# Does interim reporting pay off?


## Abstract

A change in the Danish Securities Trading etc. Act. in 2007 imposed an increased reporting scheme, commanding traded companies to do a semi-annual financial report in addition to the annual. This thesis studies the impact of the law change on Return on Equity, Return on Assets and a Stockholder's Return for the period of the companies' financial year. Two statistical studies are performed, an event study and a difference-in-difference study. The event study shows that the presentation of the bill of this amendment to the parliament, in October 2006, did not induce any abnormal stock-return during the day or in the days after. The difference-in-difference study with fundamental and market data for the years 2005-2010, shows a significant ($p<0.001$) reduction in the Stockholder's Return for the accounting period of 0.3 percentages in real values, a significant ($p<0.01$) reduction in the Return on Equity of 0.2 percentages in real values and neither a significant nor a economically relevant change in Return on Assets. Previous research suggests that the major cause is the changed behavior of managers, when exposed to increased demands on reporting.



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## Foreword

I am pleased with my time at Stockholm School of Economics. My purpose of enrolling has been to better understand economics and change my view of it. So I have done. Not only reaching this target has been delightful, also the travel there. Even the late nights, writing reports in various courses, I have ended smiling. Even the serene tranquility in the exam room has fulfilled me with joy.

This thesis has crossed my life in a time of turmoil, and has thus unfortunately experienced an elongated process time. Eventually, all matters have been sorted out and this piece of work and I separate in gentle collusion.

With this said, I can only hope that Wilhelmina will experience the ensuing time with a father more available, present and playful than the last months …

Andreas Vall,
Stockholm, May 2011

God sleeps in stones
dreams in plants
moves in animals
awakes in humans.

Old Sufi prayer

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# 1. Introduction

## 1.1. The two financial objectives

For a company there is one major financial objective: to produce value with its limited resources. This applies of course for all companies, traded as well as non-traded. One of the most common ways of measuring this value of a company is to use discounted cash-flow. All streams of future anticipated payments are discounted. The sum is, after adjustments for taxes, inflation etcetera, the value of the company. A simplification of the value-creation activity is to view the company as exposed to a stream of various projects to undertake. If a project has a positive net present value, it is normally undertaken no matter the time to completion. Naturally this also requires some risk management, especially if the positive part of the cash-flow is heavily weighted to the future. For a traded company there is yet another important financial objective. To accurately and timely forecast future figures of the value production; or in other wordings, the ability to reach previously announced targets. These two time-perspectives essentially differ only in notation. The two-folded financial objective summarized is then:

*"…to maximize the intrinsic value of the company and to properly manage the expectations of the financial market."*[1]

After the initial public offering (IPO) the all future possibilities for the company to produce value, i.e. future anticipated cash-flow, is disclosed or assumed and, based on this the market decides the price of the shares. The market value of the company is set and should be maintained. All presently available information about future earnings is already considered in the price of the share. Only new information, like a new discovery, a new law or a new president, should possibly change the market value. It should be noted that not only a lower cash-flow than anticipated is disruptive for the company, also a higher is. In the latter case, the company may be subjected to a hostile take-over. This two-folded set of objectives creates a tension for management. They shall both manage the creation of value in the company and the information flow to the stock-market. The reporting activity itself pinpoints this tension. Too frequent reporting impairs the value creation and too rare harms the availability of information for stakeholders. In this study, this tension is scrutinized. What is a too frequent reporting? What is the impact of reporting on value creation?

In the area of social sciences, one has to stick with the existing reality and its unfolding opportunities. In this report, a Danish law-change is used to examine the economical impact of interim reporting.

[1] Koller T, Goedhart M, Wessels D. Valuation Measuring and managing the value of companies. 4th ed. Hoboken, NJ: John Wiley & Sons Inc; 2005. p. 53. l. 6.

## 1.2. The law-change in Denmark

On 14th of October 2006, the Minister for Economics and Business Affairs in Denmark, Bendt Bendtsen, proposed an amendment to the *Securities Trading, etc. Act*[2]. The suggested change would implement some EU-directives and included a change in the regulation of information disclosure of listed companies in Denmark. This law, *Act no. 108 of 7th February 2007*, was adopted by the parliament and subsequently entered into force on 1st of June 2007.[3]

To address the difference this law imposed, a short introduction of the legal structure of the Danish financial area is needed, see Figure 1. The parliament enacts new laws. Often this means amendments of existing laws, like in the case of *Act no. 108 of 7th of February 2007*. Roughly two times a year, these amendments and the original Act are put together in a Consolidated Act (CA). Beside the legislative role of the parliament, also the Danish Financial Supervisory Authority (DFSA)[4] is an important legal entity. DFSA is a part of the ministry for economics and business affairs and one of its tasks is to supervise the Danish financial markets. Furthermore, DFSA issues detailed regulation for the financial market called Executive Orders (EO). These Executive Orders always reference back to the pertinent Acts (dashed arrows in the figure). In the figure the valid documents are marked with bold lines. When there is a need to further clarify the regulation, the DFSA issues a guideline (GL).

[2] [Bill of Amendment of Securities Trading, etc. Act.], LF 20, Danish Parliamentary 1st Sess. (2006). Danish.
[3] Amendment of Securities Trading, etc. Act no. 108 of 7th Feb 2007. Danish Law. It was adopted of parliament 1st Feb. 2007, ratified on the 7th Feb. 2007, and published 8th Feb. 2007.
[4] Danish Financial Supervisory Authority: About Us [Internet]. Copenhagen: Danish FSA; [cited 2011 Apr 30]. Available from: http://www.finanstilsynet.dk/.

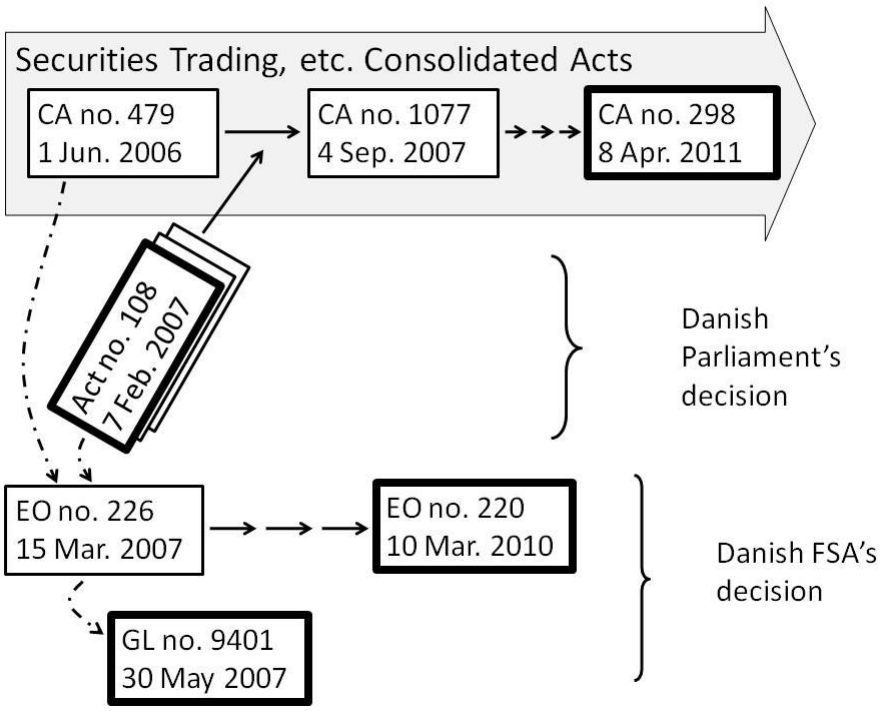


***Figure 1: The legal structure of the Securities trading legislation***
Legend: EO = Executive Order, CA = Consolidated Act, GL = Guideline.

The sections referring to listed companies reporting scheme in the *Act no. 108 of 7th February 2007* are §27(7-8) of the *Securities Trading, etc. Act.* To highlight this law-change, the *Consolidated Act no. 479 of 1st June 2006* and the *Consolidated Act 1077 of 4th September 2007* will be compared, see Figure 1. Also *Executive Order no. 226 of 15th March 2007* and its pertinent guideline, *Guideline no. 9401 of 30th May 2007*, will be used to describe the change. Even if new Executive Orders and Consolidated Acts have replaced these ones, still the sections §27(7-8) remains the same, as implicitly indicated in the figure, since *Act no. 108 of 7th February 2007* still is valid. In addition, also the *Guideline no. 9401 of 30th May 2007*, is still valid.

The Securities Trading, etc. Consolidated Act before the law-change reads:

> *"An issuer of shares …shall periodically publish accounting information..."*[5]

The new regulation was much more requiring:

[5] Securities Trading etc. Consolidated Act no 479 of 1 Jun 2006; §27(7). Danish Law. The translation in the quote from Danish is made by the author.

> *"The issuer [of shares] shall also publish the interim financial statement approved by the board of directors for the first six months of the financial year. The publication of the interim financial statement shall take place as soon as possible after expiry of the six-month period, but no later than two months after said period."*[6]

When previously not much was regulated regarding the content of the financial statements, the DFSA, regulates the requirements of a half-year financial report in more detail:

> *"The half-yearly financial report shall as a minimum include information about:*
>
> *1) Half-year financial statements.*
>
> *2) A management report.*
>
> *3) A management statement where the name and function of each member in relation to the company is clearly indicated …"*[7]

And besides the half-year report also financial statements in between the half-year and the annual report was regulated in the Act:

> *"An issuer of shares … shall publish an interim financial statement during the first as well as the second six-month period of the financial year. The statement shall be published ten weeks after the beginning of the six-month period in question at the earliest and no later than six weeks before then end hereof."*[8]

These interim reports in between the annual and the half-year report have lower requirements, but these are more demanding than the reporting requirements before the law-change. An excerpt of the EO no. 226 of 15th March 2007 reads:

> *"…interim notification shall provide:*
>
> *1) an explanation of material events and transactions that have taken place during the relevant period and their impact on the financial position of the issuer and its controlled undertakings.*

[6] Securities Trading, etc. Consolidated Act no. 1077 of 4 Sep. 2007; §27(7). Danish Law. Since then, amendments have been done in this Act, but for this quote, the legal text in Danish has not changed since Act no. 108 of 7th Feb. 2007 was adopted.
[7] Executive Order on Issuer's Duty to Provide Information, Executive Order no. 226 of 15 March 2007:12(2). Danish Financial Supervision Authority Regulation.
[8] Securities Trading, etc. Consolidating Act no. 1077 of 4 Sep. 2007; §27(8). Danish Law.

> *2) a general description of the financial position of the issuer and its controlled undertakings during the relevant period."*[9]

In short, the situation changed from periodically publishing accounting information to a formal half-year report and additional interim statements between the half-year report and the annual report.

The companies were obliged to follow the rules for interim reporting for financial year starting from 1st June 2007. However, for the half-year reports, the regulation entered into force 1st June 2007.[10] This means that for all companies, financial years starting 1st January 2007 and forward required a half-year report. We should see effects, if any, in annual reports from 31st December 2007 and forward. It is worth noting, that for companies already producing quarterly reports, the impact of the legislative change that *Act no. 108 of 7th February 2007* imposed, is less than for other companies.

## 1.3. This thesis's contribution

This thesis looks at one interesting aspect of the balance between information and value-creation for the management team: to produce interim reports. This clearly fulfils or leads to a fulfillment of a traded company's second objective, to produce information. But does it fulfill the first objective, to create value? Is it economically sound to have quarterly reporting? It is possible to argue that reporting is costly and the company would be better off using its limited resources to produce value, instead of reporting. On the other side it is possible to argue that reporting aligns the company's internal processes (not only informational) or control and hence contributes to a more apt company and consequently an enhanced ability to produce value.

To narrow the scope of this report, I scrutinize one point in the reporting space, the interim reports. The question for this report is; *"Does interim-reporting pay off?"* And based on the empirical reality, this question will be answered by studying the difference between compulsory annually and compulsory semi-annually reporting.

## 1.4. Structure of this Thesis

This thesis proceeds with a theory-chapter outlining research in the field of reporting. In chapter 3 the datasets used in the study are described. Chapter 4 outlines a presentation of the methods used

[9] Executive Order on Issuer's Duty to Provide Information, Executive Order no. 226 of 15 March 2007:4(1). Danish Financial Supervision Authority Regulation.
[10] Executive Order on Issuer's Duty to Provide Information, Executive Order no. 226 of 15 March 2007:17. Danish Financial Supervision Authority Regulation.

in this report. The results are presented in chapter 5. A discussion tying theory and results, presenting conclusions and discuss critical aspects of this study is found in chapter 6. A comprehensive reference list is found in chapter 7.

# 2. Reporting Theory

Reporting and its consequences for companies has been studied in various areas. In this report, the theories are divided into four dimensions:

- Value of reporting
- Voluntary disclosure
- Frequency of reporting
- Depth of reporting

The first dimension looks at the overall value of reporting and tries to answer why reporting is important. The second addresses the question of voluntary reporting versus regulated reporting. The third dimension investigates what reporting frequency is optimal. The fourth area relates to the amount and quality of the reports. Of course, as always when complex reality meet simplified models, the borders between these areas occasionally blur.

These areas do not have equal relevance for this study, especially the first and third bullet is important. Still the second and fourth dimensions give insight in the reporting theory and are included in order to get a more comprehensive picture of the research. These areas may also be interesting for ideas of possible future studies in this area.

These four dimensions are described with a stakeholder approach. This means that it refers to which stakeholders gain and which lose with different regulation, according to the theory. The main stakeholders are society, enterprises, investors, and stock-owners. The theories are described based on some initial questions and briefly summarized in the end of each section.

## 2.1. Value of reporting

What is the overall value of reporting? What stakeholders are better off with reporting? What is the negative side of reporting?

These questions address the tension and the trade-offs between value-production and reporting, as described in the introduction. No requirement of reporting is good for the value-production but bad for the investors since they have limited information to base an investment decision on.[11] From the investor perspective, the reason is obvious. With less information it is difficult to assess the risks involved. A sound investor would require a higher return, than with ample information. The investors thus risk declining a potentially good investment. Intriguing enough, the investment may in

[11] Levy M, Benita G, Levy H. Financial Disclosure and Regulation. The Journal of Portfolio Management. 2006 Winter; 32(2):107-115.

reality be better when no reporting is mandatory. With reporting requirements, managers prefer to have profits on a stable level and sacrifices long term value.[12]

With information available, the stock-owners and potential investors are in a better position to question managers' decisions. This is not always preferable for the value-creation and indeed, when the pressure from the market is high, the managers seem to have a bias to shorter projects.[13] This means that possible profitable undertakings with a long time-horizon risk to be rejected.

Another effect is how information flow influences the liquidity. Reporting regulation does in some cases have a positive effect on the stock's liquidity.[14] A reduced liquidity has a negative effect on the investor. For the company, this means that a possible liquidity premium[15] is reduced and hence the Weighted Average Cost of Capital (WACC) is lowered. In some cases, the firm wants to improve the stock- prices or efficiency, and hence disclose more information, likely to reduce WACC. Sometimes, this even leads the firm to disclosing more information than the social optimum.[16]

To conclude, reporting is beneficial for investors, both bad and good for the company and increases the short-sightedness of managers.

## 2.2. Voluntary reporting

Is it beneficial for a company to report voluntary? Is it beneficial for any other stakeholder?

If reporting contributed much to the value of an enterprise, we would anticipate a lot of companies voluntarily disclose information. This is not the case. Research also concludes that there is not a strong incentive for voluntary reporting.[17] On the other hand, voluntary reporting could be important when valuing a business. There is a study showing that compulsory reports are of limited value when a business is valued.[18] This is interesting, since one of the main purposes of reporting is to produce information for the stock-owners. If the second financial objective, to produce

[12] Graham JR, Harvey CR, Rajgopal S. The Economic Implications of Corporate Financial Reporting. Journal of Accounting and Economics. 2005 Dec; 40(1-3):3-73.
[13] Bhojraj S, Libby R. Capital Market Pressure, Disclosure Frequency –Induced Earnings/Cash Flow Conflict, and Managerial Myopia. The Accounting Review. 2005; 80(1):1-20.
[14] Bushee BJ, Leuz C. Economic Consequences of SEC Disclosure Regulation: Evidence from the OTC Bulletin Board. Journal of Accounting and Economics. 2005 Jun; 39(2):233-264.
[15] Bodie Z, Kane A, Marcus AJ. Investments. 7th ed. Internat. ed.New York: McGraw-Hill; 2008. p. 506.
[16] Fishman MJ, Hagerty KM. Disclosure Decisions by Firms and the Competition for Price Efficiency. Journal of Finance. 1989 Jul; 44(3):633-646.
[17] Leftwich RW, Watts RL, Zimmerman JL. Voluntary Corporate Disclosure: The Case of Interim Reporting. Journal of Accounting Research. 1981; 19(Suppl):50-77.
[18] Gigler F, Hemmer T. On the Frequency, Quality, and Informational Role of Mandatory Financial Reports. Journal of Accounting Research. 1998; 36(Suppl):117-147.

information, does not approach its ultimate goal, is there any reason for companies to do the reporting? One reason is of course to report to authorities, e.g. tax-authorities. Still, these reports not necessarily need to be publicly disclosed. Nevertheless, there is at least one economical sound reason for voluntary reporting: The time for information to be included in the stock price is shortened with voluntary reports.[19] However, improving the efficiency of the market, voluntary reporting not necessarily gives the individual company any advantage. Furthermore, any attempt of regulating to get this effect inevitably ends up in a catch 22 situation: the reporting seize to be voluntary.

To conclude, there is evidence of voluntary reporting being good for the efficiency of the market but good for neither the individual company nor the stock-owner.

## 2.3. Reporting frequency

What is the impact of a more frequent reporting? What is then the optimal reporting frequency?

The time to include a new piece of information in the stock price appears not to be different between companies that reports every quarter and a companies that reports every half-year.[20] Again, this highlights that enhancing the market efficiency by imposing more frequent reporting, does not necessarily work. One reason why semi-annual and quarterly reporting does not differ is that a lot of influencing factors are related only to the annual report.[21] Taxes, bonuses and other accrual issues are dependent of the total yearly result more than any interim result. Also the quality of interim audits may be uncertain for the market. Hence the interim reports have less value than the annual report.[22] Another issue with interim reporting is that an increased flow of information requires more resources, both to produce and to utilize. Hence, this implies an increase in social cost with interim reports.[23] Contrasting this is that disclosing information as such leads to increased social welfare since decisions are based on more information.[24]

[19] Butler M, Kraft A, Weiss IS. The Effect of Reporting Frequency on the Timeliness of Earnings: The Cases of Voluntary and Mandatory Interim Reports. Journal of Accounting and Economics 2007 Jul; 43(2-3):181-217.
[20] Butler M, Kraft A, Weiss IS (2007)
[21] Seidler LJ, Benje W. The Credibility Gap in Interim Financial Statements. Financial Analysts Journal. 1967 Sep – Oct; 23(5):109-115.
[22] Seidler LJ, Benje W (1967)
[23] Yee KK. Interim Reporting Frequency and Financial Analysts' Expenditures. Journal of Business Finance & Accounting. 2004 Jan; 31(1-2):167-198.
[24] Admati AR,Pfleiderer P. Forcing Firms to Talk: Financial Disclosure Regulation and Externalities. The Review of Financial Studies. 2000; 13(3):479-517

There are still advantages for the market to have access to interim reports. The reporting reduces the risk of investing. Viewed from another perspective, risk sharing is improved.

In addition, increasing reporting frequency is beneficial for dealers even if the reasons are somewhat different for big and small dealers. Bigger dealers reduce their cost of analyzing enterprises. Smaller dealers have better access to information since they do not possess the same abilities as the big dealers to analyze companies without an interim report.[25]

Another advantage is the reduction in volatility. The stock price varies less on reporting day if interim reporting is required.[26] This is beneficial for the company. Volatility in the stock-price is associated with risk for the investor. Consequently, reducing this risk increases the possibilities for the company to raise capital, at a lower cost, and a reduced volatility hence gives the companies lower WACC.

The optimum scheme of reporting is not a problem that is readily solved.[27] Still, there is evidence that it does exists a policy of disclosure that makes all shareholders better off due to information cost saving and improved risk sharing.[28] One problem with finding the optimum reporting scheme is of course to weigh factors described above. Another, is that these factors most likely differ over different industrial sectors.[29] To adjust this with different regulations for different industries is not feasible or at least cumbersome.[30]

To conclude, a more frequent reporting is not necessarily beneficial for society. Dealers are better off and the cost of capital for the company decreases with more frequent reporting. It is hard to find an optimum frequency.

## 2.4. Depth of reporting

What should be reported? What are the reasons for the quality of reports?

It is always easier to convey good news, and this is also found in the company communication. Companies disclose more information to the market when the times are good.[31] The private interest of the manager influences the reporting. If the market is not aware of the managers' objectives or when managers' private cost of biasing the report falls, the information content of the reporting is

[25] Yee KK (2004)
[26] Yee KK (2004)
[27] Levy M, Benita G, Levy H(2006)
[28] Diamond DW. Optimal Release of Information by Firms. Journal of Finance. 1985 Sep; 40(4):1071-1094.
[29] Levy M, Benita G, Levy H(2006)
[30] Admati AR,Pfleiderer P (2000)
[31] Miller GS. Earnings Performance and Discretionary Disclosure. Journal of Accounting Research. 2002 Mar; 40(1):173-204

reduced.[32] Especially if the market cannot adjust for the bias of the manager, the quality of the information is reduced since the managers are better off with the option to bias the reports.[33] On the other hand, if the manager faces increased quality in his/hers private information, the manager will disclose more information.[34]

However, there is a difference between annual and interim reports. The cost of equity capital decreases with the level of disclosure in the annual report, but increases with the level of disclosure in interim reports. This is likely to be due to higher volatility.[35] These results may however be dependent on what the normal level of disclosure is. If the level is low to start with, there may be lower cost of capital for increased level of disclosure in interim reports.[36] Hence there seem to be an optimum not only for the frequency of reporting but also for the level of disclosure.

To conclude, more information is revealed when there is good news. Also there is a risk for biased report if the managers cost for this is low and the market has difficulties to adjust for this.

[32] Fischer PE, Verrecchia RE. Reporting Bias. The Accounting Review. 2000 Apr; 75(2):229-245
[33] Fischer PE, Verrecchia RE (2000)
[34] Verrecchia RE. Information Quality and Discretionary Disclosure. Journal of Accounting and Economics. 1990 Mar; 12(4):365-380.
[35] Botosan CA, Plumlee MA. A Re-examination of Disclosure Level and the Expected Cost of Equity Capital. Journal of Accounting Research. 2002 Mar; 40(1):21-40
[36] Leuz C, Verrecchia RE. The Economic Consequences of Increased Disclosure. Journal of Accounting Research. 2000; 38(Suppl):91-124.

# 3. The Data sets

Hereunder, the different data sets used are described. It is also noted how they have been cleansed.

## 3.1. Fundamental data

Fundamental data of all traded companies on the stock exchange of Helsinki, Stockholm and Copenhagen is collected from the Compustat Global Annually database.[37] This database includes all companies except banks and financial companies, which were traded on any of these stock exchanges during year 2007. The collected data includes accounting dates from 1st January 2004 until 31st December 2010. In reality the first accounting day for any company is 31st May 2004. The variables collected for each company is described in Table 1. The figures are reported in millions SEK/EUR/DKK.

***Table 1: Fundamental variables retrieved***

| Collected Variable | Acronym |
|---|---|
| Total Assets | TA |
| Long-Term Debt | DEBT |
| Earnings Before Taxes (Pretax Income) | PI |
| Earnings Before Interest, Taxes, Depreciation and Amortization | EBITDA |
| Earnings Before Interest and Taxes | EBIT |
| Total Revenues | REV |
| Total Income Taxes | TAX |
| Stockholders' Equity | EQ |
| Expenses on R&D | RD |
| Fixed Selling Expenses | XS |
| Expenses on Wages etc. | W |

The total number of observations is initially 3583 and it consists of 550 companies. Out of this, 328 companies are traded on Stockholm Stock Exchange, 117 companies are traded on Helsinki Stock Exchange and 105 companies are traded on Copenhagen Stock Exchange. The reduction in

[37] Standard & Poor's: Compustat Global Fundamentals Annual [Internet]. Philadelphia (PA): Wharton Research Data Service (US); c1994-2011 [accessed 2011 May 11]. Available from: http://wrds-web.wharton.upenn.edu/wrds/.

observations due to cleansing actions is described in Table 2. Note that a large portion of this reduction emanates from the creation of last-year's figures, and it is more a matter of selecting the number of years the study should encompass, than a reduction as such.

An observation, i.e. fundamental data for one year for one company, is dropped if the company did report in another than the domestic currency or if they did change the financial year during the observation time. If there are substantial amount of missing variables and if the dependent variable is missing the observation is also dropped. A majority of the observations with many values missing are from 2010, probably because the values have not yet entered the Compustat database. The impact of these missing values on this study is judged to be minor.

Finally, 2167 observations remain of 514 companies. 310 companies are traded on Stockholm Stock Exchange, 117 companies are traded on Helsinki Stock Exchange and 87 companies are traded on Copenhagen Stock Exchange.

***Table 2: Reduction of observations***

| **Reason for reduction** | **Observations** |
|---|---|
| Retrieved observations | 3583 |
| Non-domestic currency | -583 |
| Change in reporting period | -37 |
| Creating last-year's variables | -529 |
| Missing market data (when merged) | -267 |
| Observations after reduction | 2167 |

In addition to this general reduction of observations, there will be reductions in the regressions. If there is a missing value in a variable in an observation for a certain regression, the whole observation will be discarded. This means that there is a dependence between which variables are included in the regressions, and the number of observations used.

The variables with many missing values are Long-Term Debt (DEBT), the Expenses of Wages etc. (W), Fixed Selling Expenses (XS) and Expenses on R&D (RD). For one of these variables, RD, values in RD are replaced with zero when missing. With this, the problem with missing values in the variable is solved without omitting the variable. It is reasonable to believe that some companies did not report any figure for R&D expenses if they did not have any. An evidence for this is that no reported R&D expense figure equals zero. Even if this is not the case, this measure means that the information in variable RD is utilized whenever present without discarding the observations with missing RD value.

## 3.2. Market Data

Market data is collected from Compustat Security Daily database.[38] All closing prices and dividend paid, from all trading days during the period from March 25th 2004 to 31 December 2010 are retrieved from the database. However the daily figures are only used for the three month period including the announcement of the Danish law-change, September 1st to November 30th 2006. For the market data that is used in the difference-in-difference study, only the price on the accounting day, or the last day prior if the accounting day is a non-trading day, is used. Adjustments due to splits etcetera, of the closing price and dividend ex-date, are made using the appointed method in accordance with the database manual.[39] To compensate for few[40] observations with missing adjustment factors, the previous adjustment factor is used. The variables collected for each company is described in Table 3.

To simplify the treatment of prices, the earliest issue of the stock still on trade[41], is used and the subsequent issues discarded. The prices are usually in the same range for different issues, and considering the efficient market hypothesis, the return should not differ.

***Table 3: Market Variables Retrieved***

| Collected Variable | Acronym |
|---|---|
| Closing Price | P |
| Dividend (ex-date) | DIV |

Beside the stock data also two indices are used, OMX Copenhagen PI[42] and OMX Stockholm PI.[43] The indices are daily, except for non-trading days, between August 31st and November 30th 2006. No missing values exist in the indices. The indices used are price indices. This means that any dividend

[38] Standard & Poor's: Compustat Global Security Daily [Internet]. Philadelphia (PA): Wharton Research Data Service (US); c1994-2011 [accessed 2011 May 13]. Available from: http://wrds-web.wharton.upenn.edu/wrds/.
[39] Standard & Poor's. Standard & Poor's Compustat Xpressfeed Understanding the Data. The McGraw-Hill Companies, Inc.; 2007
[40] In total this is the case for 75 observations of 749 418. For most of them the surrounding factors are equal, hence, this is considered not to have significant impact.
[41] In reality, the earliest issue existing in the first day of the dataset is used, and the other is discarded. This is judged to have no significant influence.
[42] Nasdaq OMX Nordic: OMX Copenhagen PI [Internet]. New York: The NASDAQ OMX Group, Inc.; [cited 2011 May 4]. Available from: http://nasdaqomxnordic.com/.
[43] Nasdaq OMX Nordic: OMX Stockholm PI [Internet]. New York: The NASDAQ OMX Group, Inc.; [cited 2011 May 4]. Available from: http://nasdaqomxnordic.com/.

paid is not included in these indexes. The reason for using the price index (PI) instead of a growth index (GI) is due to data availability.

## 3.3. Additional data

The Consumer Price Indices of Sweden Denmark and Finland are used to deflate the figure in the countries respectively. Since the available data is monthly figures, these are used. These monthly figures are for a full month, and are assigned to the last day of the month to be able to match with the fundamental data. The Consumer Price Index (CPI) is collected from the statistical authorities of Finland[44], Sweden[45], and Denmark[46]. There are no missing values in these monthly indices.

To get comparable figures, all currencies are converted to Euro. This gives only one exchange-rate for the deflated figures, 1st January 2011. However, for the Event study, exchange rates during the study's three months are used to compare the different stock market indices.[47] No missing values exist in this data set.

[44] Official Statistics of Finland (OSF): Consumer price index [Internet]. ISSN=1799-0254. Helsinki: Statistics Finland; [cited 2011 Apr 13]. Available from: http://www.stat.fi/.
[45] Statistics Sweden: Consumer Price Index [Internet]. Stockholm: Statistics Sweden; [cited 2011 Apr 13]. Available from: http://www.scb.se/.
[46] Statistics Denmark: Consumer Price Index [Internet]. Copenhagen: Statistics Denmark; [cited 2011 Apr 13]. Available from: http://www.dst.dk/.
[47] Federal Reserve Bank: Foreign Exchange Rates Daily [Internet]. Philadelphia (PA): Wharton Research Data Service (US); c1994-2011 [accessed 2011 Apr 13]. Available from: http://wrds-web.wharton.upenn.edu/wrds/.

# 4. Method

Two different types of methods are used to examine the impact of the Danish law-change. First, an announcement effect study is conducted, to discover whether the law-change was anticipated by the companies. Second a difference-in-difference study is performed to try to catch the economical impact of this new law.

## 4.1. Announcement Effect

An announcement effect study, or event study, aims to check what immediate effect an announcement has on the security prices.[48] In this study, more specifically the announcement of the Danish law-change is investigated. Two underlying assumption is the foundation of an event study. First, the efficient market hypothesis, that all available information is immediately incorporated in the price of a security. Second, that all factors, save for the event, is unchanged.

Specifically, the event study checks if there are abnormal returns (AR) in the imminent future after an event. The event window is usually the first day that the return could be influenced. The return of the share within this event day is compared to an anticipated normal return:

(1) $$\boldsymbol{AR = R_{realised,\tau} - R_{expected,\tau}}$$

Here, R is return of a certain stock and τ refers to a time within the event window. To calculate the anticipated return, the market return is used. To adjust for differences in betas, the individual stock returns are regressed to the market index or the return of a comparable firm. This is done prior or after the event, but not during the event, as indicated by the change in time-subscript from τ to t:

(2) $$\boldsymbol{R_{realised,t} = \alpha + \beta R_{m,t} + \varepsilon}$$

where ε is the random error. With the alpha and beta given from this regression, an expected normal return for the individual stock is predicted for the days within the event window.

(3) $$\boldsymbol{R_{expected,\tau} = \hat{\alpha} + \hat{\beta} R_{m,\tau}}$$

With the expected return, Equation (1) is used to calculate AR. Beside the AR, also a cumulative abnormal return (CAR) could be calculated for the event day and some days after:

(4) $$\boldsymbol{CAR = \sum_{\tau} AR_i}$$

Subsequently, AR and CAR is tested with the hypotheses:

[48] Wooldridge JM. Introductory Econometrics A Modern Approach. 3rd ed. Mason, OH: Thomson South-Western; 2006. p. 358.

(5) $\boldsymbol{H_0: AR = 0}$

and

(6) $\boldsymbol{H_0: CAR = 0}$.

In this study, there is one additional issue. The Danish all-stock-market index, most likely also encompass the effects of the law-change, since it is based on the listed securities. This may compromise the conclusions, to believe there is no change even if it is. To correct for this, the Swedish all-stock-index will be used.

## 4.2. Difference-in-difference

Like an event study, a difference-in-difference study[49] also investigates the impact of an event, but with different settings. A difference-in-difference study is a regression over variables pertinent to a treatment group or a control group.[50] The data used is panel data from times before the event occurred and times after. The treatment group is a population exposed to some event. The event is a law-change in this study. The effect of the event is measured and to control for other factors this effect is compared to the change in the control group. The basic assumption is that the control group similarly responds on all other factors as the treatment group. To increase the number of observations, the data is used as pooled panel data.

A simple description of the model would be:

(7) $\boldsymbol{Y = f(x_1, x_2, x_3, \ \dots\ , c_1, c_2, c_3, \dots)}$

Where the $x_i$:s represent the difference-in-difference factors, the $c_i$:s represent the controlling factors and the Y is the factor which is examined for possible impact of the law-change.

### *The control group*

The control group's ultimate goal is to be as similar as possible to the treatment group, except for the event of interest. Hence all other influencing factors can be disregarded. In this case it would be a control group similar to the Danish companies traded on the Copenhagen Stock Exchange.

Naturally, companies trading at Stock Exchanges in countries similar to Denmark, is the first option of control group. The control group for this study is selected to be traded companies in Sweden and Finland. These countries have similar business climate, similar political climate and similar juridical system. Since the time period of interest includes 2008, there may be issues looking at Swedish

[49] Wooldridge JM (2006) p. 456.
[50] This apparent medical terminology emanates from the fact that difference-in-difference studies were developed for clinical studies.

companies, since the bank sector was highly influenced by the economical crisis in the Baltic States. Furthermore, Finland has adopted Euro and Denmark has its exchange rate locked to Euro, so it is possible that Finland will be a better control group candidate than Sweden. Eventually, it will be checked for statistically.

### *The regressands*

Since the question of this report is if interim reports do pay off, the *Y* in Equation (7), the regressand, should be a measure related to this. Considering that we base our main data from yearly financial statements, it is straightforward to use a quota as the factor to examine.

In this study one of the regressands will be Return on Assets (ROA).[51] ROA is defined as:

(8) $$\boldsymbol{ROA = \frac{EBIT - TAX}{TA}}$$

Another factor to be used as regressand, is Return on Equity (ROE).[52] This is calculated as:

(9) $$\boldsymbol{ROE = \frac{PI - TAX}{EQ}}$$

To get the stockholder's perspective, also the one year return is used:

(10) $$\boldsymbol{RETURN = \frac{P_0 - P_{-1} + DIV}{P_{-1}}}$$

Where $P_0$ is the price on the accounting day, $P_{-1}$ is the price on last year's accounting day and DIV is the dividend paid during last year.

[51] See for instance: Brealey RA, Myers SC. Principle of Corporate Finance. 7th ed. New York: McGraw-Hill; 2003. p. 830.
[52] See for instance: Alexander D, Nobes C. Financial Accounting An International Introduction. 2nd ed. Essex, UK: Pearson Education Limited; 2004. p. 147.

### *The difference-in-difference equation*

The special portion in the difference-in-difference model is the $x_i$:s in Equation (7). The standard model for a difference-in-difference study is:

(11) $$\boldsymbol{Y = \beta_0 + \delta_0 \cdot EVENT + \beta_1 \cdot T + \ \delta_1 \cdot EVENT \cdot T + \cdots}$$

where EVENT is a time dummy-variable. It is equal to one if the event has occurred and zero otherwise. T is a dummy-variable which is equal to one if the observation belongs to the treatment group and zero otherwise. The dots represent the other factors that are controlled for.

The impact of the event is readily found as the coefficient $\delta_1$.This is seen when doing the difference-in-difference calculation, where the difference before and after the event in the control-group is reduced from the same difference in the treatment group

(12) $$\left(\underset{T=1}{Y_{EVENT=1}} - \underset{T=1}{Y_{EVENT=0}}\right) - \left(\underset{T=0}{Y_{EVENT=1}} - \underset{T=0}{Y_{EVENT=0}}\right) =$$

$$= (\boldsymbol{\beta_0 + \delta_0 + \beta_1 + \ \delta_1 - \beta_0 - \beta_1}) - (\boldsymbol{\beta_0 + \delta_0 - \beta_0}) = \boldsymbol{\delta_1}$$

If the coefficient $\delta_1$ is statistically significant, the event did in fact have an impact on the regressand, the Y.

### *Controlling factors*

One more portion of the regression model remains: the controlling factors, the $c_i$:s in Equation (7). What should be controlled for in the regression? Based on data availability, economical research and reasoning, a set of controlling factors are introduced below.

Since the data availability is crucial due to missing values in some of the variables, there is a trade-off between the amount of controlling factors, their complexity and numbers of observations used, as mentioned previously. In short, if more controlling factors are included, especially compounded ones, the number of observations used in the regressions may decrease substantially. Since the aim of the controlling factors are to cancel out other explanations for differences in the regressands, than the event effect, still various variables contributing to value or profitability must be used.

The simplest set of controlling factors is to use the variables retrieved from the fundamental data, and market data, that is the variables in Table 1 and Table 3. However, since the regressands are ratios, it is reasonable that also the regressors reflect this. For instance, it tells more about a company to know how much of their cost is spent on R&D activities, than the R&D cost as such. In the latter case, a high R&D figure could either be a big enterprise spending comparably little on R&D or a small company spending much on R&D. Since our variables related to cost are afflicted with

many missing values, a suitable denominator would be the revenues. This quota is sometimes referred to as R&D-Intensity and is also related to profitability.[53]

The XS variable is used in the same way, together with revenue.

The DEBT variable and the Stockholders' Equity (EQ) are more interesting when combined, telling about the leverage of a company. Hence the DEBT/EQ is one of the controlling factors.[54] To be able to use also market variables, the sums of last year's Dividend ex-date (DIV) and Closing Price (P) is used as a quota. This is sometimes referred to as yield, and does have an impact of the return.[55]

Last year's figures are usually a good proxy for expected figures.[56] The last years ROE ($ROE_{-1}$) and last year's ROA ($ROA_{-1}$) are hence used as controlling factors.

Profitability is also influenced by earnings and change in earnings.[57] Thus, Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) is used together with the change in EBITDA from last year (ΔEBITDA).

A few compounded figures are used. The logarithm of Price-to-Book is related to profitability[58]. Here, a somewhat simpler variant is used, due to data availability and the selection of only one issue of stocks. Based on our denominations, it is the logarithm of the quotient of P to Total Assets (TA) that forms this factor.

Using logarithms could be beneficial, especially for variables related to growth. Unfortunately, a broad usage of logarithms creates a lot of missing observations. Hence logarithms are used only for the variables DIV and P/TA.

To summarize, our controlling factors are:

$$c_i \epsilon \left\{ \frac{RD}{REV}, \frac{XS}{REV}, \frac{DEBT}{EQ}, \frac{DIV}{P}, ROE_{-1}, ROA_{-1}, EBITDA, \Delta EBITDA, ln\left(\frac{P}{TA}\right), ln(DIV) \right\} \quad (13)$$

One important aspect of these controlling factors is that they are not having a close to linear relationship to either the Y or any other factor in the regression equation. This is also the reason why most of the initially retrieved, 'raw' variables are not used as controlling factors.

[53] Hirschey M, Wichern W. Accounting and Market-Value Measures of Profitability: Consistency, Determinants, and Uses. Journal of Business & Economic Statistics. 1984 Oct; 2(4):375-383.
[54] One of the parts of the DuPont system, the division of ROE in constituents, is leverage, so this quota seems apt. The DuPont system is described in for instance: Brealey RA, Myers SC (2003) p. 830.
[55] Wilcox JW. The P/B-ROE Valuation Model. Financial Analysts Journal. 1984 Jan-Feb; 40(1):58-66.
[56] See for instance Wilcox JW (1984), where historical ROE are used.
[57] Easton PD, Harris TS. Earnings As an Explanatory Variable for Returns. Journal of Accounting Research. 1991 Spring; 29(1):19-36.
[58] Wilcox JW (1984)

Besides this set of controlling variables, also dummy-variables will be used. In part, this is needed for the difference-in-difference equations, but also to control for differences in years, countries and activity. The dummy-factors consist of two country factors, since there are three countries in the data; five year factors, since there are six years in the data (2005-2010), and one activity factor, to cover companies that seize to exist in our time-frame (as opposed to companies with observations from the latest years just missing).

## 4.3. Comparability of Monetary Figures

All figures used in the difference- in-difference study, described above, are deflated with monthly consumer price index for each country. Even if the exchange rate between Danish Krona (DKK) and Euro (EUR) is fixed, still domestic indices are used to catch differences in inflation. The date they are deflated to is 1st January 2011. To simplify comparison, all currencies are subsequently converted into Euro.

Since the Event study described above is conducted for a short period of time, the figures are not deflated. In addition, no conversion of currencies is made. This may of course introduce errors, but it is also possible that such conversion would introduce problems due to other events occurring in the Euro-area, considering Denmark's currency's locked exchange rate to Euro.

# 5. Results

## 5.1. Announcement effects

As described in section 4.1, the all-stock-index, OMX Copenhagen PI index, is likely to include also the same abnormal return as the individual stocks. Instead the OMX Stockholm PI index will be used to calculate abnormal returns in Equations (1) - (4). To compare these two indices, they are plotted in Figure 2.

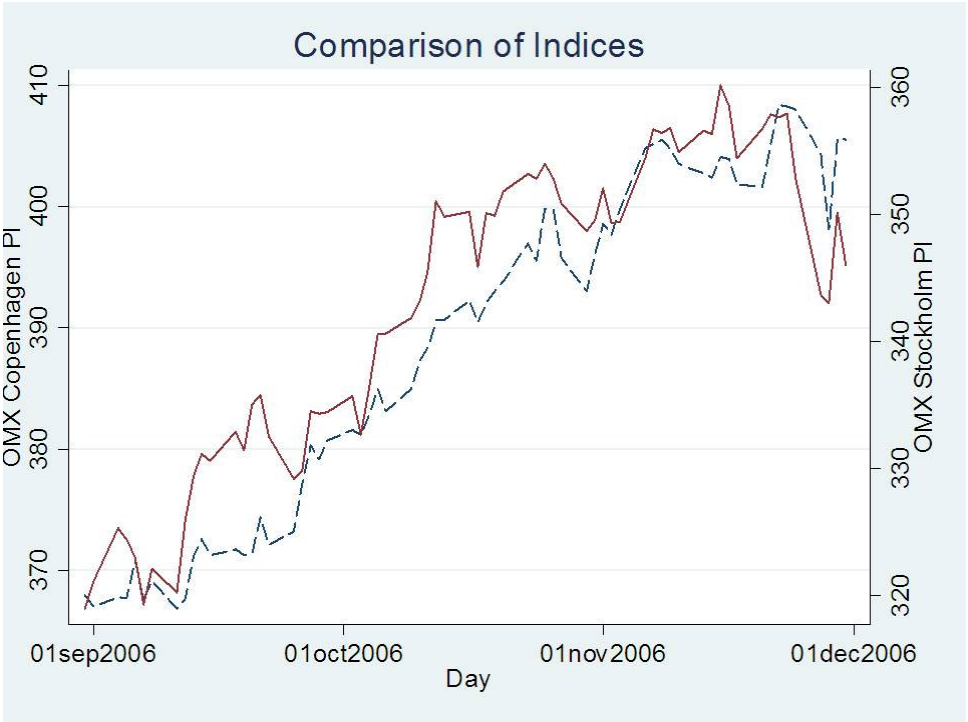


***Figure 2 Comparison between market indices.***

Legend: Dashed = OMX Copenhagen PI; Continuous= OMX Stockholm PI

Since they appear to be reasonable similar, the OMX Stockholm PI index will be used to check if there are any abnormal returns related to the announcement of the new law. The bill was presented on October 4th 2006 and no alteration of paragraphs §27(7) and §27(8) was done until the law was adopted. Thus, October 4th is the date we use for checking if there are any abnormal returns. Abnormal return and cumulative abnormal return was then tested to the hypothesis that they are equal to zero. The result is presented in Table 4.

***Table 4: T-test of abnormal return and cumulative abnormal return.***

| | MEAN | 95% CONF. INTERVAL | | t-STAT. |
|---|---|---|---|---|
| AR | 0.0004267 | -0.0043053 | 0.0051586 | 0.1796 |
| CAR(3 DAYS) | -.0054343 | -0.0129528 | .0020841 | -1.4396 |
| Observations | 77 | | | |

## 5.2. Difference-in-difference study

The three different Y-values, ROE, ROA and RETURN are regressed with all controlling factors, including the year-dummies, country-dummies, and activity-dummy. The regression equations are Equation (7), combined with the difference-in-difference factors, Equation (11), controlling factors, Equation (13) and dummy-factors. In the regressions, the last year's regressors $ROA_{-1}$ and $ROE_{-1}$ will only be used with their pertinent regressand.

First an initial regression of the controlling factors is performed. This is done to check that the number of observations is not too much reduced. The results are presented in Table 5, where the coefficients of the three regressions are the columns off the table. Worth noting is the $R^2$-value, telling us how much of the variance of the Y-values that the model can explain. Worth noting is also if the factors are significantly non-zero. In the table, the significance level, indicated by stars, is presented together with the coefficients.

***Table 5: Regression of controlling factors.***

| | ROE | ROA | RETURN |
|---|---|---|---|
| $ROE_{-1}$ | 0.0388 | | |
| EBITDA | -0.0000343 | -0.00000849 | $0.0000626^{***}$ |
| DEBT/EQ | $-0.225^{***}$ | 0.000378 | 0.000729 |
| DIV/P | $-0.310^{***}$ | $-0.0466^{***}$ | $-0.298^{***}$ |
| XS/REV | -0.000778 | -0.000187 | -0.000424 |
| RD/REV | -0.00628 | -0.00302 | $-0.00417^{**}$ |
| LOG-DIV | $0.107^{***}$ | $0.0242^{***}$ | $-0.0332^{**}$ |
| LOG-P/AT | $-0.0709^{*}$ | $-0.00817^{*}$ | $0.0497^{***}$ |
| ΔEBITDA | $0.000111^{*}$ | $0.0000276^{***}$ | 0.0000819 |
| DUMMY-ACTIVE | 0.0923 | 0.0194 | $0.110^{**}$ |
| DUMMY-FINL | 0.229 | -0.00373 | $1.367^{***}$ |
| DUMMY-DENM | -0.0229 | $-0.0524^{**}$ | -0.000965 |
| DUMMY-Y05 | 0.368 | $0.0336^{*}$ | 0.578 |
| DUMMY-Y06 | 0.291 | -0.0137 | 0.0836 |
| DUMMY-Y07 | 0.276 | -0.0110 | $-0.146^{***}$ |
| DUMMY-Y08 | 0.341 | -0.0138 | $-0.458^{***}$ |
| DUMMY-Y09 | 0.257 | $-0.0297^{*}$ | $0.336^{***}$ |
| $ROA_{-1}$ | | $0.546^{***}$ | |
| CONST. | -0.457 | -0.000703 | $0.325^{***}$ |
| Observations | 1996 | 1994 | 2007 |
| $R^2$ | 0.319 | 0.419 | 0.523 |

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$

If the $R^2$-value is high, but there are many non-significant regressors, it could be due to multicollinearity. Even if this does not seem to be the case, a check of the correlation between the factors is done. The result is found in Table 6. There are two correlations with absolute value larger than 0.5. In the correlation between DEBT/EQUITY and ROE, the negative sign reflects the debt crisis within the last years. However, when the DEBT/EQ factor is removed from the regression, the $R^2$-value decreases substantially. Accordingly, it is kept. The other high correlation figure is ROA that is highly correlated with $ROA_{-1}$. This is anticipated, and is not considered a problem.

***Table 6: Correlations between the dependent and explaining factors***

| | ROE | ROA | RETURN | $ROE_{-1}$ | $ROA_{-1}$ | EBITDA | DEBT/EQ | DIV/P | XS/REV | RD/REV | LOG-DIV | LOG-P/AT | ΔEBITDA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROE | 1.000 | | | | | | | | | | | | |
| ROA | $0.222^{***}$ | 1.000 | | | | | | | | | | | |
| RETURN | $0.070^{**}$ | $0.168^{***}$ | 1.000 | | | | | | | | | | |
| $ROE_{-1}$ | 0.042 | $0.155^{***}$ | 0.015 | 1.000 | | | | | | | | | |
| $ROA_{-1}$ | $0.111^{***}$ | $0.609^{***}$ | $0.057^{*}$ | $0.127^{***}$ | 1.000 | | | | | | | | |
| EBITDA | 0.034 | $0.100^{***}$ | 0.016 | 0.034 | $0.090^{***}$ | 1.000 | | | | | | | |
| DEBT/EQ | $-0.550^{***}$ | -0.001 | -0.007 | -0.003 | 0.000 | 0.002 | 1.000 | | | | | | |
| DIV/P | $-0.070^{**}$ | -0.027 | $0.126^{***}$ | 0.000 | 0.029 | -0.005 | $0.097^{***}$ | 1.000 | | | | | |
| XS/REV | -0.029 | $-0.170^{***}$ | $-0.058^{**}$ | 0.012 | $-0.155^{***}$ | -0.026 | -0.006 | -0.024 | 1.000 | | | | |
| RD/REV | -0.033 | $-0.212^{***}$ | $-0.052^{*}$ | -0.014 | $-0.186^{***}$ | -0.022 | -0.001 | -0.022 | $0.446^{***}$ | 1.000 | | | |
| LOG-DIV | $0.078^{***}$ | $0.335^{***}$ | $0.205^{***}$ | $0.116^{***}$ | $0.367^{***}$ | $0.225^{***}$ | 0.007 | $0.355^{***}$ | $-0.106^{***}$ | $-0.076^{***}$ | 1.000 | | |
| LOG-P/AT | 0.008 | -0.010 | $0.071^{**}$ | 0.031 | -0.003 | $-0.294^{***}$ | $-0.050^{*}$ | $-0.185^{***}$ | $0.046^{*}$ | 0.012 | $0.205^{***}$ | 1.000 | |
| ΔEBITDA | 0.011 | 0.033 | 0.025 | -0.005 | -0.008 | $0.301^{***}$ | -0.001 | $-0.045^{*}$ | -0.005 | -0.002 | 0.032 | 0.027 | 1.000 |

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$

And finally the difference in difference regressions is performed. The result is found in Table 7. The factor DIFF-IN-DIFF in Table 7 corresponds to the $\delta_1$ in Equations (11) and (12). It is interesting to note that the DIFF-IN-DIFF factor is significant both in the RETURN and ROE equations. The ROA's DIFF-IN-DIFF factor has a t-value of -0.6 and is not significant on a 95% level. And even if it was significant, the magnitude of the effect has no economical relevance since the DIFF-IN-DIFF factor is small for ROA. It is interesting to note how much the leverage term, which is the major difference between ROE and ROA, means for the result. The $R^2$-value is reasonable, stating that the model explains roughly half the variance in the RETURN regression and a third in the ROE and the ROA models. There are many significant figures in the models.

***Table 7: Difference-in-difference regression.***

| | ROE | ROA | RETURN |
|---|---|---|---|
| DIFF-IN-DIFF | -0.212* | -0.0168 | -0.286*** |
| EVENT | 0.167 | 0.0258 | -0.164*** |
| $ROE_{-1}$ | 0.0387 | | |
| EBITDA | -0.0000328 | -0.00000832 | 0.0000630*** |
| DEBT/EQ | -0.225*** | 0.000374 | 0.000660 |
| DIV/P | -0.310*** | -0.0466*** | -0.298*** |
| XS/REV | -0.000805 | -0.000190 | -0.000455 |
| RD/REV | -0.00612 | -0.00300 | -0.00403** |
| LOG-DIV | 0.107*** | 0.0242*** | -0.0316** |
| LOG-P/AT | -0.0719* | -0.00827* | 0.0489*** |
| ΔEBITDA | 0.000113* | 0.0000277*** | 0.0000836* |
| DUMMY-ACTIVE | 0.0876 | 0.0189 | 0.107** |
| DUMMY-FINL | 0.230 | -0.00347 | 1.361*** |
| DUMMY-DENM | 0.0992 | -0.0429 | 0.169* |
| DUMMY-Y05 | 0.456 | 0.0534* | 0.302 |
| DUMMY-Y06 | 0.424 | 0.00943 | -0.127 |
| DUMMY-Y07 | 0.407 | 0.0114 | -0.342*** |
| DUMMY-Y08 | 0.342 | -0.0136 | -0.457*** |
| DUMMY-Y09 | 0.258 | -0.0296* | 0.338*** |
| $ROA_{-1}$ | | 0.546*** | |
| CONST. | -0.611 | -0.0255 | 0.507*** |
| Observations | 1996 | 1994 | 2007 |
| $R^2$ | 0.319 | 0.419 | 0.529 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

To compare the magnitude of our model variables for these years, some summary statistics of ROE, ROA and Return is presented in Table 8. The ROE and ROA figures for these years are not high, reflecting the economical hardship during this period, and especially 2008. Though, the RETURN

figure is higher. Note also that these figures are deflated. The change in legislation lowers the real return for the stockholder with 0.3 percentages and the real return on equity with 0.2 percentages.

***Table 8: ROE, ROA and RETURN for Swedish, Danish and Finnish listed companies, year 2005-2010.***

| | ROE | ROA | RETURN |
|---|---|---|---|
| MEAN | -0.095 | -0.004 | 0.439 |
| STD DEV | 2.11 | 0.24 | 0.83 |
| MIN | -62.71 | -3.01 | -0.81 |
| MAX | 26.78 | 0.42 | 12.83 |
| Observations | 2120 | 2120 | 2120 |

# 6. Conclusions

## 6.1. Discussion

According to the results in last chapter, there is no significant announcement effect. This could be explained by either that the announcement was done prior to the bill was presented, and consequently that the market already had discounted this change. Since the *Act no. 108 of 7th February 2007* was implementing EU directives, it is reasonable to believe that the market did know that some legislation was on its way.

The result of the difference-in-difference study reveals an impact of the Danish law-change on ROE and RETURN. In this section, a possible reason for this result will be outlined and discussed.

Based on the theory described above, essentially three major effects have importance on ROE and RETURN. The first effect, the increase of liquidity, is merely positive. An increased liquidity enhances the company's WACC. This means that profitability will increase and ROE will increase. This also leads to an increased return.

The second effect is the relatively abundance of information. This will reduce the volatility as written above. Together with the reduced risk for the investor with more information this will reduce the WACC, which is positive for the ROE and return. On the other hand, the reduction in volatility and risk will increase the price of the security. This will have a negative effect on return, as described more in detail below. With more information, the investors may question managers' decision and the market pressure may hence increase. According to the theory presented above, this could lead to short-sightedness of the managers which also have a negative effect, as described below. The total effect of the increased amount of information is then not solely positive for ROE and return.

The third effect is the change in behavior of management. Managers prefer stable profits to long-term value and have a bias for short-term projects under high market pressure. This priority means that profitable but risky projects or long-term projects will not be considered and there will be less profitability for the company. This lowers the ROE and lowers potential dividends. The stable profit approach also is likely to reduce the risk of the investor which increases the price level of the stock. Since the correlation between yield (DIV/P) and RETURN is significant and positive (see Table 6) the increased price together with reduced dividends, is likely to have a negative impact on return.

Due to the negative effect of managers' behavior, and the ambiguous effect of the information flow, it is likely that the last effect, the manager behavior, is the one explaining most of the reduction in return and ROE, when regulation of reporting is increased from annually to semi-annually. It would be an interesting field of research to verify this.

Observe that this not inevitable leads to the conclusion that interim reporting should be terminated. First, lack of information is always a risk, and sometimes, however unlikely, the worst scenario occurs. Also the manager has an incentive to bias the reporting when the market lacks information as described in the theory section. Theory also concludes a positive relationship between social welfare and reporting. Eventually, this is a political decision. But as all political decisions, it is better to have more information, and to know the associated costs. This thesis brings a little more clarity on this matter. And the cost of introducing interim reporting is substantial. By introducing semi-annually reports, the ROE has decreased 0.2 %-units on average in real values. The one year return for a stock-owner has decreased almost 0.3 %-units. For the years 2005-2010, this reduced the return with half. Still, the reduction in one year stockholder's return and ROE is measured in absolute figures rather than relative figures, that is, it will be around 0.3 and 0.2 percentages, no matter the average return in one specific year. This is logical since the reporting activity as such does not increase with increased revenue.

And to finally address the initial question: Does interim reporting pay off? The answer is: It depends on how the benefits of reporting are valued. Nevertheless, requiring interim reporting is not costless.

## 6.2. Criticism

When doing this kind of study, there are many choices that could impact the results. Here some of these issues are discussed.

To increase the amount of observations, the panel data are pooled. This means that when dealing with panel data, there may be fixed effects not considered. There is not possible to include the fixed effects, since the difference-in-difference equation has time-invariant factors. Still, the controlling factors are judged to capture some of the possible fixed effect differences in the companies. Another statistical issue is heteroscedasticity, i.e. the variance differs with time. This is considered since the regressions used are robust.

Only two event windows were used when checking abnormal return after the bill was presented for the Danish Parliament, a one day window and a three day window. In some cases the cumulative response could continue for a much longer time[59] and this is not checked.

Some of the companies in the study already performed quarterly reporting, either voluntarily or due to that their stocks are traded on another stock exchange than the Danish, imposing another reporting scheme. This is not controlled for in the regressions. Since they already doing the required

[59] See for instance Bodie Z, Kane A, Marcus AJ (2008). pp. 376-8.

reporting, their ROA, ROE and RETURN, should not change due to the law-change. Hence, taking this into consideration would only increase significance and magnitude and not compromise the results.

The selection of controlling factors is crucial. The results could vary depending on what is controlled for. This is naturally a problem. Still, given the availability of data, the controlling factors are selected based on previous research and economical reasoning, and should not compromise the results. A lot of factors initially selected were not suitable to use as controlling factors due to missing data. Since there was a trade-off between having many observations and many factors, if some of the values were missing, the set of factors is a reasonable selection. A factor that could be included in later studies could be sector returns.[60] Other factors that could be used as controlling factors are age, uncertainty of future value measured for instance as volatility.[61]

To simplify the usage of market data, only the first issued stock, still in trade, was used. This does not give the full picture, but is judged to be a reasonable simplification. Still, the stocks from different issues have similar prices and returns.

Different equity is not taken under consideration in this study. This could influence for instance the net income, and thus the ROE or ROA. Preferred equity is usually only a small fraction of the stockholders equity, and problem arising from this simplification are judged to be minor.

When calculating the return, the dividends during the year are summed up on the accounting day. This means that the stock price does not consider the information in the fundamental data of the same period. The return may have been substantially different if they could have been calculated some time after the accounting day, when the last year result has been communicated. Usually, major deviations between expected and realized results are communicated from management, to avoid excess volatility in stock prices on the reporting day. The accounting day yearly return then implicitly also consider the fundamentals. Eventually, it was selected based on simplicity and reasonably relevant information.

In the database selected, banks and other financial companies are not included. There is no reason to believe that including them would change the results. The financial companies are likely to have similar costs etcetera for increasing the frequency of reporting as other companies.

When calculating the yearly return from dividends, no deflation is done except on the yearly figure, this can of course introduce errors if the dividend was paid early on the year and the inflation was high.

[60] See Hirschey M, Wichern W (1984), showing that industry growth determines profit.
[61] See Pastor L, Veronesi P. Stock Valuation and Learning about Profitability. The Journal of Finance. 2003 Oct; 58(5):1749-1789. The paper connects these factors to enterprise value.

Survivorship bias is often a problem. The impact on this study is assumed to be minor. There may be companies that have seized to exist due to the law-change, but if they were still active in 2007, they are included in this study.

## 6.3. Future research

As indicated above, the study can be performed with other controlling factors. There may be other countries that have changed the reporting regulations, which could be studied. Also to understand what factors is driving the decrease in return and ROE could be an area for a study. The impact on society as whole is hard to study, but the question of finding the optimum reporting frequency is indeed interesting. In the area also a study of differences in what are reported could be of interest. Is there a reporting requirement that is less demanding on the companies, but still gives the other stakeholders enough information?

It could be interesting to further discover how managers' behavior is affected, and also to compare alternative contingency strategies to reduce this impact.

Some of the criticism above could be useful as a basis for a study, for instance to overcome potential fixed effects, a similar study could be performed, but with first differences in the model.

# 7. References

References used in this thesis are listed hereunder sorted by type of source and in alphabetical order.

## Books

*Alexander D, Nobes C. Financial Accounting An International Introduction. 2nd ed. Essex, UK: Pearson Education Limited; 2004.*

*Bodie Z, Kane A, Marcus AJ. Investments. 7th ed. Internat. ed.New York: McGraw-Hill; 2008.*

*Brealey RA, Myers SC. Principle of Corporate Finance. 7th ed. New York: McGraw-Hill; 2003.*

*Koller T, Goedhart M, Wessels D. Valuation Measuring and managing the value of companies. 4th ed. Hoboken, NJ: John Wiley & Sons Inc; 2005.*

*Standard & Poor's. Standard & Poor's Compustat Xpressfeed Understanding the Data. The McGraw-Hill Companies, Inc.; 2007.*

*Wooldridge JM. Introductory Econometrics A Modern Approach. 3rd ed. Mason, OH: Thomson South-Western; 2006.*

## Papers

*Admati AR, Pfleiderer P. Forcing Firms to Talk: Financial Disclosure Regulation and Externalities. The Review of Financial Studies. 2000; 13(3):479-517*

*Bhojraj S, Libby R. Capital Market Pressure, Disclosure Frequency –Induced Earnings/Cash Flow Conflict, and Managerial Myopia. The Accounting Review. 2005; 80(1):1-20.*

*Botosan CA, Plumlee MA. A Re-examination of Disclosure Level and the Expected Cost of Equity Capital. Journal of Accounting Research. 2002 Mar; 40(1):21-40*

*Bushee BJ, Leuz C. Economic Consequences of SEC Disclosure Regulation: Evidence from the OTC Bulletin Board. Journal of Accounting and Economics. 2005 Jun; 39(2):233-264.*

*Butler M, Kraft A, Weiss IS. The Effect of Reporting Frequency on the Timeliness of Earnings: The Cases of Voluntary and Mandatory Interim Reports. Journal of Accounting and Economics 2007 Jul; 43(2-3):181-217.*

*Diamond DW. Optimal Release of Information by Firms. Journal of Finance. 1985 Sep; 40(4):1071-1094.*

*Easton PD, Harris TS. Earnings As an Explanatory Variable for Returns. Journal of Accounting Research. 1991 Spring; 29(1):19-36.*

*Fischer PE, Verrecchia RE. Reporting Bias. The Accounting Review. 2000 Apr; 75(2):229-245*

*Fishman MJ, Hagerty KM. Disclosure Decisions by Firms and the Competition for Price Efficiency. Journal of Finance. 1989 Jul; 44(3):633-646.*

*Gigler F, Hemmer T. On the Frequency, Quality, and Informational Role of Mandatory Financial Reports. Journal of Accounting Research. 1998; 36(Suppl):117-147.*

*Graham JR, Harvey CR, Rajgopal S. The Economic Implications of Corporate Financial Reporting. Journal of Accounting and Economics. 2005 Dec; 40(1-3):3-73.*

*Hirschey M, Wichern W. Accounting and Market-Value Measures of Profitability: Consistency, Determinants, and Uses. Journal of Business & Economic Statistics. 1984 Oct; 2(4):375-383.*

*Leftwich RW, Watts RL, Zimmerman JL. Voluntary Corporate Disclosure: The Case of Interim Reporting. Journal of Accounting Research. 1981; 19(Suppl):50-77.*

*Leuz C, Verrecchia RE. The Economic Consequences of Increased Disclosure. Journal of Accounting Research. 2000; 38(Suppl):91-124.*

*Levy M, Benita G, Levy H. Financial Disclosure and Regulation. The Journal of Portfolio Management. 2006 Winter; 32(2):107-115.*

*Miller GS. Earnings Performance and Discretionary Disclosure. Journal of Accounting Research. 2002 Mar; 40(1):173-204*

*Seidler LJ, Benje W. The Credibility Gap in Interim Financial Statements. Financial Analysts Journal. 1967 Sep – Oct; 23(5):109-115.*

*Verrecchia RE. Information Quality and Discretionary Disclosure. Journal of Accounting and Economics. 1990 Mar; 12(4):365-380.*

*Wilcox JW. The P/B-ROE Valuation Model. Financial Analysts Journal. 1984 Jan-Feb; 40(1):58-66.*

*Yee KK. Interim Reporting Frequency and Financial Analysts' Expenditures. Journal of Business Finance & Accounting. 2004 Jan; 31(1-2):167-198.*

## Internet sources

*Danish Financial Supervisory Authority: About Us [Internet]. Copenhagen: Danish FSA; [cited 2011 Apr 30]. Available from: http://www.finanstilsynet.dk/.*

*Federal Reserve Bank: Foreign Exchange Rates Daily [Internet]. Philadelphia (PA): Wharton Research Data Service (US); c1994-2011 [accessed 2011 Apr 13]. Available from: http://wrds-web.wharton.upenn.edu/wrds/.*

*Nasdaq OMX Nordic: OMX Copenhagen PI [Internet]. New York: The NASDAQ OMX Group, Inc.; [cited 2011 May 4]. Available from: http://nasdaqomxnordic.com/.*

*Nasdaq OMX Nordic: OMX Stockholm PI [Internet]. New York: The NASDAQ OMX Group, Inc.; [cited 2011 May 4]. Available from: http://nasdaqomxnordic.com/.*

*Official Statistics of Finland (OSF): Consumer price index [Internet]. ISSN=1799-0254. Helsinki: Statistics Finland; [cited 2011 Apr 13]. Available from: http://www.stat.fi/.*

*Standard & Poor's: Compustat Global Fundamentals Annual [Internet]. Philadelphia (PA): Wharton Research Data Service (US); c1994-2011 [accessed 2011 May 11]. Available from: http://wrds-web.wharton.upenn.edu/wrds/.*

*Standard & Poor's: Compustat Global Security Daily [Internet]. Philadelphia (PA): Wharton Research Data Service (US); c1994-2011 [accessed 2011 May 13]. Available from: http://wrds-web.wharton.upenn.edu/wrds/.*

*Statistics Denmark: Consumer Price Index [Internet]. Copenhagen: Statistics Denmark; [cited 2011 Apr 13]. Available from: http://www.dst.dk/.*

*Statistics Sweden: Consumer Price Index [Internet]. Stockholm: Statistics Sweden; [cited 2011 Apr 13]. Available from: http://www.scb.se/.*

## Legal sources

*Amendment of Securities Trading, etc. Act no. 108 of 7th Feb 2007. Danish Law.*

*[Bill of Amendment of Securities Trading, etc. Act.], LF 20, Danish Parliamentary 1st Sess. (2006). Danish.*

*Executive Order on Issuer's Duty to Provide Information, Executive Order no. 226 of 15 March 2007. Danish Financial Supervision Authority Regulation.*

*Securities Trading etc. Consolidated Act no 479 of 1 Jun 2006. Danish Law.*

*Securities Trading, etc. Consolidated Act no. 1077 of 4 Sep 2007. Danish Law.*