SWEDEN’S GOT A BRAND NEW TAX RATE

AN EVENT STUDY ON THE SWEDISH STOCK MARKET FOLLOWING A CORPORATE TAX RATE REDUCTION IN 2018

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Abstract:

In this paper, we intend to investigate the Swedish stock market's reaction upon the acceptance of the 2018 corporate tax rate reduction. The purpose is to examine if there was a significant stock market reaction and if it was heterogeneous across sub-samples based on market capitalization. We discover a potentially significant stock market reaction on the acceptance day and we find support that it was heterogeneous across sub-samples. This indicates the importance of examining different sub-samples of firms to better understand the implications of a reduction in the corporate tax rate. To further investigate the significance of the reaction, we perform a permutation test and several robustness checks. The results indicate that the initially observed reaction is likely due to noise or difficulties in distinguishing the reaction from other interfering events, given the small magnitude of the tax rate reduction. This suggests that future researchers should focus on larger tax changes to be better able to distinguish the reaction from noise to derive meaningful results.

Keywords:

Stock Market, Tax Rate, Sweden, Denmark, Efficient Market Hypothesis

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I. Introduction

In "*The cost of capital, corporation finance and the theory of investment*" (1958), Modigliani and Miller introduced the idea that in a perfect capital market, the firm value is independent of a firm's financing and payout decisions. Over the following decades, research in corporate finance has advanced and examined the multitude of financial frictions that affect, not only the firm's choice of capital structure, but also other corporate decisions. The area of corporate taxes has been greatly studied and it is a financial friction that plays a central role in firms' capital structure, payout policy, and investment decisions. Firms are subjected to pay various taxes and one tax that is particularly salient in political debates is the *corporate income tax*, which is paid on the profits that remain after deducting all operating and financial expenses from revenues. With the importance of taxes in mind, a meaningful question arises, "How does the stock market react to a reduction of the corporate tax rate?". The aim of this study is to research this question and empirically investigate the Swedish stock market's reaction to a reduction in the corporate tax rate. We will revisit the efficient market hypothesis by examining the stock market's ability to price in the implications of this change. Using the difference-in-differences method we exploit a reduction in the Swedish corporate tax rate, accepted in 2018, as an exogenous event and use Denmark as our control group.

The key contribution of this paper is that we focus on the Swedish stock market, compared to previous literature that primarily focuses on the U.S. stock market. Moreover, in addition to examining the aggregate stock market reaction, we refine our samples into sub-samples based on market capitalization. Thus, we are able to examine the stock price reaction of two groups that are relatively unexamined so far, the mid and small-capitalization segments.

Our approach and method provides three main benefits. Firstly, by segmenting the aggregate sample based on the company's market capitalization, we are able to uncover potential heterogeneous reactions to tax news. This will contribute to our knowledge about how firms might be impacted differently by various tax changes, and enable us to study the reaction of market participants.

Secondly, using the difference-in-difference method with Denmark as our control group is advantageous for our event of study. In 2016, the EU passed a directive that was to be implemented by 2019 and which would impact the tax deductibility of the net interest expense. The Swedish government decided to lower the corporate tax rate in conjunction with the implementation of this new directive. A benefit of our approach is that Denmark and Sweden had the same corporate tax rate prior to the event (22%) and they are both members of the EU. A comparison to previous years performance or with a non-EU country would complicate the study as we would likely capture the combined effect of the EU initiative *and* the reduction in the corporate tax rate. By using Denmark as our control group, we were likely able to avoid the issues with the EU directive interfering with our results.

Thirdly, by using firm fixed effects we are able to control for unobservable differences across individuals that are constant over time meaning we are able to isolate the effect of the tax reduction to a larger extent.

We further examine the robustness and validity of our results through various robustness tests. Firstly, in addition to examining the stock market's reaction upon the acceptance day, we investigate whether there was a significant reaction upon the *suggestion* of the tax rate reduction, as well as its first *implementation* stage. This enables us to examine whether a small reaction could be the result of the market already pricing in its implications upon its suggestion, or if there was uncertainty remaining that was resolved upon its implementation. Initially, we do not find a significant reaction upon the implementation date. An issue with the implementation date is that it was in January, a month during which stock returns tend to exhibit seasonality. After including time fixed effects in our regressions to attempt to control for the seasonality, we find a negative reaction in the aggregate sample, but we do not find support for a significant reaction in the sub-samples. The reaction upon the suggestion date indicates that there was a negative stock market reaction, meaning that Swedish firms earned lower returns than Danish firms during this period. To investigate whether the repeatedly negative results were due to the implications of the tax rate reduction being successively priced in, or if it was due to noise, we conducted a permutation test. The results from the permutation test suggest that we most likely have captured noise.

Our analysis is motivated by empirical insights with regard to how tax news may lead to heterogeneous stock price reactions across firms, as well as how efficiently financial markets incorporate this information in the pricing of publicly traded securities.

Similar to other papers that have examined the stock market reaction upon changes to the corporate tax rate, our results are ambiguous, and although they indicate a heterogeneous reaction across large, mid and small-capitalization stocks, we do not have enough support to draw this conclusion.

The structure of the paper is as follows. Section II and III covers related literature, background, and motivation for our analysis. Section IV provides background information on the tax reform, our research question, and our empirical predictions. Section V details how the data was obtained, filtered, and sampled. Section VI explains the methodology used to conduct the analysis. Section VII describes our empirical findings. Section VIII discusses the results of robustness checks. Lastly, section IX concludes.

II. Related Literature

Our study relates to other studies that examine the stock market's reaction to policy announcements and thus naturally relates to the vast literature on the efficient markets hypothesis (EHM). Some key differences are that our study examines a different geographical setting, the Swedish stock market, and that we try to capture potential heterogeneous reactions by examining three sub-samples.

Many papers have examined the relationship between taxes and leverage using cross-country comparisons. Faccio and Xu (2015) found a significant positive relationship between the corporate tax rate and leverage. Heider and Ljungqvist (2015) performed a single-country study and found support for firms changing their capital structure following changes to the corporate income tax. The latter paper criticizes cross-country studies and problematizes how firms from different countries may differ in unobserved ways, which may impact the responses. Our study differs from previous cross-country studies in that we attempt to mitigate these issues by comparing the two Nordic countries, Sweden and Denmark, which share many historical, geographic, and economic similarities.

Multiple papers discuss the difficulties in empirically examining the relationship between corporate taxes, firm characteristics, and the stock market's reaction. Wang, H. and Macy, A. (2021) examine the stock market's reactions to large corporate tax rate changes. They document heterogeneous effects across countries and attribute this mixed reaction to interfering variables, such as national news. Doidge and Dyck (2015) point out the difficulties with conducting empirical studies and explain that to study its implications, the tax change must be unambiguous, of large magnitude, and unanticipated. Their event study exploits a largely unanticipated tax change that would imply substantially higher taxes for a group of publicly traded Canadian firms. The authors document a large drop in the firm value for the group affected by this tax change, and a strong negative stock price reaction in the market upon the announcement day and the following days. We are aware of the multiple difficulties and have attempted to address them by refining our samples to uncover potential heterogeneous reactions. Moreover, we will conduct multiple robustness checks to ensure the robustness of our results and attempt to answer whether our results capture noise or an actual stock market reaction.

Corporate stock price reaction to policy announcements, changes to the corporate tax rate or other areas of the tax system are well examined areas. One paper in this area is written by David M. Cutler (1988). Cutler uses an asset pricing approach to investigate the U.S. stock market reaction to the 1986 Tax Reform Act which would decrease the corporate tax rate by 12 percentage units and impose changes to the relative treatment of old and new capital. The analysis finds little evidence for a large stock market reaction. A more recent paper is written by Wagner, Zeckhauser et al. (2018). The authors examine the response of U.S. company stock prices to the 2016 U.S. presidential election. The election results were considered a shock due to Trump's relatively lower probability of winning and to the wide policy differences in the expected corporate tax policy changes. The paper investigates how taxes impact firm value and how efficiently stock prices respond to potentially large changes to the corporate tax rate and other areas of the tax system. The authors find evidence that supports that the cross-section of stock returns were substantially impacted by the expectations of a major corporate tax cut (Wagner, Zeckhauser et al. 2018). Our study is closely related to the two above-mentioned papers, since our overarching idea similar to both Cutler and Wagner, Zeckhauser et al., as we intend to examine the stock market's reaction to news about changes to the corporate tax rate. However, we study how the *Swedish* stock market reacts to tax news. Moreover, we study the reaction of sub-samples based on market capitalization to uncover heterogeneous reactions due to inherent differences in the characteristics of firms belonging to these groups.

Similar to the findings by Cutler (1988) and Wang, H. and Macy, A. (2021) our results are ambiguous. Our results suggest that there might have been a heterogeneous reaction in the Swedish stock market, with a possible positive reaction in stock prices and returns of large-capitalization companies, and a negative reaction in the mid and small-capitalization segments. The results are to a large extent insignificant and we can therefore not draw any clear conclusions. Although our findings support that it might be difficult to empirically examine small changes to the corporate tax rate, they suggest that it might be useful to test whether theories and conclusions hold for smaller and mid-sized firms.

III. Motivation

Capital markets are imperfect and there exists multiple financial frictions that impact the firm's choice of financing, investment decisions, and payout policies (Berk & DeMarzo, 2019). A well-studied financial friction is the area of taxes, ranging from taxation of dividends, capital gains taxes and deferred tax items to corporate taxes. This study will focus on corporate taxes, which are paid on the remaining profit after subtracting all relevant expenses from the revenues. Because interest is deducted before taxes are paid, it lowers the firm's taxable income and generates interest tax shields for the firm, which increases the firm's market value and lowers its cost of debt. All else equal, the higher the corporate tax rate the higher the tax shields. It is interesting to examine how a reduction in the corporate tax rate impacts firms and their returns due to the effect corporate taxes have on corporate decision-making and policies and the effect on their international competitiveness and investment (OECD, 2011), (Nasdaq, 2021).

There is limited literature that examines the reaction of different sub-groups, based on market capitalization size, to tax reforms. One motivation behind this study is therefore to examine the reactions of firms with different market capitalization. We will examine three sub-groups: large, mid, and small-capitalization firms. Most literature generally focuses on large-capitalization firms, meaning that these results might not be representative of those of mid and small market capitalization. For instance, data from CRSP and Compustat show that there is a larger share of U.S small-capitalization firms that have negative earnings compared to the share of U.S large-capitalization firms, meaning that changes to the corporate tax rate might have different implications depending on the firm's market capitalization (Dimensional, 2020). Hence, these groups might have different characteristics and face conditions that may lead to heterogeneous stock price reactions.

Additionally, few papers examine the stock price reaction of Swedish firms upon changes to the corporate tax rate as most of the previous literature has studied the U.S stock market. For instance, U.S firms are required to apply the U.S GAAP, while Swedish firms follow IFRS and K-regelverket (Bokföringsnämnden, 2022). These different accounting standards might imply that Swedish firms react differently upon a tax cut compared to U.S. firms. Our study is therefore also motivated by the potential insights we can contribute regarding the difference in the Swedish stock market reaction compared to the U.S.

To conclude, our study is motivated by empirical insights with regard to whether there are heterogeneous reactions across firms to tax news, and also how efficiently financial markets incorporate this information. It should however be acknowledged that examining the impact of changes in corporate taxes remains challenging given that the changes must be significant enough to have an impact on corporate decisions and one must be able to distinguish the tax effects from other changes. Additionally, changes to corporate taxes might be widely anticipated given that countries want to stay competitive in relation to other countries and attract investment. Hence, it might be difficult to claim that the decision to make changes to the corporate tax rate is exogenous. Consequently, the results obtained from such studies may be ambiguous and open to multiple interpretations, or simply not statistically significant given the interference of events other than the tax policy.

IV. The Event Study and Empirical Predictions

A. *Restricted Interest Deductibility and Corporate Taxes*

In 2016, the EU commission released an anti-tax avoidance directive intended to address the increasing engagement in tax-avoidance practices(Eur-Lex, 2016). On 20th of June 2016, the council adopted the Directive, which would force all member states to impose an interest limitation rule by restricting the taxpaying entities' ability to deduct exceeding borrowing costs. The measures were to be implemented by 1st of January 2019, and as members of the EU, Sweden and Denmark were both subjected to follow the directive. (European Commission, 2016). The two countries implemented the new directive on January 1st 2019, which limited entities subject to corporate income tax to deduct a maximum negative net interest to an amount corresponding to 30% of the EBITDA. (Business Sweden, 2022;Ministry of Foreign Affairs of Denmark, 2021). In conjunction with this directive, the Swedish parliament proposed a reduction in the corporate tax rate from 22.0% to 20.6%. The proposal was prepared and debated between May and June in 2018 and was later accepted on the 14th of June the same year. The reduction would be implemented in two steps. The first reduction would lower the corporate tax rate from 22.0% to 21.4% and be implemented on 1st January 2019. The tax rate of 21.4% would remain for one year until 1 January 2020 in which the second reduction from 21.4% to 20.6% would be implemented. The reduction in the corporate tax rate was motivated by primarily two reasons. Firstly, a reduction in the nominal corporate tax rate was intended to entice investment and contribute to economic growth. The law council referral that the Swedish government handed over to the law council investigates the proposal and its implications. In the referral, it states that a lower corporate tax rate impacts the investment activity through the cost of capital. A lower cost of capital would make more investments profitable at the margin and increase the return on investment. These factors would subsequently lead to an increase in companies' investment activity, which in turn could impact the aggregate production levels. Secondly, the reduction was motivated by the impact the corporate tax rate has on domestic and foregin investment in Sweden. A reduction in the corporate tax rate could entice both domestic and foregin investors to invest in Sweden, and it could also attract multinational companies. To conclude, the proposal was motivated by the positive impact on economic growth and to attract multinational companies and foregin investors (Regeringen, 2018). In contrast to Sweden, Denmark did not change their corporate tax rate during this period. They maintained a corporate tax rate of 22%, which was the same tax rate as Sweden had prior to the proposal, during the entire period. We expect the Swedish stock market to have a positive reaction in response to this news, given the expectations about a higher future growth and return on investment. Thus, Swedish firms should have higher returns than those of Danish firms upon the acceptance of the tax rate reduction.

Considering that both countries are members of the EU, we are better able to control for any potential direct impact on firm characteristics stemming from this directive, but also for other changes that might impact firm performance. Assuming that the directive will have a roughly homogenous impact on both countries we are thus able to isolate the stock market's reaction to a reduction in the corporate tax rate.

B. *The Efficient Market Hypothesis: The Stock Market Reaction*

The EMH argues that markets are efficient and that the prices of publicly traded securities reflects all available information to investors. This implies that when new information emerges, for instance about the future performance of a stock, the market prices will immediately react as savvy investors start to trade and adjust their portfolios to account for this new information. Hence, security prices adjust upon the release of new information. Assuming that markets are efficient, we can infer that the Swedish stock market will react upon the acceptance of a reduction to the Swedish corporate tax rate as this will impact all firms with operations in Sweden, although to varying degrees. Given that the motivation behind the corporate tax reduction was to favor growth and investment, we expect a positive stock price reaction motivated by the expected improved business conditions and growth prospects. Furthermore, although the reduction was stated to be implemented in two steps, the EMH implies that the full effect of the reduction should be priced in upon the announcement of its acceptance as the market will price in *all* available information.

C. *Research Question and Hypothesis*

The overarching research question that we aim to examine in this paper is "*How does the stock market react to a reduction in the corporate tax rate*?" To examine our question we will use the event described above and we have deconstructed our research question into three separate hypotheses as seen below.

H1: The Swedish stock market will have a positive reaction to a reduction in the corporate tax rate.

Previous literature has found that lower corporate tax rates encourage capital investments by existing firms (Cummins, Hassett et al. 1996) and that one can observe strong positive effects on average investments from tax incentives (Guceri, Albinowski 2021). Wang and Macy (2021) find positive excess returns for countries around a tax-cut. These findings support that reducing the tax rate will favor investment and growth. We therefore believe that the tax reform will result in a positive effect for stocks traded on the Stockholm Stock Exchange in comparison with stocks traded on the Copenhagen Stock Exchange.

H2: The stock market reaction will be heterogeneous across different segments.

Previous literature has uncovered heterogeneous reactions across firms in response to a corporate tax reduction. Wang and Macy (2021) documents heterogeneous reactions across countries in conjunction with a tax reform. In addition, F. Wagner et.al (2018) find different reactions depending on the firm's capital intensity and the deferred tax items they have. We believe there will be heterogeneous effects across segments depending on the size of their market capitalization as the firms in each segment may have different characteristics that induce different responses to the tax cut.

H3: The largest reaction will be seen upon the acceptance of the proposal.

Previous event studies that examine the stock market reaction to tax news (Doidge and Dyck, 2015; Wang and Macy, 2021) attribute the announcement day of the tax policy, meaning when it is accepted, as the main event day and concentrate their event windows around this date. In line with previous studies and in accordance with the EMH, we believe that the positive effect should occur when the announcement of the acceptance of the reform becomes public knowledge. When the reform is suggested there is still uncertainty regarding if it will be accepted. On the implementation day, the implications will likely already be anticipated and therefore, according to EMH, priced.

V. Data and Sample Construction

A. The Ideal Data Set and Ideal Setting

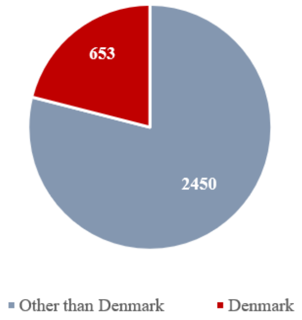
Ideally, our study would compare two economies facing identical macroeconomic conditions and shocks, and they would have identical trade relations and economic fundamentals. The firms would therefore operate under the same conditions in each respective country. Moreover, preferably each individual firm would have concentrated its operations in one country, meaning that it would not have tax obliged subsidiaries in other jurisdictions. The treatment would be that one country is randomly and unexpectedly assigned a tax rate reduction. Hence, all else would be equal between these two countries but the tax rate. The group of firms operating in the country with the tax rate reduction would constitute the treatment group, whilst the firms with operations in the other country would be the control group. By investigating the difference-in-difference in stock market reaction for these two groups, we would capture only the possible reaction to the tax rate reduction.

The ideal dataset would preferably have a large sample size and it would be without missing data points as the missing data can bias our sample and consequently our results. Ideally, the control group and treatment group would have the same number of firms and observations, the firms would be of the same size and operate in the same industry.

Unfortunately we are unable to construct the ideal data set and obtain the ideal setting in practice. For instance, note in Chart I. that there are multiple Swedish enterprise groups with subsidiaries abroad and approximately 21% of these are located in Denmark (Tillväxtanalys, 2020). This may interfere with the results because if a Swedish firm has a subsidiary in Denmark that represents a large part of its operations, then the tax rate reduction will have a smaller impact than it would if it had all operations in Sweden. This will likely have a dilutive effect that will bias our coefficient intended to capture the difference in returns between Danish and Swedish firms towards zero. Thus, it should be known that the datasets and the setting used in this study are not ideal and may therefore contain biases or unwanted effects which could affect the results and limit the possibilities of drawing accurate conclusions.

Chart I.
Swedish Enterprise Groups with Subsidiaries Abroad

The pie chart shows the number of Swedish enterprise groups with subsidiaries abroad in 2018. Roughly 21% of the Swedish enterprise groups had subsidiaries in Denmark in 2018. (Tillväxtanalys, 2020)



B. Cross-Country Comparison: Choice of Control Group

For this event study, we will compare the two Nordic economies Sweden and Denmark. In our study, the sample of Swedish firms constitutes the treatment group as they are subjected to the change in the corporate tax rate, whilst the sample of Danish firms constitutes the control group. The Swedish and Danish economies share many similarities as they both are Nordic countries, members of the EU, and share a long common history. To compare the two economies, we have selected several variables that have been documented to impact firm characteristics and country conditions. We will use macroeconomic variables that are considered to be traditional determinants of leverage in firms, as expressed by Faccio and Xu (2015). We, therefore, provide an overview of the development of both countries' gross domestic product (GDP), inflation rate, and interest policy rates over a three year period. Additionally, we include the country's debt as a % of GDP given the theoretical and empirical support on debt and its impact on economic growth and how it contributes to an enhanced vulnerability of economies to macroeconomic shocks (European Central Bank, 2020). Lastly, we include a globalization index given the important role globalization plays in economic growth. Globalization has been positively linked to economic growth due to knowledge spillovers, increased access to other markets, and enchanted production efficiency (Grossman, Helpman 2015). In this study, we will use the KOF Globalization Index which measures the degree a country's economy is globalized. The results from the comparison are presented further down in section IV in which we also test the parallel trend assumption.

Additional factors to consider to decide if the two countries are similar enough are governing party and culture. A country's governing party is of interest since its ideology often includes an opinion on tax rates for corporations and individuals. In 2018 Denmark was ruled through a coalition of 3 parties, "Venstre", "Liberal Alliance" and "Det Konservative Folkeparti" which is a center-right government while Sweden had an election that was won by the left side social-democratic party (SVT, 2020). During 2019 Denmark had an election which resulted in their social-democratic party forming a government(Folketinget, 2019). The social democratic parties in Denmark and Sweden share many values and they have been called "systerpartier", which directly translates to "sister parties"(SVT, 2020). Moreover, Sweden and Denmark share a long history and have similar cultures. To evaluate similarities and differences we will, as the majority of economic researchers, rely upon the dimensions proposed by Geert Hofstede (Gibson, Kirkman et al. 2006). Culture can affect the optimal level of tax revenue and taxation. Hofstede's dimensions, individualism, and power distance were found to have a significant relationship with the optimal taxation in a country. In addition, masculinity was found to have a significant relationship as well when controlled for individualism (Čábelková, Strielkowski 2013). Sweden and Denmark score similarly on both individualism, and power distance with Denmark slightly more individualistic and Sweden slightly higher power distance. Both Sweden and Denmark score very low on masculinity (Geert Hofstede). We, therefore, conclude that Sweden and Denmark, with their shared history, share many similarities.

C. Stock Data

To construct the two samples, we collect daily stock prices for Swedish and Danish publicly listed firms over a period starting on 1 June 2016 until 31 December 2021. We use FinBas, a high-quality financial database containing stock price data for firms listed on the Nordic Stock Exchanges between 1912 and 2021. We download the *last price,* which is the last traded price of the stock at the end of the trading day. The price is adjusted for corporate actions, which makes the prices in a time series comparable over time. FinBas offers stock data on two stock exchanges for Sweden and Denmark respectively. The Swedish stock exchanges are *Stockholm Stock Exchange* and *Stockholm Stock Exchange First North*, while the Danish stock exchanges are *Copenhagen Stock Exchange* and *Copenhagen Stock Exchange First North.* The stock exchanges differ slightly in the types of stocks listed and the regulatory requirements to be listed. *Stockholm Stock Exchange First North* and *Copenhagen Stock Exchange First North* generally target small and medium-sized companies with a focus on high growth. In addition, they have lower listing requirements compared to the more established exchanges, making them suitable platforms for companies preparing for a listing on one of the larger exchanges. We will, however, not use the stock data available on the First North stock exchanges due to the lack of balance sheet data on these firms and to avoid the potential problems of cross-listings.

It is important to ensure that we have separated the treatment and control group to avoid spill-over and dilutive effects on the treatment effect. For the treatment group, we only want to include firms that are headquartered in Sweden and thus subjected to the reduction in the corporate tax rate, whilst we only want to include firms that are headquartered in Denmark for our control group, where the tax rate has remained stable. The intention is to isolate the impact the reduction in the corporate tax rate has on stock returns and firm characteristics from other macroeconomic and country specific variables that may otherwise interfere with the results. To find the country a firm is headquartered in, we sort on the two first characters in the stocks' ISIN code. A security issued by a firm headquartered in Sweden will have "SE" as the first two characters in their ISIN code, while a Danish firm has "DE". In addition to separating the control and treatment groups, we exclude stocks issued by companies headquartered in countries outside of Sweden and Denmark. It is important to note that there is a possibility that firms that are headquartered have subsidiaries in other countries which would be subject to the tax rate in the country they are established in. This can affect the reliability of our results.

In the sample construction, we consider that one firm can issue multiple securities e.g series A and B, but also that a firm may engage in mergers or acquisitions, or simply a change of name. This is important as we do not want to count the reaction from one firm multiple times as this would bias our results. We treat a stock that has the same company name but different ISIN as one entity with the rationale being that stocks of different series may have different voting rights and payment priority, but ultimately they reflect the fundamentals of the same firm and that changes to the firm performance should be reflected similarly in these stocks. If a stock belongs to an entity that has had different company names, but the same ISIN, it is also treated as the same entity. This could potentially introduce a bias in our results as a name change could be the consequence of a merger or acquisition. Consequently, the announcement of either a merger or acquisition, as well as the actual execution of it, may impact the equity returns of the stocks belonging to these entities, thereby interfering with our obtained results.

Next, we remove entities that do not fulfill our minimum return availability requirements. The minimum return availability requirement is that the entity shall have at least one return before and one after the tax change was accepted. This is an attempt to avoid the survivorship bias and sample selection bias. The requirement is to ensure that the firms in the samples have been impacted by the same macroeconomic variables and that the results are not driven by other unobservable variables. Many of the entities do not have full availability of stock price data spanning the entire period, but rather have missing stock prices for multiple days. Missing observations are left without data as introducing new numbers for the missing values risks introducing a bias in the data. We compute the daily stock returns based on the available stock price data in each sample. We use equation 1 where $P_{i,t}$ is the stock price at time *t*, $P_{i,t-1}$ is the stock price the day prior to *t*.

$$R_{i,t} = \frac{P_{i,t}}{P_{i,t-1}} - 1 \quad \textbf{(Eq 1)}$$

Equation 1 can be interpreted as the day-on-day percentage change in the stock price. The daily stock return can only be computed if the stock price is available for two consecutive days. We then filter the data on an industry basis and follow Heider and Ljungqvist (2015) filtering process, which is similar to that of many other papers. We exclude firms operating within the financial services, utilities, and public sectors. The exclusion of financial firms is due to their business model and balance sheet structure, which is highly different from other companies (Fama, French 1992). We remove all entities with SIC codes 6000 (depository institutions e.g., banks), 6200 (security and commodity brokers), 6300 (insurance carrier) and 6700 (holdings and other investment offices). Real estate firms with SIC 6500 are excluded due to lack of data availability on an item required to construct one of the firm controls. The reason for excluding public utility firms is due to their possible connection to the state. Public firms are not often profit-orientated and are highly affected by governmental decisions which is inappropriate given the aim of the study. Their economic role is to serve public tasks, and as a result their business model also differs from other private companies. Lastly, we remove firms that do not have data available on all variables and/or SIC codes. This is to ensure that control variables can be created for all firms included and that they do not belong to the industries that we filtered out. The final sample of Swedish firms comprises 277 entities, 394 unique ISIN codes, and 328,816 observations, whilst the final sample of Danish firms consists of 85 entities, 98 unique ISIN codes, and 117,275 observations. This sample comprises all data from June 2016 until December 2021.

Table I

Data Filtering Process: All firms

This table shows the number of observations and stocks with unique ISIN codes that remain after each step in the filtering process. The most right column shows the number of observations and stocks that were dropped for each step. The number of observations are presented in brackets.

	SSE	CSE	Dropped
Start	617 (555,087)	177 (191,087)	0 (0)
HQ in correct country	583 (519,062)	164 (178,484)	47 (48,628)
Fulfilling minimum return req.	495 (491,299)	127 (136,025)	125 (70,222)
Remove SIC 6000<6999	484 (478,220)	126 (134,466)	12 (14,638)
Remove SIC 6500	449 (441,130)	111 (119,921)	50 (51,635)
Full accounting data	394 (382,816)	98 (117,275)	68 (60,960)
Total Remaining	394 (382,816)	98 (117,275)	68 (60,960)

D. *Accounting Data and Control Variables*

In addition to downloading daily stock price data from FinBas, we also obtain the market capitalization for each firm. FinBas provides two types of market capitalization, the first is *market value* (MV) which is computed stock class by stock class, if applicable. The second is *total market capitalization* (TMV) which is obtained by aggregating the market capitalization from each stock class. We used the market capitalization provided by MV to avoid double counting. For stocks traded on SSE, both MV and TMV are available on a monthly basis. To compute the market capitalization day for day there are two possible approaches, either we assume that the market capitalization for a given month remains static until the next month when new data becomes available, or we back out the shares outstanding and use it to compute the market capitalization for the remaining days of the month using the daily stock price. Using the former approach assumes that the market capitalization remains static throughout the month, thereby making the implicit assumption that the shares outstanding change as the stock price changes. The latter approach assumes that shares outstanding remain static throughout the month, but that the market capitalization is dynamic because of changes in the stock price. We decided on the second approach in which we derive shares outstanding to then compute the market capitalization as a function of the stock price. This is more intuitive as shares outstanding usually are fairly stable. FinBas did not provide monthly market capitalization on Danish firms traded on CSE. We therefore manually collected data on shares outstanding and market capitalization from the stock's fact sheet provided by Nasdaq for each traded security. If the fact sheet was unavailable, we collected the information from the annual report. We assume that the number of shares outstanding at the end of the month represents the number of shares outstanding during the month, thus if a company has X number of shares outstanding 31st December, we assume that they have had X number of shares outstanding throughout the entire December.

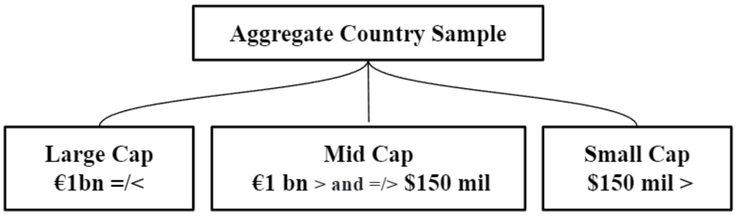
Data on firm fundamentals was retrieved from Compustat Capital IQ Global, a database that provides fundamental and market information on non-U.S. and non-Canadian active and inactive publicly held companies. We obtain accounting data on Swedish and Danish firms on an annual basis, with some firms having more frequent updates, and retrieve the following items: total assets (at), common equity (ceq), short-term debt (dlc), long-term debt (dltt), operating income before depreciation (oibdp), property plant and equipment (ppent). A more detailed explanation of each variable is provided in the appendix in Table XXI. The accounting data is matched to the stock data on an entity basis, meaning that stocks of series A and B that belong to the same firm will be matched to the same balance sheet data. It is conventional to introduce a time lag when matching accounting data to stock returns to account for the fact that accounting data usually becomes available later in time. A conventional six-month lag was introduced when matching accounting data to stock returns (Fama, French 1992). The accounting information is almost exclusively available on an annual basis for both Swedish and Danish firms, with some exceptions for semi-annual updates. When matching the annual accounting data to daily stock returns, we assume that the accounting data will remain throughout the year until new information becomes available. We use similar firm controls as Doige and Dyck (2015) and Heider and Ljungqvist (2015), these are *ROA*, *Tobin's Q, leverage, and tangibility.* The definition of the control variables and their constituents can be found in the appendix. We identified a systematic loss of firms within the real estate sector for both Sweden and Denmark due to unavailable data on items required to create control variables. In general, the real estate sector usually operates with high financial leverage, meaning that the loss of these firms will lead to lower aggregate leverage when we later construct our summary statistics.

E. Sub-Samples

This study intends to examine if there is a heterogenous or homogenous stock market reaction across firms, specifically if firms with different sized market capitalization react differently. Therefore, we created three sub-samples from each pooled country sample. The firms are classified into three samples: large, mid, and small-capitalization. We defined *large-capitalization* firms as firms with a market value greater than €1bn, which roughly translates to a market capitalization of SEK 10.3 billion, *mid-capitalization* firms as firms with a market value that is between €1 billion and €150 million and *small-capitalization* firms as firms with a market value smaller than €150 million (See figure I). We also account for two issues that arise when classifying stocks. The first issue is that a firm's market capitalization does not strictly determine the segment a firm belongs to as there is no automatic segment transfer as soon as you hit a threshold for a given segment. Secondly, given that we examine multiple stocks for an entity, the market capitalization of the stock might indicate that they belong to one segment, whilst the total market capitalization for the entity might say differently. Therefore, we manually collect data for the entity's segment belonging to classify it accordingly.

Figure I
Sub-Sample Definitions

The figure depicts the classification rules used to allocate firms into our three sub-samples.



Some entities were excluded to avoid biasing the samples because they were transferred to another segment in close conjunction to the event. In Table II and Table III we provide an overview of the final sub-samples for each country.

Table II
Data Sampling and Sample Size for Sub-Samples: Sweden

This table shows the number of observations and number of unique ISIN in each sub-sample. The most right column provides information about the number of observations and unique ISIN that were lost from the original pooled sample. The number of observations is presented in brackets.

Sweden

	Large Cap	Mid Cap	Small Cap	Dropped
Total	126 (104,701)	102 (91,491)	136 (142,087)	30 (44,537)

Table III
Data Sampling and Sample Size for Sub-Sample: Denmark

This table shows the number of observations and number of unique ISIN in each sub-sample. The most right column provides information about the number of observations and unique ISIN that were lost from the original pooled sample. The number of observations is presented in brackets.

Denmark

	Large Cap	Mid Cap	Small Cap	Dropped
Total	30 (38,172)	24 (23,928)	41 (46,081)	3 (9,094)

F. Stock Indices

To examine the parallel trend assumption, we downloaded daily historical data over a 1 year period prior to the acceptance day for Swedish and Danish stock indices from Nasdaq (Nasdaq). For the pooled samples, we downloaded data for OMXSPI and OMXCPI, for Sweden and Denmark respectively, which are value weighted price indices that consist of all shares on each exchange. These two indices give an overall picture of the stock market development. For the sub-samples, we downloaded data on OMXSSCPI and OMXCSCPI, OMXSMCPI and OMXCMCPI, and OMXSLCPI and OMXCLCPI to illustrate the development for the samples with small, mid and large-capitalization firms respectively.

For our AR and CAR regressions, we downloaded daily data on the value weighted stock index S&P Europe 350. This constitutes our proxy for the benchmark return which we will compare the individual stock return against.

VI. Methodology

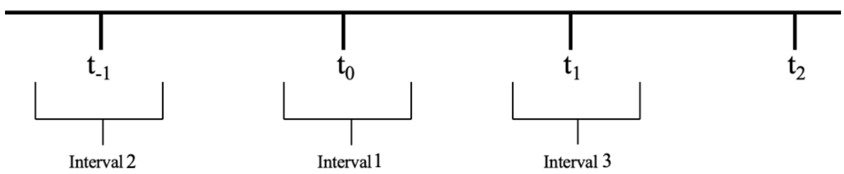
A. Event Study

To conduct our event study, we will, to a large extent, rely on our main reference article, which is written by Doidge and Dyck (2015). However, given that our event differs in some aspects compared to theirs, we will also resort to the methodology used in other event studies that have been published in prominent journals. To study our event, we have divided the tax rate reduction into 3 separate events, the suggestion day (t_{-1} = 2018-05-03), the acceptance day (t_0 = 2018-06-14), and lastly the implementation day (t_1 = 2019-01-01 & t_2 = 2020-01-01) (Riksdagen). To examine the stock market reaction to the change in the tax rate, we will primarily focus on the second event, t_0 , which was when the tax reform was passed and we believe the information regarding its implications should have been priced in by the stock market.

Figure II

Event Timeline and Interval Definitions

The figure illustrates the timeline of events related to the tax rate reduction we are investigating in our study. We have also indicated the main time period (interval 1) which we will investigate in the empirical analysis below.



Following the event study performed by Doige and Dyck (2015), we will examine three different event windows. Doige and Dyck (2015) examine an event that was largely unanticipated and therefore used asymmetrical event windows. There was likely less uncertainty related to our event and it is possible that its acceptance was expected. Therefore we will use symmetrical event windows to account for reactions that can have occurred before the acceptance of the proposal. Similarly to the common event study practice and to for example Wang and Macy (2021) we will use the event windows presented in Table IV in which each day represents a trading day.

Table IV

Event Window Specification

This table shows the three event windows and how many trading days, prior and post the event, that are included in each window. Day 0 represents the event day.

Window	1	2	3
Day	0	**± 1**	**± 3**

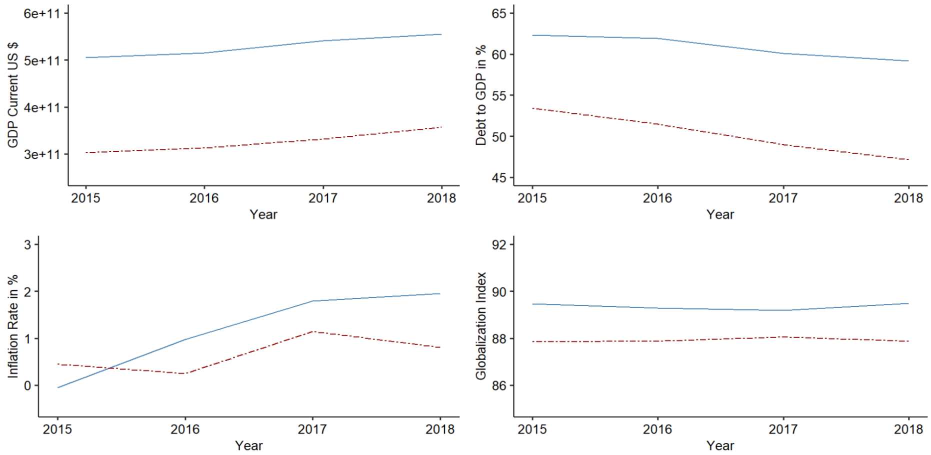
The three event windows constitute interval 1 in figure II. In accordance with the EHM we believe interval 1 to have the largest, if any, significance. Still, it's possible that there was an early or lagged reaction. Therefore, we will later examine when the reform was suggested (interval 2) and the first implementation of the reduction (interval 3). The second implementation date (2020-01-01) is not examined due to the possible impact the outbreak of the COVID-19 pandemic might have had. This could lead to unobservable effects that could interfere with the effects from the reduction in the tax rate. We also expect that the largest price implications will be in conjunction with the announcement of the acceptance of the tax change or the first implementation of it. Later in section VIII, we will focus on interval 2 and 3 to check the robustness of our results.

B. Parallel Trend Assumption

To examine whether the stock returns of Swedish publicly traded firms were higher than Danish firms on the acceptance day, we will use the difference-in-difference method. This method relies on the equal or "parallel" trends assumption, meaning that the two groups, treatment and control, follow similar trends prior to the event. We will examine whether this assumption holds by examining the stock market development, as well as some selected macroeconomic variables. If a parallel trend is missing or cannot be confirmed, the comparison of the stock returns before and after the new regulation would be misleading and the results from the difference-in-difference estimation irrelevant. The macroeconomic variables we have chosen are GDP in current US dollars, debt to GDP (in %), inflation rate (in %), and a globalization index As seen in graph I the two groups have parallel trends in three out of four of the selected variables over the selected period. Notable is that the inflation rate in Sweden and Denmark has not been parallel from 2015 to 2019.

Graph I
Development of selected country descriptive variables

The following graph shows how the GDP, debt-to-GDP, inflation rate in % and Globalization has developed over the period 2015-2018 in Sweden and Denmark. The blue graph depicts the development in Sweden.



We then examine firm characteristics of firms in each country to see whether the firms are comparable in terms of for instance size and leverage. When calculating summary statistics for the two groups, we start by summarizing the values for the different variables on an entity basis. This is to ensure that firms with multiple stocks do not get a larger weight when summarizing the data. After obtaining the summary statistics for each entity, we then obtain the summary statistics for the aggregate sample. The results are presented in Table V and Table VI for Sweden and Denmark respectively. To ensure that the absolute values, such as market value and total assets are comparable, we use the average exchange rate DKK to

SEK for the year to convert the Danish values that are provided in DKK to SEK. As seen in Table V and Table VI the two samples share many similarities in terms of size, profitability, and growth prospects. Notable differences are in the market value and tangibility. Swedish firms seem to generally have a larger market cap, as seen from the median, however the size distribution in the Danish sample is likely skewed by some large Danish firms that inflate the mean. Although both the Swedish and Danish economies are characterized by large industrial sectors, the Danish sample has a much higher PPE and tangibility ratio, suggesting that they are more capital intensive compared to the Swedish sample.

Table V
Summary Statistics: Sweden

The table presents the summary statistics of all accounting and control variables for the Swedish firms over the period June 14, 2016 to June 1, 2018. The statistics are summarized on an entity basis and then on an aggregate basis.

Statistic	Min	Mean	Median	Max	25 Percentile	75 Percentile
Market Value	0.1	11,847.8	1,968.8	311,148.7	632.3	5,839.7
Total Assets	21.1	12,075.4	1,209.0	386,665.0	335.0	5,431.0
Equity	−565.6	4,980.1	546.7	143,137.3	146.9	2,203.9
Short Term Debt	0.0	704.0	32.8	56,909.8	0.1	247.8
Long Term Debt	0.0	2,251.0	98.1	84,856.0	0.9	1,153.4
OIBDP	−200.1	1,438.1	112.7	32,075.1	27.6	642.6
PPE	0.0	2,497.0	61.1	88,844.3	7.6	532.5
ROA	−4.2	0.0	0.1	0.6	0.1	0.2
Book Leverage	0.0	0.2	0.2	2.6	0.0	0.3
Market to Book	0.0	5.1	1.6	180.0	0.9	3.4
Tangibility	0.0	0.1	0.1	1.0	0.0	0.2
Tobins Q	−198.7	8.2	2.9	268.9	1.6	6.2

Table VI
Summary Statistics: Denmark

The table presents the summary statistics of all accounting and control variables for the Danish firms over the period June 14, 2016 to June 1, 2018. The statistics are summarized on an entity basis and then on an aggregate basis.

Statistic	Min	Mean	Median	Max	25 Percentile	75 Percentile
Market Value	46.2	31,517.8	1,269.4	849,192.7	342.1	18,942.3
Total Assets	43.4	9,608.6	1,206.9	164,326.5	312.0	5,985.0
Equity	−248.1	4,274.9	612.5	61,651.3	127.7	3,235.0
Short Term Debt	0.0	308.8	41.2	8,960.9	2.6	129.4
Long Term Debt	0.0	1,533.2	83.7	34,153.0	0.7	661.4
OIBDP	−167.0	1,911.0	116.3	65,916.5	18.8	771.6
PPE	0.0	2,581.1	260.0	55,742.1	26.8	1,339.4
ROA	−2.0	0.1	0.1	0.5	0.1	0.2
Book Leverage	0.0	0.2	0.2	1.0	0.1	0.3
Market to Book	0.1	5.6	1.5	95.6	0.8	3.7
Tangibility	0.0	0.3	0.2	0.9	0.1	0.4
Tobins Q	−0.4	16.6	3.0	491.3	1.1	7.3

To examine whether these differences are significant or not, we perform Welch's t-test for unequal variances to examine the significance of the difference in the means reported in Table V and Table VI. We calculate the t-statistics according to the formula below and then calculate the corresponding P-value:

$$t = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{s_x^2}{n_x} + \frac{s_y^2}{n_y}}}$$

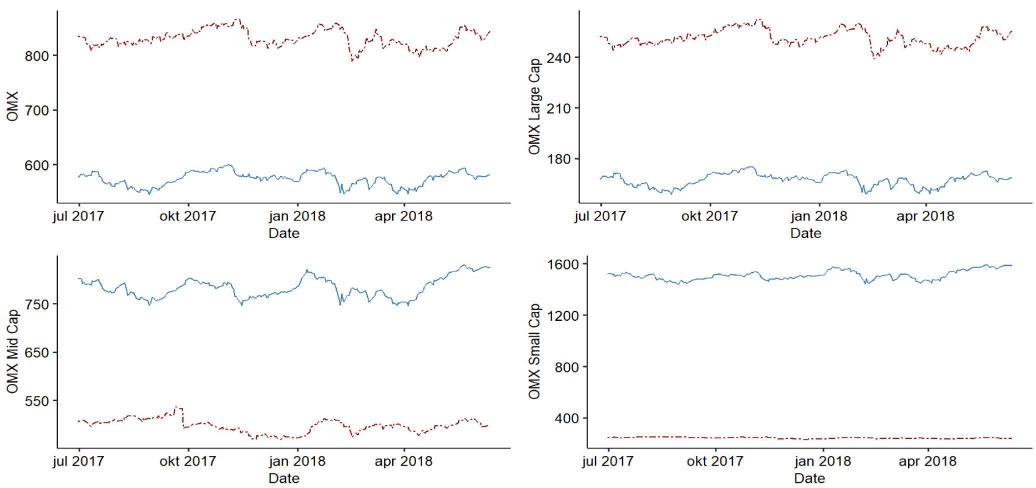
$\bar{x}$ and $\bar{y}$ are the sample means. s is the sample variance and n the number of observations in the sample. The results from the test are reported in Table XVIII in the appendix. From the tests, we can only find a significant difference in the means for the tangibility ratio. The P-value is below 0.1% meaning that the difference is highly significant. For the remaining tests, we do not find that the difference in means is different from zero. Overall, our results suggest that the difference in means is only significant for the tangibility ratio, not for the other variables and ratios. This supports that the firm characteristics of the firms in the two economies are similar.

Finally, we examine if the stock market development in Sweden and Denmark one year prior to the event is parallel. Given the aim of our study, we will examine the development for the aggregate market, as well as for the sub-samples we will focus on in our analysis. In Graph II we see that all indices share an overall positive long-term trend over the selected period, which is in line with each country's positive GDP development. The development of Denmark and Sweden's large-capitalization indices, OMXSLC and OMXCLC, is nearly identical to the all share index. This is expected since both OMXS and OMXC are value-weighted indices. Visually, the trends of OMXSLC and OMXCSM seem to follow a similar development one year prior to the change in the Swedish corporate tax rate. We note a few deviations in the movement, but overall that the trends move in parallel and therefore provide support for the parallel trend assumption for this segment. The mid-capitalization indices, OMXSMC and OMXCMC, exhibit a stronger parallel trend compared to the all share and the large-capitalization indices. We do not observe any periods in which the indices notably diverge or break the trend. Visually the trends of OMXSMC and OMXCMC seem parallel, thereby providing support for the parallel trend assumption for this segment too. Lastly, for the small-capitalization indices, OMXSSC and OMXCSC, there is greater variation in the Swedish index compared to the Danish. Although the long-term trend is the same, we must acknowledge that the two indices diverge at times and that we find weaker support for the parallel trend assumption.

Graph II

Parallel Trend Assumption

The graphs plots OMXSPI and OMXCPI, OMXSLC and OMXCLC, OMXCMC and OMXCMC, and OMXSSC and OMXCSC over the period 30 June, 2017 to 14 June, 2018. The Danish indices are in red.



Overall, despite some differences between Denmark and Sweden, such as in the tangibility ratio and their historic inflation rates, we believe the similarities outweigh the differences. Considering the parallel trends over the year prior to the reduction in the corporate tax rate and the similarities in various firm characteristics, we conclude that

Denmark is an appropriate control group to Sweden for the all share, large-capitalization and mid-capitalization segments, but less for the small-capitalization segment. We will examine all three segments, but we should be aware that the results we derive for the small-capitalization segment might not be representative given that we do not find as strong a support for the parallel trend assumption.

C. Abnormal and Cumulative Abnormal Returns

To see whether there was a significant stock market reaction, we will examine the abnormal return (AR) and cumulative abnormal return (CAR). We follow the method used by Doidge and Dyck (2015) and calculate AR and CAR for 3 different event windows. However, due to the nature of the reform as discussed above, we will calculate CAR for a symmetric window instead of an asymmetric one, resulting in the event windows: the acceptance day, the acceptance day ± 1 trading days and acceptance day ± 3 trading days. The following regression model was used to estimate the abnormal returns.

$$R_{i,t} = \alpha_i + \beta_i * R_{b,t} + \gamma_i * Event + \varepsilon_{i,t} \quad \textbf{(Reg I)}$$

R_i is the daily return for stock *i*, R_b is the value-weighted return of the benchmark, and *Event* is a dummy that equals 1 for the days specified in the event window. The estimate of γ is the abnormal return of each firm over the event period. To calculate the CAR, each γ will be multiplied by the number of days in the event period. There are different approaches to estimate the expected return. One possible approach is to use a Swedish stock market index, however since the tax rate reduction affects all companies in Sweden, the entire index would be upward biased. Therefore, we will use a value-weighted European index, S&P Europe 350. The index contains both large, mid, and small-capitalization companies from a total of 16 countries. Both Sweden and Denmark are among those 16 countries. The benefit with using an European index, instead of a Nordic, is that each Swedish and Danish individual stock has a smaller impact on the index movement.

D. Regressions

To capture the Swedish stock market reaction we apply the difference-in-difference method. The statistical method enables us to study the differential effect of a treatment between a treatment group and a control group. (Angrist & Pischke, 2009). The difference-in-difference approach rests upon the parallel trend assumption discussed above. When performing our difference-in-difference regressions we perform a step-by-step approach where we gradually increase controls to provide a clear view of the effects. The regressions will be estimated for the pooled sample and then performed on each sub-sample. The first regressions are Ordinary Least Square (OLS) regressions that do not include firm fixed effects. For the OLS regressions, the following regression was estimated:

$$Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \varepsilon_{i,t} \quad \textbf{(Reg II)}$$

Y is the stock return and our dependent variable, *Z* are the firm controls and ε is the error term. *D1* is a country dummy that equals one if it is a Swedish firm, 0 otherwise. *D2* is our event dummy that equals one if the time is within our event window, 0 otherwise. The interaction effect is the product of these two dummy variables and intends to capture the difference-in-difference.

Following the OLS regression, we perform a firm fixed effects regression. The benefit of fixed effects models is that it controls and reduces the endogeneity problem and accounts for the unobservable differences across individuals that are constant over time. A fixed effect regression is common among papers examining changes to corporate taxes in which they examine entities that may have unobservable differences, such as firms or countries (Wang & Macy, 2021 and Doidge & Dyck, 2015).

$$Y_{i,t} = \beta_0 + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t} \quad \textbf{(Reg III)}$$

Y is the dependent variable which is the return of the stocks. The variable ε is the error term. The entity fixed effects regression will be performed on each sub-sample as well; large, mid, and small-capitalization. ν is the firm fixed effect that captures unobservable differences that are different across entities but constant across time. *D1* is a country dummy that equals one if it is a Swedish firm, 0 otherwise. *D2* is an Event Dummy that equals one if the time is within our event window, 0 otherwise.

In the following step we add firm control variables to the regressions. The addition of control variables improves the validity of the regression results by eliminating the influence of other exogenous variables.

$$Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t} \quad \textbf{(Reg IV)}$$

Y is the dependent variable which is the return of the stocks. *Z* are the firm controls. ν is the firm fixed effects. We include the same dummy variables from the firm fixed effect model. The variable ε is the error term. The entity fixed effects with firm control variables regression will be performed on each sub-sample as well; large, mid, and small-capitalization. It is common for event studies to include control variables in their fixed effects regression when empirically examining the event in question. The use of firm fixed effects is in line with the methodology used in the study by Doidge and Dyck (2015) who similarly use firm fixed effects together with firm controls. Firm fixed effects control for individual-specific attributes that are constant across time but varies across entities. Our control variables, such as ROA, on the other hand vary both across time and entities. Other studies published in renowned journals such as *the Journal of finance* and *the journal of financial economics* also perform firm fixed effects together with firm controls (Getry, Kemsley et al. 2003; Heider, Ljungqvist 2015).

In addition to the firm fixed effects regressions, we will also perform industry fixed effects regressions. *Y* is the dependent variable which is the return of the stocks. *Z* are the firm controls. We include the same dummy variables from the firm fixed effect model.

$$Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \gamma_i + \varepsilon_{i,t} \quad \textbf{(Reg V)}$$

The variable ε is the error term. ɣ is the industry fixed effect. We classify firms into industries using the two-digit SIC-code, which categorizes firms into one out of ten possible industries. The SIC-code industry name and SIC-codes are presented in Table XXIV. Although the firm fixed effects are more robust as they control for both unobservable differences across industries *and* for unobservable differences across firms within the same industry, it might be useful to see whether the results differ across the two different fixed effects regressions.

VII. Empirical Analysis

A. Abnormal Returns and Cumulative Abnormal Returns

We begin with estimating abnormal returns (AR) and cumulative abnormal returns (CAR) around the acceptance date. We run regression I, which is the same regression model as Doidge and Dyck (2015), over the period June 14, 2017 to December 31, 2018. The event window that solely includes the acceptance date, is the only regression that produces a statistically significant AR. The return is 0.59% and statistically significant at the 1% level. The other two event windows do not show any statistically significant CAR. This regression suggests that Swedish firms earn AR only on the acceptance date.

Table VII
AR and CAR Regressions: All Shares

The regression $R_{i,t} = \alpha_i + \beta_i * R_{b,t} + \gamma_i * Event + \varepsilon_{i,t}$ is estimated for each stock. The table shows the estimated AR for Swedish firms on the acceptance day and the average AR for windows (-1, 1) and (-3 , 3). The CAR is obtained by multiplying γ with the number of days in the event window. The CAR for event window (-1, 1) is 0.03% and the CAR for event window (-3, 3) is -0.7%.

	Model 1	**Model 2**	**Model 3**
Coeffcient	*Estimates*	*Estimates*	*Estimates*
Intercept	0.0016 ***	0.0016 ***	0.0016 ***
SP 350	-0.2577 ***	-0.2531 ***	-0.2524 ***
AR Day 0	0.0059 **		
Day +/-1		0.0001	
Day +/-3			-0.0010
Observations	106030	106030	106030
R^2 / R^2 adjusted	0.002 / 0.002	0.002 / 0.001	0.002 / 0.002

* *p<0.05* ** *p<0.01* *** *p<0.001*

The results for the sub-samples are presented in the Appendix (Table XXVII).

A. Stock Market Reaction: OLS Regressions

Using the OLS regression specified in regression II we examine whether we find a statistically significant reaction in the Swedish stock market upon the acceptance of the tax rate reduction. The results are presented in Table VIII. First, we use the pooled samples over the period April 14, 2018 to August 14, 2018, a four month period. The dependent variable is the daily stock return. Our primary variable of interest is the interaction effect, which captures the potential return differential between Swedish and Danish publicly traded firms for our event windows. *SSE* measures whether a stock was traded on the Swedish Stock Exchange during this selected period. In our first regression, the coefficient is 0.0014 and significant at 5%. The coefficient is 0.0017 in the second and third model and they are significant at the 1% level. This implies that Swedish firms generally have slightly higher returns over this period than Danish firms. The coefficient on the interaction effect is insignificant for the event window that only includes the acceptance day, but it is -0.0069 and -0.0043 and significant at the 5% level for an event window of (-1, 1) and (-3, 3) respectively. Overall, the results from the OLS regressions suggest that a reduction in the corporate tax rate had a small negative effect on the stock returns of Swedish publicly traded firms. We note however that there is heteroscedasticity in the error terms for all regression, see results from the test in the appendix Table XXII.

Table VIII
OLS Regressions: All Shares

The table presents the OLS regression with firm controls for the period April 14, 2018 to August 14, 2018. The regression estimate for all stocks is: $Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \varepsilon_{i,t}$. The pooled sample includes daily stock returns on Swedish and Danish publicly traded firms and data on firm characteristics. The dependent variable is daily stock returns. *SSE* equals one for firms that are traded on the Stockholm Stock Exchange. A regression was run for each event window, the acceptance day June 14, 2018 (1), the acceptance day ± 1 trading days (2) and the acceptance day ± 3 trading days (3).

	Model 1	**Model 2**	**Model 3**
Coeffcient	*Estimates*	*Estimates*	*Estimates*
Intercept	-0.0003	-0.0005	-0.0004
SSE	0.0014 *	0.0017 **	0.0017 **
ROA	-0.0016	-0.0015	-0.0015
Leverage	0.0007	0.0007	0.0007
MTB	0.0001 *	0.0001 *	0.0001 *
Tangibility	0.0030 *	0.0030 *	0.0030 *
Tobins Q	0.0000	0.0000	0.0000
Interaction Day 0	-0.0013		
Interaction +/- 1		-0.0069 *	
Interaction +/- 3			-0.0043 *
Observations	29090	29090	29090
R^2 / R^2 adjusted	0.001 / 0.000	0.001 / 0.001	0.001 / 0.001

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

We run the same regressions but for our sub-samples to see whether there is a statistically significant reaction, and if so, if it is heterogeneous or homogeneous across firms with different sizes of their market capitalization. The regression results are presented in Table IX. *SSE* measures whether a stock was traded on the Swedish Stock Exchange during this selected period. For the small-capitalization sample, the coefficient is 0.0037 and statistically significant at the 5% level in the model with the acceptance date as the event window. The coefficient is 0.0042 and statistically significant at the 1% level for the models with an event window of (-1, 1) and (-3, 3) respectively. This indicates that Swedish small-capitalization firms generally earned higher returns than Danish firms during this period. No clear conclusions can be drawn about the other two samples. The majority of the interaction dummies are negative, indicating that Swedish firms in the sub-samples earned negative returns during the event windows. However, most are insignificant. The interaction effect for large-capitalization firms for the event window (-1, 1) is -0.0055 and statistically significant at the 5% level. The results from these OLS regressions show that it likely was the stock returns from the large-capitalization segment that contributed to the negative value on the coefficient on the interaction effect in the pooled sample for the event window (-1, 1).

Overall, there seems to be a mixed reaction given that some coefficients are positive for the large and mid-capitalization firms, while the rest are negative. For both small and mid-capitalization firms, the results are statistically insignificant, regardless of the event window used. The results from the OLS regression suggest a possible heterogeneous reaction, but overall little evidence that there was a large reaction. Like the regression for the all share sample, the sub-sample regressions too have problems with heteroscedasticity, see results in the appendix Table XXII.

Table IX
OLS Regressions: Sub-Samples

The table presents the OLS regressions with firm controls for the sub-samples over the period April 14, 2018 to August 14, 2018. The regression estimated is: $Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \varepsilon_{i,t}$. The sample includes daily stock returns and data on firm characteristics. The dependent variable is daily stock returns. *SSE* equals one for firms that are traded on the Stockholm Stock Exchange. The table provides an overview of the regression results for each of the three samples on the acceptance day June 14, 2018 (1), on the acceptance day ± 1 trading days (2) and on the acceptance day ± 3 trading days (3).

	LC (1)	**LC (2)**	**LC (3)**	**MC (1)**	**MC (2)**	**MC (3)**	**SC (1)**	**SC (2)**	**SC (3)**
Coeffcient	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*
Intercept	0.0030 ***	0.0029 ***	0.0032 ***	0.0008	0.0001	0.0003	-0.0031 *	-0.0035 *	-0.0033 *
SSE	-0.0012 *	-0.0009	-0.0011 *	0.0022	0.0029	0.0029	0.0037 **	0.0042 **	0.0042 **
ROA	-0.0044	-0.0044	-0.0045	-0.0016	-0.0017	-0.0017	0.0000	0.0000	-0.0000
Leverage	-0.0004	-0.0004	-0.0003	-0.0047	-0.0047	-0.0048	0.0004	0.0004	0.0004
MTB	0.0001 ***	0.0001 ***	0.0001 ***	0.0000	0.0000	0.0000	0.0002	0.0002	0.0002
Tangibility	-0.0032 **	-0.0032 **	-0.0033 **	0.0010	0.0010	0.0010	0.0103 ***	0.0103 ***	0.0103 ***
Tobins Q	-0.0000 *	-0.0000 *	-0.0000 *	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Interaction LC 0	0.0021								
Interaction LC +/- 1		-0.0055 *							
Interaction LC +/- 3			-0.0009						
Interaction MC 0				0.0007					
Interaction MC +/- 1					-0.0064				
Interaction MC +/- 3						-0.0037			
Interaction SC 0							-0.0019		
Interaction SC +/- 1								-0.0117	
Interaction SC +/- 3									-0.0066
Observations	8413	8413	8413	7216	7216	7216	11095	11095	11095
R^2 / R^2 adjusted	0.007 / 0.006	0.004 / 0.003	0.004 / 0.003	0.001 / 0.000	0.002 / 0.001	0.002 / 0.001	0.002 / 0.001	0.002 / 0.001	0.002 / 0.001

* *p<0.05* ** *p<0.01* *** *p<0.001*

B. Fixed Effects Model without Firm Controls

Next, we run a fixed effects model without firm controls, as specified in regression III. The results are presented in Table X. We begin with the pooled sample and use the same time period as above. The dependent variable is the daily stock return. Our primary variable of interest is the interaction effect, which captures the potential return differential between Swedish and Danish firms for our event windows when the reduction in the corporate tax rate was accepted. As seen in Table X, the coefficient on the interaction effect is significant for the second and third event window (-1, 1) and (-3, 3) respectively. This is similar to the OLS model, but we can note that the magnitude has decreased on both coefficients. Overall, the results from the fixed effects regressions without firm controls suggest that the reduction in the corporate tax rate resulted in a negative stock market reaction.

Table X
Fixed Effects without Firm Controls: All Shares

The regression estimated for all stocks is: $Y_{i,t} = \beta_0 + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t}$. The table provides an overview of the regression results on the acceptance day (1), on the acceptance day ± 1 trading days (2) and on the acceptance day ± 3 trading days (3).

	All Shares:		
	(1)	(2)	(3)
event	0.0040	0.0049	−0.0001
interaction	−0.0014	−0.0069**	−0.0034**
Observations	29,441	29,441	29,441
R^2	0.0001	0.0002	0.0005
Adjusted R^2	−0.012	−0.012	−0.012
F Statistic (df = 2; 29082)	0.953	2.799*	6.701***
Note:			*p<0.1; **p<0.05; ***p<0.01

We run regression III on our sub-samples to see whether there is a statistically significant reaction and whether it is heterogeneous across the samples. The results are presented in Table XI. The majority of the coefficients for the interaction effect are negative, however, there are some with a positive direction which suggests that there was a heterogenous stock market reaction. We note that the interaction coefficient is significant at the 5% level for the second event window (-1, 1) for the mid-capitalization segment, and the second and third event window for the small-capitalization segment, (-1, 1) and (-3, 3) at the 5% and 1% level respectively. This is different from the OLS regressions where there was only one significant interaction coefficient, which was on the second event window for the large-capitalization segment. Taken together, there seem to be mixed results given that some coefficients are positive, however as the majority of the interaction coefficients were negative and the only statistically significant interaction effects were negative, the results indicate that there was a negative stock market reaction for the Swedish firms in the sub-samples.

Table XI
Fixed Effects without Firm Controls: Sub-Samples

The regression estimated for all stocks in each sample is: $Y_{i,t} = \beta_0 + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t}$. The table provides an overview of the regression results on the acceptance day (1), on the acceptance day ± 1 trading days (2) and on the acceptance day ± 3 trading days (3).

	Large Cap:			*Mid Cap:*			*Small Cap:*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
event	0.0065	0.0032	−0.0022	0.0089**	0.0029	−0.0006	0.0019	0.0119*	0.0027
interaction	0.0078	−0.0024	0.0014	−0.0041	−0.0052**	0.0004	−0.0029	−0.0139*	−0.0066**
Observations	8,592	8,592	8,592	7,399	7,399	7,399	11,132	11,132	11,132
R^2	0.002	0.0003	0.0003	0.0003	0.0001	0.00001	0.00001	0.0004	0.0004
Adjusted R^2	−0.009	−0.011	−0.011	−0.013	−0.013	−0.013	−0.013	−0.013	−0.013
F Statistic (df = 2; 8498)	7.293***	1.338	1.214	1.052	0.515	0.018	0.037	2.341*	2.124
Note:	*p<0.1; **p<0.05; ***p<0.01								

C. *Fixed Effects Model with Firm Controls*

As previously stated we increasingly add variables to our regressions. Therefore, we run regression IV, which is the fixed effects model that includes firm controls. The results are presented in Table XII. Again, we begin with the pooled samples for Sweden and Denmark over the period April 2018 to August 2018. The dependent variable is the daily stock return. Our primary variable of interest is the interaction effect, which captures the potential return differential between Swedish and Danish publicly traded firms for our three event windows. The coefficient on the interaction effect is still significant for the second and third event window, however, the magnitude and significance have decreased. The firm control of MTB and Tobin's Q are statistically significant at the 0.1% level, indicating that they have explanatory value. This is however likely because these firm controls depend on the stock price, whilst the other firm controls depend on variables with relatively infrequent changes. Overall, the coefficients on the interaction effect are all negative and although the magnitude has decreased, the coefficients on the second and third window are still significant. This suggests that there was a negative stock market reaction. The F-statistic is significant at the 5% level which suggests that our firm controls should be included as they are jointly significant in explaining the dependent variable. Given the issues with heteroscedasticity, we have used robust standard errors when reporting the regression results. For the industry fixed effects regressions reported in the appendix Table XXV, we see that the interaction effect on the second and third event windows, (-1, 1) and (-3, 3) are significant at the 5% and 0.1% level respectively. In the firm fixed effects regression, we see similar results but the interaction effect on the third event window has a lower significance. One difference is that in the firm fixed effects regression we note that both MTB and Tobin's Q are statistically significant control variables, whereas in the industry fixed effects regression only MTB is significant.

Table XII

Fixed Effects with Firm Controls: All Shares

The regression estimated for all stocks is: $Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t}$. The table provides an overview of the regression results on the acceptance day (1), the acceptance day ± 1 trading days (2) and on the acceptance day ± 3 trading days (3). The results are reported with robust standard errors.

	All Shares:		
	(1)	(2)	(3)
event	0.004	0.005	−0.0001
roa	0.0034	0.0033	0.0033
leverage	0.005	0.005	0.005
mtb	0.0002***	0.0002***	0.0002***
tangibility	−0.0098	−0.0097	−0.0101
tobinsq	0.0000***	0.0000***	0.0000***
interaction	−0.001	−0.0067*	−0.0032*
Observations	29,090	29,090	29,090
R^2	0.0005	0.001	0.001
Adjusted R^2	−0.012	−0.012	−0.012
F Statistic (df = 7; 28729)	2.017*	2.463*	3.475**
Note:			*p<0.05; **p<0.01; ***p<0.001

We run the same fixed effects regression but for our sub-samples. The results are presented in Table XIII. The firm controls contribute to differences in the coefficient estimates and the significance of the interaction effect. We note that the magnitude of all coefficients for the interaction effects decreases and the coefficient of the interaction effect for the second event window in the small-capitalization segment becomes insignificant. Moreover, given the mixed directions on the coefficient estimates, the results from the regression suggest that there were heterogeneous reactions across sub-samples. Still, the only statistically significant coefficients have negative directions, which suggests that there was a negative stock market reaction that subsequently led Swedish firms to earn lower returns compared to the Danish firms during these event windows. We note that only the F-statistic for the large-capitalization segment is significant. Although the F-statistic still is insignificant for the other models, it has increased. Overall, this suggests that the firm controls should be included for the large-capitalization regressions, but that they do not add much value to the regressions. Again, given the issues with heteroscedasticity, we have used robust standard errors when reporting the regression results for the sub-samples as well. For the industry fixed effects regressions, we note that the interaction effect is significant for all windows in the large-capitalization segment. The first window is significant at the 5% level and is 0.003, and the two other coefficients are significant at the 0.1% level and are 0.005 and 0.003 respectively. In the firm fixed effects regressions they are insignificant and have a lower magnitude at 0.0006, -0.0024, and 0.0014. We also note that there is no significant interaction coefficient for the small and mid-capitalization segments in the industry fixed effects. In the industry fixed effects regressions, we see that the control variables are highly significant for the large-capitalization segment and some for the mid-capitalization segment, but they are insignificant when we introduce firm fixed effects. Overall, we attribute these results to firm fixed effects being more robust, meaning that they control for more. The results are presented in appendix Table XXVI.

Table XIII

Fixed Effects with Firm Controls: Sub-samples

The regression estimated for all stocks in each respective sub-sample (large, mid and small-capitalization) is: $Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t}$. The table provides an overview of the regression results on the acceptance day (1), on the acceptance day $\pm$ 1 trading days (2) and on the acceptance day $\pm$ 3 trading days (3).The results are reported with robust standard errors.

	Large Cap:			*Mid Cap:*			*Small Cap:*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
event	0.0066	0.003	−0.002	0.0089*	0.0029	−0.0069	0.0018	0.0119	0.0026
roa	−0.012	−0.012	−0.012	0.0078*	0.0078*	0.0079*	0.0067	0.0067	0.0063
leverage	−0.002	−0.002	−0.001	0.0039	0.0032	0.0032	0.0092	0.0093	0.0091
mtb	0.0002***	0.0002**	0.0002**	0.0003	0.0003	0.0003	0.0006*	0.0006*	0.0005*
tangibility	0.0059	0.0059	0.0063	−0.032***	−0.032***	−0.032***	−0.0119	−0.0119	−0.0122
tobinsq	−0.0000	−0.0000	−0.0000	0.0000	0.0000	0.0000	0.0000***	0.0000***	0.0000***
interaction	0.0006	−0.0024	0.0014	−0.0041	−0.0048*	0.0006	−0.0028	−0.0137	−0.0065*
Observations	8,413	8,413	8,413	7,216	7,216	7,216	11,095	11,095	11,095
R^2	0.003	0.002	0.002	0.001	0.001	0.001	0.0004	0.001	0.001
Adjusted R^2	−0.008	−0.010	−0.010	−0.012	−0.012	−0.013	−0.014	−0.013	−0.013
F Statistic (df = 7; 8315)	3.820***	2.206*	2.148*	1.397	1.231	1.119	0.635	1.278	1.217
Note:	*p<0.05; **p<0.01; ***p<0.001								

From the regression output for the all shares fixed effects regression with firm controls, we note that the MTB and Tobin's Q are highly significant. Both have a positive direction, but a magnitude that is close to zero. It is worth noting that they are the only firm controls that directly depend on the share price, which might explain their significance as they will have the most variability. The low significance of the other control variables might be due to three reasons. Firstly, there might be too little variability in the firm controls. Secondly, they might simply not be appropriate controls for explaining the variation in returns. Thirdly, the variability in the sub-samples might work against each other such that they become insignificant on an aggregate level.

Moving on to the sub-samples, we note that MTB is significant for both the large and small-capitalization segments. The estimates have a positive direction, but similar to the all shares sample, the estimates have a magnitude near zero. Upon examining the sub-samples, we do note some cross-sample differences. Tobin's Q is significant for the small-capitalization segment only and it has a positive direction. Moreover, for the mid-capitalization segment, tangibility is statistically significant and has a negative direction, which differs from the large-capitalization segment which has a positive direction on the same firm control. Moreover, ROA has a small positive impact on returns in the mid-capitalization segment, while the sign is negative for large-cap firms, though insignificant. This may in turn give rise to heterogeneous stock market reactions.

Overall, our results suggest that there might be differences in the firm characteristics for the different sub-samples such that it leads to different reactions to a reduction in the corporate tax rate. The results suggest that the acceptance of the tax rate reduction might have had a heterogeneous impact across firms given the mixed direction of the coefficients for the interaction effect. Moreover, the market seemingly reacted either the days prior to the acceptance or it had a sluggish reaction given that the coefficient on the interaction effect was insignificant on the actual acceptance date, but significant for our broader event windows. Still, the results from the pooled sample and the sub-samples ‘suggests that there generally was a negative stock market reaction given that the few statistically significant coefficients for the interaction effect were negative. The other coefficients were insignificant to a large extent. Besides controlling for firm fixed effects, we also investigated the reaction using industry fixed effects. The industry fixed effects regressions suggest that there was a significant reaction on the acceptance day for the large capitalization, but not for the other two segments.

As previously mentioned, Doidge and Dyck (2015) present three main challenges when empirically studying tax effects: the change should be dramatic, largely unanticipated, and not contaminated by other events. A reason behind our statistically insignificant results might be that the reduction is too small. The event studied is a reduction amounting to 1.4 percentage points, compared to for instance Doidge and Dyck who studied a change of 31.5 percentage points and Cutler (1988) who studied a change of 12 percentage points. The small magnitude of the reduction may be difficult to distinguish from noise, such as news and other changes occurring concurrently. To control for this, we will run a series of permutation tests. Moreover, the acceptance of the tax change might have been anticipated by the market, meaning that it might have already been priced in during the time it was debated and that only little uncertainty was resolved upon the acceptance of the proposal. Alternatively, if a lot of uncertainty remained, it might have ultimately been resolved upon the actual implementation day. This may have caused us to observe only a small market reaction on the acceptance day, but not one significant enough to create statistically significant results. In the following section, we will conduct a series of robustness checks to examine if there was a reaction in the Swedish stock market upon the suggestion date and the implementation date. For these regressions, we will use firm fixed effects and include firm controls given the statistically significant F-statistic.

VIII. Robustness Checks

In this section, we test the validity and reliability of our results. We use an alternative approach to estimating CAR to see whether Swedish firms indeed earned positive AR on the announcement day, or if the results are unreliable. Moreover, we examine if the small market reaction upon the acceptance day is the result of the implication of the corporate tax rate reduction already being incorporated upon its suggestion, and/or if the market reacted upon the implementation day due to the remaining uncertainty being resolved. Lastly, we will conduct a permutation test in which we examine whether the coefficient estimates simply capture noise, or whether they indeed are significant.

A. Abnormal and Cumulative Abnormal Returns

Another approach to calculating AR and CAR is used to test the robustness of our results. The reason we study the CAR is to capture the effect of information that may have been acquired prior to the official acceptance as well as the market reactions the days after the acceptance. The AR and CAR are defined as:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}|X_t) \quad \textbf{(Reg V)}$$

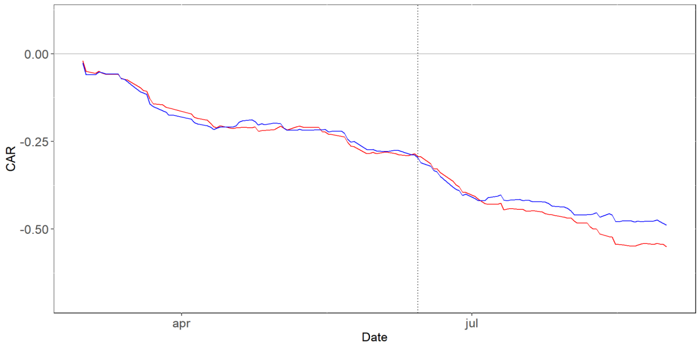
$$CAR_i(t_{-y}, t_y) = \sum_{t=t_{-y}}^{t_y} AR_{i,t} \quad \textbf{(Reg VI)}$$

$AR_{i,t}$ is the AR for stock i at time t, $R_{i,t}$ is the actual return of stock i at time t and $E(R_{i,t}|X_t)$ is the expected return of stock i at time t. See equation 1 for the equation for the actual return. $CAR_i(t_{-y}, t_y)$ is the CAR for stock *i* between time period t_{-y} and t_y. After calculating the AR we will aggregate them into CAR. Since the event affects all firms simultaneously we do not need to worry about clustering, i.e., that the event windows do not overlap. Graph III provides a graphical illustration of the CAR. Notable from the graph is that the AR and CAR in Sweden and Denmark seem to follow a similar development in the pre-period, but we see that they diverge from July onwards. We see no apparent difference in AR on the acceptance day, however, Swedish firms seem to earn relatively higher AR than Danish firms in the post-period. Considering that the returns start to diverge from July, it is unlikely that this is a lagged reaction to the tax rate reduction as it would strongly contradict the efficient market's hypothesis. It is most likely a reaction to other external events.

Graph III

Cumulative Abnormal Returns

This graph shows the cumulative abnormal returns for Swedish and Danish firms over the period March 1, 2018 to September 1, 2018. The blue line is the CAR for the Swedish sample. The black line intersects the graphs on the announcement day, the 14th of June, 2018.



B. Fixed effects with firm controls: Suggestion Date

Next, we examine the stock market upon the suggestion date and the implementation date to see whether there was a significant reaction. We run Equation IV which is the fixed effects regression with firm controls. Our primary variable of interest is the interaction effect on our event windows. The coefficient is -0.0046 and insignificant on the event day. However, we find a strong negative market reaction on the event windows (-1, 1) and (-3, 3) trading days surrounding the suggestion day. The coefficients are -0.0063 and -0.0072 and are significant at the 1% and 0.1% level respectively. These results imply that Swedish firms earned lower returns than Danish firms on the days surrounding the suggestion date.

Table XIV

Fixed Effects with Firm Controls: All Shares

The table presents the results from the fixed effect regression with firm controls for the pooled sample over the period March 2018 to July 2018. The regression estimated for all stocks is: $Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t}$ Three regressions were run were each event window respectively: the proposal day May 3, 2018 (1), the proposal day $\pm$ 1 trading days (2), and the proposal day $\pm$ 3 trading days (3). The results are reported with robust standard errors.

	All Share:		
	(1)	(2)	(3)
event	0.0019	0.0054**	0.0067***
roa	0.0043*	0.0045*	0.0045*
leverage	0.0046	0.0045	0.0045
mtb	0.0002***	0.0002***	0.0002***
tangibility	−0.0072	−0.0073	−0.0073
tobinsq	0.0000***	0.0000***	0.0000***
interaction	−0.0046	−0.0063**	−0.0072***
Observations	28,148	28,148	28,148
R^2	0.001	0.001	0.002
Adjusted R^2	−0.012	−0.012	−0.011
F Statistic (df = 7; 27786)	4.028***	5.092***	7.677***
Note:	*p<0.05; **p<0.01; ***p<0.001		

We then run the same regressions for the same time period for our sub-samples. The coefficients on the interaction effect for the three event windows are *all* negative, which differs slightly from the results from previous regressions in which some were positive. Moreover, the coefficients have a larger magnitude and the majority of them are significant. For the large-capitalization segment, the coefficient estimates are -0.0094 and -0.0077 and significant at the 1% and 0.1% level for event windows (-1, 1) and (-3, 3) respectively. For the mid-capitalization segment, the second and third event windows are significant and are -0.0067 and -0.0076 and significant at the 5% and 0.1% level respectively. For small caps, all coefficients share a negative direction, but all are insignificant. Our results suggest a homogeneous negative reaction across segments with all coefficients being negative. Additionally, the negative market reaction surrounding the suggestion date is seemingly stronger than it was for the acceptance date given the larger magnitude of the coefficients and higher significance. Different from the previous regressions, we find that the F-statistic is significant for *all* sub-samples and the P-value is always below 5%. It is the most significant for the large-capitalization segment where the P-value is below 1% for the first model and below 0.1% for models two and three.

Table XV

Fixed Effects with Firm Controls: Sub-Samples

The table presents the results from the fixed effect regression with firm controls for the sub-samples over the period March 2018 to July 2018. The regression estimated for all stocks is: $Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t}$. Three regressions were run were each include one of the following event window respectively: the proposal day May 3, 2018 (1), the proposal day $\pm$ 1 trading days (2), and on the proposal day $\pm$ 3 trading days (3). The results are reported with robust standard errors.

	Large Cap:			*Mid Cap:*			*Small Cap:*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
event	0.0007	0.0071^{**}	0.0091^{**}	0.0091^{*}	0.0073^{**}	0.0071^{***}	−0.00003	0.0023	0.0037
roa	−0.0059	−0.0057	−0.0057	0.0116^{**}	0.0117^{**}	0.0119^{**}	0.0099^{*}	0.0099^{*}	0.0097^{*}
leverage	0.0101^{*}	0.0106^{*}	0.0109^{*}	0.0077	0.0082	0.0009	0.0070	0.0068	0.0068
mtb	0.0002^{***}	0.0002^{***}	0.0002^{***}	0.0003	0.0003	0.0003	0.0010^{**}	0.0010^{**}	0.0010^{**}
tangibility	0.0157	0.0155	0.0159	-0.0146^{***}	-0.0145^{***}	-0.0143^{***}	−0.0103	−0.0105	−0.0106
tobinsq	−0.00002	−0.00002	−0.00002	0.0000	0.0000	0.0000	0.0000^{***}	0.0000^{***}	0.0000^{***}
interaction	−0.0057	-0.0094^{***}	-0.0077^{**}	−0.0056	-0.0067^{*}	-0.0076^{***}	−0.0095	−0.0048	−0.0044
Observations	8,111	8,111	8,111	6,943	6,943	6,943	10,738	10,738	10,738
R^2	0.003	0.004	0.007	0.003	0.003	0.003	0.003	0.002	0.002
Adjusted R^2	−0.009	−0.008	−0.005	−0.011	−0.011	−0.011	−0.012	−0.013	−0.013
F Statistic (df = 7; 8013)	3.164^{**}	4.522^{***}	8.063^{***}	2.584^{*}	2.672^{**}	3.181^{**}	3.899^{***}	2.926^{**}	2.951^{**}

Note: *p<0.05; **p<0.01; ***p<0.001

The results indicate that there was a stronger negative market reaction to the *suggestion* of the reduction in the corporate tax rate than there was to the *acceptance* of it. This is supported by the larger negative magnitude and higher significance of the coefficient estimates for the interaction effect. This suggests that the market might have suspected that the proposal would likely pass and thus instantly priced in its implications. It is however surprising that the market reaction seems to be negative given that the motives behind a reduction in the corporate tax rate are to attract investment and positively impact economic growth, which suggests that there should be a positive impact on the stock returns. Thus, our results are contradicting the expected effects of the policy.

C. *Fixed effects with firm controls: Implementation Date*

Next, we examine if we find a significant stock market reaction on the actual implementation date of the reduction in the corporate tax rate. One challenge is that the stock market was closed on January 1, 2019, which was when the first reduction was implemented. (Nasdaq, 2018) Therefore, we used the following day January 2, 2019. We are aware that this might impact the results we derive from this robustness test. Again, the coefficient estimates for the interaction effect for all three event windows have a negative direction, suggesting that Swedish firms earned lower returns. However, the coefficient for the interaction effect for the implementation day and the two other event windows are insignificant. Moreover, we observe that the coefficient for the *Event* variable for all windows is much higher in magnitude compared to our previous regressions and it is significant at the 0.1% level for all event windows. These results may be due to seasonality in stock returns. A difficulty with examining an event window in January is that stock returns are known to exhibit seasonality. One commonly known seasonality is the "January effect" which has demonstrated that returns generally are higher during this month (Jones, Pearce et al. 1987; Haug, Hirschey 2006). If this effect is present and the seasonality is stronger in one of the countries, it could interfere with our results.

Table XVI

Fixed Effects with Firm Controls: All Shares

The table presents the results from the fixed effect regression with firm controls for the pooled sample over the period November 1, 2018 to March 1, 2019. The regression estimated for all stocks is: $Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t}$ .Three regressions were run were each include one of the following event window respectively: the implementation day January 1, 2019 (1), the implementation day $\pm$ 1 trading days (2), and on the implementation day $\pm$ 3 trading days (3). Since we had no stock data for January 1, 2019 we used the following day January 2, 2019.

	All shares:		
	(1)	(2)	(3)
event	0.0225***	0.0104***	0.0119***
roa	−0.0170	−0.0170	−0.0169
leverage	−0.0010	−0.0102	−0.0010
mtb	0.0005	0.0005	0.0005
tangibility	−0.0113	−0.0110	−0.0114
tobinsq	0.0000	0.0000	0.0000
interaction	−0.0099	−0.0054	−0.0028
Observations	28,778	28,778	28,778
R^2	0.004	0.002	0.005
Adjusted R^2	−0.009	−0.011	−0.008
F Statistic (df = 7; 28420)	15.882***	7.933***	18.372***
Note:	*p<0.05; **p<0.01; ***p<0.001		

We run the same regressions but for the sub-samples. We obtain similar results as for the acceptance date with the majority of the coefficient estimates for the interaction effect having a negative direction, with an exception for the positive coefficient for the event window (-3, 3) for the small-capitalization segment. Different from the acceptance date, we note that there are no statistically significant coefficients on the interaction effect for any window in any sample. Again, we note that the coefficient for the *Event* variable is highly significant and of large magnitude, but that it is primarily for the small-capitalization segment. It is noteworthy that the small-capitalization segments seemingly earn the highest returns during these event windows. The seasonality in returns may interfere with our results. To examine the previous January performance and investigate any potential seasonality, we have plotted the Swedish and Danish all shares indices OMXPI, and the indices for the large, mid, and small-capitalization segments OMXLCPI, OMXMCPI, and OMXSCPI over December 1st to March 1st for the years 2017, 2018 and 2019. For the all share and large-capitalization indices, the Danish indices seem to show a better performance than the Swedish equivalent. This points to that it is possible that seasonality may interfere with our results. For the small and mid-capitalization segments, it is ambiguous if any of the countries perform better. The results are presented in the appendix in Table XXVIII and Table XXIX. Considering these results, we run a final fixed effects regression that includes time-fixed effects on a monthly basis to attempt to control for any monthly seasonality. For the all shares sample we notice that the coefficient on the interaction effects for the first and second event windows are significant. Both the magnitude and the significance increases for the coefficients. For the sub-samples, we do not see significant differences besides a smaller magnitude on the coefficients. We note that the F-statistic increases for the all share, large- and mid-capitalization models, but declines for the small-capitalization regressions. The adjusted R-square increases for the all share samples and all regressions in all sub-samples, which signifies that it is meaningful to include the time-fixed effects. The results are reported in the appendix in Tables XXX. and Tables XXXI.

Overall, our results suggest that the market might have reacted slightly upon the implementation of the reduction in the corporate tax rate due to additional uncertainty being resolved. However, as the direction is still contrary to what would be expected and Swedish firms systematically earn lower returns during all three event windows for all our three events, it might be that we simply capture noise or some unobservable difference. Our findings from investigating previous January returns and from that of the time-fixed effects suggests that seasonality might have impacted our results. Hence, the results from the regressions that investigate the implementation date might have been impacted by seasonality as we find a negative reaction in the aggregate sample when we control for time-fixed effects. Although we do not find a reaction in the sub-samples, we note changes to the coefficients.

Table XVII

Fixed Effects with Firm Controls: Sub-Samples

The table presents the results from the fixed effect regression with firm controls for the sub-samples over the period November 1, 2018 to March 1, 2019. The regression estimated for all stocks is: $Y_{i,t} = \beta_0 + \beta_i * Z_{i,t-1} + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \nu_i + \varepsilon_{i,t}$. Three regressions were run for each of the three sub-samples and were each include one of the following event window respectively: the implementation day January 1, 2019 (1), the implementation day ± 1 trading days (2), and on the implementation day ± 3 trading days (3). Since we had no stock data for January 1, 2019 we used the following day January 2, 2019.

	Large Cap:			*Mid Cap:*			*Small Cap:*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
event	0.0118*	−0.0094	0.0078**	0.0200	0.0114	0.0143**	0.0369**	0.0217***	0.0153***
roa	0.0003	0.0002	0.0003	0.1684***	0.1652***	0.1701***	−0.0296	−0.0292	−0.0285
leverage	−0.0072*	−0.0073*	−0.007*	0.0725***	0.0696***	0.0743***	−0.0113	−0.0108	−0.0097
mtb	0.0010**	0.0010**	0.0010**	0.0053*	0.0053*	0.0054**	0.0063	0.0063	0.0062
tangibility	0.018	0.0109	0.0105	0.7263***	0.7315***	0.7219***	−0.0230	−0.0232	−0.0237
tobinsq	−0.0001*	−0.0001*	−0.0001*	−0.0007*	−0.0006*	−0.0007*	0.0001***	0.0001***	0.0001***
interaction	−0.0093	−0.0013	−0.0024	−0.0100	−0.0119	−0.0084	−0.0138	−0.0065	0.0008
Observations	8,202	8,202	8,202	7,254	7,254	7,254	10,723	10,723	10,723
R^2	0.003	0.003	0.005	0.006	0.004	0.006	0.013	0.012	0.014
Adjusted R^2	−0.008	−0.009	−0.006	−0.008	−0.009	−0.008	−0.001	−0.002	−0.0005
F Statistic (df = 7; 8109)	4.045***	2.919**	6.216***	5.675***	4.591***	6.089***	20.304***	17.684***	20.732***

Note: *p<0.05; **p<0.01; ***p<0.001

From the regression output for the suggestion date for the aggregate sample ROA, Tobin's Q and MTB are statistically significant and have a positive direction. When examining the sub-samples we can see that the MTB ratio is significant for the large and small-capitalization segments and that it has a positive direction. ROA is significant for the mid and small-capitalization segments and has a positive direction. Leverage is significant for the large-capitalization segment and has a positive direction. Tangibility is significant for the mid-capitalization segment and has a negative magnitude. Tobin's Q is significant and positive for the small-capitalization segment.

When examining the regression results for the implementation date, there is no significant control variable for the regressions with the aggregate sample. This is different from both the acceptance and suggestion date. For the sub-samples, the MTB ratio is significant for the large and small-capitalization samples and has a positive direction. Tobin's Q is significant for all sub-samples, with a negative direction for large and mid-capitalization segments but a positive direction for the small-capitalization segment. Tobin's Q has a higher magnitude than during the two previously studied event dates. From all our regressions we see differences in the coefficient estimates direction, magnitude, and significance across segments. This indicates that the segments have different firm characteristics which could give rise to heterogeneous reactions. This suggests that it is important to examine the sub-samples separately to capture the different reactions which might cancel out when we examine the aggregate sample.

Overall, we identify stronger negative returns on the suggestion date compared to the implementation date. We find significant interaction coefficients on both the suggestion and acceptance dates. Thus, it is difficult to determine whether the effect of the reduction in the corporate tax rate was successively incorporated, on both the suggestion date and acceptance date, or whether the systematically lower returns for the Swedish firms could be attributed to something else. Despite our efforts to try to confirm the parallel trend assumption, it is possible that we have failed to control whether the assumption holds across other important variables. Hence, our ambiguous results may be due to the parallel trend assumption not holding. This would interfere with our results as the observed differences cannot be attributed to the change in the corporate tax rate as the effect may stem from differences in other variables. Alternatively, the significant coefficients may be the result of capturing noise. To better assess whether we have captured noise on the acceptance day, or not, we will carry out a permutation test to examine if we are likely to obtain our observed values on the interaction coefficient under ordinary circumstances without any exogenous shocks occurring.

D. Permutation Test

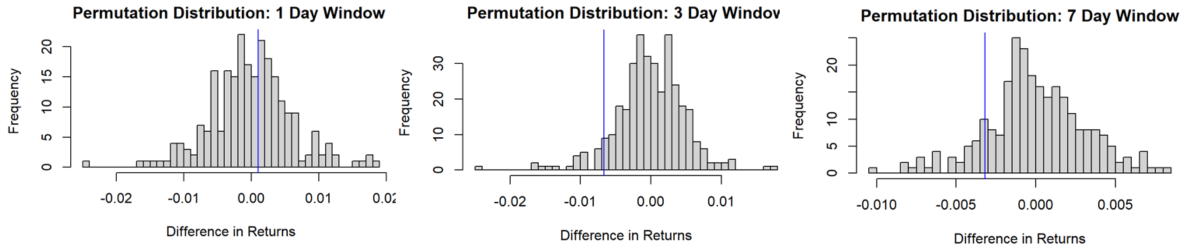
As a last robustness check, we will conduct a permutation test for each of our three event windows to investigate whether our regressions have captured a market reaction to the tax rate reduction or noise. The distribution of our test statistic is obtained by shifting the event window multiple times and then computing the obtained value until we have obtained all possible values for it. This is done by running the same fixed effects regressions with the same firm controls as presented in reg IV, with the only difference being that we shift the dates for the event windows. Essentially, the dates of the exogenous shock are shifted to random dates. For this test, the null hypothesis is that all samples come from the same distribution. The distribution obtained from the permutation test approximates the possible observed values of our test statistic under the null hypothesis. By observing where our originally obtained test statistic falls within this distribution, we are able to calculate a P-value, which represents the probability of obtaining our initially observed value under the null hypothesis. The P-value is calculated as the proportion of sampled permutations that are more extreme that our initially obtained value and with this value we can either reject or accept the null hypothesis. In our tests, we will use a two-sided P-value as we want to see if there was a significant stock market reaction at all, either positive or negative. Although it was stated in our first hypothesis that we believed the Swedish stock market reaction to be positive, we have presented support for that the reaction can be heterogeneous and other articles have reported both positive and negative reactions, indicating that the direction of the reaction could be either positive or negative. Moreover, our overarching research question and our interest is to examine if there was a significant stock market reaction in any direction. Together, this motivates the use of a two-sided P-value.

The results from the all share sample are presented in Histogram I. One can observe that for the (0, 0) and (-3, 3) day window, it is highly likely that our initially observed values belong to the distribution under the null hypothesis. The three-day window (-1, 1) is however more extreme compared to the other two windows. Still, all two-sided P-values are higher than 5%, meaning that we cannot reject the null hypothesis. Hence, we cannot rule out that we have simply captured noise in our regressions. See the reported P-values in Table XVIII.

Histogram I

Permutation Event Date: All Shares

The graphs show the distribution of the interaction coefficient for the event windows (0), (-1, 1) and (-3 , 3) for the all share sample. The blue line represents the obtained coefficient value on the actual acceptance day for each of the three event windows.



Histogram II. presents the results from the permutation test for the sub-samples. The results are similar to the all share sample results considering that it is primarily the three-day event window (-1, 1) that presents the most extreme results. The P-value is significant at the 5% level for the second event window for the small-capitalization segment, but the remaining P-values are all above 5%. For all other event windows for the other two segments, the P-values are all higher than 5%, meaning that we cannot reject the null hypothesis. See Table XXVIII. for the two sided P-values. Based on these results, it is likely that the observed values belong to the distribution under the null hypothesis and we can therefore not reject that we have captured noise in our regressions.

Histogram II

Permutation Event Date: Sub-samples

The graphs show the distribution of the interaction coefficient for the event windows (0), (-1, 1) and (-3 , 3) for the large, mid and small-capitalization samples. The blue line represents the obtained coefficient value on the actual acceptance day for each of the three event windows.

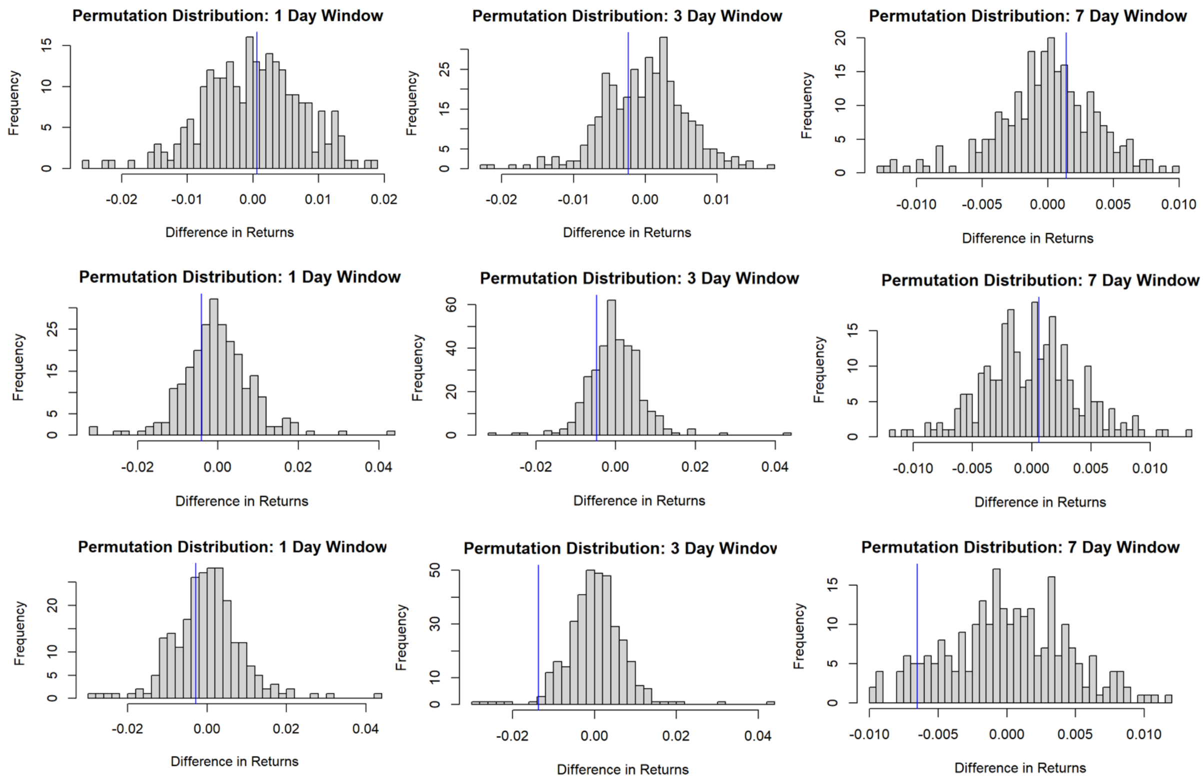


Table XVIII.
Two-Sided P-Value

The table reports the two-sided p-values obtained from the permutation tests above.

	All Shares			Large Cap			Mid Cap			Small Cap		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
P-Value	85.71%	13.11%	70.82%	91.87%	71.23%	75.49%	40.11%	40.33%	21.23%	45.60%	3.87%	36.31%

Note: *P<0.05; **P<0.01; ***P<0.001

IX. Conclusion

In this study, we examined the Swedish stock market's reaction to the announcement of a reduction in the Swedish corporate tax rate. Using the difference-in-difference method, with a set of Danish publicly traded firms as our control group, this reduction provided us with an opportunity to examine whether the market was efficient in pricing in the implications of the reduction, as well as determine whether the stock market reaction was homogenous or heterogenous across different segments. The results obtained from our event study suggest that the tax change might have had a heterogenous impact across the three groups of firms on its acceptance day, as seen from the mixed directions on the coefficient estimates on the interaction effect. This is in line with our second hypothesis. This suggests that it might be meaningful to examine different segments of firms to better understand the implications of a reduction in the corporate tax rate. However, the results are ambiguous given that the coefficients were insignificant to a large extent. We are thus unable to confirm with certainty if there was a significant stock market reaction. We can therefore not confirm our first hypothesis as we cannot find evidence that supports that there was a positive stock market reaction. Our results are not in line with our third hypothesis as we find that the largest stock reaction is on the suggestion day. Overall, we do not find support for a strong stock market reaction to the reduction in the corporate tax rate on its acceptance day. This was further indicated by our permutation tests as the results showed that we most likely captured noise on the acceptance day for the majority of the sub-samples and event windows. Although the P-value was below 5% for the second window for the small-capitalization segment, we concluded in the country comparison that we did not find strong support for the parallel trend assumption holding for this group. In other words, our regressions likely captured noise, or the reaction was difficult to distinguish from other events.

Other papers, such as Cutler (1998), Doige and Dyck (2015) and Wang and Macy (2021), have expressed difficulties with studying the impact of tax-related changes due to the challenges posed by other interfering events, as well as the importance of the change being unanticipated and having a large magnitude. Given our thorough data cleaning process aimed at eliminating sources that could distort or in any way interfere with our results, our large dataset with at least as many firms and observations as other papers that have shown results, and a comprehensive methodology that examined the parallel trend assumption for both for the pooled sample and our sub-samples, we argue that if there had been a significant impact on the Swedish stock market, we would have been able to detect it. However, our study did face limitations that might have impacted our results. The main limitations constitute the nature of the tax rate reduction, as it was small in magnitude compared to what previously have been studied and because it might have been anticipated. Moreover, we must acknowledge that a possible limitation of our study is that the sample of Danish publicly traded firms might have been an inappropriate choice of control group as is it possible that they differed across other variables that we did not examine. One last limitation is that we cannot remove the impact of noise, such as news, on the financial market. We investigated what news articles that were published on the event day, and articles relating to inflation and rates might have impacted our results, see the appendix Table XXI. The above mentioned reasons may have impacted our ability to obtain relevant results.

Finally, our study contributes to the literature that examines how tax policies and changes to the tax system impact the stock market by suggesting that it may be meaningful to examine refined samples based on market capitalization to better understand the effect of the policies. Given the different characteristics of firms in these different sub-samples, it may enable researchers to uncover potential heterogeneous reactions and effects in responses to these policies. Moreover, the results from our study indicate that it might not be fruitful to examine smaller corporate tax changes as it might be difficult to isolate the stock market reaction to the tax news from other noise. Hence, future researchers should concentrate on larger tax changes to be able to derive more meaningful results.

Further extensions to this study would be to examine the long-term effects of the change to the corporate tax rate and how it may impact corporate decision making differently in the different sub-samples. This would further contribute to our understanding of how various policies and tax-related changes impact firms and how it might impact them differently depending on their segment belonging.

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Appendix

Table XVIII.

The table reports the t-statistics and P-values obtained from Welch's t-test that investigated the difference in means for the variables and ratios for the Swedish and Danish firms.

Variable	Market Value	Total Assets	Equity	Short Term Debt	Long Term Debt	OIBDP
T-statistic	-1.7522	0.68517	0.46996	1.5646	1.0023	-0.54604
P-value	0.08321	0.494	0.6389	0.1186	0.3172	0.5862

Variable	PPE	ROA	Leverage	MTB	Tangibility	Tobin's Q
T-statistic	-0.078151	-0.7531	-0.34862	-0.29985	-4.43	-1.2623
P-value	0.9378	0.4524	0.7279	0.7647	2.183e-05***	0.2098

Note: *P<0.05; **P<0.01; ***P<0.001

Table XIX.

The table provides the definition of the accounting variables downloaded from Compustat that were used to create the firm specific control variables.

Name	Definition
at	This item represents the value of the total assets reported on the balance sheet.
ceq	This item is the firm's total common/ordinary equity and represents the value of the book equity.
dlc	This item is the debt component in current liabilities, meaning that it represents the short-term debt. It consists of long-term debt due in one year and short-term borrowings.
dltt	This item represents the firm's long-term debt i.e., debt obligations that mature in more than one year on the company's balance sheet.
ppent	This item is the value of the property, plant and equipment on the balance sheet. It represents the costs, less the accumulated depreciation, of the tangible fixed assets.
oibdp	This item is the operating income before depreciation which accounts for COGS, SG&A and other operating expenses.

Table XX.

The table provides the definition of the firm control variables used in the OLS and fixed effects regressions.

Name	Definition
ROA	Defined as operating income before depreciation over total assets (oibdp/at).
Tobin's Q	Defined as market value of equity over common equity (mv/ceq)
Tangibility	Tangibility or fixed asset ratio is defined as the value of tangible fixed assets over total assets (ppent/at).
Leverage	Defined as total debt over total assets [(dltt + dlc)/at]
MTB	Defined as market value equity plus debt over total assets [(mv + dltt + dlc)/at]

Table XXI.

The table shows some of the major headlines on 14 June 2018, which was the acceptance date of the corporate tax rate reduction. The second column provides an english translation of the headlines provided in Swedish.

Headline		Source	Scope
"Allt snabbare avsmältning i Antarktis"	"Increasingly faser melting in Antarctica"	DN	World
"EU enigt om energimål 2030"	"EU united regarding 2030 energy goals"	DN	World
"Färre arbetslösa - Stort glapp mellan grupper"	"Fewer unemployed - Major gap between groups"	DN	Sweden
"Inflationen steg i maj"	"Inflation rose in May"	DN	Sweden
"ECB håller räntan oförändrad"	"ECB keeps the interest rate unchanged"	DN	World

Table XXII.
Breush-Pagan Test: OLS With Firm Controls

The table shows the results from the BP-test performed on the OLS models with firm controls. The null hypothesis is that the error variances are all equal.

	All Shares			Large Cap			Mid Cap			Small Cap		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
BP	16.475	16.542	16.596	38.068	37.744	39.726	3.879	2.612	2.625	18.158	18.194	18.243
P-Value	0.0306*	0.0353*	0.0346*	0.0000***	0.0000***	0.0000***	0.8679	0.9559	0.9556	0.0201*	0.0198*	0.0195*

Note: *P<0.05; **P<0.01; ***P<0.001

Table XXIII.
Breush-Pagan Test: Fixed Effects With Firm Controls

The table shows the results from the BP-test performed on the fixed effects models with firm controls. The null hypothesis is that the error variances are all equal.

	All Shares			Large Cap			Mid Cap			Small Cap		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
BP	16.475	16.542	16.638	38.321	38.377	37.877	2.582	2.629	2.672	18.158	18.188	18.265
P-Value	0.0361*	0.0353*	0.0341*	0.0000***	0.0000***	0.0000***	0.958	0.955	0.953	0.0200*	0.0199*	0.0193*

Note: *P<0.05; **P<0.01; ***P<0.001

Table XXIV.

The table shows the industry definitions used to classify firms into an industry. Each firm's 2-digit SIC-code was used as a basis for classification for industry belonging.

2- Digit SIC Code	Industry Title
01-09	*Agriculture, Forestry and Fishing*
10-14	*Mining*
15-17	*Construction*
20-39	*Manufacturing*
40-49	*Transportation, Communication, Electric, Gas and Sanitary Services*
50-51	*Wholesale Trade*
52-59	*Retail Trade*
60-67	*Finance, Insurance, and Real Estate*
70-89	*Services*
90-99	*Public Administration*

Table XXV.
Industry Fixed Effects: All Shares

The regression estimated for all stocks is: $Y_{i,t} = \beta_0 + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \gamma_i + \varepsilon_{i,t}$. The table provides an overview of the regression results on the acceptance day (1), on the acceptance day $\pm$ 1 trading days (2), and on the acceptance day $\pm$ 3 trading days (3). γ is the industry fixed effect.

	All Shares:		
	(1)	(2)	(3)
sse	0.001*	0.002*	0.002*
event	0.004	0.005	−0.0001
roa	−0.001	−0.001	−0.001
leverage	0.0001	0.0001	0.0001
mtb	0.0001***	0.0001***	0.0001***
tangibility	0.002	0.002	0.002
tobinsq	0.00000	0.00000	0.00000
interaction	−0.001	−0.007*	−0.003***
Observations	29,090	29,090	29,090
R^2	0.001	0.001	0.001
Adjusted R^2	0.0001	0.0002	0.0004
F Statistic (df = 8; 29074)	2.083**	2.512***	3.442***
Note:	*p<0.1; **p<0.05; ***p<0.01		

Table XXVI.
Industry Fixed Effects: Sub-Samples

The regression estimated for all stocks is: $Y_{i,t} = \beta_0 + \beta_1 * D1_i + \beta_2 * D2_i + \beta_3 * D1_i * D2_i + \gamma_i + \varepsilon_{i,t}$. The table provides an overview of the regression results on the acceptance day (1), on the acceptance day $\pm$ 1 trading days (2), and on the acceptance day $\pm$ 3 trading days (3). γ is the industry fixed effect.

	Large Cap:			*Mid Cap:*			*Small Cap:*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
sse	−0.001***	−0.002***	−0.002***	0.003***	0.003***	0.003***	0.004**	0.004**	0.004**
event	−0.0002	−0.003***	−0.002*	−0.003*	−0.001	−0.001	−0.001	0.001	−0.0004
roa	−0.005***	−0.005***	−0.005***	−0.002*	−0.002*	−0.002*	−0.0001	−0.0001	−0.0001
leverage	−0.0003	−0.0003	−0.0003	−0.005**	−0.005**	−0.005**	−0.0004	−0.0004	−0.0003
mtb	0.0001***	0.0001***	0.0001***	0.00004***	0.00003***	0.00004***	0.0001	0.0001	0.0001
tangibility	−0.003***	−0.003***	−0.003***	0.001	0.001	0.001	0.010	0.010	0.010
tobinsq	−0.0001***	−0.0001***	−0.0001***	0.00001	0.00001	0.00001	0.00000	0.00000	0.00000
interaction	0.003*	0.005***	0.003***	−0.001	−0.003	−0.001	0.0003	−0.001	0.001
Observations	8,413	8,413	8,413	7,216	7,216	7,216	11,095	11,095	11,095
R^2	0.004	0.004	0.004	0.002	0.002	0.002	0.001	0.001	0.001
Adjusted R^2	0.002	0.002	0.002	−0.0004	−0.0003	−0.0004	−0.0002	−0.0002	−0.0002
F Statistic (df = 8; 8397)	3.790***	4.098***	3.945***	1.379	1.519	1.397	1.614	1.618	1.617
Note:	*p<0.1; **p<0.05; ***p<0.01								

Table XXVII.
AR and CAR

The table shows the results from the AR and CAR regressions for the Swedish sub-samples.

	Model 1 LC	**Model 2 LC**	**Model 3 LC**	**Model 1 MC**	**Model 2 MC**	**Model 3 MC**	**Model 1 SC**	**Model 2 SC**	**Model 3 SC**
Coeffcient	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*
Intercept	0.0004 ***	0.0004 ***	0.0004 ***	0.0003	0.0003	0.0004	0.0005 *	0.0004 *	0.0005 *
SP 350	0.9464 ***	0.9457 ***	0.9457 ***	0.7766 ***	0.7735 ***	0.7737 ***	0.5557 ***	0.5513 ***	0.5516 ***
AR Day 0	-0.0014			-0.0052			-0.0069		
CAR Day +/-1		-0.0010			-0.0022			-0.0009	
CAR Day +/-3			-0.0010			-0.0027			-0.0020
Observations	29090	29090	29090	26399	26399	26399	40677	40677	40677
R^2 / R^2 adjusted	0.148 / 0.148	0.148 / 0.148	0.148 / 0.148	0.033 / 0.033	0.033 / 0.033	0.033 / 0.033	0.010 / 0.010	0.010 / 0.010	0.010 / 0.010

* *p<0.05* ** *p<0.01* *** *p<0.001*

Table XXVIII.
January effect: OMXCPI and OMXSPI

The graphs show the stock indices development over the period December 1st to March 1st for the years 2017, 2018 and 2019. The Danish index OMXCPI is in red and Swedish index OMXSPI is in blue. The grey area marks the month of January.

2017	2018	2019

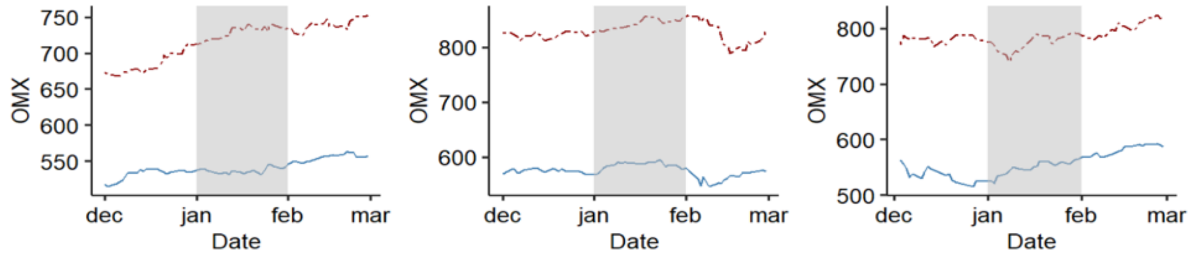
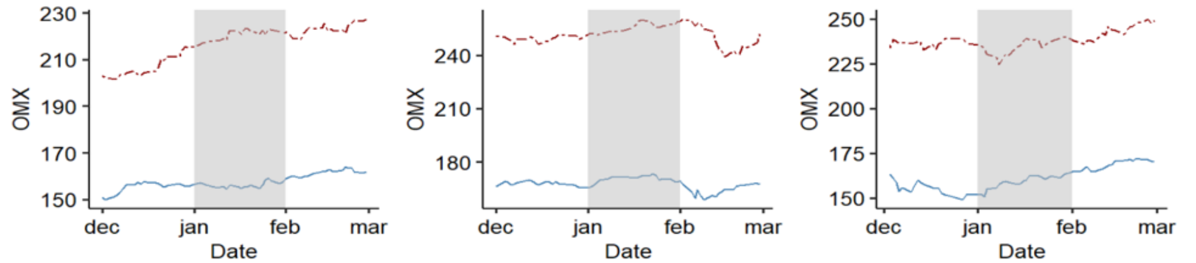


Table XXIX.
January effect: Sub-samples

The graphs show the stock indices development over the period December 1st to March 1st for the years 2017, 2018 and 2019. The Danish indices OMXCLCPI, OMXCMCPI and OMXCSCPI are the red graphs. The Swedish indices OMXSLCPI, OMXMCPI and OMXSSCPI are the blue graphs. The grey area marks the month of January.

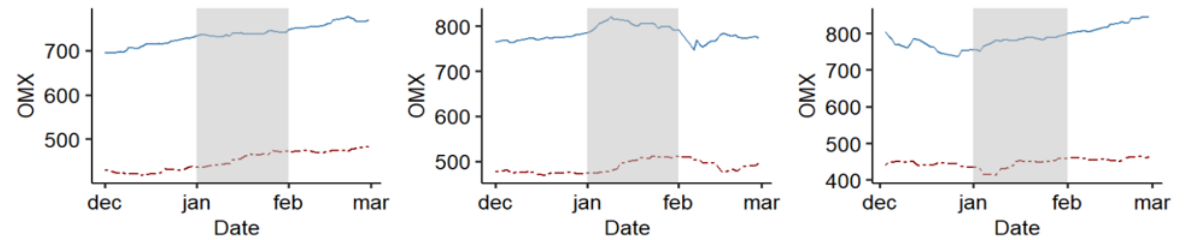
LC

2017	2018	2019



MC

2017	2018	2019



SC

2017	2018	2019

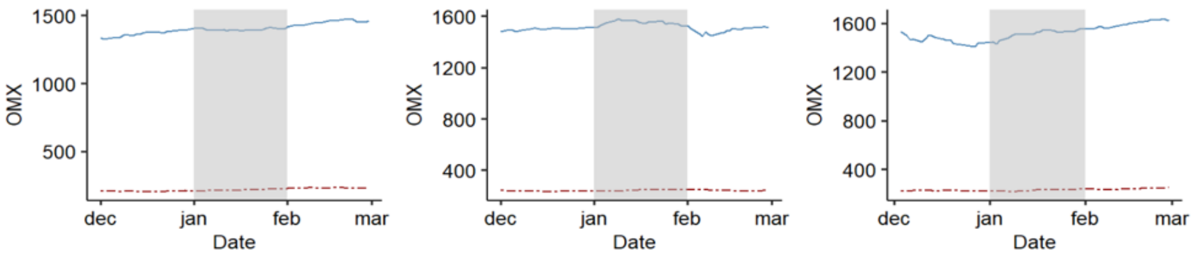


Table XXX.
Firm and Time Fixed Effects: All Shares

The table shows the output for the fixed effects regressions with both firm and time fixed effects over the period November 1, 2018 to March 1 2019. A dummy was estimated for December, January and February. Three regressions were run where each include one of the following event window respectively: the implementation day January 1, 2019 (1), the implementation day ± 1 trading days (2), and on the implementation day ± 3 trading days (3). Since we had no stock data for January 1, 2019 we used the following day January 2, 2019.

	All Shares:		
	(1)	(2)	(3)
event	0.021***	0.008**	0.011***
roa	−0.013	−0.013	−0.013
leverage	−0.011	−0.011	−0.010
mtb	0.0003*	0.0003*	0.0003*
tangibility	−0.007	−0.007	−0.008
tobinsq	0.0000	0.0000	0.0000
dec	−0.001*	−0.001*	−0.001*
jan	0.005***	0.005***	0.004***
feb	0.004***	0.004***	0.004***
interaction	−0.011**	−0.007*	−0.004
Observations	28,778	28,778	28,778
R^2	0.010	0.008	0.010
Adjusted R^2	−0.002	−0.004	−0.002
F Statistic (df = 10; 28417)	29.101***	24.060***	29.405***
Note:	*p<0.05; **p<0.01; ***p<0.001		

Table XXXI.
Firm and Time Fixed Effects: Sub-Samples

The table presents the results from the fixed effects regressions with both firm and time fixed effects over the period November 1, 2018 to March 1 2019. A dummy was estimated for December, January and February. Three regressions were run for each of the three sub-samples and were each include one of the following event window respectively: the implementation day January 1, 2019 (1), the implementation day ± 1 trading days (2), and on the implementation day ± 3 trading days (3). Since we had no stock data for January 1, 2019 we used the following day January 2, 2019.

	Large Cap:			*Mid Cap:*			*Small Cap:*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
event	0.009*	−0.004	0.012*	0.018*	0.009	0.012*	0.034***	0.019***	0.013***
roa	0.0002	0.0002	0.167	0.168	0.167	0.167	−0.023	−0.023	−0.023
leverage	−0.006	−0.006	0.062	0.062	0.061	0.062	−0.008	−0.008	−0.008
mtb	0.001**	0.001**	0.005***	0.005***	0.005***	0.005***	0.006***	0.006***	0.006***
tangibility	0.007	0.006	0.269	0.267	0.268	0.269	−0.020	−0.020	−0.020
tobinsq	−0.00005	−0.00004	−0.001***	−0.001***	−0.001***	−0.001***	0.0001**	0.0001**	0.0001**
dec	−0.002**	−0.002**	−0.001	−0.001	−0.001	−0.001	−0.0003	−0.0003	−0.0003
jan	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***	0.004***	0.004***	0.003***
feb	0.004***	0.004***	0.005***	0.005***	0.005***	0.005***	0.002*	0.002*	0.002*
interaction	−0.009	−0.001	−0.009	−0.010	−0.012	−0.009	−0.014	−0.007	0.001
Observations	8,202	8,202	7,254	7,254	7,254	7,254	10,723	10,723	10,723
R^2	0.019	0.020	0.010	0.010	0.010	0.010	0.016	0.014	0.015
Adjusted R^2	0.008	0.008	−0.004	−0.004	−0.004	−0.004	0.002	−0.0002	0.001
F Statistic	16.053***	16.334***	7.409***	7.390***	6.976***	7.409***	17.317***	15.139***	16.586***
Note:	*p<0.05; **p<0.01; ***p<0.001								