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Do investors reward gender diversity?

An event study of the MSCI World Women's Leadership Index

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Abstract

The aim of this thesis is to study how global markets value companies that exhibit a commitment towards gender diversity among their board of directors and among the leadership positions. We investigate how stock returns and trading volume are affected by inclusion in or exclusion from the MSCI World Women's Leadership Index (WWLI). The effect is measured on both the date of announcement and the effective date of the index rebalancing. We use both global samples as well as geographically categorized subsamples to study the effects in North America, Europe, and Asia Pacific individually.

The data is processed by removing observations from the dataset which are affected by confounding events that could bias the results. Our findings suggest that on an aggregate level, investors seem to value index inclusion, as we observe significant abnormal returns on the day of the event. In the geographical subcategories the results suggest that investors in Europe and Asia do not value, and rather punish firms included in the index. Furthermore, deletions yield no significant results, apart from in the European region where investors seem to penalize exclusion from the World Women's Leadership Index. Neither inclusion nor exclusion appear to have a significant effect on trading volume. The results could potentially be biased by endogenous variables, as both inclusion and exclusion from the index could be explained by the same factor that causes abnormal returns.

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1 Introduction

Despite increasing recognition of the importance of gender diversity within organizations, gender equality is still a pressing issue in many companies across the globe. Without awareness and recognition by the financial markets, companies have less incentive to evolve and improve their gender diversity practices. Thus, the purpose of this thesis is to investigate how investors react to the news of a neutral third-party vouching for a firm's gender diversity practices.

The method by which this study investigates this question is to employ the event study methodology on how the markets react to companies that are included in or excluded from the MSCI World Women's Leadership Index (WWLI). The index functions as a list of companies that exhibit commitment towards the gender diversity cause. As per the efficient market hypothesis, the prices of shares reflect all available information about the security. Consequently, by examining an event's effect on the price of a security one can gain insight on the market's perception of the event of interest. Firms that are added to or deleted from the WWLI, are examined. Specifically, the study examines whether the event of index inclusion or exclusion yields abnormal returns on the affected stocks. Inclusion in the index vouches for a company's commitment towards gender equality, while exclusion from the index holds companies accountable for their lack of sustained efforts on the issue. By studying the market's reactions to these events, this study examines the investors' opinions towards gender equality in listed companies.

The effects are studied on an aggregate level with a global sample from 23 different developed markets. When reviewing daily average abnormal returns from this sample, the results suggest a significant positive relationship between inclusion in the WWLI and positive abnormal returns at the 10% level. This effect is only observed on the effective index rebalancing date. When applying multi-day event windows on geographical sub-samples the findings indicate an opposite effect. Observations from the geographical sub-samples reveal significant variation in how North America, Europe and Asia Pacific react to the events of inclusion and exclusion. In North America, no significant effect is detected on neither inclusions nor exclusions. In the European sub-sample, both inclusion and exclusions yield significant negative abnormal returns. These findings support the findings in an event study on the Dow Jones Sustainability Index a sustainability ' index. In this study, Cheung and Roca (2013) also observe significant

negative abnormal returns for both included as well as excluded companies. Further supporting their study, this study also finds significant negative effects on companies in the Asia-Pacific sub-sample. The sustainability redundancy hypothesis is proposed as a likely explanation for the significant negative abnormal returns and is covered in section 3.

This thesis is organized as follows. Firstly, we discuss the role and effect of gender diversity in organizations. Thereafter, we present the MSCI World Women's Leadership Index and the requirements for inclusion. This is followed by a presentation of the theoretical framework as well as an overview of relevant previous studies. Next, we introduce the hypotheses and explain the rationale behind them. We proceed with a section on the data and an overview of the sample selection process. Subsequently, we display and discuss the empirical results. Lastly, we present the conclusions of this study.

1.1 Gender equality and financial performance

Gender inequality is still a pressing issue and companies are expected to show their commitment to this cause. Focus on Environmental, Social and Governance (ESG) is becoming increasingly more prevalent in our society leading stakeholders to apply more emphasis on firms' treatment of their employees as well as their contribution to society. According to a McKinsey report from 2015, advancing women's equality could add \$12 trillion dollars to global growth (Woetzel, et al., 2015). Hence, committing to advancing gender equality within organizations could potentially lead to substantial economic benefits and the subject is on many companies' agenda.

Moreover, improving gender equality is an excellent way for companies to increase their diversity. Research provides evidence to support that diversity unlocks innovation and drives market growth (Hewlett, Marschall, & Sherbin, 2013). The significance of diversity is further emphasized by a McKinsey report from 2015, in which the researchers find that firms in the top quartile for gender diversity have a 15 percent increased likelihood of yielding financial returns above their respective national industry medians (Hunt, Layton, & Prince, 2015). The subject of gender diversity in relation to financial performance was also studied by Morgan Stanley who find that "more gender diverse firms did as well as, or better than their peers, but

with less volatility and a better risk profile” (Parker & Zlotnicka, 2016). As a result, investors with a preference for a less risky portfolio have incentives to identify companies that are trying to establish more gender equality.

On the other hand, applying a strict gender-equality approach to capital allocation may have its downsides. Introduced by Cheung and Roca (2013), the sustainability hypothesis suggests that picking stocks on the basis of their corporate sustainability performance leads to suboptimal portfolios in regard to minimizing risk and maximizing return. They argue that corporate sustainability entails imposing extra and redundant constraints on a company, thus preventing an optimal portfolio. This corroborates with their findings from an event study on the Dow Jones Sustainability Index where they find significant negative abnormal returns associated with inclusion in the index (Cheung & Roca, 2013). Furthermore, Morningstar data reveals that “only one in six passive gender funds in the US and Europe have outperformed their relevant broad-market benchmark since inception” (Boyde, 2021).

To summarize, the relationship between gender equality commitment and financial performance is debated. This thesis aims to add to this discussion by investigating whether inclusion or exclusion from the WWLI yields abnormal returns.

2 The MSCI World Women’s Leadership Index

The MSCI Women’s Leadership Index (WWLI) aims to represent the performance of those companies that exhibit a commitment towards gender diversity among their board of directors and among the leadership positions (MSCI, 2016). The index aims to include companies which lead in their respective countries of female representation in Board and in leadership positions. The index includes all companies from the parent index, MSCI World Index, that meet certain criteria in the following three areas: Number of Women in Leadership Position, Percent of Women on Board & Discrimination and Workforce Diversity Controversy. With the increased focus on corporate social responsibility (CSR) in today’s markets, the index can serve as a platform to attract new investors and more capital.

As of September 2021, there are 636 companies included in the index across 11 different sectors. Rebalancing of the index occurs on a quarterly basis to coincide with the regular Index

Reviews of the MSCI Global Investable Market Indexes. Gender data of directors on the Board and leaders for the Quarterly Index Reviews are taken “as of the end of the month preceding the Index Review, i.e., January, April, July and October” (MSCI, 2021). The index is constructed as a sector neutral index with the intention that each sector weight in the index is equal to its weight in the parent index, the MSCI World Index (MSCI, 2016). Within each sector, the constituents are weighted equally.

Security selection

The MSCI World Women’s Leadership Index selects companies from its parent index, the MSCI World, which meet the following three requirements (MSCI, 2016).

1. Number of women in leadership positions

To fulfill this requirement a company must satisfy at least one of these conditions:

- Minimum three female directors
- Or minimum one woman in a current leadership position and at least one other female director. MSCI defines leadership position as:
 - o Chairman
 - o Co-Chairman
 - o Executive Chairman
 - o Lead Director
 - o CEO
 - o Co-CEO
 - o CFO

2. Percentage of women on the board

The proportion of women directors on the board of the company must be greater than the average proportion of women directors on the board of all firms within the same MSCI country of classification. The average is estimated based only on the companies for which MSCI publish data on gender of board members.

3. Discrimination and workforce diversity controversy

“Companies must not have faced very severe or severe structural controversies, or severe on-going diversity related controversies”

Together, these three conditions make up the key requirements a company must satisfy to be eligible for inclusion. As the index is reviewed on a quarterly basis, a persistency on these standards is required to avoid being deleted from the index.

3 Theoretical framework

Section 3 presents the theories and academic literature upon which we have based our hypotheses. This section also covers other studies on the index effect on companies' inclusion in an ESG index.

Efficient market hypothesis

According to the efficient market hypothesis the prices of shares always reflect all available information about the security (Fama, 1970). The market is defined as efficient when all participants maximize profits and information relevant to the securities is accessible to everyone. In such a market, the competition among the many intelligent participants leads to a situation in which the actual prices of individual securities already reflect the information based both on events that have occurred and events the market expects will take place in the future (Fama, 1965). As a result, the efficient market hypothesis tells us that attempting to beat the market by purchasing an undervalued stock or selling at inflated prices is pointless due to observed prices being the correct prices.

There are three assumptions upon which the efficient market hypothesis relies (Fama, 1970):

- i. There are no transaction costs in trading securities
- ii. All market participants can costlessly access all available information
- iii. Participants agree on the implications of the information for the price and distribution of future prices of each security

Fama categorizes three different forms of efficient markets. First, the weak form in which only historical information on price and volume is reflected in the stock price. As a result, excess returns are unobtainable as information is available to all market participants. Then there is the semi-strong form of market efficiency in which both public and historical information is

incorporated in the stock price. Thus, obtaining excess returns through technical analysis cannot be achieved unless one trades on undisclosed information known as insider trading. Lastly, there is the strong form of an efficient market, in which private, public and historical information is reflected in the stock price at all times. Consequently, obtaining excess returns and beating the market is not achievable.

A key assumption upon which our thesis is based is that when MSCI announces new constituents to the Women's Leadership Index the information is new to the market. If the efficiency of the market is semi-strong and the market participants value inclusion in the index, the new information should be incorporated in the stock price as soon as investors receive it.

Asymmetric information

Information asymmetry is a problem that occurs in an economic transaction whereby the parties have different levels of information. An example of such a transaction is the transaction between a seller and a buyer. If information is asymmetric, one party with less information about the product could end up making suboptimal decisions which in turn leads to less efficient outcomes. Most economic transactions entail asymmetric information in some way, usually in the form of adverse selection, moral hazards and monitoring costs.

The issue of adverse selection arises when the seller has more information than the buyer, or the other way around. Take for instance a credit lender who cannot differentiate projects with different levels of risk. This leads to moral hazards, as the debtor can take advantage of the creditor's lack of information on the risk of the project by concealing factors of risk. Moreover, monitoring costs appear from moral hazards and describes the debtor's hidden action by reporting lower-than-actual earnings (Bebczuk, 2003)

Information asymmetry is what leads financial intermediaries to arise and efficiently produce information in environments in which project owners have private information concerning their investment opportunities (Prescott & Boyd, 1986). We can observe these intermediaries all over the world as credit rating agencies, financial bank and analyst agencies whose task is to decrease the degree of information asymmetry between parties in financial transactions.

As investors have a limited ability to absorb, process and interpret information (Harrison & Freeman, 1999), one could assume that firms have more information about their gender diversity status than the stakeholders. While some information such as proportion of women on the board might be public, other aspects related to gender diversity are less available to the public. Therefore, the argument could be made that asymmetric information could explain why inclusion in an ESG index could lead to an increase in firm value (Doh, Howton, Howton, & Siegel, 2010). As the company is included in the index, the information asymmetry decreases as a neutral third-party such as MSCI vouches for the firm's commitment towards gender diversity.

Doane (2005) suggests that when firms disclose their CSR practices it could in some cases be a way for the companies to appear more committed to social issues while concealing irresponsible conduct in their organization. As a result, an investor's assessment of a company's CSR practices becomes more difficult to perform. An index such as the MSCI Women's Leadership Index, however, could aid investors in identifying companies committed to gender diversity. Consequently, if investors value gender diversity and equality in companies, one would expect an increase in the value of companies when included in the MSCI Women's Leadership Index. Thus, a firm's inclusion in the index can reduce the asymmetric information regarding the firm's gender equality commitment between the company and potential investors. Moreover, observing ESG indices can aid investors in picking firms with a more transparent risk profile, as companies that score high on ESG metrics tend to be more transparent concerning risk (Giese, Lee, Melas, Nagy, & Nishikawa, 2019)

Signaling

A common way to deal with information asymmetry is the use of "signaling". By signaling a company's true value to the market without moral hazard or disclosure of confidential information, financial instruments can aid in reducing asymmetric information (Talmor, 1981).

There are two counterparts in signaling theory. The signaler and the receiver. The signaler, an executive manager for instance, has information that is undisclosed to the public, while the receivers are market participants, to whom this information could be of benefit.

The information signaling hypothesis articulates that positive signals lead to an increase in share price as the new information is absorbed by investors (Ross, 1977). The hypothesis is relevant to our thesis as inclusion or exclusion from an index can be interpreted as new information being released to the market. Hence, such events can signal a firm's commitment to CSR. This applies to our thesis where a company's inclusion into the WWLI should be perceived as a positive signal by investors valuing gender diversity and lead to an increase in price. On the other hand, exclusion may be interpreted as a negative signal by these investors causing the price to decrease. As MSCI applies certain demands for inclusion in the Women's Leadership Index, being included in this index should signal high level of commitment to create a gender-diverse organization. In addition, the information signaling hypothesis also suggests that the increase in price from the signaling is permanent.

3.1 The index effect

The index effect refers to the phenomenon where stocks that are added to or excluded from an index experience abnormal returns and trading volume surrounding the event of inclusion or announcement of inclusion (Renshaw, 2020). The index effect is explained by the hypotheses covered in this section.

Price pressure

The price pressure hypothesis suggests that the demand and trade volume for stocks sharply increase close to the date of inclusion leading prices to diverge from their information-efficient values (Scholes, 1972). Furthermore, the hypothesis is based on the assumption that the index inclusion provides no new information on its own. The increase in price represents the compensation to shareholders for the transaction costs and portfolio risk they assume when providing liquidity as a result of the demand shift. These increased prices last for a short period of time before returning to their information-efficient values. An example of this phenomenon was observed by researchers who estimated that companies added to the S&P 500 Index earn 3% abnormal return at the date of inclusion (Harris & Gurel, 1986). They suggest that despite providing no new information, inclusion in the S&P 500 increase demand as investors track the

S&P 500 index. Therefore, it essential for our hypotheses to hold that a sufficient number of investors pay attention and follow the MSCI World Women's Leadership Index.

Awareness

Proposed in 1986, the awareness hypothesis suggests that shares listed in an index get more attention than similar securities that are non-listed (Goetzmann & Garry, 1986). Consequently, the investors searching costs are reduced when a company is included in an index which in turn reduces trading cost and the perception of the stock's value increases. This reduction in trading cost should result in an increase in price and volume around the index rebalancing announcement.

Imperfect substitutes

The imperfect substitutes hypothesis assumes that investors perceive each share as a unique asset for which there are no perfect substitutes (Scholes, 1972). Consequently, investors will choose stocks based on their characteristics and their personal preference. Thus, the value of a security will be dependent upon supply and demand. Under the imperfect substitute hypothesis, the slope of the demand curve will be downward as opposed to a horizontal demand curve. On the other hand, if a security has perfect substitutes the value of the share will not be dependent upon supply and demand.

Downward sloping demand curve

Under such conditions where the demand curve is downward sloping, the share price is sensitive to demand shocks (Shleifer, 1986). When the demand for a security suddenly increases, the price will subsequently increase and reach a new equilibrium, and the other way around when demand decreases. Hence, if a firm is included in an index, one might expect the price to permanently increase as investors react to the index changes and consequently reweight their portfolios. Regarding our case, investors on the search for companies committed to the gender equality cause could thereby achieve a less volatile portfolio with the same rate of return. This connection between volatility and gender-diversity has been suggested by Morgan Stanley and was previously discussed in section 1.1 of this thesis (Parker & Zlotnicka, 2016).

Liquidity hypothesis

The liquidity hypothesis explains that market participants who invest in securities with less available information and low liquidity demand a premium (Beneish & Gardner, 1995). The demand comes from the increased bid-ask spreads caused by low liquidity and the increased transaction costs as collecting information becomes a more costly process. Inclusion in a recognized index will lead to increased coverage from analysts and more available information for investors. Consequently, new investors are attracted causing the liquidity and volume to increase resulting in a reduction in bid-ask spreads. Therefore, inclusion in the WWLI should be associated a lower risk premium and a lasting increase in price and volume as a result of the information becoming more available to investors.

Corporate sustainability taste

The corporate sustainability taste hypothesis can be applied to our thesis, as it suggests that investors may have a taste or preference for sustainable firms (Cheung & Roca, 2013). The hypothesis proposes that investors with such preferences will receive additional utility from holding these stocks on top of the returns the shares yield. Hence, one expects share prices to increase (decrease) when a company is included (excluded) in an index that represents such sustainability. Consequently, provided investors track the index, we expect to observe a similar effect on the stock price of a company that is included in the MSCI World Women's Leadership Index.

Sustainability redundancy

The same scholars who introduced the corporate sustainability taste hypothesis, also formed the sustainability redundancy hypothesis (Cheung & Roca, 2013). This hypothesis suggests that picking stocks on the basis of their corporate sustainability performance leads to suboptimal portfolios in regard to minimizing risk and maximizing return. Hence, the sustainability redundancy hypothesis implies that by producing suboptimal portfolios, inclusion in a sustainability index should be interpreted as a negative signal and lead to increased trading volume.

3.2 Previous event studies

Since the start of the millennium, the interest and focus on ESG has become increasingly larger. Demand for more transparency in companies' CSR practices has enabled investors to identify socially responsible firms more easily. The rising interest on this matter has also given rise to a number of indices aimed to represent firms with high CSR and ESG standards. Such indices serve as intermediaries between firms and the rest of the market. They work as independent and neutral third-parties, making the investors' effort to search and assess each company's ESG standards more efficient.

The long-term value of ESG commitment in companies has become established, and consequently many studies have been conducted on the effect of inclusion (exclusion) in an ESG index. As the pool of event studies specifically aimed at gender-diversity indices is limited, this section also includes studies on indices that cover all aspects of ESG. Nevertheless, the findings from these studies are still relevant for this thesis, as they investigate how investor's potential preference for responsible companies may influence stock returns. The studies have different time periods, event windows, regions and sample sizes. The findings have varied from negative abnormal returns to positive abnormal returns and with a variety of different levels of significance.

An event study from 2016 looked at the Calvert Social Index and the MSCI KLD 400 Social Index (Oikonomou & Kappou, 2016). They study the abnormal returns and trading volume over the entire lifespan of the indices. From the Calvert Social Index they have observations from 2000-2011 and from 1990-2010 for the MSCI KLD 400. They use a 140-day event window ranging from 15 days prior to the event to 125 after, thereby capturing the long-term effects. The results show that inclusion in the Calvert Index leads to positive abnormal returns in the event window before the inclusion, but they turn negative from the date of the event and remain as such. Regarding excluded firms, they experience positive abnormal returns surrounding the events. None of these observations from the Calvert index have statistical significance. Furthermore, they find no statistically significant effect on trading volume on both included and excluded companies. The results from the MSCI KLD 400 Index show similar abnormal returns surrounding the date of inclusion without significance. Companies deleted from the index experience significant long-term negative abnormal returns. Lastly, deletion from this

index shows statistically significant positive abnormal trading volumes from ten days before the inclusion to five days after.

A 2007 event study on the effect of inclusion (exclusion) in the Domini 400 Social Index over the period 1990-2004 finds a significant upward trend in absolute value abnormal returns for both additions as well as deletions (Becchetti, Ciciretti, & Hasan, 2007). After controlling for concurring financial distress shocks and market seasonality, they find that the effects are significantly negative in the event of index deletions. Their findings also suggest that the role of CSR funds has risen over time and that investor's focus on the matter has increased.

Sudeck and Iatridis conducted a study on how the German stock market reacts to the event of female board appointments (Sudeck, & Iatridi, 2014). With a sample of events from 2007 to 2012, the study is performed covering 30 announcements of female board appointments. They find significant positive reactions to the announcement of a female being appointed a board position. Their findings suggest that investors appear to consider female additions to the board to add value. Furthermore, the study finds that the dissemination of the information prior to the official appointment date tends to have a significant positive impact on stock returns as well.

A 2009 event study on the impact of inclusion (deletion) in the Dow Jones Sustainability Stoxx index (DJSSI) over the period 2001-2006 suggests that the evaluation of the CSR performance of a firm is a significant criterion for asset allocation activities (Consolandi, Jaiswal-Dale, Poggiani, & Vercelli, 2009). For their study they used a window from 10 days prior to announcement to 10 days after the announcement. Their results show positive abnormal returns for index inclusions. These abnormal returns increase from the pre-announcement day up until the official date, at which point it starts to decline again. They find the same phenomenon for exclusion, but with negative abnormal returns. Furthermore, the researchers find that the punishment for exclusion is more severe than the reward for inclusion. They speculate that the reason behind this is that the market's expectations of lasting high CSR performance are already incorporated in the price of the share. As a result, inclusion in a CSR index yields less positive abnormal returns. Exclusions, however, are penalized more severely as investors are reacting to the unexpected reduction in sustainability standards. Lastly, the researchers find that included companies also experience positive abnormal trading volume over the 20-day time period surrounding the event, whereas deleted companies experience no such effect.

A similar event study was conducted on companies from the US and how the market reacted to their inclusion and exclusion in the Dow Jones Sustainability World Index over the period 2002-2008 (Cheung W. K., 2011). In addition to analyzing the effect on returns, Cheung also analyzes the effects on risk and liquidity. His research finds no significant effects around the announcement. Around the effective date, however, a significant, temporary increase in returns is found in included firms and a decrease found for deleted firms. The effect of inclusions was also larger than the effect of exclusions.

A 2012 study researched the market's reaction to inclusions in the DJSI STOXX on European companies over the period 2001-2008 (Lackmann, Ernstberger, & Stich, 2011). The interval of the event window was 21 days. They articulate that an inclusion in an ESG index does not convey any new pieces of information on its own. Most firms tend to disclose their CSR practices to the public to promote themselves or to hide more unethical practices within the organization. Therefore, it becomes difficult for investors to evaluate the available information. The study suggests that ESG focused indices serve as mediators to promote the company's reliability when it comes to their disclosed information. The study finds that inclusion yields significant positive abnormal returns over the whole interval. They observe no effect on volume. Lastly, the study explains that firm-specific risk and leverage play a role in the degree to which a company is affected by an inclusion. They argue that higher levels of firm-specific risk and leverage increase the effect of being included in an ESG index.

A 2013 study conducted by Cheung and Roca (2013) studied the DJSI World with focus on countries in the Asia-Pacific region over the period 2002-2010. They find no change in the firms' systematic risk, but both inclusions and exclusions lead to an increase in firm-specific risk. There are negative abnormal returns associated with both included and excluded firms as well as an increased trading volume surrounding the effective date of inclusion. From these results it appears that the Asia-Pacific markets consider firms' commitment to ESG to be of detriment to financial performance. Cheung and Roca refer to this as the sustainability redundancy hypothesis, which suggests that ESG has a negative impact on company value. They argue that corporate sustainability entails imposing extra and redundant constraints on a company, thus preventing an optimal portfolio.

In 2003, Norway passed a law that required publicly listed companies to have a female board representation of at least 40%. In a study on how this event influenced the valuation of companies affected by this legislation, a significant drop in the stock price at the announcement of the law was observed (Ahern & Dittmar, 2011). They also find a strong decline in Tobin's Q over the subsequent years. They argue that when selecting a board, the company aims to maximize value. By imposing the mandatory requirement, boards became younger and less experienced and operating performance deteriorated according to the researchers.

Johansen and Sandnes (2008) investigate the effect of the same legislation. They find that the announcement of a new female board director is interpreted negatively as it is measured by a CAR of -1.96%. They find similar data in the event of a company reaching the 40% requirement with a CAR of -0.83%. Nevertheless, none of these results were statistically significant.

In 2018, researchers did a large-scale longitudinal study on the first global sustainability index, the DJSI World (Hawn, Chatterji, & Mitchell, 2018). The authors covered inclusions, exclusions, and continuations of companies in the DJSI World with a sample of companies from 27 countries from 1999 to 2015. The study wished to cope with what they refer to as "substantial empirical limitations", from which previous studies on ESG indices suffered. They coped with this by studying continuations in addition to inclusions and exclusions. Furthermore, they included groups for comparison consisting of similar companies that were not included in the index. In addition, they studied several countries and controlled for firm-specific heterogeneity. The authors find that when comparing results with equivalent companies and controlling for firm-specific factors, neither inclusion, exclusion nor continuation in the DJSI World had significant impact on the returns.

Durand, Paugam and Stolowy corroborate these findings in their study (Durand, Paugam, & Stolowy, 2019). They control for idiosyncratic risk and compare with similar firms and their results show no significant effect. The authors also look at the firms' visibility and find modest evidence of inclusions and continuations leading to increased attention by financial analysts and long-term stakeholders.

To summarize, the findings from previous research differ depending on methodology, time periods, geographical location, and selected index. The contradicting results suggest that some regions consider CSR a constraint on financial performance, some believe it increases value of

the organization and many seem to be indifferent. According to these studies, CSR is considered most valuable in the US and Europe and least valuable in the Asia-Pacific markets. Moreover, the index effect from ESG indices seems to be diminishing in the US market, in which investors appear to be neutral to inclusions. One could argue that this is due to the existing expectation of US firms to have CSR practices above a certain standard. This hypothesis is also supported by the results that show how the punishment from exclusions from an ESG index is more severe than the reward for inclusions.

The indices used in these previous studies have different requirements and means of measurement to grant inclusions. Perhaps caused by the positive results bias, research that shows detrimental effects associated with corporate gender diversity is hard to find. Moreover, event studies on gender diversity indices are also scarce. To our knowledge, an event study on the effects of both inclusion in and exclusion from an index focusing on firms committed to gender diversity has not been conducted. By conducting a study on an index such as the WWLI, this study aims to produce empirical findings on how markets value gender diversity in listed companies. By examining both inclusion as well as exclusion from the index, the research provides contribution to the limited pool of studies on effects by gender-diversity indices.

4 Hypotheses

The goal of our thesis is to capture the effect inclusion or exclusion in the MSCI World Women's Leadership Index (WWLI) has on the performance of shares in the days surrounding the rebalancing of the index. We base our thesis on the assumptions that the market values gender equality. The event of inclusion in the WWLI conveys the message that the firm exhibits commitment towards gender diversity in among their board of directors. Thus, if investors value gender-diversity and become aware of a company's commitment as a result of the inclusion in the WWLI, abnormal returns and trading volume should be observed. Provided the efficient market hypothesis holds, the news of inclusion should lead to an immediate increase in the share price as the information gets incorporated in the price.

As per the price pressure and awareness hypotheses, we should be able to observe abnormal returns and trading volume in the days surrounding the events. According to these hypotheses, inclusion (exclusion) should make demand and volume increase (decrease) rapidly and lead to

a new price equilibrium. The price and volume are affected by investors who rearrange their portfolios and the market's increased awareness of companies' practices and standards concerning gender diversity. When a company is included or excluded, asymmetric information and searching costs are reduced. In addition, the event serves as an information signaling which communicates new information regarding a firm's CSR practices. Therefore, it is suggested that the index rebalancing should lead to abnormal returns and trading volume for the affected companies.

According to the imperfect substitutes hypothesis, the market views securities as unique assets for which there are no perfect substitutes. Thus, investors select shares on the basis of their individual attributes and preferences. Consequently, the share price depends on supply and demand. Without perfect substitutes for individual shares, the demand curve slopes downward. In this case, the prices of shares are sensitive to shocks in demand. Therefore, when a company is included in the WWLI and demand subsequently increases, a new equilibrium will form as the price increases. These hypotheses and assumptions lay the foundation for the first hypothesis of this study:

H1A: Inclusion in the WWLI leads to significant positive abnormal returns.

Existing literature on the subject mostly advocate the positive relationship between gender diversity and financial performance. Assuming the market values gender equality, exclusion from the WWLI should be viewed as a negative signal by investors. As with hypothesis 1A, hypothesizing the effect of exclusion also relies on the efficient market hypothesis, price pressure and awareness hypotheses, information signaling hypothesis and imperfect substitutes hypothesis. Provided the efficient market hypothesis holds, news of exclusion should lead to an immediate decrease in the share price as the information gets incorporated in the price.

Following the same reasoning as with hypothesis 1A, the second hypothesis addresses the event of exclusion from the WWLI. It states:

H1B: Exclusion from the WWLI leads to significant negative abnormal returns.

As mentioned above, effects like the price pressure and awareness hypothesis state that inclusion (deletion) impacts both the price of a stock and the trading volume. Reduction of

asymmetric information and searching cost should also affect the trading volume. Thus, following the same reasoning as in the previous hypotheses, the effects on volume are expressed in the following hypotheses:

H2A: Inclusion in the WWLI leads to significant positive abnormal trading volume.

H2B: Exclusion from the WWLI leads to significant negative abnormal trading volume.

As our sample consists of regions with varying degrees of gender-diversity acceptance we expect the results to differ across the geographical sub-samples. In Asia, women account for only 12.8 percent of board seats among the 1557 largest listed companies (CWDI, 2017). In Northern Europe, this figure is 35.6%. As a result, we expect the regions to react differently to the news of inclusion and exclusion, giving rise to the last two hypotheses:

H3A: The effect of inclusion in the WWLI varies between geographical regions.

H3B: The effect of exclusion from the WWLI varies between geographical regions.

5 Data

A complete dataset of companies represented in the index at each rebalancing date was provided by MSCI at request. The first step of processing the data is to identify every addition and deletion to the WWLI from August 2016 to March 2021. We retrieve closing prices, index prices and trading volume from Refinitiv Eikon, and conduct the empirical analysis in R Studio. As we use a total return index, all stock prices have been adjusted for dividends. Henderson (1990) explains how log transforming the returns improves the normality of the return distribution and eliminates negative values. Therefore, we find the logarithmic change in the total return index (TRI) to calculate returns using the formula:

$$r_{i,t} = \ln \left(\frac{P_{i,t}}{P_{i,t-1}} \right)$$

In which $r_{i,t}$ denotes the return of the share i at time t . $P_{i,t}$ and $P_{i,t-1}$ denote the value of the TRI for stock i at time t and $t-1$.

The global scope of this study makes accurately measuring the aggregate reactions more difficult as the markets do not react in synchrony due to differences in time-zones. Consequently, we assume that some markets react to the new information from the index at different times. Europe is only five to seven hours ahead of the American countries, which suffices to assume that these markets will react on the same day. The time difference between America and the East-Asian countries in our sample is around 12 hours. Consequently, we lag the data from East-Asia by a day and thereby avoid issues with lack of synchronism in trading hours (Park, 2004).

Every company in our sample is checked through the Bloomberg Terminal's "company events" to exclude companies with confounding events that could bias the results. This study examines the effects of inclusion/deletion in the WWLI index, and to isolate that effect other effects must be removed. Confounding events are events such as the declaration of dividends, announcement of an impending merger, signing of a major government contract, or announcement of a new product (McWilliams & Siegel, 1997). It is important to note that we have only checked for confounding events inside the [-11:10] event window. This implies that events that could affect the returns in the estimation window are still present and could bias the result from the

regression when computing estimated normal returns. In addition, events taking place a few days prior to the event window might not have been fully incorporated in the price and could also bias the mean return in the first day(s) of the event window. Events taking place in the 21-day quiet window [-32:-12] should already be incorporated in the price and should therefore not affect the return in the event window. Due to our relatively large dataset, we have removed the firms with events where it is not obvious whether the news could have affected the stock price or not to measure the effect as precisely as possible. This is an important step to address the potential issue of endogeneity that could make the results misleading.

A limitation with event studies is the assumption that firms joining the index are not themselves changing for other reasons. This becomes evident in studies regarding indices such as the Russell 1000 which has a market cap criterion for inclusion. The Russell 1000 is made up of the 1000 largest firms in its parent index, Russell 3000. A concern regarding the study of such an index is that included firms must have surpassed the firms already included in the index in terms of market value. This can bias the results towards growing firms and vice versa for deletions. In this case, the index of interest does not have a market cap criterion for inclusion, but the mother index, MSCI World, does. Thus, firms excluded from the mother index would also be excluded from WWLI even though the firm is still eligible for representation in the index. This limitation only affects the deletions of the WWLI, not the inclusions as there is no upper limit to the number of constituents in the index.

Furthermore, we process our data to look for outlier returns. Including these could yield biased results and diminish the validity of the CAAR statistics (Mills, Coutts, & Roberts, 1996). We use the method of winsorization to prevent extreme values to bias our data. The data is winsorized at the 1st and 99th percentile. This process makes the most extreme values less extreme. Figure A.1 and A.2 in the Appendix present the unprocessed and winsorized data respectively.

5.1 Final sample

The initial sample consisted of 1021 observations, from which 314 was removed due to missing trading values or confounding events. The final sample is presented in the table below:

Table 5.3: Final sample

	All events	Percent
Full sample	1021	100 %
No daily trading prices	161	16 %
Confounding events	153	15 %
Final sample	707	69 %

Furthermore, 50% of the observations are from Canada and the US, 37% from Europe and 13% from Asia-Pacific.

Table 5.4: Samples by region

	All observations		Inclusions		Deletions	
North						
America	352	50 %	226	32 %	126	18 %
Europe	263	37 %	151	21 %	112	16 %
Asia Pacific	92	13 %	53	7 %	39	6 %
Total	707	100 %	430	61 %	277	39 %

Note: Summary of samples across regions

Table 5.5: Historical inclusions and exclusions

Inclusions				Deletions		
Date	North America	Europe	AsiaPacific	North America	Europe	AsiaPacific
11.08.2016	71	58	13	0	0	0
01.09.2016	5	5	2	3	2	0
09.02.2017	9	1	2	2	4	3
01.03.2017	5	2	3	5	1	0
10.08.2017	10	7	2	3	2	3
01.09.2017	6	5	2	2	8	1
09.02.2018	6	6	3	9	13	2
01.03.2018	4	1	1	3	1	2
13.08.2018	5	9	3	10	9	5
03.09.2018	10	6	2	6	5	1
11.02.2019	7	1	5	7	8	2
01.03.2019	0	5	1	2	2	0
08.08.2019	16	7	1	4	11	2
29.08.2019	10	4	1	13	10	0
12.02.2020	12	2	3	7	3	5
03.03.2020	4	2	1	5	3	0
12.08.2020	17	9	0	11	11	7
01.09.2020	7	11	3	25	10	2
09.02.2021	10	5	4	6	4	2
01.03.2021	12	5	1	3	5	2
Total	226	151	53	126	112	39

Note: Table 5.3 presents inclusions and exclusions in the sample at the different event days across the regions.

6 Event study methodology

To calculate the effects of WWLI inclusion/exclusion we use the event study methodology. This methodology is a recognized tool to measure effects on company values caused by specific events (MacKinlay, 1997). To test the efficient market hypothesis, we search for abnormal stock returns caused by the effect of a specific event within a time window. This study aims to add to the existing research by performing an event study on the MSWI World Women's Leadership Index which to our knowledge, has not been done.

6.1 Event window

Defining the event window is an essential part of any event study. The event of interest regarding our hypotheses is the event of rebalancing the WWLI. The WWLI is rebalanced on a quarterly basis at the end of February, May, August and November (MSCI, 2017). MSCI announce the pro-forma indices nine business days ahead of the effective date. If we assume the inclusion or deletion from the WWLI reduces information asymmetries, the effect should occur when investors become aware of a companies' index inclusion/exclusion. Depending on how effective MSCI announcement methods are, this new information should reach investors at the day of announcement, i.e., nine business days before rebalancing. Therefore, we define the announcement day as an event of interest. Thus, we are left with the following events of interest: the announcement day and the effective rebalancing date.

With the established events of interest, the next step is selecting the event windows.

When forming event windows, the duration is the main consideration. Applying a shorter event window reduces the chances of capturing confounding events that affect returns. Nevertheless, a shorter event window might also fail to capture the total effect of the event. On the other hand, a longer window will capture the total effect at the risk of including confounding events. In most similar studies, the event window is larger than the events of interest to enable detection of effects surrounding the event of interest. Typically, the event window encompasses the day of interest as well as the following day. Additionally, days preceding the event might also be of interest to the study (MacKinlay, 1997). To tailor the event window to our case we believe it makes sense to include the nine days prior to the effective date to capture the effect of the

announcement. In addition to capturing the pre-event reactions, we also want to capture the reactions following the event. As some market participant may require a couple of days to receive and process the information, we also include the following 10 days. In our case, we apply a total event window of 22 days divided in the following sections:

Table 6.2: Event windows

Interval	Length
Full interval	[-11:10]
Pre announcement	[-11:-10]
Announcement	[-9:-7]
Event	[0:2]
Event long	[0:10]

The [0,2] event window is selected to detect abnormal returns around the effective date of the index rebalancing. If the news of a company’s inclusion in the index is new information to the investors and investors value the gender diversity commitment there is a reduction in the information asymmetry and we should observe positive abnormal returns. Furthermore, the index effect should have a similar effect if it occurs.

The [-9,-7] interval aims to capture abnormal returns on the day of announcement. As MSCI announces the pro forma index nine business days in advance, the new information regarding a firm’s gender equality practices may already reach investors on the date of announcement or the following days. Therefore, if this announcement gains publicity and reaches a sufficient number of investors, a similar effect is expected.

Then there is the long-term window [-11,10]. If the downward sloping demand curve hypothesis holds, we expect to see abnormal returns in this time-period as this captures the effect from investors who need time to react to the latest information and subsequently cause a sudden shift in demand.

In the event of information leakage, the effect of the index inclusion/exclusion may occur prior to the announcement date. Therefore, the event window [-11:-10] is included.

6.2 Estimation window

In order to detect abnormal returns, a benchmark for normal returns is required (MacKinlay, 1997). To find an appropriate benchmark we must select an estimation window, which is a time-period from which we derive the normalized returns. To prevent returns from the event window to influence the benchmark returns, the estimation window must be applied prior to the event window. Provided the estimation window is longer than 100 days, the results' sensitivity to the specific duration of the estimation window is not significant (Armitage, 1995). Furthermore, an estimation window of considerable length is required to prevent any bias caused by country-specific noise. In our study, which covers a multitude of countries there is a probability that the estimation window could pick up noise that is specific to the respective country (Park, 2004). Thus, it is even more important to apply a sufficiently long estimation window. Hence, this study applies an estimation window of 150 trading days. Moreover, selecting an estimation window too close to the event window may cause upward bias. As there is a chance for information leakage or investors who anticipate the index inclusion, returns may already increase prior to the event date. All though we consider this to be unlikely, we apply a 21-day quiet period before the announcement date.

6.3 Estimation of normalized returns and volume

After selecting a window for estimation, the next step is selecting an appropriate model to estimate the normalized returns. According MacKinlay (1997), there are two common approaches for modeling the normal returns: the simple market model and multi-factor models. As our study includes a multitude of countries, considering country-specific noise could speak in favor of multi-factor models. Nevertheless, there is no clear evidence to suggest that country-specific noise have a lasting and significant effect on returns through time (Ferson & Harvey, 1994). They proved that global and domestic financial markets were of almost equal importance in explaining returns on equity. This contradicts another study which suggests that a higher explanatory power is achieved by using a domestic index instead of a global one (Lundgren & Olsson 2010). Regarding choice of model, they find small differences between the simple market model and a multi-factor model. Furthermore, the securities in the sample and the benchmark indices are highly correlated in terms of both mean and median market

capitalization. Therefore, the multi-factor models will not necessarily yield results with more precision and reliability than the market model.

To aid in the decision of model, we regressed a sample of returns from a variety of countries on a domestic, regional and on the parent index. Domestic and regional indices showed similar levels of explanatory power. Thus, we opted for the simple market model with regional medium to large capital indices used for the estimation of normalized returns. The simple market model equation is:

$$E(r_{i,t}) = \alpha_i + \beta_i r_{m,t} + \epsilon_{i,t}$$
$$E(\epsilon_{i,t}) = 0$$

In which $r_{i,t}$ is the estimated return for security i at time t and $r_{m,t}$ is the estimated return on the market m at time t . α_i and β_i are the parameters of the model with the error term denoted as $\epsilon_{i,t}$, with an expected value of 0.

As the companies in our sample operate in different regions of the world, we use three different regional mid-large capital indices to control for location. We use the:

- MSCI North America Index
- MSCI Europe Index
- MSCI AC Asia Pacific Index

The MSCI North America Index consists of 715 large and mid cap constituents and covers 85% of the free float-adjusted market capitalization in the US and Canada (MSCI, 2021). The MSCI Europe Index captures large and mid-cap representation across 15 developed European domestic markets. With its 430 constituents it also covers 85% of the free float-adjusted market capitalization across the European Developed Markets equity universe (MSCI, 2021). The MSCI AC Asia Pacific Index captures large and mid cap representation across five developed markets and nine emerging markets in the Asia Pacific region.

6.4 Abnormal returns

Abnormal return is defined as the component of the return that is not due to systematic influences (Nasdaq, 2021). We use the traditional methodology of Fama, Fisher, Jensen, and Roll (1969) to calculate three measurements of abnormal returns. First, we calculate the abnormal return for each firm. It is calculated by subtracting the normal return from the observed return using the following formula:

$$AR_{i,t} = r_{i,t} - E(r_{i,t})$$

Where $r_{i,t}$ denotes the return of security i at time t .

We calculate the abnormal returns for every stock throughout the entire event window [-11, 10]. Then, the mean abnormal return is calculated by averaging the number of securities N . This gives us the *average abnormal return (ARR)* which is calculated with the following formula:

$$AAR = \frac{1}{N} \sum AR_{i,t}$$

Lastly, we calculate *cumulative average abnormal returns (CAAR)* by taking the sum of *average abnormal returns* over the T days in the event window. This is calculated as follows:

$$CAAR = \sum_{t=1}^T AAR_t$$

The next step is to test the statistical significance of the *CAAR*. This requires the variance of the *AAR* which is computed using the following formula:

$$\sigma_{AAR}^2 = \frac{1}{N-2} \sum_{T=t_0}^{T_1} (AAR_t - \overline{AAR})^2$$

In which T_1 and T_0 refer to the duration of the estimation window.

To test whether we can reject the null hypothesis that the $CAAR$ is equal to zero, we calculate the t-static by use of the following formula:

$$t_{CAAR} = \frac{CAAR}{\sqrt{L\sigma_{AAR}^2}}$$

In which L refers to the total number of days within the respective intervals.

6.5 Abnormal trading volume

We calculate the metric for trading volume by dividing the number of daily traded shares for a company by the number of shares outstanding. It is computed as follows:

$$V_{i,t} = \frac{VO_{i,t}}{n_{i,t}}$$

Where $V_{i,t}$ denotes the percentage of outstanding shares of security i traded at time t . The number of traded shares at time t is represented by $VO_{i,t}$. $n_{i,t}$ denotes the total numbers of outstanding shares. To prevent a non-normal distribution the data is log-transformed (Campbell & Wesley, 1993).

$$V_{i,t} = \ln(VO_{i,t})$$

In this thesis, the constant-mean-return model is used to compute the expected trading volume. It is estimated using the formula:

$$AV_{i,t} = V_{i,t} - \overline{V_{i,t}}$$

In which $\overline{V_{i,t}}$ is

$$E(V_{i,t}) = \overline{V_{i,t}} = \frac{1}{T} \sum_{t=T_1}^{t=T_2} V_{i,t}$$

The number of days in the estimation window is denoted by T . As with the estimation of returns, the estimation window consists of 150 trading days.

The statistical significance of the observations of abnormal trading volume is tested by a parametric test. It is estimated using the formula:

$$t_{AV,t} = \frac{\overline{AV}_t}{\sigma_{AV}}$$

In which the numerator is:

$$\overline{AV}_t = \frac{1}{N} \sum AV_{i,t}$$

And denominator is:

$$\sigma_{AV} = \sqrt{\frac{1}{T} \sum_{T=t_0}^{T_1} (AV_t - \overline{AV}_t)^2}$$

7 Empirical findings

This section covers the empirical findings obtained from this study. The significant observations and relevant results are described along with an assessment of the validity of our hypotheses.

7.1 Abnormal returns

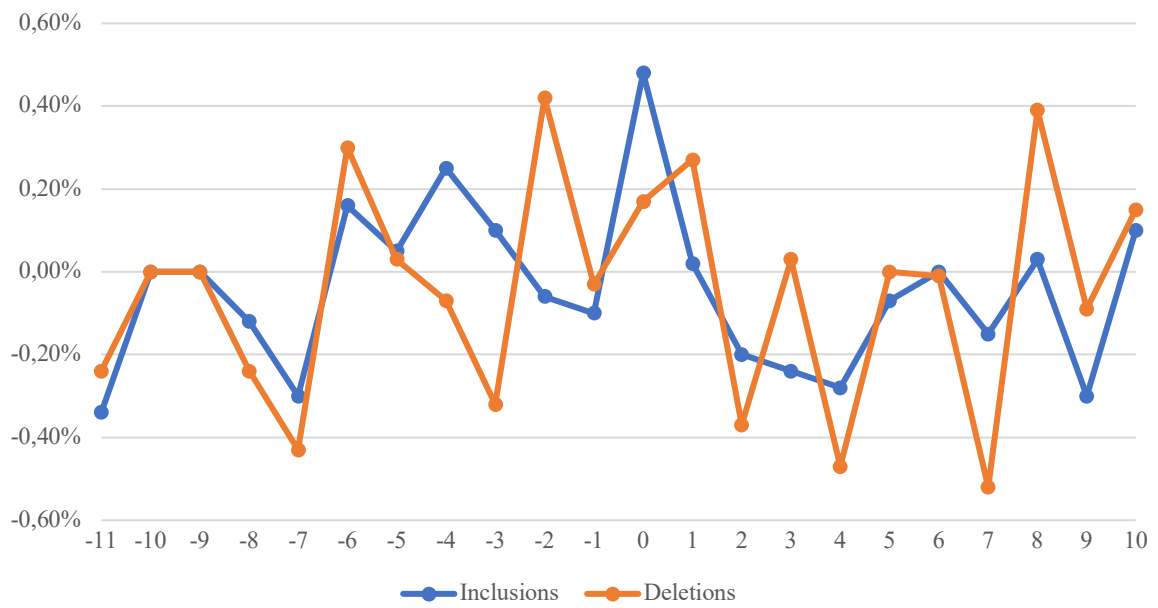
Table 7.7: AAR (daily)

Event	Inclusions			Deletions	
	Event Day	AAR (%)	t-stat	AAR (%)	t-stat
Announcement	-11	-0,15 %	-0,499	-0,16 %	-0,329
	-10	-0,01 %	-0,033	-0,12 %	-0,247
	-9	-0,37 %	-1,230	-0,25 %	-0,514
	-8	-0,09 %	-0,299	-0,20 %	-0,411
	-7	-0,26 %	-0,864	-0,39 %	-0,802
	-6	0,17 %	0,565	0,31 %	0,637
	-5	0,06 %	0,199	0,05 %	0,103
	-4	0,29 %	0,964	0,00 %	0,000
	-3	0,17 %	0,565	-0,20 %	-0,411
	-2	-0,10 %	-0,332	0,40 %	0,822
	-1	-0,08 %	-0,266	-0,01 %	-0,021
Event	0	0,54 %	1,795*	0,28 %	0,576
	1	0,01 %	0,033	0,25 %	0,514
	2	-0,22 %	-0,731	-0,39 %	-0,802
	3	-0,23 %	-0,765	0,04 %	0,082
	4	-0,28 %	-0,931	-0,49 %	-1,007
	5	-0,10 %	-0,332	-0,01 %	-0,021
	6	0,02 %	0,067	0,01 %	0,021
	7	-0,14 %	-0,465	-0,51 %	-1,048
	8	0,03 %	0,100	0,43 %	0,884
	9	-0,28 %	-0,931	-0,06 %	-0,123
	10	0,12 %	0,399	0,16 %	0,329

*Note: The table contains the daily average abnormal return (AAR) of the total sample for each day in the event window. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

Table 7.1 displays the average abnormal return for both included as well as excluded firms from 2016 to 2021. The only statistically significant result is found at the event day (0), which shows a significant positive return of 0.54% at the ten percent level for stocks that are included in the index. The rest of the observations in table 7.1 are not significant.

Figure 7.1: AAR over the event window



Note: Figure 7.1 presents daily average abnormal return of both included and excluded companies over the 22-day event window.

7.1.1 Inclusions

Table 7.8: Inclusions

Event	Inclusions	AM		EU		Asia	
		CAAR	t-stat	CAAR	t-stat	CAAR	t-stat
Long term	[-11,10]	0,52 %	0,284	-2,03 %	-1,330	-3,69 %	-2,852**
PA	[-11,-10]	-0,07 %	-0,121	-0,35 %	-0,725	0,01 %	0,024
AD	[-9,-7]	-0,55 %	-0,776	-0,98 %	-1,6581*	-0,84 %	-1,6763*
ED	[0,2]	0,66 %	0,932	0,05 %	0,085	-0,28 %	-0,559
ED Long	[0,10]	-0,03 %	-0,022	-1,05 %	-0,928	-2,08 %	-2,1678**

Note: PA = pre-announcement. AD = announcement date. ED = effective date

The table displays the cumulative average abnormal return of companies included to the index.

*Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

Hypothesis 1A states that inclusion in the WWLI leads to significant positive returns.

Table 7.2 shows the cumulative average abnormal return (CAAR) on included companies and functions as a measurement on the effect of inclusion and the validity of hypothesis 1A. There is no significant effect in any of the event windows in the North American region. In the European region, the results from the event window surrounding the announcement date [-9,-7] show a significant negative abnormal return of -0.84% at the ten percent level. The other event windows have no significant impact in Europe. Thus, it seems the investors to whom inclusion is a negative signal, receive this information on the announcement date and not the effective rebalancing date. From table 7.1, one may expect to observe significant positive abnormal returns in the effective date event window. However, when controlling for regions and applying a multi-day event window the positive effect observed on the event date in Table 7.1 is reduced to nonsignificant in the [0,2] event window in Table 7.2.

Furthermore, the result from the long-term event window [-11,10] in Asia shows a significant negative abnormal return of -3.69% at the one percent level. Moreover, the Asian region delivers significant negative abnormal returns of -0.84% at the ten percent level in the event window surrounding the announcement. This indicates that investors in the Asian-Pacific markets also react negatively to a company's inclusion in the MSCI WWLI.

In summary, no significant results are found in North America. Significant negative abnormal returns are observed in Europe in the announcement date window, and in Asia in the long-term

and announcement date window. The sustainability redundancy hypothesis might explain this phenomenon, as investors believe picking stocks based on their gender diversity commitment leads to sub-optimal portfolios. A similar result was found by Cheung and Roca (2013), who found that index inclusion in a sustainability index led to a significant decline in returns. The results from North America are insignificant, indicating that the index inclusion does not reduce information asymmetry to such an extent that we can observe significant abnormal returns.

From this, we can reject hypothesis 1A: Inclusion leads to significant positive abnormal returns. We accept hypothesis 3A: the effect of inclusions in the WWLI varies between geographical regions.

7.1.2 Deletions

Table 7.9: Exclusions

Event	Deletions Window	AM		EU		Asia	
		CAAR	t-stat	CAAR	t-stat	CAAR	t-stat
Long term	[-9,10]	-0,25 %	-0,075	-2,17 %	-1,352	0,83 %	0,349
PA	[-11,-10]	-0,16 %	-0,151	-0,54 %	-1,064	0,04 %	0,053
AD	[-9,-7]	-0,43 %	-0,331	-1,21 %	-1,9462*	-1,11 %	-1,203
ED	[0,2]	0,57 %	0,439	-0,25 %	-0,402	-0,10 %	-0,108
ED Long	[0,10]	-0,80 %	-0,616	-0,06 %	-0,050	-0,47 %	-0,266

Note: PA = pre-announcement. AD = announcement date. ED = effective date

The table displays the cumulative average abnormal return of companies excluded from the index.

*Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

Hypothesis 1B states that exclusion from the WWLI leads to significant negative returns. The results from the days surrounding the announcement date [-9,-7] show a significant negative abnormal return of -1.21% at the ten percent level in the European region. This indicates that the European markets penalize deletion from the index. Exclusion from the index means a company no longer meets the requirements for representation in the index, which sends a negative signal to investors who value firm commitment to the gender diversity cause.

Furthermore, the results indicate that it is the announcement date, and not the effective rebalancing date, that has the largest effect. No significant effects are found in any of the other regions.

Regarding our hypotheses, it seems hypothesis 1B: exclusion leads to negative abnormal returns only holds in the European region. Hypothesis 3B: the effect of exclusion in the WWLI varies between geographical regions is accepted.

7.2 Abnormal trading volume

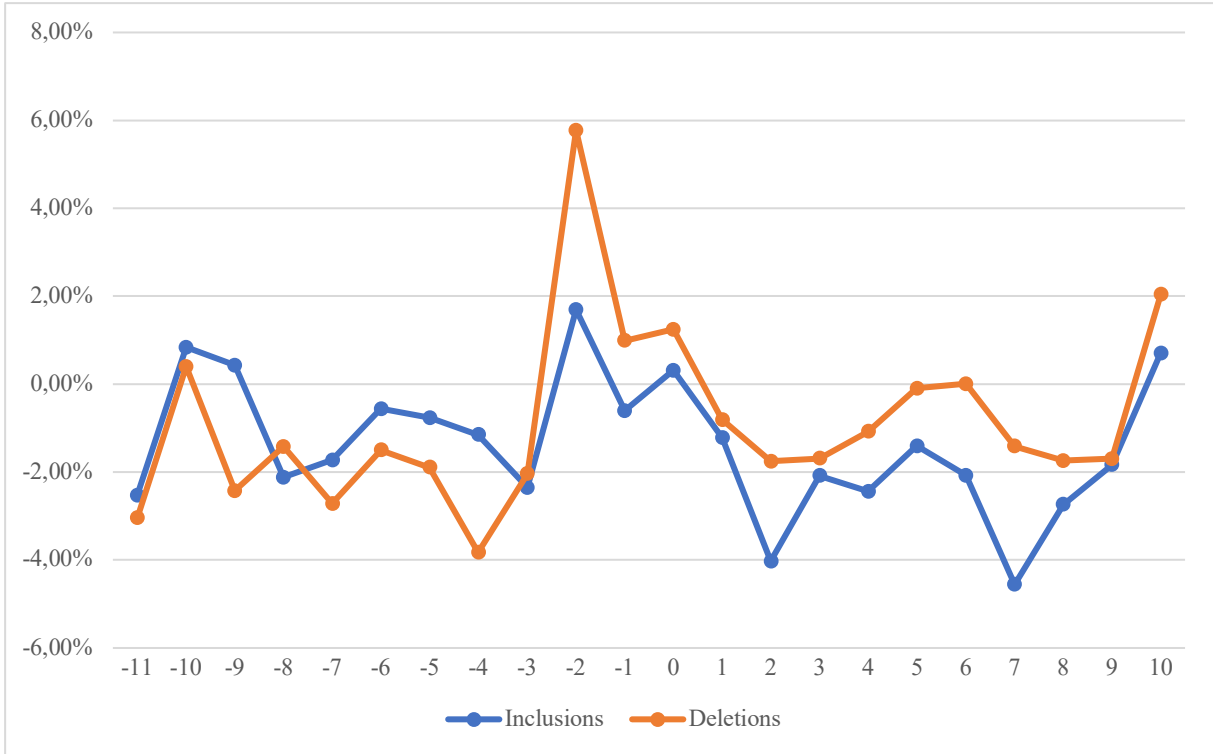
Table 7.10: Abnormal trading volume

Event		Inclusion		Deletions	
	Event day	AAV (%)	t-stat	AAV (%)	t-stat
Announcement	-11	-2,53 %	-0,686	-3,04 %	-0,757
	-10	0,83 %	0,226	0,40 %	0,100
	-9	0,43 %	0,116	-2,43 %	-0,604
	-8	-2,12 %	-0,574	-1,42 %	-0,354
	-7	-1,73 %	-0,468	-2,72 %	-0,677
	-6	-0,56 %	-0,152	-1,50 %	-0,373
	-5	-0,76 %	-0,207	-1,90 %	-0,472
	-4	-1,15 %	-0,311	-3,83 %	-0,953
	-3	-2,35 %	-0,637	-2,04 %	-0,507
	-2	1,70 %	0,459	5,78 %	1,438
	-1	-0,61 %	-0,164	0,99 %	0,247
Event	0	0,31 %	0,085	1,24 %	0,310
	1	-1,21 %	-0,329	-0,81 %	-0,202
	2	-4,03 %	-1,092	-1,76 %	-0,437
	3	-2,08 %	-0,565	-1,69 %	-0,420
	4	-2,44 %	-0,662	-1,08 %	-0,268
	5	-1,41 %	-0,382	-0,09 %	-0,024
	6	-2,07 %	-0,562	0,00 %	0,001
	7	-4,56 %	-1,235	-1,41 %	-0,352
	8	-2,74 %	-0,742	-1,74 %	-0,433
	9	-1,84 %	-0,498	-1,70 %	-0,423
	10	0,71 %	0,192	2,04 %	0,507

*Note: The table contains the daily average abnormal volume (AAV) of the total sample for each day in the event window. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

According to hypothesis 2A and 2B, we should observe positive (negative) abnormal trading volume on included (excluded) firms surrounding the announcement or rebalancing event. Table 7.4 presents no significant results on any of the days in the event window. Consequently, hypothesis 2A and 2B are rejected.

Figure 7.2: Average abnormal return



Note: Figure 7.2 presents daily average abnormal trading volume of both included and excluded companies over the 22-day event window.

7.3 Interpretation and discussion of results

The result of this paper yields few significant observations, which can be explained by a combination of the theoretical framework presented in section 3 of this study. The assumptions on which the hypotheses rely are:

- Market is efficient in semi-strong form
- Presence of information asymmetry
- Both inclusions and deletions in WWLI act as a signal to investors
- Index-effects are associated with the events.

MSCI are the exclusive holder of the information on which companies will be included or excluded from the index prior to the announcement day. The announcement will reduce information asymmetry and the new information can be viewed both positively and negatively by investors. As we assume that the markets are efficient in the semi-strong form, the efficient market hypothesis states that the news of the inclusion (deletion) in the index should be incorporated in the price of the stock within a few days. If there are existing expectations from investors that companies perform well in CSR standards this may already be incorporated in the price. In that case, inclusion in the WWLI will not lead to significant observations.

Furthermore, the hypotheses of this study assume that information asymmetry between firms and the market is present. Inclusions and exclusions act as signals to investors that help reduce the existing asymmetries. Inclusions in the WWLI verifies a firm's high gender diversity standards, whereas an exclusion holds companies accountable for their lack of sustained efforts on the issue. This way, MSCI functions as an unbiased intermediary between firms and the market.

The increasingly present phenomenon of sustainability reporting may also provide explanation to the lack of significant results. According to a study by KPMG, 96% of the world's 250 largest companies report on their sustainability performance compared to 35% in 1999 (Threlfall, King, Shulman & Bartels, 2020). Even though investors consider inclusion in the WWLI to be a positive signal and it reduces the asymmetric information, it may not be

considered valuable in an economic sense. Consequently, the decrease in the present asymmetries may not suffice to create an effect on price as the expectation of gender diversity already exists and is absorbed in the price. This may also explain the findings of Durand et al. (2019), who articulate that inclusion in or exclusion from a sustainability index does not have significant effects on trading volume when compared to other comparable firms in the same industry.

Lastly, the hypotheses of this study assume that an index effect occurs in the event of inclusion and exclusion. As per the price pressure hypothesis, the demand for securities included in an index increases sharply close to the date of inclusion. Trading volume consequently increases, and prices diverge from their information-efficient values. The price pressure hypothesis assumes that the inclusion in the index provides no new information on its own. The increase in price represents the compensation to shareholders for the transaction costs and portfolio risk they assume when providing liquidity because of the demand shift. Moreover, this hypothesis assumes that a substantial number of investors pay attention and follow the index and readjust their portfolio in accordance with the index updates. To our knowledge, there is no ETF that tracks the WWLI. This absence of an ETF tracking the WWLI may be an explanation to the low number of significant observations. Other similar event studies on more established and followed indices involve ETFs tracking the index who as a result of the index rebalancing cause significant increase in demand and trading volume. In our regression we have not controlled for the companies' weight in the index. The constituent weighting varies between 0.1% and 0.5% percent. With difference in weights, presence of ETFs tracking the index would make the effects of inclusion and exclusion vary in size, as larger weighted firms would experience a larger impact on demand by the index rebalancing.

The hypotheses regarding information signaling, awareness and liquidity articulate that inclusion in the WWLI should produce a price increase as the event conveys a positive signal and the firms attract more notice. Information asymmetries are reduced by the signal the inclusion represents leading to a reduction in information costs and bid-ask spreads. Thereby, value is increased. Nevertheless, depending on how investors regard gender diversity the increased attention may not produce an impact on the security price.

Positive effects on returns may be explained by the sustainability taste hypothesis (Cheung & Roca, 2013). This hypothesis proposes that investors with preference for sustainable companies will receive additional utility from these stocks in addition to the returns yielded. Combined with the imperfect substitutes hypothesis this suggests that investors choose stocks with regard to their attributes and individual preference. Hence, when companies are included in the WWLI this hypothesis suggests that the demand will increase causing the price to rise as well.

The same scholars who introduced the corporate sustainability taste hypothesis, also formed the sustainability redundancy hypothesis (Cheung & Roca, 2013). This hypothesis suggests that picking stocks on the basis of their corporate sustainability performance leads to suboptimal portfolios in regard to minimizing risk and maximizing return. Hence, the sustainability redundancy hypothesis implies that by producing suboptimal portfolios, inclusion in the WWLI should be interpreted as a negative signal and lead to increased trading volume and negative returns. This may explain the negative abnormal returns observed in the Asia Pacific region. Furthermore, the negative reactions explained by this theory may also offset the effect of investors who perceive the inclusion positively. In that case, the effect would not be visible in our results and would explain why we find few significant observations.

With a downward sloping demand curve caused by imperfect substitutes, share prices will be sensitive to shocks in demand (Shleifer, 1986). When the demand for a security suddenly increases, the price will subsequently increase and reach a new equilibrium, and the other way around when demand decreases. Hence, when a firm is included in the WWLI an increase in demand should follow as the event attracts investors who want to include gender-diverse companies in their portfolio. In this study, no significant observations on abnormal trading volume are found which could explain the lack of positive abnormal returns observed.

Assuming the observed reactions by the markets serve as indicators for how the markets value gender-diversity, the North American region appear to be indifferent, as no significant results are found. In the Asia Pacific, investors penalize inclusion which indicates that gender-diversity is not valued by this market. The European region seems to penalize both inclusion as well as exclusion as significant negative abnormal returns are observed in connection to both events. In a similar event study on the DJ Sustainability Index, Cheung and Roca (2013)

also found negative abnormal returns associated with both included and excluded firms. Investors who penalize inclusions are most likely doing so based on their belief that imposing gender-specific requirements to board and director selection leads to a smaller pool of candidates and consequently a suboptimal solution. If that is the case, the same investors may not reward a deleted company in proportion with their punishment of an included firm. This way, it may occur that investors who penalize inclusions, do not reward deletions. And the investors who penalize deletions do not reward inclusions.

The mostly negative results observed corroborate the findings by Cheung and Roca (2013) and Consolandi et al. (2009). They present regional and culture differences as part of the explanation as to why Asia-Pacific considers gender-diversity to be more constraining than value-adding. This is also evidenced by research that finds that the Asia Pacific is lagging behind Europe and North America in terms of gender diversity in top level management (Woetzel et al., 2018).

7.4 Cross-sectional analysis

To investigate if company-specific traits interfere with the results, a cross-sectional analysis is performed. The results from section 7.1 indicate that the only significant effects occur surrounding the announcement date. Consequently, the cumulative abnormal returns (CAR) of each security in the [-9:-7] event window is used as the dependent variable for this analysis. The process entails regressing the CARs on a range of variables to examine the sensitivity of the securities' individual CARs to different financial indicators. In addition, dummy variables representing the different regions are included to assess the validity of hypothesis 3A and 3B, with North America as the baseline region. Lastly, 18 companies are removed from the sample due to missing data on any of the chosen financial indicators.

The analysis controls for these company-specific characteristics:

Leverage, which is represented by the debt/asset ratio. Data on companies' debt and assets is retrieved from the last financial publication prior to the inclusion/exclusion. As a negative relationship between company leverage and returns is found in empirical research, it is included in this analysis (Fama & French, 1992).

Price to book ratio (P/B) is used to compare firms on their market value relative to their book value. Firms with low P/B, referred to as value stocks, are found to yield higher returns in the long-run compared to companies with higher Price/Book ratios (NBIM, 2012).

Market capitalization at the time of inclusion/exclusion is used a proxy for company size. This indicator is chosen as it has significant influence on returns (Fama & Fench, 1992). The authors also suggest that smaller firms tend to yield higher returns than larger companies. As the firm-size distribution is right-skewed, this variable is log-transformed (Halvarsson, 2013).

Price to earnings ratio (P/E) is used as tool to compare relative value of stocks. As with P/B ratios, companies with low price to earnings ratios are referred to as value stocks which in the long-run tend to outperform companies with higher price/earnings ratios.

Table 7.11: Cross-sectional analysis on abnormal returns

	Dependent variable:			
	CAR			
	(Inclusion)	(Deletion)	(Inclusion)	(Deletion)
D/A	0.0004 (0.007)	-0.001 (0.003)	0.002 (0.007)	-0.001 (0.003)
P/B	0.0000 (0.00003)	-0.0001 (0.00005)	-0.00000 (0.00003)	-0.00005 (0.00005)
Log(marketcap)	0.0001 (0.001)	0.0003 (0.001)	-0.00005 (0.001)	0.0005 (0.001)
P/E	-0.00001 (0.00002)	0.00000 (0.00001)	-0.00001 (0.00002)	0.00000 (0.00001)
AsiaPacific			-0.009** (0.004)	-0.006 (0.005)
Europe			-0.006** (0.003)	-0.007* (0.004)
Constant	0.003 (0.011)	-0.001 (0.014)	0.007 (0.011)	0.001 (0.014)
Observations	418	271	418	271
R ²	0.001	0.005	0.024	0.020
Adjusted R ²	-0.008	-0.010	0.009	-0.003
Residual Std. Error	0.025 (df = 413)	0.028 (df = 266)	0.025 (df = 411)	0.028 (df = 264)
F Statistic	0.139 (df = 4; 413)	0.342 (df = 4; 266)	1.666 (df = 6; 411)	0.887 (df = 6; 264)

Note: Table 7.5 presents the cumulative abnormal returns from the [-9:-7] event window regressed on company-specific financial indicators and regional dummy variables. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The results in table 7.5 suggest that the selected firm-specific characteristics have no significant effect on the CARs. The Asia-Pacific dummy indicates a significant negative effect from inclusion on firms from this region, which is in accordance with the results from section 7.1. Furthermore, the Europe dummy has a significant negative effect on CARs for both inclusion and exclusions. Nevertheless, the R² estimation indicates that the regression has low explanatory power. To test for heteroskedasticity, a Breusch–Pagan test was conducted.

Table 7.12: Cross-sectional analysis on abnormal trading volume

	<i>Dependent variable:</i>			
	CAV			
	(Inclusion)	(Deletion)	(Inclusion)	(Deletion)
D/A	0.027 (0.148)	-0.003 (0.039)	0.005 (0.148)	-0.006 (0.039)
P/B	-0.0004 (0.001)	-0.0004 (0.001)	-0.0004 (0.001)	-0.0004 (0.001)
Log(marketcap)	0.009 (0.023)	-0.025 (0.020)	0.008 (0.023)	-0.023 (0.020)
P/E	0.0002 (0.0004)	-0.00002 (0.0002)	0.0001 (0.0004)	-0.00004 (0.0002)
AsiaPacific			0.130 (0.083)	-0.075 (0.074)
Europe			-0.013 (0.060)	-0.033 (0.052)
Constant	-0.227 (0.238)	0.218 (0.195)	-0.222 (0.241)	0.219 (0.196)
Observations	418	271	418	271
R ²	0.002	0.009	0.009	0.013
Adjusted R ²	-0.008	-0.006	-0.006	-0.010
Residual Std. Error	0.537 (df = 413)	0.391 (df = 266)	0.536 (df = 411)	0.392 (df = 264)
F Statistic	0.192 (df = 4; 413)	0.592 (df = 4; 266)	0.608 (df = 6; 411)	0.579 (df = 6; 264)

Note: Table 7.6 presents the cumulative abnormal trading volume from the [-9:-7] window regressed on company-specific financial indicators and regional dummy variables. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The results in table 7.6 suggest that the selected firm-specific characteristics have no significant effect on the CAVs. Furthermore, the regional dummy variables are also insignificant. The absence of significant variables also aligns with the R² estimation which indicates that the regression has low explanatory power. To test for heteroskedasticity, a Breusch–Pagan test was conducted.

7.5 Robustness

The validity of the estimation window was tested by performing a robustness check. When comparing the results from our estimation window of 150 trading days to the results when using an estimation window of 100 and 200 trading days, only minor variations are observed. No new significant observations appear, and the existing significant results remain as such. The results are shown in the Appendix in table A1 and A2

8 Conclusion

This thesis aims to study how the market reacts to firms being included in or excluded from the MSCI World Women's Leadership Index. Furthermore, the geographical differences in investors' approach to portfolio management is explored. The markets' reactions to the event of inclusion or exclusion are estimated by observing trading prices of the relevant stocks to detect significant abnormalities in both the positive and negative direction. The study looks at different event windows to capture the specific period in which the market reacts to the new information communicated by the index. In a broader context, the thesis investigates investors' opinions towards firms that are committed to the gender diversity and equality cause.

A significant positive price effect is observed on the day of the index rebalancing for firms included in the index in the total sample covering all three regions. This supports hypothesis 1A and indicates that inclusion in the WWLI leads to significant positive abnormal returns.

When studying geographical subsamples, the results indicate a significant negative valuation of firms' gender equality commitment in both the European and Asia-Pacific region. This also corroborates with the findings by Cheung and Roca (2013), who observed significant negative abnormal returns associated with inclusion in a sustainability index. A possible explanation for this phenomenon is that corporate sustainability entails imposing extra and redundant constraints on a company, thus preventing an optimal portfolio. The North American region yields only insignificant results. These findings do not support hypothesis 1A and B. They do, however, support the hypothesis that the inclusion effect varies across regions.

Deleted firms only experience negative reactions in the European region, in which negative abnormal returns of significance is observed. This supports the hypothesis that exclusion in the index leads to significant negative abnormal returns. In addition, these findings indicate that the regions react differently. Regarding abnormal trading volume, no significant results are found.

To conclude, our study finds existing evidence to suggest that investors value firm commitment to gender equality. Furthermore, the results also indicate that the inclusion in the WWLI is negatively viewed by some investors. Moreover, we observe significant differences in how regions react. Most notably, in the Asia-Pacific and European regions wherein investors punish firms that are included. Moreover, deletions from the index only seem to yield significant abnormal returns in Europe, in which the market's reaction indicates that investors punish firms who perform poorly on gender equality measurements.

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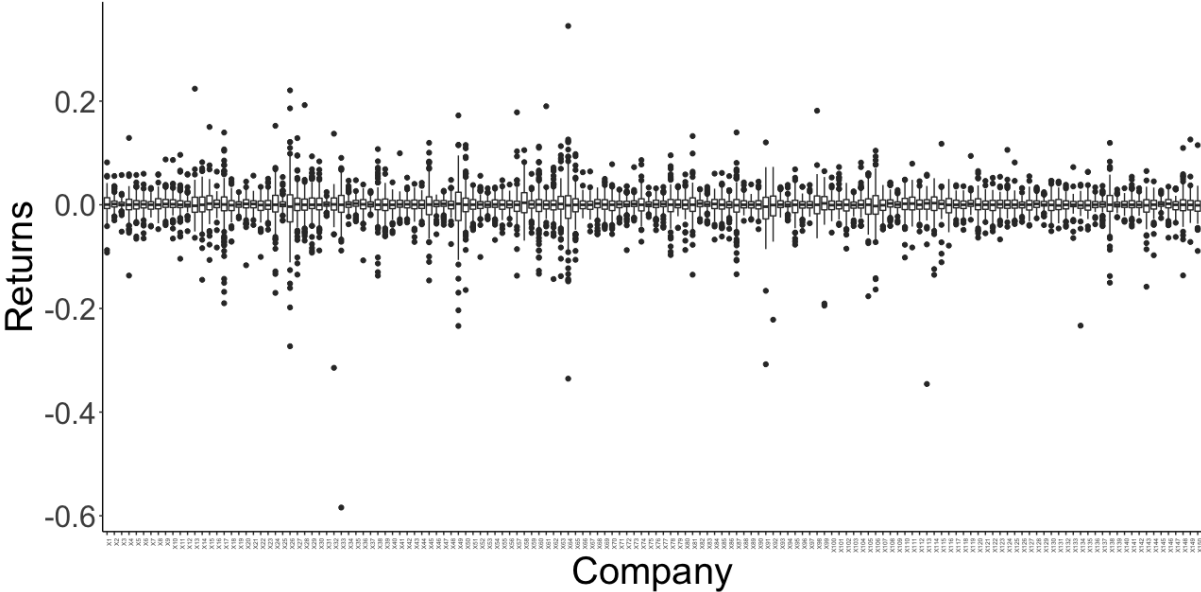
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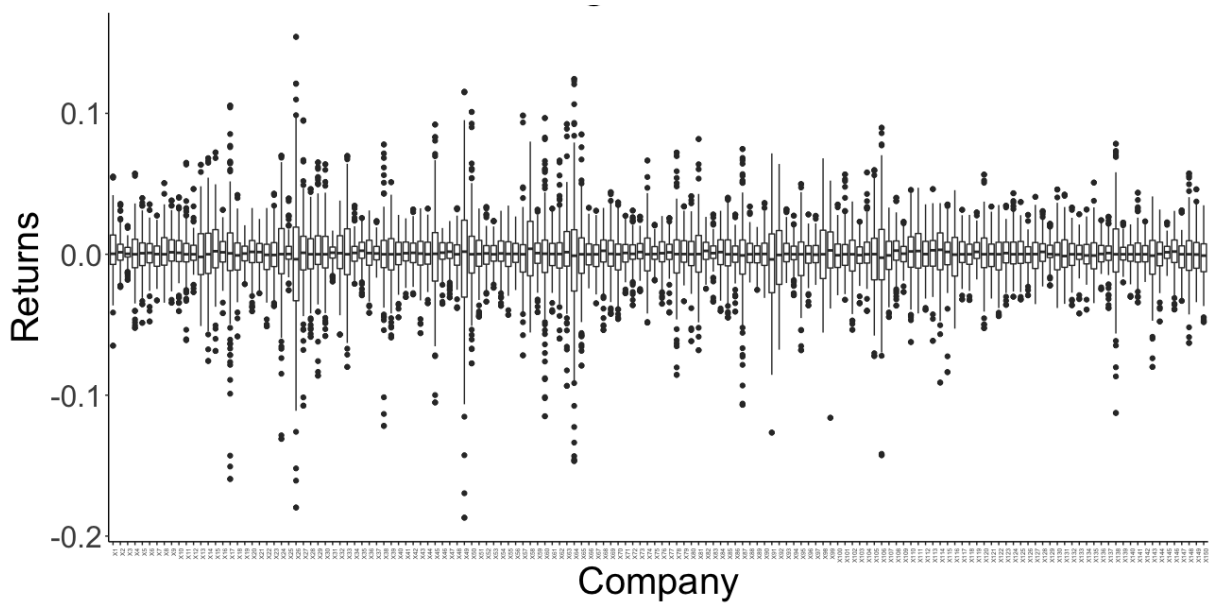
Appendix

Figure A.1: Unprocessed data



Note: Figure A.1 presents a boxplot of untreated data. Singular dots illustrate outliers that are outside the upper bound of $Q3+1,5*IQR$ and lower bound of $Q1-1,5*IQR$.

Figure A.2: Winsorized data



Note: Figure A.2 presents the processed data winsorized at the 1st and 99th percentiles.

Table A.1: Robustness check 200 trading days

Event	Inclusions	AM		EU		Asia	
	Event window	CAAR (%)	t-stat	CAAR (%)	t-stat	CAAR (%)	t-stat
Long term	[-11,10]	0,41 %	0,224	-1,95 %	-1,278	-3,88 %	-2,998**
PA	[-11,-10]	-0,08 %	-0,138	-0,35 %	-0,725	-0,01 %	-0,024
AD	[-9,-7]	-0,56 %	-0,790	-0,92 %	-1,557	-0,86 %	-1,7157*
ED	[0,2]	0,64 %	0,903	0,06 %	0,102	-0,31 %	-0,619
ED Long	[0,10]	-0,08 %	-0,059	-1,01 %	-0,892	-2,18 %	-2,2713*

Event	Deletions	AM		EU		Asia	
	Event window	CAAR (%)	t-stat	CAAR (%)	t-stat	CAAR (%)	t-stat
Long term	[-9,10]	-0,37 %	-0,110	-2,00 %	-1,246	0,44 %	0,185
PA	[-11,-10]	-0,17 %	-0,160	-0,52 %	-1,024	0,00 %	0,000
AD	[-9,-7]	-0,45 %	-0,346	-1,19 %	-1,9138*	-1,15 %	-1,246
ED	[0,2]	0,56 %	0,431	-0,23 %	-0,370	-0,16 %	-0,173
ED Long	[0,10]	-0,84 %	-0,647	0,02 %	0,017	-0,67 %	-0,379

Table A.2: Robustness check 100 trading days

Event	Inclusions	AM		EU		Asia	
	Event window	CAAR (%)	t-stat	CAAR (%)	t-stat	CAAR (%)	t-stat
Long term	[-11,10]	1,39 %	0,758	-1,61 %	-0,994	-3,74 %	-2,8903**
PA	[-11,-10]	-0,03 %	-0,052	-0,32 %	-0,625	0,01 %	0,024
AD	[-9,-7]	-0,43 %	-0,605	-0,84 %	-1,339	-0,85 %	-1,6961*
ED	[0,2]	0,80 %	1,126	0,07 %	0,112	-0,29 %	-0,579
ED Long	[0,10]	0,15 %	0,110	-0,84 %	-0,699	-2,10 %	-2,1883*

Event	Deletions	AM		EU		Asia	
	Event window	CAAR (%)	t-stat	CAAR (%)	t-stat	CAAR (%)	t-stat
Long term	[-9,10]	2,24 %	0,666	-1,35 %	-0,841	1,60 %	0,670
PA	[-11,-10]	-0,01 %	-0,009	-0,46 %	-0,906	0,09 %	0,119
AD	[-9,-7]	-0,10 %	-0,077	-1,10 %	-1,769*	-0,97 %	-1,049
ED	[0,2]	0,96 %	0,737	-0,14 %	-0,225	0,00 %	0,000
ED Long	[0,10]	-0,11 %	-0,084	0,32 %	0,269	-0,18 %	-0,102