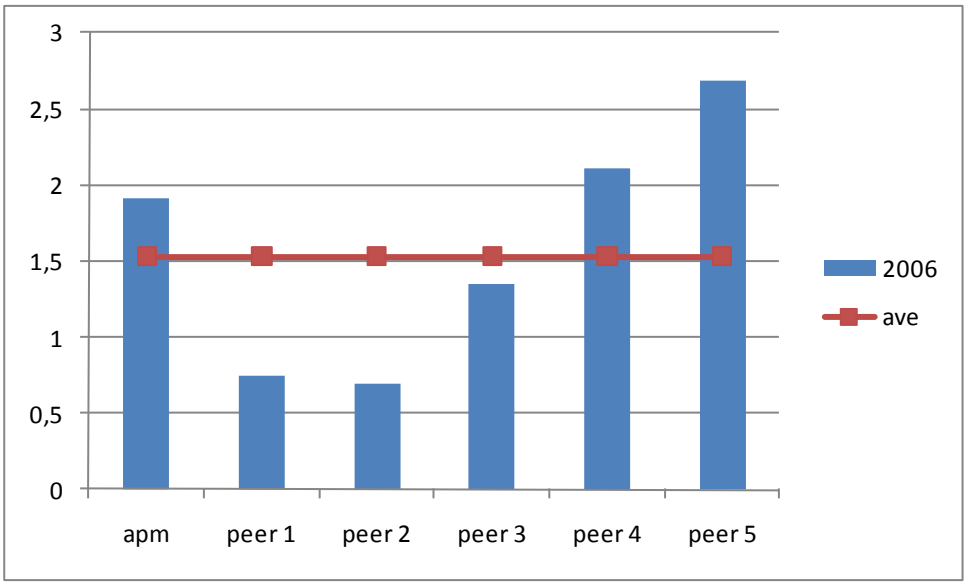
kh
2005
ave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2006
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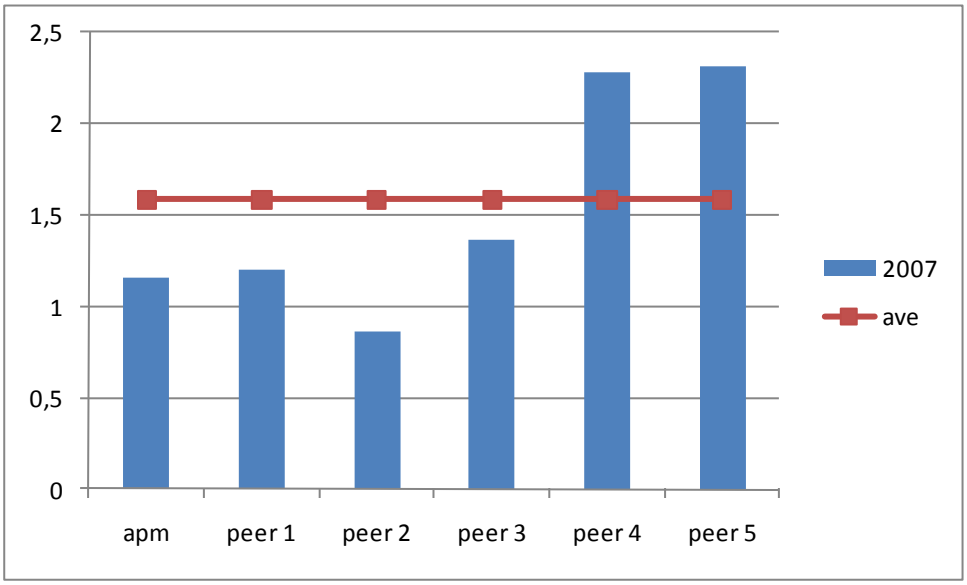
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2007
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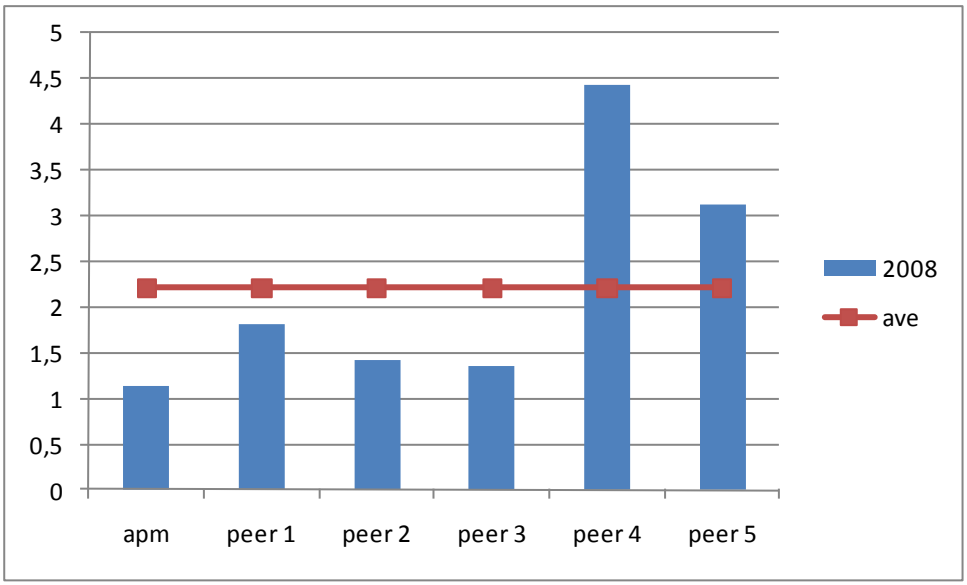
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peer 3
peer 4
peer 5
2008
ave