

CEO Compensation

- The Effect of Owning Foreign Subsidiaries

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Abstract

There have historically been high differences in CEO compensation levels internationally, specifically between the US and the rest of the world. It has however been argued that the growing internationalization of firms should contribute to a convergence of CEO compensation. In this thesis the effect of owning foreign subsidiaries on CEO compensation is analysed. Cross-sectional regressions are performed on a sample of 160 listed Swedish firms for the year 2006 to test the relationship. The results show that owning foreign subsidiaries increases CEO compensation after controlling for firm size and industry. This effect is even stronger when subsidiaries are established in high compensation countries. Unexpectedly however, no significant effect of owning subsidiaries in the US is observed, nor do the results support the hypothesis of an effect on equity-based compensation.

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Table of Contents

1. Introduction	3
2. Theoretical framework and previous research	5
2.1 Measurement of the pay gap	5
2.2 Explanations of the pay gap	5
2.3 The drivers of convergence	7
3. Hypotheses	9
4. Data	12
4.1 Subsidiaries	12
4.2 CEO compensation and its components	12
4.3 Market capitalization	12
4.4 Industry	13
4.5 Limitations	13
4.6 Summary statistics	14
5. Methodology	16
5.1 Regression specification	16
5.2 Additional regressions	17
5.3 Robustness	17
5.4 Heteroskedasticity	17
5.5 Multicollinearity	17
5.6 Missing values	18
5.7 Outliers	18
6. Results	19
6.1 Results from main regressions	19
6.2 Results from robustness regressions	21
6.3 Results from additional regressions	21
7. Analysis	23
7.1 Validation of hypotheses	23
7.2 Signification for the drivers of convergence	25
8. Concluding remarks	26
9. Suggestions for further research	27
10. References	28
11. Appendices	30

1. Introduction

The literature refers to the *US pay gap* as the significant difference between CEO compensation in the US compared to the rest of the world. In 2006, the US was averaging 56 % higher CEO compensation than the second highest compensation country, Switzerland, and 128 % higher than Sweden (Towers Perrin 2006). Interestingly this large pay gap is observed only for CEOs. For employees – The Towers Perrin report provides an international comparison of the compensation level for accountants and manufacturing employees – there is no significant difference between the US and other developed countries. For management positions, although it is true that US high-level managers are the best paid in the world, the difference is much smaller than for CEOs: compensation is only 6 % higher than in the second highest compensation country, the UK. The US pay gap is thus an issue specific to CEOs which requires a multi-faceted explanation. Although part of the gap is relatively easily explained by differences in firm characteristics, trying to provide a complete explanation requires an understanding of the institutional differences between high- and low-compensation countries, such as share ownership differences, labor market differences and even cultural aspects. The theoretical framework included in this thesis will start by reviewing the tentative explanations for the US pay gap.

Contemporary to searching for explanations of the pay gap, scholars started observing and theorizing whether the gap was deepening or being reduced. The predominant view has been that in the long run, CEO compensation levels are expected to converge internationally. The reasoning is that with the increasing integration of goods markets, financial markets and labor markets, CEO compensation levels should slowly converge to a unique international level. Therefore, if studies can find that firms that are highly internationalized also have high CEO compensation, then this evidence can be used to predict an international convergence of the compensation levels. Previous research has found that CEO compensation increases with factors such as the level of foreign sales (Oxelheim and Randøy 2004), the degree of international ownership in the firm, if the firm is cross-listed on a foreign stock exchange and if the CEO has international experience (Fernandes et al 2009). These findings all support a convergence. The second part of the theoretical framework in this thesis will review the evidences of a convergence.

The Swedish economy is growing more and more integrated with the rest of the world, it can for instance be noted that the share of exports in the Swedish GDP has grown from 32.7 % in 1993 to 48.4 % in 2009 (SCB/Statistics Sweden 2010). One facet of internationalization is the growing development of multinational firms, which can be estimated by the number of foreign subsidiaries a firm owns. The aim of this thesis is to investigate if there is a relationship between the level of international development of Swedish firms and the compensation for the CEO in these firms. In particular it will be investigated if the development of subsidiaries in the US and in other high-

compensation countries signifies higher compensation for CEOs of the Swedish mother company. If a relationship is found it will give support to the hypothesis of an international convergence of CEO compensation: if CEOs in firms which develop their organization internationally have higher compensation, and more and more firms develop their organizations outside their borders, then we should in the end expect a convergence of compensation levels.

The first part of this thesis is dedicated to theoretical framework and previous research. The hypotheses will be presented in the second part of the thesis. The third part is consecrated to the data, which consists of information about the subsidiaries and the CEO compensation for 160 Swedish listed companies. The data is analyzed using a cross-sectional OLS regression, a methodology that is outlined in the fourth part of the thesis. In the succeeding parts the results are presented and finally discussed.

2. Theoretical framework and previous research

2.1 Measurement of the pay gap

There are two ways to measure CEO compensation. The most common is to calculate the compensation as the opportunity cost *for the firm*, which is the cost of the foregone resources to the firm. The cost is usually found by performing a Black & Scholes valuation (see Appendix 1) of the options attributed during the year and adding that value to the cash and cash-equivalent compensation during the year.

The second way to measure CEO compensation is to measure it as the opportunity cost *for the CEO*, which is the replacement value of the whole compensation package for the CEO. This value differs from the first one because of taxes paid on the compensation, purchasing power differences between the countries and the fact that the CEO, being employed, has access to privately consumed services through the public sector, which differ internationally (Abowd and compensation Bognanno 1995). It should be noted that the pay gap persists in both measures.

2.2 Explanations of the pay gap

Broadly speaking, any difference in CEO compensation must be due to either firm characteristics, CEO characteristics or country characteristics. Early literature studied the difference in CEO compensation between firms in the same country and found a number of explaining firm characteristics, the most incontestable ones being firm size and industry, but also characteristics such as performance, risk and liquidity (Fernandes et al 2009). The literature also found that CEO characteristics such as age, education and experience helped to explain the compensation level. Taking the reasoning further, if the populations of firms and CEOs in the US are different from the rest of the world then it should not be surprising to find higher levels of CEO compensation in the US. The literature shows that this is to some extent the case: notably US firms are larger and more performant. Therefore firm and CEO characteristics explain the US pay gap, but only partly (Fernandes et al 2009, Conyon Murphy 1998). The remaining difference must therefore be due to country characteristics. In what follows three tentative explanations based on *shareholder structure* differences between the US and the rest of the world will be considered, one tentative explanation related to the *labor market*, one to *tax levels* and one to the *culture* of the country.

A number of influential explanations of the US pay gap derive from the more dispersed ownership in US firms. Agency theory states that if the alignment of the interests of the principal (in our case the shareholders) and agent (the CEO) can not be made through direct control by the principal, then alignment through monetary incentives should be used (Jensen and Meckling 1976), therefore in firms

where the ownership is dispersed such as in the US, a heavy use of equity-based compensation should be found. Basic portfolio theory explain why the use of equity-based compensation leads to higher compensation levels: the holding of large amounts of options or stocks in the firm being a highly undiversified investment, the risk averse CEO requires a higher expected return than if the compensation was in cash (Hall and Murphy 2000). Thus, higher compensation levels are expected in countries where the use of equity-based compensation is common – that is, in countries with dispersed ownership. Lower CEO compensation for firms with control shareholders could also have a different significance however: when the CEO is also the major shareholder she has the possibility to take money out of the firm through self-dealing (Thomas 2003). The CEO compensation level as it appears in statistics could therefore be lower in concentrated shareholder firms for this reason.

A second explanation that links ownership dispersion to higher US CEO compensation is provided by the marginal revenue product theory. This theory states that in a competitive labor market the CEO should be paid her marginal revenue product (Thomas 2003). The dispersed ownership means that CEOs take critical decisions that are otherwise taken by the controlling owner in firms with concentrated ownership, hence the CEO's impact is higher and she is expected to be rewarded with higher compensation.

The impact of the CEO on the firm is also thought to have increased with the intensification of hostile takeovers in the 1980's. In firms lacking a control shareholder the CEO gained new power since she could decisively influence the success or the failure of a takeover bid. It is believed that with the increasing power the CEOs also saw their compensation increase (Thomas 2003).

Opportunity cost theory is another explanation for CEO compensation differences. The CEO opportunity cost is the compensation the CEO could get in the best alternative job. The higher this amount, the higher her required compensation will be. It is thought that US CEOs have better opportunities firstly because of the bigger domestic market, thus the larger number of job options, and secondly because US CEOs have better opportunities to start their own companies, due to the more dynamic financing system for start-ups in the US (Thomas 2003).

Another important explaining variable of CEO compensation is the tax level. It has been proven that CEO compensation is correlated negatively with the tax level (Abowd and Bognanno 1995). An explanation for this phenomenon could be that CEOs in high-tax countries, discouraged to claim a compensation raise, increase their benefits by other means (self-dealing). As the US has a low marginal tax in international comparison, it is believed to explain part of the gap.

Lastly, there is a large pan of the CEO pay research which focuses on cultural differences, stating that

US CEO compensation levels are not culturally acceptable abroad, and hence although the use of high equity-based compensation would be optimal it can not be implemented (Murphy Conyon 2000).

2.3 The drivers of convergence

Internationalization can be characterized as stock market integration (which can be estimated by the increase in international ownership), goods market integration (estimated by the increase in firms' foreign sales) and labor market integration (estimated by the increase in international hiring). Empirically the effects of internationalization on the US pay gap are not undisputed, but recent studies such as Thomas (2008) and Fernandes et al. (2009) show proof of a convergence, mainly through the increasing use of equity-based compensation outside the U.S. The mechanisms of internationalization thought to be responsible for a convergence of CEO compensation are the following:

- *Internationalization of goods market.* It is thought to lead to a convergence of the opportunity cost for the compensation package to the firm. Simply stated, increased international competition is expected to lead to a convergence of costs and performance of competing firms. CEO compensation being an important cost for firms, abnormal compensation levels are expected to disappear in the long run (Abowd and Bognanno 1995).
- *Internationalization of ownership.* It is thought to lead to a convergence of incentive levels. Evidence of internationalization of share ownership is largely reported. On the Swedish stock market international ownership has increased from 8 % to 37 % between 1992 and 2007 (Sundin and Sundqvist 2007). The internationalization is thought to have resulted in a dispersion of ownership, which, following the agency theory outlined previously, is expected to lead to higher compensation levels, and thus be a driver of convergence (Thomas 2008). The internationalization of ownership is accelerated by cross-listing, which has been identified as a significant explanatory variable for CEO compensation (cross-listing of foreign firms on US stock exchanges, Fernandes et al 2009).
- *Internationalization of hiring.* It is thought to lead to a convergence of CEO opportunity costs. Although still not very pronounced, a trend of a globalization of the labor market for CEOs can be observed, this can for instance be seen in Sweden with the recruiting since 1998 of American CEOs to lead Swedish companies (Thomas 2008). A globalized labor market gives foreign CEOs the possibility to be employed in the US. Their opportunity cost is thus increased and as a result the compensation level in the local market for CEOs rises. CEO compensation is also increased by the recruitment of US CEOs who require a higher compensation than the local levels. A study of CEO characteristics finds that international experience is a significant explanatory variable of CEO compensation (Fernandes et al 2009).

- *Internationalization of organizations.* It is thought to lead to a convergence of CEO opportunity costs. Firms expand internationally by buying foreign companies in cross-border merger and acquisition deals, or by establishing foreign subsidiaries. The executives in these firms hence develop international skills, which increase their opportunity cost (Thomas 2008). Moreover, multinational firms, which employ executives all over the world often maintain a uniform pay system. Thus a US multinational firm that expands internationally will often keep an equity-based compensation structure for the executives in the foreign countries in which it expands (Thomas 2008). Similarly, to be competitive, a Swedish firm with operations in the US would have to adapt to the local compensation structure and level for its US subsidiary, but this compensation structure could spread to the Swedish mother company, because of the desire to unify the pay system and because it is not usually accepted that a branch manager is better paid than the CEO. Some evidence for this theory has been given in studies (Fernandes et al. 2009, Oxelheim and Randøy 2004) where the volume of foreign sales of a firm proved to be correlated with CEO compensation. A third explanation states that the CEO of an international firm is subject to higher risks, since she is evaluated on outcomes over which she can exert very little influence, such as changes in the exogenous economical or political climate (Oxelheim and Randøy 2004). The CEO therefore requires a risk premium, which increases the compensation level.

3. Hypotheses

The scope of this thesis is to further analyze one of the alleged drivers of convergence, namely the effect of the internationalization of organizations on CEO compensation. Our proxy for the internationalization level of a firm is its number of foreign subsidiaries. The implementation of foreign subsidiaries or the acquisition of foreign firms, integrated as subsidiaries, is expected to have an effect on CEO compensation. In this thesis and similarly to Oxelheim and Randøy (2004), Scandinavia will be considered sufficiently homogenous with regards to compensation levels, labor market and systematic risk to be considered as a group. Foreign subsidiaries are therefore defined as subsidiaries in countries other than Sweden, Norway, Denmark and Finland.

There are multiple options for a firm that wants to expand its operations internationally. If a firm wants to initiate sales in a country, one option is to establish partnerships with local firms and start to export to the country. Another option is to establish a subsidiary (fully owned, or through a joint venture). While expanding sales to a new region is a frequent reason for establishing subsidiaries, firms also implement subsidiaries for other reasons. Examples include the establishment of subsidiaries in charge of production or of R&D. Whether a firm chooses to expand its organization by implementing foreign subsidiaries or instead works through partnerships with other firms have implications on the compensation structure for the executives – and ultimately for the CEO – in the mother company.

Previous research – including studies using Swedish data (Oxelheim and Randøy 2004) – have tested the relation between a firm's foreign sales and the compensation of the CEO of the firm, and found a positive relationship. To the best of our knowledge however there is no study that uses the number of foreign subsidiaries as a proxy for internationalization.

The alternative approach of using subsidiaries as proxy is interesting not only for robustness purposes with regards to previous studies, but also because it captures the internationalization of a firm differently. When taking foreign sales as proxy, it is left untold if the firm sells internationally through local partnerships or if it has subsidiaries, it also doesn't take into account subsidiaries established for other reasons than to increase sales. Instead, using the number of subsidiaries as proxy signifies that the organizational development of the firm is captured to a larger extent. However no information is given on the contribution of the various subsidiaries to the revenue of the firm. Therefore, comparing the effect of the two proxies can help to determine if the effect on compensation appears when the firm develops its organization internationally by implementing subsidiaries, or only at the point when its exports start to represent a significant share of its revenue.

Two of the drivers of convergence referred to in the theoretical framework concern the organizational development of a firm. For a firm with many subsidiaries there is an expectation of increased compensation because the CEO increases her opportunity cost by managing a more internationalized organization, and because uniform pay system can mean that large compensation in subsidiaries spread to the mother company. The proxy used in this thesis should capture these drivers to a large extent. It should on the contrary capture to a less extent the third driver, which is the risk induced by an international firm, since the risk mainly appears when foreign countries become responsible for a significant share of the revenue of the firm. Therefore, the approach of this thesis could contribute to determine the drivers of convergence related to the international organizational development of Swedish firms.

As seen previously, in the broadest sense implementing a subsidiary in a foreign country is thought to give the CEO managing the multinational firm a higher opportunity cost, since she increases her skills in managing international firms. Related to this theory our first hypothesis will be:

H1: CEO compensation increases with the number of foreign subsidiaries a firm owns

If a multinational firm is implemented in countries where executive compensation is higher than in Sweden, the whole organization is expected to adapt to some extent to the local compensation level, as a spillover effect. As the compensation structure is often uniform at the firm level, high compensation levels in subsidiaries is expected to have an effect on the compensation level in the controlling company and thus on the CEO compensation. High compensation countries are defined in this thesis as countries where the CEO compensation is at least 20 % higher than in Sweden according to Towers Perrin (2006), which is the case in the US, in Switzerland, in France, in the UK and in Germany. It will be tested if firms with subsidiaries in high compensation countries in general, or in the US in particular, have higher CEO compensation:

H2: CEO compensation increases with the number of subsidiaries in high-compensation countries a firm owns

H3: CEO compensation increases with the number of US subsidiaries a firm owns

In the US, as opposed to Sweden, the CEO compensation structure is largely equity-based. A further way to test the theory which states that implementing subsidiaries in the US leads to a spillover effect to the Swedish mother company is thus to analyze if there is a relationship between the establishment of subsidiaries in the US and the level of the equity-based part of the CEO compensation package:

H4: CEO equity-based compensation increases with the number of US subsidiaries a firm owns

Finally, as part of a more general investigation, each compensation component (fixed salary, bonus and options are tested, perks and long term shares are excluded because they represent too small a share of the total compensation package) will be tested separately against the three variables: number of foreign subsidiaries, number of subsidiaries in high-compensation countries and number of subsidiaries in the US.

4. Data

In order to test the hypotheses, data for the year 2006 has been gathered for all Swedish stock listed companies on the OMX large, mid and small cap lists, where required information was available. The result is a dataset consisting of 160 companies. The scope of the thesis has been limited by looking at a snapshot of the market, namely for the year 2006. A discussion on this and its implications will follow later in this section. Below follows a description of the required information for each company in the dataset.

4.1 Subsidiaries

The information about subsidiaries for each firm has been gathered through Orbis (Bureau van Dijk). For each of the 160 companies the latest updated number of foreign subsidiaries and the specific country of each subsidiary was registered.

Since subsidiaries have not been used in any previous studies on CEO compensation, there were no guidelines to follow in determining whether a company should be considered a subsidiary or not. Since minority investments imply limited influence in both directions, companies where the mother company controls (directly and indirectly) more than 50% of a company's votes have been entered as subsidiaries. This definition corresponds to the Swedish legal definition of a subsidiary (Aktiebolagslag 2005).

4.2 CEO compensation and its components

Compensation data has been collected from the companies' annual reports. Components of CEO compensation are often divided into fixed salary, bonus, perks, options and share grants. The same categorization has been applied in this thesis. Based on these components, the equity-based compensation has been defined as options and share grants. The stock options have been valued using the Black and Scholes model (see Appendix 1). Restricted share grants have been valued using the reference price if available; otherwise the market price at year-end of the period is used.

4.3 Market capitalization

In order to control for firm size when testing for the effect of foreign subsidiaries on CEO compensation, market capitalization at the end of 2005 has been included as a proxy. This date has been chosen since performance for the full year 2006 is measured on the basis of figures at the beginning of the year, i.e. end of 2005 (Hartzell and Starks 2003, Conyon and Murphy 2000). Market capitalization is simply the number of shares multiplied by the stock price on the last trading day of 2005.

4.4 Industry

The 160 companies in our dataset have been split into nine categories based on Affärsvärlden's classifications: consumer goods, finance, healthcare, IT, manufacturing, media and entertainment, raw materials, services and telecommunications.

4.5 Limitations

One major limitation of this thesis is the fact that it only includes a snapshot of subsidiary data via Orbis. That is, only the current number of subsidiaries can be seen. Optimally data for several or even two separated years would have been collected. In that way it would have been possible to measure the degree of internationalization against CEO-compensation for each company over the relevant period. With the available data the thesis is limited to comparing the degree of internationalization between the sample companies.

The second limitation is that all subsidiaries are entered with equal weight into the dataset. A larger subsidiary (in terms of sales, assets etc.) may have a larger impact on the parent company compared to a smaller subsidiary. This would thus be interesting to test for. To include this aspect into the thesis, however, would incur a problem of scope as the total number of subsidiaries is well above three thousand. However, if the subsidiaries were to be based on their size the thesis would implicitly, in some ways, be testing for firm size and not directly for internationalization. Based on this reasoning, it is believed that the approach of this thesis is more relevant.

Out of all stock-listed firms in 2006, the firms that used warrants or convertibles in their compensation package were excluded due to lack of data required for valuing these instruments. The initial sample of firms for which compensation data was available thus included 207 observations.

Out of these 207, information about subsidiaries could be found for 160 firms. Although the remaining sample size is satisfactory, the existence of 47 missing values (firms for which it was unclear whether there were no subsidiaries or if the information was simply lacking) could bias the data sample. Missing values can bias a data set if they are not drawn randomly from the population, which in this thesis would be the case if the missing values systematically have different characteristics in terms of level and composition of the compensation package than the observations in the final data set. In order to reveal a potential bias a test for the significance of missing values will be performed in the next part of the thesis.

A last limitation follows from the fact that CEO pension benefits, which is the last component of the compensation package, is not included in the data. Pension benefits have been excluded due to

difficulties in finding information disclosed by the companies, and with the valuation of pension obligations.

4.6 Summary statistics

Average total CEO compensation in the sample is 5 706 502 SEK. The total CEO compensation has a large standard deviation (6 667 341). The values span from just 240 000 SEK (Digital Vision) to 57 429 483 SEK (MTG).

Chart 1 below shows the composition of the compensation package. The figures show that fixed salary is still the major component of CEO compensation (60 %), followed by bonus (25 %), equity-based compensation (options and share grants) represents a small part of the total package (13 %).

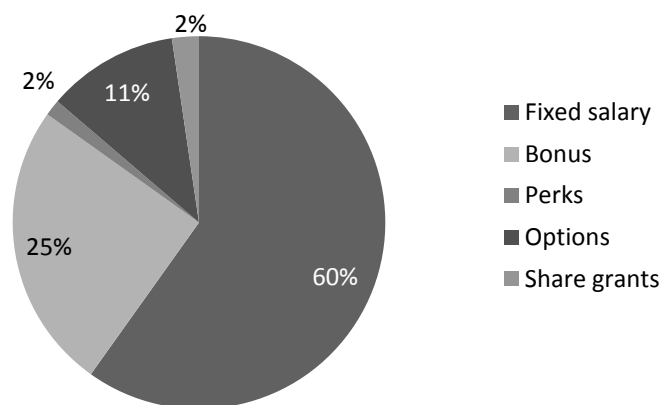


Chart 1. Composition of the compensation package.

Table 1 below shows average total compensation per industry, together with the standard deviation of the compensation, the average firm size (market capitalization for the previous year) and the number of observations.

	Observations	Average total compensation in SEK	Std dev total compensation in SEK	Average firm size in billions of SEK
Consumer goods	21	4 647 749	3 996 352	16.8
Finance	21	7 257 908	7 625 434	39.1
Healthcare	14	3 197 609	3 057 007	3.4
IT-companies	27	3 097 185	1 880 767	6
Manufacturing	43	6 190 037	5 132 009	15.6
Media and entertainment	4	17 300 000	26 800 000	6.3
Raw materials	9	6 265 508	3 761 118	19.1
Services	10	5 145 065	4 764 562	7.8
Telecommunications	11	8 298 489	9 080 851	61.8

Table 1. Industry characteristics for 2006.

The highest-compensation industry is Media and entertainment. However, these results are highly biased because of MTG being the overall highest-compensation company, and the industry only includes 4 companies. The highest-compensation industries thus appear to be telecommunications (8.3 BSEK) and finance (7.26 BSEK), which are also the industries with the largest firm sizes (respectively 61.8 BSEK and 39.1 BSEK). The lowest-compensation industries appear to be healthcare and IT-companies, which are also the industries with the lowest firm sizes (respectively 3.41 BSEK and 6 BSEK).

The companies in the sample had an average of 15 foreign subsidiaries. The figure has a large span: 23 companies don't have any foreign subsidiaries at all while the company with the largest organization outside Scandinavia, Sandvik, has 179 foreign subsidiaries. Table 2 below shows the top 5 countries in terms of implementation of subsidiaries.

	Germany	UK	US	Netherlands	France
Percentage of firms with subsidiaries in the country	51.25%	47.50%	45.00%	37.50%	32.50%
Total number of subsidiaries	369	184	203	213	156

Table 2. Top 5 countries in terms of implementation of subsidiaries.

The most popular country is Germany where over half (51.25 %) of the Swedish companies in the sample had implemented at least one subsidiary. The Anglo-Saxon countries appear 2nd and 3rd: 47.5 % of the companies had at least one subsidiary in the UK and 45 % at least one subsidiary in the US. Netherlands and France appear in 4th and 5th position.

5. Methodology

5.1 Regression specification

A cross-sectional OLS regression will be performed to test the relations specified in the hypotheses. Corresponding to the four hypotheses the regressions specified in equations 1-4 below will be performed:

H1:

$$totalCompensation_i = \alpha + \beta_1 subsidiariesAbroad_i + \beta_2 firmSize_i + \sum \beta_k industryDummyVariables_i + \varepsilon_i \quad (1)$$

H2:

$$totalCompensation_i = \alpha + \beta_1 subsidiariesHighCompensationCountries_i + \beta_2 firmSize_i + \sum \beta_k industryDummyVariables_i + \varepsilon_i \quad (2)$$

H3:

$$totalCompensation_i = \alpha + \beta_1 subsidiariesUSA_i + \beta_2 firmSize_i + \sum \beta_k industryDummyVariables_i + \varepsilon_i \quad (3)$$

H4:

$$totalEquityBasedCompensation_i = \alpha + \beta_1 subsidiariesUSA_i + \beta_2 firmSize_i + \sum \beta_k industryDummyVariables_i + \varepsilon_i \quad (4)$$

The dependent variables are defined as:

- *totalCompensation* is the natural logarithm of the value of the compensation package for the CEO of the firm
- *totalEquityCompensation* is the natural logarithm of the value of the equity-based part of the compensation package for the CEO of the firm

The independent variables of interest in the test are defined as:

- *subsidiariesAbroad* is the number of foreign subsidiaries of the firm
- *subsidiariesHighCompensationCountries* is the number of subsidiaries in high compensation countries of the firm
- *subsidiariesUSA* is the number of subsidiaries in the US of the firm

The control variables are defined as:

- *firmSize* is the natural logarithm of the firm market capitalization for the previous year.
- *industryDummyVariables* represent the 9 industry dummies, which have 9 corresponding beta coefficients. Each industry dummy variable takes the value of 1 if the firm is categorized in the actual industry and takes 0 otherwise.

The control variables, firm size and industry, have been chosen because they are empirically the most incontestable firm characteristics explaining CEO compensation, and their explanatory power is high (Thomas 2003). Although as was seen in the theoretic part of this thesis other firm or CEO characteristics have been found to be significant in explaining CEO compensation, they have been excluded from our set of control variables because the consistency of their effect is still disputed; also their inclusion would have increased the risk for multicollinearity in the results.

5.2 Additional regressions

Separate regressions will be run for the single component of the compensation package: fixed salary, bonus, and options. Too few firms included perks and share grants in their compensation package and therefore no regressions are performed for these two single components.

5.3 Robustness

To ensure the robustness of the results, whenever it is possible, regressions will be performed using alternative proxies. Therefore, all regressions will be performed using an alternative proxy for firm size, namely the firm book value at the end of 2005.

There is also a need to test that the effect of foreign subsidiaries on CEO compensation is due to the fact that the subsidiaries are implemented abroad, in other words the effect of having a foreign subsidiary should be more important than having a subsidiary in Scandinavia. In order to test this regressions are introduced where the control variable *totalSubsidiaries* is set to the total number of subsidiaries of a firm (including those inside Scandinavia) and where is taken as independent variable of interest the proportion of foreign subsidiaries instead of the absolute number of foreign subsidiaries. Appendix 2 provides specifications for the robustness regressions.

5.4 Heteroskedasticity

The homoskedasticity assumption is believed to be unrealistic for the data in this study – homoskedasticity would imply a constant variance of the error term. In order to get robust results even in case of heteroskedasticity of the data, the regressions are performed using heteroskedasticity-robust standard errors. The heteroskedasticity-robust standard errors provide a method for computing t-statistics that are asymptotically t-distributed independent on the actual presence of heteroskedasticity (Wooldridge 2005).

5.5 Multicollinearity

The choice of control variables, as seen above, should be an insurance against high levels of multicollinearity. For the basic model (equation 1) a correlation of -0.5797 is found between the coefficient for the number of foreign subsidiaries and the coefficient for the market capitalization, therefore revealing some extent of multicollinearity which can however not be considered as

problematic for the model (absolute values > 0.8 are usually considered problematic). Appendix 3 provides complete results for the correlation tests. The Variance Inflation Factor (VIF) can determine if the multicollinearity inflates the variance of the coefficient estimate significantly (Gujarati 2003). The VIF is calculated and shows values below 5 for all variables, multicollinearity can therefore not be considered a reason for concern (see Appendix 4).

5.6 Missing values

The hypothesis that the missing values are not randomly drawn out of the population (see the Limitations section of the Data part above) is tested by running a regression on all 207 observations in the original sample with total compensation as the dependent variable and as independent variables the control variables firm size and industry, along with a dummy taking the value 1 if the observation has no subsidiary information, i.e. is a missing value. The specification allows testing if the fact that an observation is a missing value explains the compensation level. The results show that the dummy variable is insignificant in explaining the total compensation (t-value of -0.11, see Appendix 5 for complete results), and therefore the hypothesis that the missing values are drawn randomly out of the sample can not be rejected, confirming the unbiased character of the remaining sample of 160 firms.

5.7 Outliers

Identification of outliers – single outlying observations which influence the regression results to a large extent – can be performed econometrically by using the regressions residuals (Gujarati 2003), studentized residuals and by performing a Cook's distance test (Cook 1977). Because they were identified as outliers, the two extreme values in terms of total compensation (Modern Times Group and Digital Vision) were excluded prior to running the regressions. A first reason for this exclusion is that the two values can easily be identified as outliers in absolute terms (Digital Vision CEO has a total compensation of 240 000, which corresponds to less than a third of the second lowest CEO compensation in the sample, similarly Modern Times Group CEO has 74 % higher compensation than the 2nd highest paid CEO). In presence of such abnormal values, the existence of particular underlying factors – which are not captured by the model of the thesis – is suspected. Further on these observations were identified as outliers in terms of residuals of the regression for the basic model, with studentized residuals of respectively -3.44 and 2.62 (identification as outliers with 5 % significance). The influence of the single observations on the regression output was also tested using Cook's distance, which provided values of respectively 0.048 and 0.228 (higher than the cut-off point defined as $4/(n - k - 1)$ where n is the number of observations and k the number of parameters, resulting in a cut-off point of 0.027) therefore showing that the regression results are highly sensible to the inclusion or exclusion of the observations (see Appendix 6 for details on the exclusion of outliers).

6. Results

6.1 Results from main regressions

The results for the four main regressions are presented in tables 3-6 below.

	Coeff	Robust std. error	t-statistic	p-value
Number of foreign subs	0.0032267	0.0018493	1.74	0.083
Market cap.	0.2717998	0.0298208	9.11	0.000
Consumer industry	-0.0704403	0.1743725	-0.40	0.687
Finance industry	-0.1497475	0.2038277	-0.73	0.464
Healthcare industry	-0.1778816	0.1707283	-1.04	0.299
IT industry	-0.0721391	0.1719602	-0.42	0.675
Manufacturing industry	0.0903277	0.1314096	0.69	0.493
Media industry	0.4397749	0.3137764	1.40	0.163
Raw material industry	dropped			
Services industry	0.0875905	0.1607196	0.54	0.587
Telecom. Industry	0.2245447	0.1737634	1.29	0.198
Intercept	9.24352	0.6586838	14.03	0.000

Table 3. The first regression, corresponding to Hypothesis 1. Total CEO compensation is explained by the number of foreign subsidiaries.

	Coeff	Robust std. error	t-statistic	p-value
Number of subs. in high-compensation countries	0.0086716	0.0033971	2.55	0.012
Market cap.	0.2721625	0.0268202	10.15	0.000
Consumer industry	-0.0787892	0.1773775	-0.44	0.658
Finance industry	-0.1571905	0.2078922	-0.76	0.451
Healthcare industry	-0.196292	0.1715724	-1.14	0.254
IT industry	-0.0818923	0.1752724	-0.47	0.641
Manufacturing industry	0.0891732	0.1337712	0.67	0.506
Media industry	0.4208548	0.3161175	1.33	0.185
Raw material industry				
Services industry	0.0525718	0.166904	0.31	0.753
Telecom. Industry	0.2270917	0.1782428	1.27	0.205
Intercept	9.238659	0.5980628	15.45	0.000

Table 4. The second regression, corresponding to Hypothesis 2. Total compensation is explained by the number of subsidiaries in high-compensation countries.

	Coeff	Robust std. error	t-statistic	p-value
Number of subs. in the US	0.0221676	0.0198675	1.12	0.266
Market cap.	0.2851879	0.0275018	10.37	0.000
Consumer industry	-0.0751056	0.1760634	-0.43	0.670
Finance industry	-0.168781	0.2072075	-0.81	0.417
Healthcare industry	-0.1862081	0.1777639	-1.05	0.297
IT industry	-0.0781463	0.1774762	-0.44	0.660
Manufacturing industry	0.104085	0.1318404	0.79	0.431
Media industry	0.455655	0.3207969	1.42	0.158
Raw material industry				
Services industry	0.1230931	0.1612961	0.76	0.447
Telecom. Industry	0.2130458	0.17669	1.21	0.230
Intercept	8.973522	0.6129853	14.64	0.000

Table 5. The third regression, corresponding to Hypothesis 3. Total compensation is explained by the number of subsidiaries in the US.

	Coeff	Robust std. error	t-statistic	p-value
Number of subs. in the US	0.0787398	0.0862301	0.91	0.370
Market cap.	0.101422	0.1643524	0.62	0.543
Consumer industry	-1.564012	0.4480093	-3.49	0.002
Finance industry	-1.433904	1.0504	-1.37	0.184
Healthcare industry	-3.026706	0.7448912	-4.06	0.000
IT industry	-3.201482	0.8441845	-3.79	0.001
Manufacturing industry	-1.202316	0.4586263	-2.62	0.015
Media industry	-2.57699	0.7632252	-3.38	0.002
Raw material industry				
Services industry	-2.171104	0.9188311	-2.36	0.026
Telecom. Industry	-1.29476	0.6706247	-1.93	0.065
Intercept	13.66754	3.9107	3.49	0.002

Table 6. The fourth regression, corresponding to Hypothesis 4. Equity-based compensation is explained by the number of subsidiaries in the US.

It can be noted that the coefficient on the independent variable of interest in the four regressions is always positive. In regression number 1, where total compensation is explained by the number of foreign subsidiaries a firm has and in regression number 2, where the total compensation is explained by the number of subsidiaries in high-compensation countries a firm has, the coefficient is significant: p-value of respectively 0.083 and 0.012, therefore significant at a 10 % level and 5 % level

respectively. In regression number 3, where total compensation is explained by the number of subsidiaries in the US, and in regression number 4, where the number of subsidiaries in the US explains the equity-based compensation, no significance is found.

The explanation power of the regressions, measured by the R-squared, is respectively 0.5956, 0.5990, 0.5911 and 0.4405.

6.2 Results from robustness regressions

When running the regressions with book value as an alternative proxy for firm size the significance on the explanatory variable of interest is sharpened: regression number 1 shows significance level of 5 % on the number of foreign subsidiaries, and regression number 2 now shows a significance level of 1 % on the number of subsidiaries in high-compensation countries. The results from regression number 3 are different than when market capitalization was used as proxy for firm size: there is now a significance of 5 % (t-stat of 2.01) for the number of subsidiaries in the US that a firm owns. The regressions number 4 does not show any significance. Appendix 7 presents the results from regressions performed with book value as proxy for firm size.

The regressions with control for the total number of subsidiaries (Appendix 2) show that the effect of foreign subsidiaries on CEO compensation is robust to the total number of subsidiaries. The results show that having subsidiaries inside Scandinavia has no effect on CEO compensation; the effect is solely observed for foreign subsidiaries.

6.3 Results from additional regressions

The additional regressions tested the effect for a firm of owning respectively foreign subsidiaries, subsidiaries in high-compensation countries and subsidiaries in the US on three single components of the compensation package. The results show that:

- Owning foreign subsidiaries has a significant effect on the fixed salary in the regression that has book value as proxy for firm size (at 10 % significance level), however not in the regression where firm size is proxied by market capitalization.
- Owning subsidiaries in high-compensation countries has a significant effect (at 1 % significance level) on the fixed salary, robust for both proxies of firm size.
- Owning subsidiaries in the US has a significant effect on the fixed salary in the regression that has book value as proxy for firm size (at 10 % significance level), however not in the regression where firm size is proxied by market capitalization.
- Owning foreign subsidiaries – or owning subsidiaries in high-compensation countries or in the US only – doesn't have a significant effect on the part of the compensation package composed by bonus and options.

Appendices 7 and 8 show matrices of all the performed regressions, showing for each regression, the significance of the independent variable of interest.

7. Analysis

7.1 Validation of hypotheses

In what follows the hypotheses are validated or rejected in light of the results of the previous section.

H1: CEO compensation increases with the number of foreign subsidiaries a firm has

This hypothesis is accepted because a significant effect can be observed of the number of foreign subsidiaries on CEO compensation: a significance of 10 % is observed when the proxy for firm size is market capitalization, and a significance of 5 % is found when the proxy for firm size is the book value. Since the regressions are logarithmic the effect can be read out directly from the regression results: for a Swedish firm, to have an additional foreign subsidiary increases the compensation of its CEO with 0.32 %. As was seen previously, the number of foreign subsidiaries in the sample spans over a large range, therefore even if the effect for a single added subsidiary is not large, the difference in compensation for a CEO of a firm with a small amount of subsidiaries and a CEO of a firm with a large amount of subsidiaries can be important. To illustrate this an example is taken of two hypothetical firms with the same size and in the same industry, but one of the firm only operates in Scandinavia and the other firm owns 50 subsidiaries outside of Scandinavia. Then our model predicts that the CEO of the second firm would have a 16.13 % higher compensation than the CEO of the first firm.

H2: CEO compensation increases with the number of subsidiaries in high-compensation countries a firm has

This hypothesis has to be accepted because a significant effect can be observed: a significance of 5 % is observed when the proxy for firm size is market capitalization, and a significance of 1 % is found when the proxy for firm size is the book value. For a firm, the effect of adding a subsidiary in a high-compensation country is to increase the compensation of its CEO with 0.87 %. The number of subsidiaries in high-compensation countries spans from 0 to 46. The effect of the presence of subsidiaries in high-compensation countries can therefore be important. To illustrate this an example of two hypothetical firms with the same size and in the same industry can be taken, one of the firm only operates in Scandinavia or in countries where the CEO compensation is the same or lower than the Swedish levels, while the second firm owns 25 subsidiaries in countries where the CEO compensation is significantly higher than in Sweden. Then the model predicts that the CEO of the second firm would have a 21.68 % higher compensation than the CEO of the first firm.

H3: CEO compensation increases with the number of US subsidiaries a firm has

The number of subsidiaries in the US only has a significant effect on CEO compensation in the regression run with book value as proxy for firm size. Therefore the results are not robust and the

third hypothesis has to be rejected. It should be noted that the variance in the number of US subsidiaries is low, which contributes to the difficulty of finding a significant effect: the standard deviation is 2.34 whereas for the number of foreign subsidiaries and the number of subsidiaries in high-compensation countries it is higher, respectively 27.05 and 11.31.

The fact that no effect on compensation is found for US subsidiaries could signify that the CEO of a firm which expands its organization in the US doesn't increase her opportunity cost as much as the CEO of a firm which expands its organization in a European high compensation country. This observation could be explained by the fact that the mobility of CEOs inside Europe is higher than the mobility between Europe and the US, due to legal and cultural barriers. Therefore the CEO of a firm with subsidiaries in the US doesn't increase her chances of getting employment in the US by the same degree that a CEO with subsidiaries in high-compensation countries in Europe increases her chances of getting employment in these European countries. In other words, the experience that a Swedish CEO gets from managing a firm with subsidiaries in the US is not as easily monetized.

H4: CEO equity-based compensation increases with the number of US subsidiaries a firm has

The number of subsidiaries in the US does not appear to have an effect on the equity-based compensation. Both proxies for firm size confirm this result. Therefore the 4th hypothesis has to be rejected. Instead, unexpectedly, the results from the additional regressions show that the component of the compensation package that is the most impacted by the level of internationalization of a firm is the fixed salary.

It should be noted that even if the US was excluded from the group of high-compensation countries, the equity-based pay would represent 43.5 % of the compensation package for this group, compared to 18 % for Sweden. Therefore an effect on the equity-based compensation would still be expected even without the US. In other words the two results are largely independent.

The insignificant effect of owning foreign subsidiaries on equity-based compensation of Swedish CEOs could be due to institutional Swedish limitations. One first reason is that the use of stock options to encourage employees is highly penalized by the Swedish tax system (Thomas 2008). A second reason is found in the justification of equity-based compensation. As mentioned in the theory section, dispersed ownership is an important explanation behind the use of equity-based compensation, and ownership of Swedish firms is not characterized as dispersed in an international perspective. This persistent national fact could hinder the development of equity-based compensation, despite the internationalization of Swedish firms. A third reason is culture. After intense debate about “unreasonably high” CEO compensation, Sweden has in recent years implemented structures to limit the options grants (for instance the guidelines of the Swedish Code of Corporate Governance

regarding remuneration committees). The very variable character of options grants contributes to make it culturally difficult to accept: the remuneration from options grants appears to the public higher than it really is since the remuneration is usually published in the media when the option is called, ignoring the fact that the options represent remuneration for many years and that in many companies the options are never called. These factors may therefore explain that, while there is a pressure for increased compensation, the fact that equity-based compensation is limited institutionally in Sweden results in an observed effect for the fixed salary instead.

7.2 Signification for the drivers of convergence

The alleged drivers of convergence related to the organizational development of a firm that were outlined in the theoretical part will now be put in the light of the results of the thesis. The first alleged driver of convergence states that the compensation structure of the countries where a firm implements subsidiaries could spread to the mother company. Following this theory it would be expected to see a higher equity-based compensation in firms with many subsidiaries in high compensation countries, especially in the US. The results of this thesis however show that firms with many subsidiaries in high-compensation countries do not change their compensation structure. The validity of the contagion effect of the compensation structure on the mother company is hence questioned, and the convergence of compensation levels must therefore have different reasons. Parts of the previous research support that multinationals tend to maintain separate compensation programs in the mother company and in the different foreign subsidiaries. Thomas (2008) quotes US data from a Towers Perrin survey and states that nearly 40 % of all multinationals do not grant the same number of options to all employees at an equivalent hierarchical level worldwide, but instead distribute options according to geography.

The second driver of convergence is the labor market explanation, which states that the compensation for CEOs of largely internationalized firms should be higher because the CEO's opportunity cost increases. Although more data would be needed, there are reasons to believe that the results confirm the validity of this driver. The effect found for firms with foreign subsidiaries is compatible with the fact that the CEO who manages an international organization increases her skills and therefore her opportunity cost. The specific effect found for high-compensation countries is also compatible with the labor market theory: for a CEO, managing a firm with subsidiaries in high-compensation countries results in developing skills are to a higher degree monetized than if the CEO managed a firm with subsidiaries in countries where the level is the same as in Sweden (because the CEO increases her chances to switching to a position in these high-compensation countries). The fact that no significance for subsidiaries in US alone is found could be explained by the fact that, due to legal and cultural barriers, the CEO of a firm with subsidiaries in the US doesn't increase her chances of getting to work in the US to a large extent, and thus the opportunity cost is not significantly increased.

8. Concluding remarks

The thesis has analyzed the effect of owning foreign subsidiaries on CEO compensation, for stock listed Swedish firms. The results show a positive relationship: having a foreign subsidiary increases the compensation of the CEO of the firm after controlling for firm size and industry. If the subsidiary is implemented in a country where CEO compensation is higher than in Sweden, the effect is even stronger. Following previous research, it was further believed that an effect on CEO compensation would be found for firms implementing subsidiaries in the US, the US being the country with the highest CEO compensation. However this was not confirmed empirically by the results, instead it appears that the effect on CEO compensation is higher for firms implementing in European countries with high compensation. The finding could be due to the difficulty of Swedish CEOs to monetize their experience of managing firms with US subsidiaries. Since high-compensation countries have a higher share of equity-based compensation in their pay structure, it was further believed that Swedish firms with subsidiaries in high-compensation countries would have higher equity-based compensation. This was not confirmed empirically: it was shown that the fixed salary is increased for the CEOs of firms having subsidiaries in high-compensation countries and not the equity-based compensation. The finding could be due to institutional and cultural barriers to the use of options and share grants in Sweden.

The findings of this thesis can contribute to the current academic debate over a possible convergence of CEO compensation levels internationally. The internationalization, through the integration of goods markets, labor markets and financial markets, is expected in the long run to lead to an equalization of CEO compensation. One facet of internationalization is the development of multinational firms, firms with many foreign subsidiaries. If, as this thesis confirms, CEOs in multinational firms have higher compensation, then the increasing internationalization of firms will contribute to a convergence of CEO compensation.

9. Suggestions for further research

To the best of our knowledge there is no study that uses the number of foreign subsidiaries as a proxy for internationalization. Although the scope of this study has been limited, the results suggest that this proxy may be of interest to consider when investigating the effects of internationalization on CEO compensation, and as such contribute to the evidence of a convergence of international compensation levels. Further studies based on the number of foreign subsidiaries would therefore be welcomed, to help accept or reject it as a proxy for internationalization.

To further validate the results of this thesis it would be of interest to perform the same tests for a wider range of countries. In that way country specific factors could better be understood and considered. Also, the significantly larger sample size would give more reliable results.

This thesis is based on a snapshot of the market as subsidiary data could only be collected for the last available year through the Orbis database. This means that the methodology is based on comparing the degree of internationalization between the sample firms. If data were to be collected for several years a second approach could be used: measuring the degree of internationalization against CEO compensation for each firm over the relevant time period. Then one would better be able to test if a larger number of foreign subsidiaries from one year to another lead to higher CEO compensation for each specific company.

Assuming that the results of this thesis are valid, it becomes interesting to observe the strategic choices of CEOs. According to the results, a CEO interested in increasing her own compensation, should opt for growth via establishment of subsidiaries in European high compensation countries rather than growth within the Scandinavian region. This may not always be in the best interest of the company's shareholders and could as such be seen as an agency problem. However, it does not fall under the traditional agency problematic. One important prerequisite for this behavior to be seen is that the CEO is aware of the correlations observed in this thesis. Even with this information at hand it is difficult to believe that such strategic choices would be widely spread. First of all one must realize that there are a large number of factors affecting CEO compensation. Secondly, as the effect of each single foreign subsidiary on compensation is quite low, this strategy would take many years for it to have a significant influence on compensation. Nevertheless, we believe that this is an interesting topic for further research.

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11. Appendices

Appendix 1. Black and Scholes Stock Option Valuation

Although the Black and Scholes model has been subject to several areas of critique, it is still the most commonly used valuation method. For this reason, we have chosen to use this method as a base for our valuations. However, in accordance with Merton (1973), the model has been modified in order to also consider continuous dividends. Thus, the pricing formula is set up as follows:

$$c(S_0, T) = e^{-rt} (S_0 e^{(r-q)T} \cdot N(d_1) - KN(d_2))$$

Where,

$$d_1 = \frac{\ln(S_0 e^{(r-q)T} / K) + (\sigma^2 / 2)T}{\sigma \sqrt{T}} \quad d_2 = d_1 - \sigma \sqrt{T}$$

In the formula, c is the call option price determined by:

- r, the estimated risk free interest rate over the lifetime of the option. The estimated values used in our model correspond to the Swedish Riksbank's rates on T-bills and Treasury bonds.
- S_0 , the stock price at the time of issuance of the options (collected from SIXTRUST database)
- q, the estimated continuous dividend yield during the options lifetime (proxy rate of 3% used)
- K, the strike price per share (collected from company annual reports)
- σ^2 , the estimated volatility of the underlying stock (collected from SIXTRUST database)
- T, the time of maturity of the option (collected from annual reports where available, else estimated to 5 years)

Appendix 2. Regressions with control for the total number of subsidiaries

Alternative regression for H1 with control for the total number of subsidiaries

$$totalCompensation_i = \alpha + \beta_1 totalSubsidiaries_i + \beta_2 proportionOfForeignSubsidiaries + \beta_3 firmSize_i + \sum \beta_k industryDummyVariables_i + \varepsilon_i$$

	Coeff	Robust std. error	t-statistic	p-value
Total number of subs.	0.0004568	0.0010649	0.43	0.669
Proportion of foreign subs.	0.2869467	0.1563352	1.84	0.068
Market cap.	0.2782262	0.0310906	8.95	0.000
Consumer industry	-0.0150816	0.1702578	-0.09	0.930
Finance industry	-0.0674209	0.2072075	-0.81	0.417
Healthcare industry	-0.1650773	0.1724283	-0.96	0.340
IT industry	-0.0238663	0.0161556	-0.15	0.883
Manufacturing industry	0.1476633	0.1254453	1.18	0.241
Media industry	0.5180087	0.3236832	1.60	0.112
Raw material industry				
Services industry	0.1784446	0.1603721	1.11	0.268
Telecom. Industry	0.2698345	0.1652503	1.63	0.105
Intercept	8.973425	0.6475985	13.86	0.000

Alternative regression for H2 with control for the total number of subsidiaries

$$totalCompensation_i = \alpha + \beta_1 totalSubsidiaries_i + \beta_2 proportionOfSubsInHighCompensationCountries + \beta_3 firmSize_i + \sum \beta_k industryDummyVariables_i + \varepsilon_i$$

	Coeff	Robust std. error	t-statistic	p-value
Total number of subs.	0.0005999	0.0011065	0.54	0.589
Proportion of subs. in high-compensation countries	0.3540272	0.2209713	1.60	0.111
Market cap.	0.2881417	0.029507	9.77	0.000
Consumer industry	-0.0502205	0.1768983	-0.28	0.777
Finance industry	-0.1425035	0.2081056	-0.68	0.495
Healthcare industry	-0.2080065	0.1852309	-1.12	0.263
IT industry	-0.0591532	0.1761209	-0.34	0.737
Manufacturing industry	0.12162	0.1354079	0.90	0.371
Media industry	0.4814679	0.3263604	1.48	0.142
Raw material industry				
Services industry	0.1374919	0.1678744	0.82	0.414
Telecom. Industry	0.2529565	0.1810472	1.40	0.164
Intercept	8.831693	0.6331283	13.95	0.000

Alternative regression for H3 with control for the total number of subsidiaries

$$totalCompensation_i = \alpha + \beta_1 totalSubsidiaries_i + \beta_2 proportionOfSubsInTheUS + \beta_3 firmSize_i + \sum \beta_k industryDummyVariables_i + \varepsilon_i$$

	Coeff	Robust std. error	t-statistic	p-value
Total number of subs.	0.0005094	0.001135	0.45	0.654
Proportion of subs. In the US	0.2116341	0.3119382	0.68	0.499
Market cap.	0.2929598	0.0293041	10.00	0.000
Consumer industry	-0.0653837	0.1754926	-0.37	0.710
Finance industry	-0.1828262	0.210159	-0.87	0.386
Healthcare industry	-0.1796246	0.1927951	-0.93	0.353
IT industry	-0.0707717	0.1791405	-0.40	0.693
Manufacturing industry	0.1174755	0.1339208	0.88	0.382
Media industry	0.4721628	0.3213099	1.47	0.144
Raw material industry				
Services industry	0.1275621	0.1643778	0.78	0.439
Telecom. Industry	0.2242696	0.1752775	1.28	0.203
Intercept	8.797493	0.6432154	13.68	0.000

Alternative regression for H4 with control for the total number of subsidiaries

$$totalEquityBasedCompensation_i = \alpha + \beta_1 totalSubsidiaries_i + \beta_2 proportionOfSubsInTheUS + \beta_3 firmSize_i + \sum \beta_k industryDummyVariables_i + \varepsilon_i$$

	Coeff	Robust std. error	t-statistic	p-value
Total number of subs.	0.0020747	0.0061163	0.34	0.737
Proportion of subs. in the US	-0.1029663	1.198259	-0.09	0.932
Market cap.	0.1316944	0.1695783	0.78	0.445

Consumer industry	-1.371814	0.3350683	-4.09	0.000
Finance industry	-1.375524	1.080156	-1.27	0.215
Healthcare industry	-2.611709	0.6413842	-4.07	0.000
IT industry	-3.056456	0.8875387	-3.44	0.002
Manufacturing industry	-0.9633502	0.4224296	-2.28	0.032
Media industry	-2.38804	0.7530517	-3.17	0.004
Raw material industry				
Services industry	-2.09184	0.991247	-2.11	0.045
Telecom. Industry	-1.117637	0.5678233	-1.97	0.061
Intercept	12.8829	3.897364	3.31	0.003

Definition of the independent variables:

- *totalSubsidiaries*: total number of subsidiaries, in Scandinavia and outside Scandinavia
- *proportionOfForeignSubsidiaries*: number of foreign subsidiaries / total number of subsidiaries
- *proportionOfSubsInHighCompensationCountries*: number of foreign subsidiaries in high compensation countries / total number of subsidiaries
- *proportionOfSubsInTheUS*: number of subsidiaries in the US / total number of subsidiaries

Appendix 3. Coefficient correlation matrix

	Number of foreign subs	Market cap.	Consumer industry	Finance industry	Healthcare industry	IT industry	Manufacturing industry	Media industry	Raw material industry	Services industry	Telecom. industry
Number of foreign subs	1										
Market cap.	-0.5797	1									
Consumer industry	-0.0236	0.1266	1								
Finance industry	0.0720	-0.0520	0.6878	1							
Healthcare industry	-0.1140	0.2341	0.6594	0.6219	1						
IT industry	-0.0490	0.2151	0.7270	0.6928	0.6882	1					
Manufacturing industry	-0.1467	0.1761	0.7593	0.7338	0.7174	0.7817	1				
Media industry	-0.0912	0.2000	0.4328	0.3997	0.4189	0.4561	0.4712	1			
Raw material industry									1		
Services industry	-0.1220	0.1864	0.6129	0.5841	0.5835	0.6356	0.6707	0.3857		1	
Telecom. Industry	-0.0305	0.0842	0.6240	0.6132	0.5805	0.6392	0.6739	0.3793	-0.3718		1

Appendix 4. Results of VIF test on regression coefficients

	VIF	1/VIF
Number of foreign subs	1.61	0.620798
Market cap.	1.77	0.563838
Consumer industry	2.95	0.339143
Finance industry	2.91	0.344137
Healthcare industry	2.47	0.405506
IT industry	3.44	0.290888
Manufacturing industry	4.35	0.229708
Media industry	1.36	0.733225
Raw material industry		
Services industry	2.05	0.487971
Telecom. Industry	2.08	0.479996

Appendix 5. Test for the significance of missing values

Specification of the regression for the test

$$totalCompensation_i = \alpha + \beta_1 SubsidiariesDataMissing_i + \beta_2 firmSize_i + \sum \beta_i industryDummyVariables_i + \varepsilon_i$$

Results

	Coeff	Robust std. error	t-statistic	p-value
Market cap.	0.3402842	0.0231311	14.71	0.000
isMissing dummy	-0.0201347	0.1809003	-0.11	0.911
Consumer industry	-0.2227968	0.1419697	-1.57	0.118
Finance industry	-0.3933069	0.1802644	-2.18	0.030
Healthcare industry	-0.8356123	0.2724921	-3.07	0.002
IT industry	-0.2618352	0.1372242	-1.91	0.058
Manufacturing industry	-0.2125197	0.244842	-0.87	0.386
Media industry	-0.2474108	0.1454582	-1.70	0.091
Raw material industry	0.2011356	0.3582122	0.56	0.575
Services industry	-0.1534748	0.2811454	-0.55	0.586
Telecom. Industry	0.039009	0.3062154	0.13	0.899
Intercept	7.953692	0.501892	15.85	0.000

Appendix 6. Exclusion of outliers: results for residuals, standardized residuals, studentized residuals and Cook's distance

	Total compensation	Residuals	Standardized residuals	Studentized residuals	Cook's distance
Modern Times Group	57 429 483	-1.778	-3.323	-3.442	0.048
Digital Vision	240 000	1.198	2.571	2.621	0.228

Appendix 7. Results for all the performed regressions with book value as proxy for firm size

	# of foreign subs	# of subs in high- compensation countries	Number of subs in the US
Total compensation	2.26 **	2.78 ***	2.01 **
Equity-based compensation	1.00	1.20	1.22
Equity-based compensation - relative value	0.06	-0.20	0.28
Fixed salary	1.78 *	2.79 ***	1.83 *
Bonus	1.29	1.58	0.93
Options	-0.17	-0.34	-0.10

* 10 % significance

** 5 % significance

*** 1 % significance

Appendix 8. Results for all the performed regressions with market capitalization as proxy for firm size

	# of foreign subs	# of subs in high- compensation countries	Number of subs in the US
Total compensation	1.74 *	2.55 **	1.12
Equity-based compensation	0.62	0.91	0.91
Equity-based compensation - relative value	-0.38	-0.60	-0.17
Fixed salary	1.62	3.00 ***	1.21
Bonus	0.70	1.17	0.31
Options	-0.47	-0.59	-0.39

* 10 % significance

** 5 % significance

*** 1 % significance